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THE MONETARY AND REGULATORY IMPLICATIONS OF CHANGES IN THE BANKING INDUSTRY

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Introduction

During the last fifteen to twenty years, a variety of forces have had an impact on the structure, profitability and stability of the banking industry in the industrial countries. New technologies, financial innovations and liberalisation of national as well as international markets have changed the environment in which banks operate and have also had implications for the conduct of monetary policy and the fundamental stability of the financial sector. Banks have had to adjust to increased competition from other financial institutions as well as to changes in the regulatory environment and, in some cases, these changes have contributed to serious financial instability. In many countries, banks have responded by looking for economies of scale and scope, through consolidation and a widening of the range of product and services offered. At the same time, the rise in concentration and the blurring of distinctions between bank and non-bank financial intermediaries has raised further questions regarding system stability and the lender of last resort function of central banks.

Against this background and with a view to exploring macro as well as microeconomic implications, the topic of the Central Bank Economists' Meeting held at the BIS on 29th and 30th October 1998 was chosen to be:

"The monetary and regulatory implications of changes in the banking industry"

The papers submitted by the participating central bank economists were presented and discussed in four sessions covering the driving forces and key manifestations of changes in the intermediation process; the implications for the transmission of monetary policy changes; the implications for financial stability and payments systems; and policy implications. The remainder of this Introduction summarises the papers in the order in which they were presented, concluding with a brief review of the main issues discussed.

Session 1: Driving forces and key manifestations of changes in the intermediation process

In the first paper presented in this session, *T. F. Brady (Board of Governors of the Federal Reserve System)* starts by reviewing developments in the US banking sector over the last ten years, emphasising the effects of changes to the regulatory structure, advances in managerial practices and the consolidation of the banking system on competition, bank credit and profitability. All in all, it appears that competitive pressures have fostered improvements in managerial standards and, together with innovations, contributed importantly to the strong gains in bank profits and to the restoration of capital ratios to generally high levels.

The paper next discusses some of the regulatory implications of recent developments, in particular changes to the regulatory environment that have not yet been tested. The paper points to potential areas of concern, notably the potential for banks to use loan securitisation as a means to circumventing the 8% risk-based capital requirement and the difficulties of interpreting banks' capital ratios in such conditions. The author then goes on to consider some possible solutions, such as allowing bank examiners to make judgemental adjustments to estimates of banks' capital needs and possibly requiring banks to issue some minimum amount of subordinated debt. Recognising the implicit trade-off between the need to protect the safety of the banking system and avoiding discouraging practices that are risky but on balance beneficial, the author also points out that some regulatory capital arbitrage can be useful as a "safety valve".

In the final section of the paper, the author discusses the implications for the conduct of monetary policy, concluding, however, that most of the changes in the banking system have had little effect on the implementation of monetary policy and the transmission mechanism. In part, this is the result of counterbalancing effects. For instance, while the securitisation of loans is likely to have made the cost of credit more sensitive to monetary policy, it has also given banks more leeway to raise funds

independent of the level of reserves in the banking system and thus tended to weaken the credit channel of monetary policy.

Against the background of a sharp fall in profit margins of Italian banks in the early 1990s, the paper by *A. Generale and G. Gobbi (Bank of Italy)* studies the link between bank profitability, efficiency and corporate governance, using a sample of about 300 banks spanning the period 1984-96. By estimating a reduced-form equation for profits, the authors find that indicators of both allocative and operating efficiency contribute significantly to the dispersion in profit rates. More particularly, the banks with higher-than-average credit risk did not succeed in getting sufficiently high lending premia. Profitability also appears to be negatively correlated with per capita staff costs, suggesting that the benefits from employing more costly (and presumably more skilled) human resources are more than offset by the additional costs. The findings regarding the effects of corporate governance are less clear-cut although there is some evidence that privately owned banks have performed better than publicly owned banks.

The final section of the paper studies the relationship between profitability and changes in top management. Using a probit model, the paper finds that banks with higher management turnover had indeed experienced lower profitability and a greater number of bad loans in prior years. However, the relationship is rather weak and the hypothesis that it would be stronger for private than for public banks is rejected by the data. Moreover, because the period for this analysis is rather short (only 1994-96) it is uncertain whether a change in management is likely to improve future profitability.

In their paper on restructuring of the Belgian banking sector, *T. Timmermans and P. Delhez (National Bank of Belgium)* first highlight some distinguishing characteristics of Belgian banks. The first such characteristic is the very high proportion of interbank claims and liabilities on the balance sheet which reflects the openness of the economy. Second, Belgian banks hold a relatively large amount of public debt while the share of claims on individuals and companies is comparatively small. While the effects of this structure have been positive in terms of risks and overall stability, they have been rather negative in terms of profitability and returns on assets. Moreover, in periods when markets are undergoing profound changes, the low capitalisation ensuing from the structure of assets tends to narrow the room for manoeuvre. In this context, the major risk facing the Belgian banking sector seems to be a strategic one. Since banks have to adapt to a changing environment from a low capital base and relatively weak profitability, they could be tempted to adopt risky or ill-designed strategies.

So far the banks' adjustment to the various changes and challenges have mostly taken place within existing business structures. In particular, by creating mutual funds, banks have turned the process of disintermediation to their own advantage and thus managed to increase their non-interest income. Similarly, by integrating new technologies, they have developed new distribution channels without actually reducing their extended network of branches. However, this adaptation through internalisation has its limits and the introduction of the euro will force banks to reconsider their strategies. Thus, in order to reduce costs, banks will have to be more selective in organising their network. In addition, it will be necessary to develop tailor-made products from a rather traditional basis of activities to increase revenue.

Until a few years ago, the adaptation process of Belgian banks was proceeding rather slowly, as favourable economic conditions tended to reduce banks' sense of urgency to restructure. In particular, the move to low inflation and the resulting fall in interest rates have temporarily boosted income from maturity transformation. More recently, banks have been more pro-active. The number and importance of mergers and acquisitions have been striking, with all major banks having radically changed their shareholder structure. This somewhat delayed reaction could, however, entail risks and have implications for the prudential authorities as well. Indeed, many banks have to tackle the organisation and management of complex mergers or acquisitions simultaneously with the introduction of the euro, the year 2000 issue as well as a possible shift to less favourable economic conditions.

Mergers and acquisitions and their implications for competition and prudential regulations also figure prominently in the paper by *C. Braun, D. Egli, A. Fischer, B. Rime and C. Walter (Swiss National Bank)*. Following a brief review of the evolution and restructuring of the Swiss banking sector and the implications for monetary policy, the authors turn to the impact of the UBS-SBC merger on systemic

stability. The process of consolidation made a quantum leap with this merger, as, for many cantons, the increase in concentration matches that of the last dozen years. Moreover, the fact that the new bank will have a balance sheet larger than Switzerland's nominal GDP, combined with an assumption that it will be prone to take on new risks to increase returns, has significantly raised the costs of potential failure. In response, the prudential authorities have established a new group specialised in monitoring the activities of the two largest banks and relying more on on-site inspections than has been the case in the past.

The last part of the paper is an empirical analysis of the effects of the merger on concentration and competition in retail banking in Switzerland. Drawing on two indices of concentration, the authors first evaluate the effects of the UBS-SBC merger on concentration and then turn to estimating the relationship between concentration and competition. To this end they focus on two products (saving deposits and mortgage loans) and distinguish between three hypotheses: the contestable market hypothesis, whereby banks in oligopolistic markets do not exploit their market power; the structure performance hypothesis, which predicts a positive (negative) relationship between concentration and mortgage rates (rates on saving deposits); and the market efficiency hypothesis which reverses the asummed causality links by postulating that efficient banks increase their market shares (and thus concentration) by offering more favourable rates to their customers.

The empirical results are ambiguous. From cross-cantonal data it appears that the efficient market hypothesis cannot be rejected for smaller cantons whereas for medium-sized and large cantons it is the contestable market hypothesis which cannot be rejected. At the same time, using time series data, the structure performance hypothesis cannot be rejected for deposit rates whereas, for mortgage rates, the contestable market hypothesis cannot be rejected. Despite the ambiguity, however, it appears that anti-trust policies should concentrate on *changes* in concentration ratios rather than on *levels*.

The main purpose of the paper by *I. Fuentes and T. Sastre (Bank of Spain)* is to evaluate the implications of two important phenomena affecting the structure and performance of Spanish banks in the 1990s: the process of consolidation through mergers and acquisitions and the growing competition in prices which has been particularly notable in some sectors and may also have influenced the transmission mechanism of monetary policy. More specifically, the paper explores these issues using two different tools: a model for the determination of deposit and credit interest rates in an imperfectly competitive market and a case-by-case analysis of eighteen mergers over the last ten years, which evaluates the impact on performance by comparison with a control group.

Three types of conclusion are drawn from the empirical analysis. First, the consolidation process does not seem to have affected the growing degree of competition. In particular, in an environment characterised by intense competition, merged banks do not seem to have taken advantage of their increased market share. Second, while some mergers and acquisitions have been aimed at expanding business and others at reducing costs and improving efficiency, the results obtained in terms of profitability per unit of asset suggest that it is virtually impossible to simultaneously expand business and reduce costs. Third, all mergers and acquisitions have been accompanied by an improvement in capital adequacy ratios, which have not only facilitated investment growth but also strengthened the competitive position of the merged institutions.

In the last paper presented at this session, *O. De Bandt (European Central Bank)* discusses the relative importance of EMU as a factor provoking changes in banking structure and performance. According to the paper, EMU is likely to introduce a regime shift which will exacerbate the underlying trends (liberalisation, globalisation, technological changes, disintermediation and concentration) affecting the medium to long-run prospects of the European banking industry and could even play a catalytic role. EMU will also increase the depth of money and financial markets, which, in turn, will provide new challenges to banks and may reinforce the disintermediation process. The main effect, however, will be to increase the level of competition in the different market segments. The paper provides indicators showing that, at least at the beginning of Stage Three, concentration will be lower than in other areas of comparable size (for instance, the United States). Following the transitional rise in costs associated with the changeover to the euro, EMU should, in the medium run, strengthen the competitiveness of EU institutions.

Session 2: Implications for the transmission of monetary policy changes

The paper by *W. Engert, B. S. C. Fung, L. Nott and J. Selody (Bank of Canada)* first highlights the primary forces (the information and technology revolution, changing financial habits of the "baby boom" generation, and the volatile inflation and interest rate environment of the last thirty years) that have motivated and influenced the financial restructuring process in Canada. As a result of these forces, but also facilitated by legislative changes, there has been a considerable amount of consolidation. Moreover, assets have been redistributed among participants, new markets have developed and significant improvements have been made to the range of financial investment choices available to consumers.

However, despite the significant financial restructuring over the last thirty years, there is little evidence that the monetary transmission mechanism has been affected. For instance, the broad business-cycle characteristics and correlations in the 1990s are similar to those of the previous three decades. Moreover, even though monetary data have been affected, stability tests of the various models used by the Bank are not suggestive of any fundamental changes in the transmission mechanism. In some sense, these findings are not surprising as the transmission of monetary policy changes in Canada has for many years been driven by market forces and most of the financial restructuring has reinforced market forces.

In the final part of the paper, the authors discuss the implications for financial stability, noting that several innovations in the supervisory regime over the last decade have helped to maintain financial stability. They then consider a number of factors that will continue to affect financial restructuring with implications for regulatory arrangements. These include the increasing complexity of financial services, the blurring of distinctions among financial service firms, greater international linkages and improved risk proofing of clearing and settlement systems.

In the first of two contributions from the *Bank of France, S. Matherat and J.-L. Cayssials* review the major changes in the banking environment and structures in France since the mid-1980s and evaluate their implications for the regulatory authorities. Among the most significant changes are the gradual return of banks to the private sector; a steadily growing volume of international activity; a rapidly expanding role of trading activities through the growth of banks' securities portfolios and off-balance-sheet transactions; and a sharp decline in banks' intermediation business, due to more intensive competition from liberalised and booming capital markets against a background of slowing economic growth One result of the deregulation and restructuring process has been a change in the composition of banking profits in favour of income from trading activities. Moreover, as in many other countries, the various changes have led to a complete overhaul of the structure of the French banking sector, with important implications for financial stability and banking supervision. Finally, reflecting the change in composition, profitability has become more volatile and highly sensitive to movements in capital markets as well as international developments. Thus French banks suffered a severe decline in profits in the early 1990s, from which, however, they are now recovering.

The second contribution from the *Bank of France* by *C. Pfister and T. Grunspan* analyses the implications of bank restructuring for the transmission mechanism and the implementation and definition of monetary policy. As regards the transmission mechanism, the authors estimate the speed and the extent of the passthrough of changes in policy rates into bank lending rates over different periods. From the estimates, which are all derived using an error correction model, it appears that the short-run response of both short and longer-term bank lending rates to firms has increased significantly compared with the 1980s, even though the long-run passthrough is still less than complete. The estimates also reveal that, because of more intense competition, banks are no longer able to pass on their funding costs to their corporate customers. In contrast, when lending to individuals, banks are still able to pass on their full funding costs, including those related to sources at regulated rates. Despite these results, it would be premature to conclude that deregulation has strengthened the interest rate channel of the transmission mechanism. First, a large part of banks' liabilities are still remunerated at regulated rates, which are far stickier than marker rates. Second, long-term rates play an important role in the financing of the French economy and they are not under

the direct influence of the Bank. Finally, the increasing role of capital markets is likely to have weakened the credit channel and thus the influence of policy interest rates.

As regard the implementation and definition of monetary policy, one consequence of deregulation and the liberalisation of capital flows has been the abolition of direct control instruments as well as tighter constraints on the setting of more market-related instruments, such as reserve requirements and policy rates. As a result, the Bank has increasingly relied on daily fine-tuning operations to stabilise money market rates. Like in other countries, deregulation and financial market developments in general have also forced the Bank to change or adjust its intermediate objectives while, at the same time, provided opportunities for developing new indicators. Among the latter, the yield curve, monetary conditions indices, asset prices and various derivatives appear particularly useful in gauging market sentiments and evaluating future developments.

The impact of financial changes on the interest channel is also discussed by *H. Bauer and D. Domanski (Deutsche Bundesbank)* who foresee a growing significance of this channel. More generally, they expect that increasing competition will tend to quicken the pace with which monetary policy changes work through the banking sector. As regards recent developments and changes in the German banking system, the paper identifies several major trends. First, technological progress and the start of EMU have exerted continuous pressures for structural changes, in particular favouring consolidation to exploit economies of scale. Second, there has been a gradual decline in banks' overall importance as financial intermediaries, though the decline is more pronounced on the liability side than on the asset side. Third, there has been a strong rise in interbank activities and in business with other financial intermediaries as well as a greater involvement in securities markets. Finally, and similar to developments seen in a number of other countries, interest margins have tended to narrow while non-interest earnings have become more important.

Concerning the future financial landscape, the authors argue that advances in information and computer technology as well as EMU will continue to act as catalysts for changes in the financial sector and in the conditions under which services are provided. As regards the regulatory environment, European integration has undoubtedly had the strongest impact on banks and further harmonisation of banking legislation in the EU area will likely reinforce the general trend towards more competition. Banks may also become subject to increasing competition from European institutional investors who can be expected to lose some of their "home bias" when EMU takes effect.

The paper by *W. J. Jansen and R. T. L. Moonen (Netherlands Bank)* first describes the main structural features and changes of the Dutch banking sector, highlighting the high concentration and increasing internationalisation, the competitive pressures from non-bank financial institutions, the small presence of foreign banks and the predominance of lending as a source of profits. The second part of the paper attempts to explain overall interest margins and, in particular, their remarkable stability during this decade. To this end, the authors construct a measure of overall interest margins as a weighted average of interest margins on different assets. A major finding from this exercise is that, despite growing pressures on funding costs and increasing competition from other financial institutions, banks have enjoyed stable profitability because of a maturity mismatch between short-term liabilities and long-term assets. Moreover, even though rates on corporate credit have fallen and savings rates have increased, trends in interest rates have generally had a positive effect on bank profits. First, bank lending rates have responded more slowly to the lower market rates in the 1990s than average costs of funds. Second, favourable movements of the yield curve have widened margins for long-term loans significantly. However, looking ahead, the authors argue that higher savings costs could eventually counterbalance the effects of the maturity mismatch and reduce banks' profitability.

In the third section of the paper, the authors provide some information on the access of small and medium-sized firms to bank loans. From the evidence it appears that, in periods of tightening credit conditions, Dutch firms do not look for alternative sources of finance but rather try to "muddle through". The paper concludes by taking a look at the response of Dutch banks to a tightening of monetary policy. Using a VAR methodology, the authors find that banks respond to a rise in official rates by shedding foreign assets rather than by cutting back domestic securities. Moreover, a tightening of monetary policy does have a noticeable impact on output and prices. Consequently,

despite the limited room for manoeuvre, Dutch monetary authorities have enjoyed a non-negligible degree of independence.

Session 3: Implications for financial stability and payments systems

This session opened with the paper by *A. Bowen, G. Hoggarth and D. Pain (Bank of England)* which offers a very extensive and detailed review of the evolution of the UK banking industry and its implications for financial stability. The paper begins by documenting changes in the balance sheets of the non-financial private sectors, notably the shift in household assets away from banks and building societies, and a small, but potentially important, change by corporations away from bank loans towards the issue of bonds and commercial paper. The paper next examines various structural features of the banking sector, including consolidation and market concentration, profitability, efficiency and the rise in the importance of retail banking. The authors take the view that these recent developments are suggestive of increasing competition within the banking sector. However, this has been accompanied by a continuing high level of profits in both retail and investment banks. The next section, therefore, briefly reviews the factors that might explain this somewhat puzzling result. The final section of the paper evaluates the implications for financial stability. The entry of banks into more innovative activities raises some short-term concerns because these activities are relatively new to the banks. However, a shift of lending towards less risky industries and a wider diversification across regions have helped to reduce risk in traditional banking. Moreover, judging by the development in profits, UK banks appear to be healthy.

In the second paper presented in this session, *H. Toyama (Bank of Japan)* argues that the "bubble economy" of the late 1980s interrupted the impact of the global process of restructuring and financial innovation on Japanese banks. Thus, the bubble in asset prices led banks to focus on expanding their loan portfolios without paying adequate attention to the quality of credit. The subsequent collapse in asset prices left banks with large stocks of non-performing loans, which limited their capacity and incentive to innovate.

The weakened condition of the banking sector inevitably forced both the Government and the Bank of Japan to get involved and the last part of the paper describes the wide range of policy measures taken. To alleviate concerns about systemic risks and ensure continued functioning of the interbank market following the failure of several institutions in late 1997, the Bank of Japan took action by extending credit to failing financial institutions and also by injecting huge amounts of liquidity into the money market. Another type of intervention was required to facilitate international borrowing by Japanese banks which had faced difficulties (the "Japan premium") in borrowing from international banks. The support operations not only had the effect of substantially expanding the Bank's balance sheets but also raised questions concerning its role as lender of last resort. First, the operations involved the extension of credit to a non-bank financial institution, deemed too big to fail. Second, since the support operations necessitated accepting more private debt as collateral, another issue raised was the extent to which the Bank should get involved in restoring the weakened intermediary function of financial institutions.

The measures implemented by the Government are mainly of two kinds. First, a public money injection package was adopted in October 1998, amounting to some 12% of GDP. It aims at restoring the stability of the financial system by providing additional funds to the deposit insurance system, strengthening the capital base of solvent banks and taking over insolvent banks. Second, a wide-ranging package of deregulation measures (the "Japanese Big Bang"), with the purpose of strengthening the efficiency and competitiveness of the financial system, was initiated in late 1996 and is expected to be completed by 2001. The basic aims of the reform plan are essentially to: (i) liberalise the financial system in terms of entry, scope of activities and organisational structures; (ii) establish rules for fair and transparent transactions; and (iii) improve the services provided by intermediaries while promoting competition between them and developing markets which are easy to use.

The main purpose of the paper by *L. J. Radecki (Federal Reserve Bank of New York)* is to describe and analyse the consolidation and restructuring of the US banking sector and to identify the main effects. The paper first reviews the fundamental forces driving consolidation, including deregulation, the

emergence of market-based alternatives to bank products and technological and financial innovation. According to the author, the objectives of consolidation include the desire to diversify geographically, reduce overlapping operations through reorganisations, take advantage of economies of scale in implementing new technologies and the need to reach a critical mass to compete successfully in the wholesale market. The paper also looks at some considerations underlying recent mergers and at the business areas which banks see as presenting the best growth opportunities.

The second part of the paper turns to the multiple effects of consolidation, including its impact on financial stability. Consolidation has already led to an expansion of the geographical reach of markets for retail banking services. This should generally help to stabilise profits, though increased competition may also have encouraged banks to take more risks. The profitability of banks has also been influenced by their position in providing payments services. Growing demand for such services, deriving from higher trading volumes and innovation, coupled with the fact that success in this area requires heavy investment in highly sophisticated infrastructure, have created opportunities as well as challenges for banks. Given the dependence of financial markets on maintaining smoothly operating clearing and settlement systems, these developments also have important implications for policy-makers, notably with respect to supervision and the safety net.

The paper by *G. de Raaij, B. Raunig and W. Waschiczek (Austrian National Bank)* first describes the main changes of the Austrian financial system over the last decade and how these have influenced the profitability of banks. One main development has been that banks have increasingly become subject to competition from other financial institutions, to which they have responded by expanding their activities abroad, increasing their off-balance-sheet activity and engaging in take-overs and mergers. However, even though the universal banking system has helped to maintain the pivotal role of banks in Austria, profitability is still below that of other European institutions. Moreover, the advent of EMU, combined with enhanced international competition and a likely decline in the core business of banks, will probably put further downward pressure on their profitability.

The authors next look at the Value-at-Risk methodology, following three different methods in estimating VaR parameters. While two of the methods are standard in the literature, the third one is new and consists of transforming the data in such a way that they become normally distributed, whereby non-normal characteristics, notably fat tails, can more easily be dealt with. The authors then compare the performance of the three methods by applying them to different foreign exchange portfolios and daily exchange rates over twelve years. The results differ widely, suggesting that, while the VaR approach is a useful tool for risk management, it may be misleading to compare VaRs across institutions with different internal models.

The paper by *C. Kent and G. Debelle (Reserve Bank of Australia)* is organised around four topics: (i) monetary policy, financial system stability and efficiency; (ii) trends in the financial system; (iii) consolidation and its impact on efficiency and system stability; and (iv) conglomeration and the competitive fringe. The first section of the paper discusses the interaction between monetary policy and system stability, stressing that monetary policy with a medium-term orientation needs to take account of system stability in ways that, occasionally, may imply non-standard responses to short-term inflationary pressures. The second section provides an overview of the main trends in the Australian financial system and the four driving forces: financial deepening, globalisation, technological progress and deregulation. Looking forward, the authors see three principal pressures: mergers between the largest banks in an already concentrated market; pressures to form large conglomerates, which combine banking with other financial institutions; and technological developments, which reduce the costs of unbundling financial products and thus attenuate the trend towards more concentration.

In analysing the impact of consolidation, the authors review the literature on the effect of mergers on efficiency. They present arguments both for and against efficiency gains and highlight the difficulty of applying overseas evidence to the Australian situation. Also, whether concentration will lead to more monopolistic behaviour seems to depend on technological changes and on fringe competition in certain market segments. The authors develop a simple analytical framework, which incorporates a definition of system stability based on the expected macroeconomic losses that might result from problems in the financial sector. They emphasise that there may be a potential trade-off between

stability and efficiency in that heavy-handed regulation reduces the risk of instability but is also likely to reduce the efficiency of the financial system. With respect to system stability, the optimal policy response in terms of regulating the number of banks depends on a number of factors, including the likelihood of contagion and the possible perception that banks may be "too big to fail".

The authors further argue that conglomeration is likely to boost efficiency by increasing convenience and competition, while reducing information costs. However, the stability effects are ambiguous. Increased diversification may reduce the risk of bank failures but the risk of contamination from failures in non-banking activities could increase. The last section of the paper briefly discusses what central banks can do to improve system stability, stressing as positive factors low inflation and stable growth and highlighting the importance of the terms and conditions for access to both the payments system and emergency liquidity support.

In the final paper presented at this session, *M. Andersson and S. Viotti (Bank of Sweden)* discuss the Swedish banking crisis of the early 1990s and the lessons that can be drawn from it. They first point out that the eruption of the crisis can mainly be attributed to the process of full deregulation during a period of sustained economic upswing and a tax system that favoured borrowing to saving, notably in times of high inflation. This led to high investment in real estate, skyrocketing property prices and very strong credit growth, in particular collateralised lending to housing and commercial properties. The banking crisis began when the economy went into recession in 1990 and property prices fell sharply. The paper next looks at the main elements in managing the crisis. The first was the unlimited guarantee by the government to depositors of the banks, which led to a rapid restoration of confidence. The second was the creation of a separate institution (the Banking Support Authority) to handle the crisis. The third and final element was finding the best way of providing the support, for which the socalled "hammock approach" was used as the fundamental paradigm.

Concerning the lessons to be drawn from the crisis, the authors distinguish between three different phases. It is argued that, during the building-up phase, actions could have been taken in response to early warning signals and that such actions might have led to a less severe course of events. The basic problem during this phase was that the burden of defending the exchange rate fell entirely on monetary policy, which led to a conflict between the price and financial stability targets of the Central Bank. One important outcome of the lessons from this phase is the *Financial Markets Report*, which disseminates the Bank's analysis of financial system stability. In addition, a major revision of the regulatory and legislative framework is under way.

The second phase concerns the threats of payment system collapse, where subsequent work has concentrated on detecting, at an early stage, macroeconomic inconsistencies, which may pose a threat to financial system stability. In this context, the authors also discuss the lender of last resort mandate, stressing that the responsibility of the Bank is to provide short-term liquidity ("bridge loans") to solvent banks with acute payments problems, but not to take responsibility for longer-term financing or recapitalisation. The last phase is the crisis management phase where the key elements are transparency to reduce uncertainty, speed, given how quickly liquidity shortages may develop, and, to the extent possible, finding a consensus approach.

Session 4: Policy implications

Several participants reiterated the conclusions reached in Session 2 that, while the transmission mechanism of monetary policy must be affected by changes in financial structure, no statistically significant changes have been observed to date. More competitive systems are likely to increase the effects of changes in policy rates but credit availability effects will become less important. There was also general agreement that structural changes will make monetary aggregates less useful as intermediate targets and may also reduce their reliability as indicators. Moreover, even though this may occur independently of structural change, higher levels of private sector debt and/or weak banking systems may lead to non-linear responses to monetary tightening.

In returning to the implications for financial stability, some participants argued that structural change, while perhaps welcome in itself, could pose dangers during the period of transition. Such dangers

would vary, depending on the nature of the changes, and might be exacerbated by interactions with other ongoing events, including the general macroeconomic situation. The growth of derivative markets was generally seen as having increased market efficiency. However, derivatives were complicated and subject to both non-linear payouts and concerns about international legal processes in the event of bankruptcy. It was also agreed that, as documented in the paper by Mr. Radecki, payments services are increasingly important as a source of revenue. While this helps to stabilise profits in periods when other sources of revenue are diminishing, the threat to payments services by banks stemming from new technologies (Internet etc.) should also be kept in mind. As shown in the Austrian paper, the use of internal VaR models in evaluating risk exposure should lead to better management of risk. However, especially in light of recent events, concerns were expressed about the stability of historical variances ("fat tail" events) and covariances (which may suddenly rise towards unity and thus eliminate the benefits of diversification). Moreover, if many large players employ more or less the same models and techniques, all of them may be forced to retrench at the same time, thus reinforcing the effects of the original shock.

Regarding policy responses in general, many participants recognised the trade-off between efficiency and financial stability highlighted in the Australian paper. However, given the prevailing uncertainty about the exact meaning of financial stability, it is hard to draw practical conclusions from the trade-off. With respect to crisis prevention, most agreed that current safety-net provisions are too extensive and should be cut back. The current trend towards consolidating financial supervision in an institution outside the central bank was seen as providing a clearer mandate for both. However, it could also open the door to competition and hostility as well as to a lack of necessary communication. Most participants also agreed that a process of structured early intervention and resolution (SEIR) has merit for individual institutions, even though it does presume some degree of market failure. Moreover, it remains unclear how the principles underlying SEIR might be applied to institutions deemed "too big to fail" or in the event of several institutions finding themselves in trouble at the same time.

Except for the lender of last resort function of central banks, crisis management received relatively little attention during this session. Some expressed concern that central banks might feel they did not have sufficient information to warrant a rapid expansion of lending in an increasingly complicated financial world. Moreover, the removal of banking supervision from central banks could accentuate this information problem. Potential shortages of collateral were also mentioned, as was the growing importance of international banks and even international conglomerates. These issues posed additional complications for the lender of last resort function.

Participants in the meeting

Australia:	Mr. Cristopher KENT Mr. Guy DEBELLE
Austria:	Mr. Burkhard RAUNIG Mr. Walter WASCHICZEK
Belgium:	Mr. Philippe DELHEZ Mr. Thierry TIMMERMANS
Canada:	Mr. Jack SELODY Ms. Loretta NOTT
ECB:	Mr. Huw PILL Mr. Klaus TUORI
France:	Mr. Christian PFISTER Mlle Sylvie MATHERAT
Germany:	Mr. Hans BAUER Mr. Dietrich DOMANSKI
Italy:	Mr. Giorgio GOBBI
Japan:	Mr. Haruyuki TOYAMA
Netherlands:	Mr. W. Jos JANSEN
Spain:	Mr. José Luis ESCRIVÁ Ms. Teresa SASTRE
Sweden:	Mr. Staffan VIOTTI Mr. Martin ANDERSSON
Switzerland:	Mr. Dominik EGLI Mr. Bertrand RIME
United Kingdom:	Mr. Alex BOWEN
United States:	Mr. Lawrence J. RADECKI *(New York)* Mr. Thomas F. BRADY *(Washington)* Mr. John AMMER *(Washington)*
BIS:	Mr. William WHITE (Chairman) Mr. Joseph BISIGNANO Mr. Claudio BORIO Mr. Gabriele GALATI Mr. Stefan GERLACH Mr. Robert McCAULEY Mr. Kostas TSATSARONIS

Balance sheet, profitability and regulatory developments affecting US commercial banks, 1988 to 1998

Thomas F. Brady[1]

1. Introduction

US banking organizations have grown rapidly over the past decade. Bank holding company assets stood at $5,285 billion as of June, 1998, up 78.7% from ten years earlier (Table 1). Nonbank subsidiaries of the holding companies grew particularly rapidly, but banks in bank holding companies – which constitute around 95% of bank holding company assets – grew by a significant 71.1%.[2] Assets at independent banks (those not associated with bank holding companies) showed little net change over the decade and have been declining in recent years, as many of these banks have been acquired by bank holding companies through mergers. US branches and agencies of foreign banks, which mainly do wholesale banking business and account for a little under a fifth of the credit extended by banks to nonfinancial businesses, have expanded even faster than their domestically chartered counterparts, in part owing to shifts of assets to US offices from Caribbean offices in the early 1990s. Assets at all commercial banks (domestically chartered plus branches and agencies of foreign banks) rose 73.7% over the last decade, about 10% faster than the expansion in nominal GDP.

Table 1
Banking organizations in the United States
Assets by entity type, in billions of US dollars

Entity	1988	1990	1992	1994	1996	1998*
Banking holding cos.	2,958	3,266	3,362	3,932	4,541	5,285
Nonbank subsidiaries	103	176	178	243	288	400
Bank subsidiaries	2,855	3,090	3,184	3,689	4,253	4,885
Multibank HC	2,305	2,462	2,513	3,022	3,366	3,825
One bank HC	550	628	671	667	887	1,060
Independent banks	234	269	292	282	276	236
Total domestic banks	3,089	3,359	3,476	3,971	4,529	5,121
Branches and agencies of foreign banks	359	367	509	590	715	869
Total commercial banks	3,448	3,726	3,985	4,561	5,244	5,990

* June.

Sources: Financial Structure Section and Flow of Funds.

[1] This paper represents the views of the author, which do not necessarily reflect those of the Board of Governors or the Federal Reserve System. The paper has benefited from helpful comments from William English, Myron Kwast, Brian Madigan, Edward Ettin, William Nelson, William Watkins and Dennis Farley. The skillful research assistance of Adrian Sosa is greatly appreciated.

[2] The organizational structure of the banking system in the United States is more complex than in most other countries, as there are several ways in which banks may be organized, and bank holding companies can engage, through nonbank subsidiaries, in activities proscribed for banks themselves.

This paper focuses primarily on domestic US banking organizations, in particular on developments relating to domestically chartered commercial banks over the last decade.[3] Section 2 begins with a review of some of the key balance sheet developments of domestically chartered banks since 1988, including the roles of bank capital and of changes in the competitive environment in which banks have operated. The paper next turns to the two major legislative actions affecting domestically chartered commercial banks over the last decade: the FDIC Improvement Act of 1991 and the Riegle-Neal Interstate Banking and Efficiency Act of 1994. The paper then discusses the reasons for and implications of the ongoing consolidation of the US banking system, concluding the overview with an analysis of trends in commercial bank profitability over the last decade. The third and fourth sections of the paper examine the implications of the first section's findings for bank regulation and for monetary policy. The final section presents a brief summary and conclusions.

2. Overview of domestically chartered US commercial banks, 1988-98

2.1 Major on- and off-balance-sheet developments

2.1.1 Bank credit, bank capital and banks' share of financial activity

The growth of bank credit slowed in the late 1980s and early 1990s (Chart 1, top panel), apparently reflecting reductions in both supply and demand. Banks' ability to grow was constrained by regulatory and market pressures to bolster their capital at a time when the quality of their assets was poor and their cost of capital high. Many banks responded by taking active steps to limit asset growth. A substantial portion of respondents to the Federal Reserve's Senior Loan Officer Opinion Survey on Bank Lending Practices reported tightening lending standards for both commercial and industrial and commercial real estate loans in the 1990-91 period (Chart 2). Banks also established more stringent pricing policies and other terms in their commercial lending at that time. According to the Federal Reserve's Survey of Terms of Business Lending, banks substantially increased spreads of loan rates over the federal funds rate – a measure of the marginal cost of short-term funds to banks as well as a base lending rate – for both large (over $1 million) and for other business loans.[4] Banks also reported a reduced willingness to make consumer loans at that time.

Bank lending was also damped by weak demand, as both the household and the business sectors were burdened by high debt-service ratios in those years. Reflecting the lackluster demand for credit, even the relatively few banks that were well capitalized in those days expanded their balance sheets much more through securities purchases than by making loans.[5]

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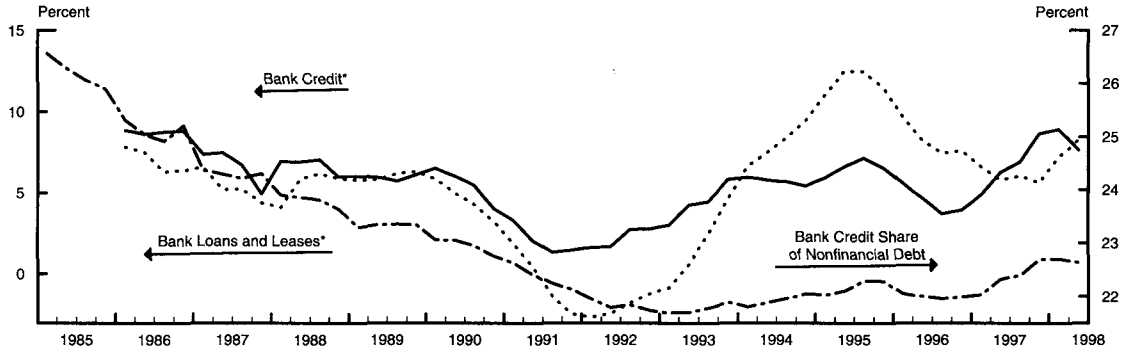
[3] To give a complete overview of commercial banking in the United States, however, an Appendix very briefly describes the major balance sheet changes at US branches and agencies of foreign banks since 1988.

[4] The wider lending spreads depicted in Chart 2 for large loans in the late 1980s appear to represent a compositional shift in lending toward riskier loans, as banks at that time were substantial suppliers of credit to finance mergers and acquisitions, including leveraged buyouts.

[5] Thus, the stronger growth of securities relative to the loan component of bank credit over that period appears to reflect the weakness of loan demand as much as or even more than the low or zero Basle risk weights on many securities. The weakness of loan demand is illustrated by the fact that bank loan growth in 1991 and 1992, negative overall, was positive (but weak) at well-capitalized banks, for which supply constraints were presumably small and where fairly strong overall asset growth was centered on securities. Well-capitalized banks likely viewed the higher yields on loans as more attractive than the low risk weights on securities. Confirming the view that well-capitalized banks would meet a strengthening of loan demand was the experience of 1993, when overall loan growth turned sharply positive. At well-capitalized banks, loan growth exceeded that of securities. Adequately and undercapitalized banks, by contrast, expanded mainly by purchasing securities. Growth rates for loans and total assets for these years at banks disaggregated by capital adequacy classifications are presented in Boyd and Gertler (1995).

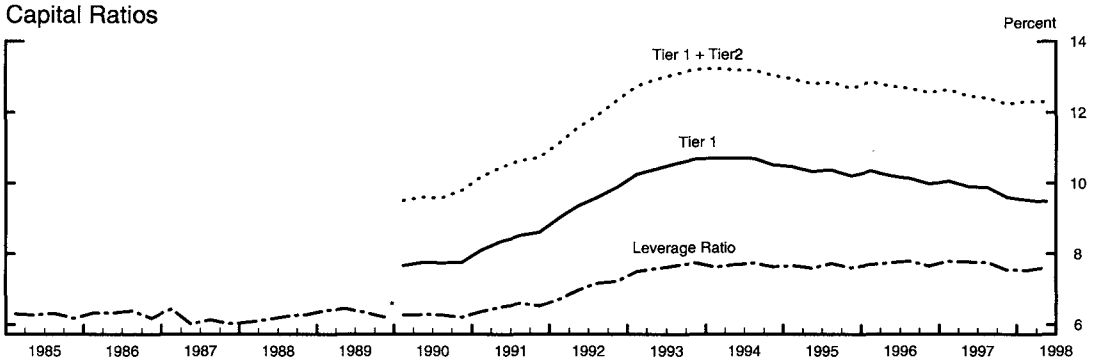
Chart 1

Bank Credit and Bank Capital



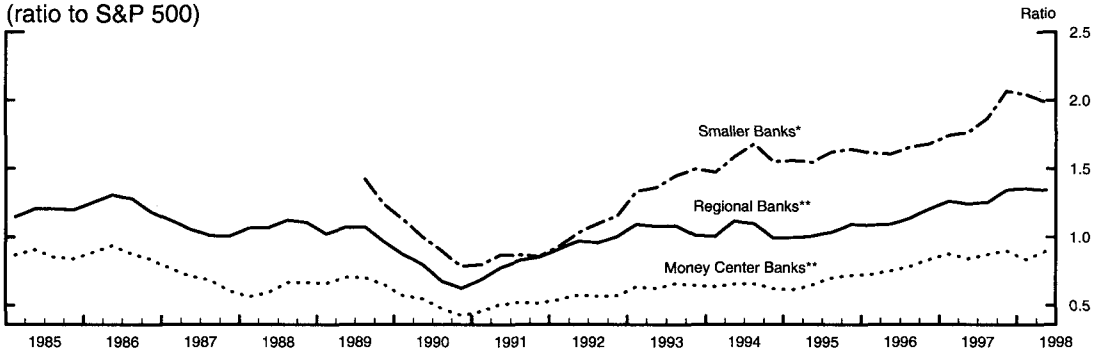
Note: domestic banks only.
*Growth from 4 quarters earlier.
Source: Flow of Funds.

Capital Ratios



*Series break: As of 1990, ratio of tier 1 capital to tangible assets; prior to that, ratio of equity to total assets.
Source: Report of Condition

Selected Bank Equity Indexes
(ratio to S&P 500)



*Banks trading on NASDAQ
**Dow-Jones

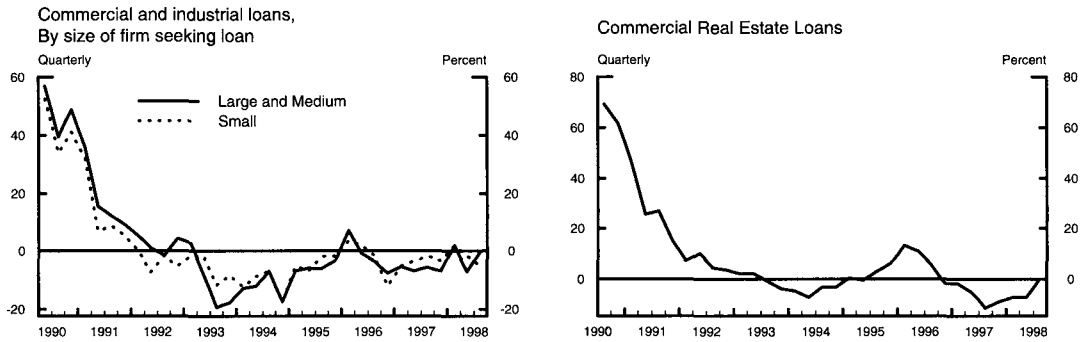
As an economic recovery eventually took hold and banks began to rebuild their capital, lending started to pick up. By the mid-1990s, growth of bank credit became sufficiently robust to reverse some of the drop in banks' share of nonfinancial debt (credit market debt of individuals, nonfinancial businesses, and governments), a decline that had been in train since the mid-1970s. Banks' gains came only after they had begun to improve their capitalization (Chart 1, top and middle panels). Facilitating this recovery was a

strong performance of the share prices for a range of banks that extended over much of the decade (Chart 1, bottom panel). The gains in banks' share prices likely reflected ongoing improvements in their asset quality and the growing efficiency with which they evidently were being operated, as discussed below in Section 2.4 on bank profitability.

Chart 2

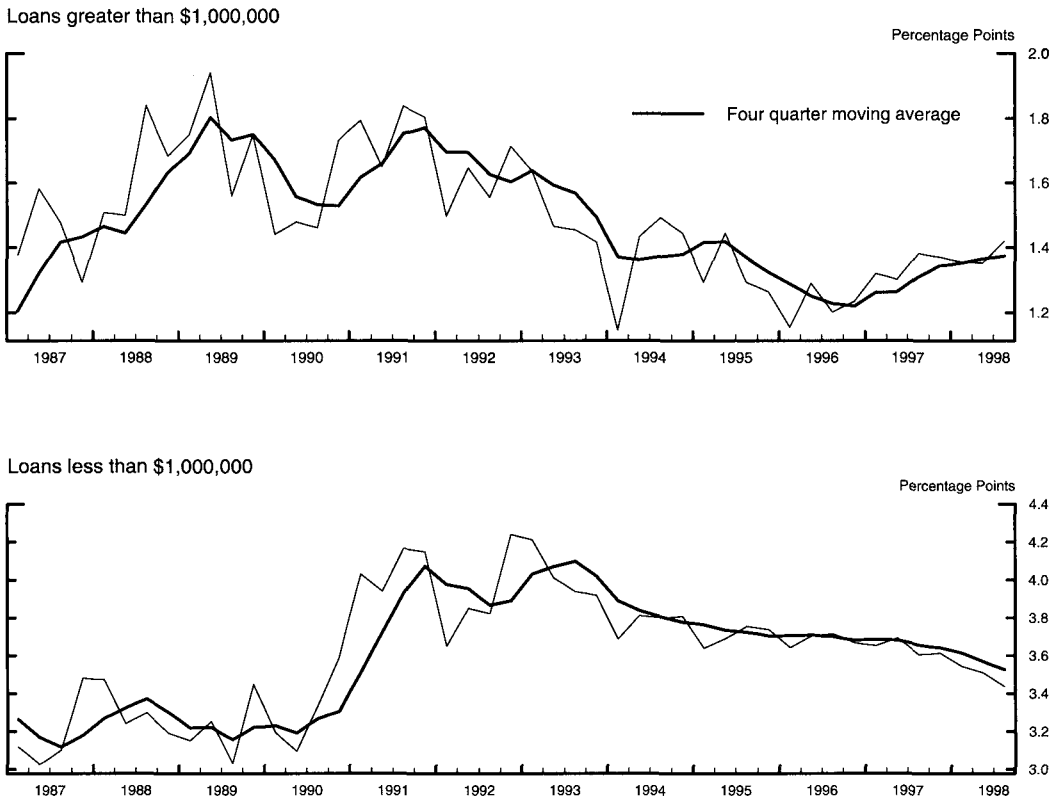
Selected Measures of Lending Standards and Terms

Net Percentage of Banks Tightening Lending Standards



Source: Senior Loan Officer Opinion Survey

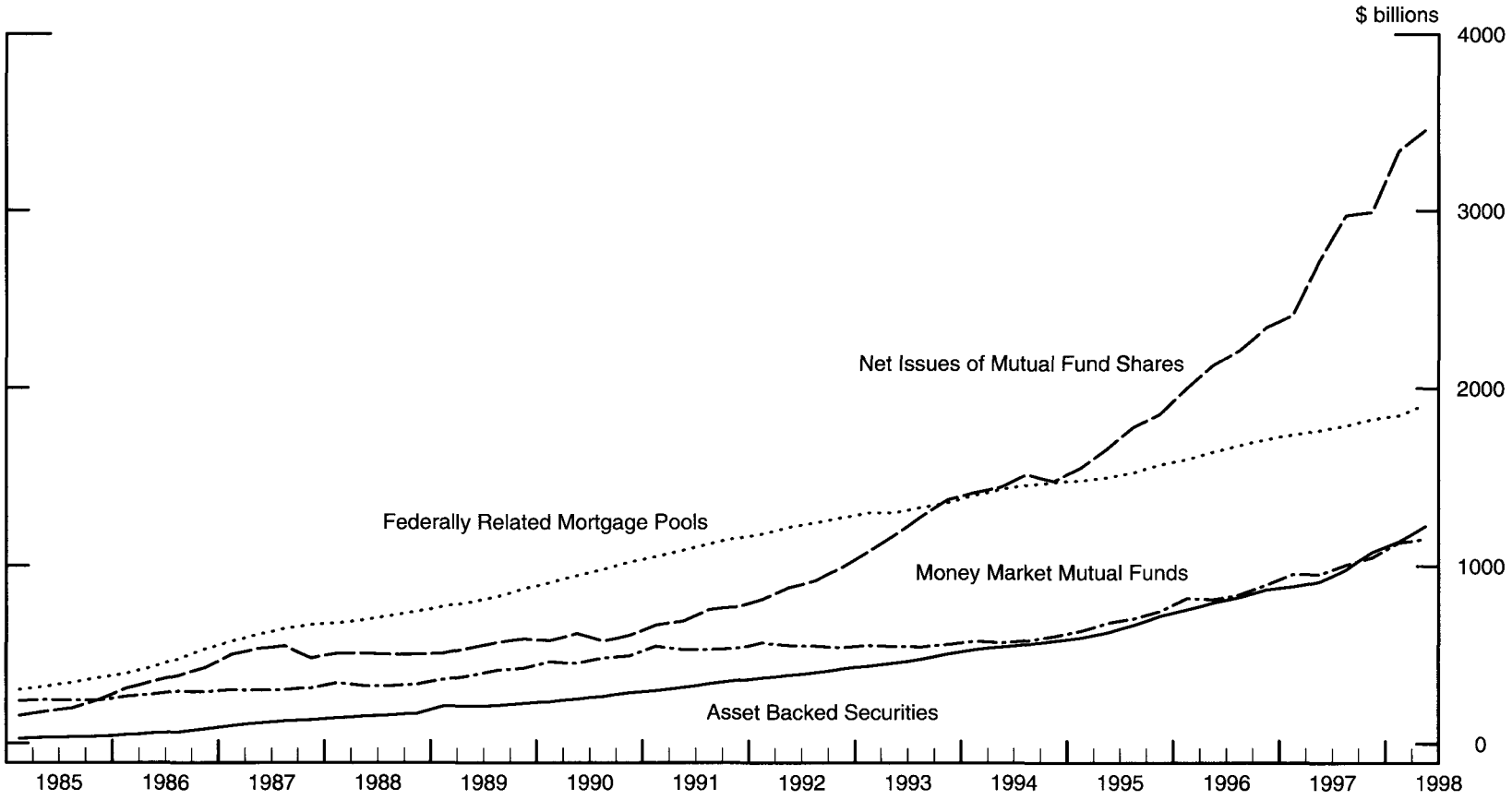
Spread of Average C & I Loan Rate over Intended Federal Funds Rate



Source: Survey of Terms of Businesss Lending

Chart 3

Securitized Assets and Mutual Fund Shares



Source: Flow of Funds.

Banks' strong recovery is particularly notable because it took place at a time when developments in computing, financial technology, and finance theory seemed particularly to favor the capital markets, as reflected in the rise of commercial paper, the junk bond market, and asset securitization. Clearly, advances that provide borrowers increased opportunities to circumvent financial intermediation by issuing debt directly to lenders should act to limit banks' potential size and growth rate by reducing demand for their assets. A parallel development, the explosion of mutual and money market fund shares, which are major purchasers of capital market instruments, simultaneously acted to damp demand for bank's core deposits, a major funding source (Chart 3).[6]

The expansion of securitized nonmarketable assets over the past decade has importantly involved bank loans. By increasing the financial resources available to purchase bank assets, albeit indirectly, securitization acts to lower returns on them and thus to diminish their attractiveness as an asset to hold on the balance sheet. Countering this effect to some degree is the greater liquidity that securitization confers on loans, making them a more attractive balance sheet item from this perspective.

Some banks have been securitizing residential mortgages that they have originated ever since this market was developed in the early 1970s by the Government National Mortgage Association (Ginnie Mae). The scope and nature of banks' securitization activities have changed over the last decade, however, as banks have developed new techniques to securitize assets. Unlike the case of straightforward securitization of residential mortgages, in which banks shed both the need to fund the securitized loans and the risk associated with them, techniques used to securitize credit cards (and, more recently, business loans) are designed to retain almost all of the credit risk at the securitizing banks. Loan securitization was given some impetus by the capital shortages banks suffered in the early years of the decade, but securitization has accelerated since then even though bank capital ratios have risen well above regulatory thresholds.

There are several methods a bank can use to securitize assets while retaining their risk, but they usually rely on a "special purpose vehicle," a trust established and controlled by the bank and having as its sole function the purchase of assets from the bank's balance sheet. The trust uses these assets to back a funding vehicle, asset-backed securities, which it issues in the capital markets. The originating bank takes an interest in a small part of the securitization, the "seller's interest." The rest – the "investors' interest" – is owned by purchasers of the securities. The earnings of the trust are distributed to the seller's interest and the investors' interest on a pro rata basis.

The investors' interest generally consists of three tranches of asset-backed securities, with the second subordinate to the first and the third subordinate to both the first and second. Owing in part to this subordination, the first tranche has an investment-grade rating, but all three tranches are largely insulated from credit losses by three separate layers of protection provided by the bank, where almost all of the risk remains. The first layer of protection consists of the trust's net income, referred to as the "excess yield" – basically the difference between the earnings on the underlying loans and the payments due on the securities, net of loan charge-offs and the trust's servicing expenses. The excess yield accrues to the bank as fee income. As long as this income is positive, it is available to absorb possible increases in charge-offs on the loans. The second layer of protection is a "spread account," an asset of the trust that is set up to fund the pro rata payments to the investors' interest were the excess yield to become temporarily insufficient to do so. The spread account is created by retaining some of the initial flow of the excess yield within the trust, rather than paying it to the bank, until a target level is reached. Finally, there is an "early wind-down" feature, which obligates the trust under certain conditions to accelerate payments of principal to the investors' interest.[7] This provision is designed to ensure that the investors' interest is paid off fully before

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6 In short, financial innovation has caused banks to lose cost advantages in acquiring liabilities and income advantages in acquiring assets. See Mishkin (1996).

7 Early wind-down is accomplished by allocating to the investors' interest a portion of the total principal payments collected by the trust that is equal to the investors' share of the underlying collateral at the *beginning* of the wind-down period. This paydown formula continues to be used to calculate monthly principal payments, even as the claims of the investors' interest on the underlying loans decline as principal is paid down. As a result, the principal payments going to the investors' interest increasingly exceed its pro rata share. This procedure greatly speeds up the paying off of the investors' interest. Although

deterioration in the underlying assets proceeds to a point that would make this impossible. Early wind-down protection typically is designed to be triggered should the three-month moving average of the excess yield turn negative.

When the underlying loans perform as expected, the bank's net earnings under this type of securitization (in the form of fee income) are what they would have been (in the form of net interest income less provisions) had the loans been held on balance sheet (apart from the expense of setting up the trust and taking into account any difference between the interest paid on the securities and the interest cost of funding the loans with on-balance-sheet liabilities). Similarly, if the loans perform less well than expected, the effect of the additional charge-offs on bank earnings would, in all likelihood, also be the same as if the loans had been held on balance sheet. Only if the loan losses were well above historical experience would the investors' interest share in the loss. To date, a credit card securitization has never defaulted.

The bank benefits from these arrangements by having to hold capital equal to 8% of the sellers' interest rather than 8% of the entire amount of loans sold to the trust. It is generally thought that the cost of capital far exceeds that of debt, so these techniques are attractive to banks. And, to the extent that the capital the market requires behind the loans being securitized is less than the 8% in the Basle standards, banks' use of these techniques could be viewed as a useful "safety valve," allowing beneficial and prudent credit extensions to proceed that banks would otherwise find to be too expensive from a capital standpoint. On the other hand, banks' use of such methods cast some doubt on the meaningfulness of their reported capital ratios. Also, these procedures could be abused to the extent that the Basle 8% capital requirement recognizes the presumed existence of balance sheet loans requiring *more* than 8% capital. Clearly, a suitable balance, from a regulatory point of view, between "below 8%" and "above 8%" loans could be disturbed by the securitization of a bank's better quality loans. This problem – referred to as regulatory capital arbitrage – is addressed below in Section 3.

Chart 4 illustrates the volume of credit card receivables that banks have securitized in recent years and also the outstanding amount of collateralized loan obligations (CLOs) issued by domestic banks in recent quarters. CLOs are multi-tranched securities backed by commercial and industrial loans that some banks have employed to remove these assets from their balance sheets. The techniques used are basically the same as those devised to securitize credit card receivables, including the banks' retention of the loans' credit risk.[8]

Apart from driving down the yield on potential loan assets as discussed above, the growth of securitization doesn't necessarily imply that bank balance sheets will be smaller than they otherwise would be. When capital is freed up, it can be used to support other assets. Moreover, the advent of securitization has spawned a variety of new financial instruments that have filled more and more financial niches. Some of these instruments may be attractive to banks. Indeed, banks' holdings of US government agency collateralized mortgage obligations (CMOs) rose from about 13% of assets in 1990 to 3% in 1993, although they have since fallen back to about 2%. There is no evidence that domestic banks have yet begun to add significant volumes of securitized credit card receivables, CLOs, or similar assets to their investment accounts, although trading in these instruments might help to explain a rise in banks' trading account assets from 1.3% of assets in 1988 to 3.1% at mid-year 1998.

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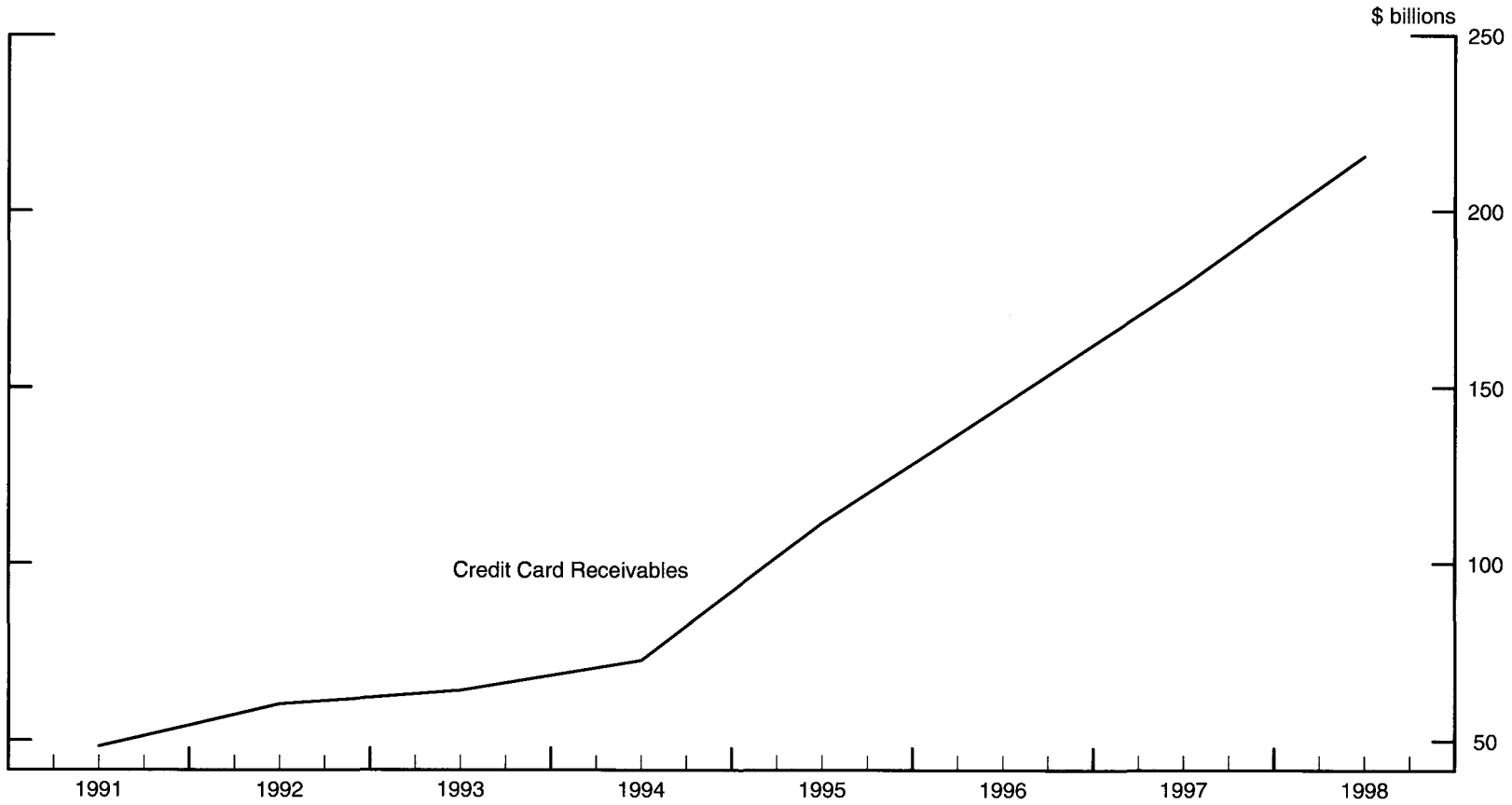
the early wind-down feature mitigates credit risk, it presents interest rate risk, i.e. the need to reinvest the funds at interest rates prevailing at the time of the repayment.

[8] Typically, loans used to back CLOs are of high quality. They often are selected to provide a great deal of diversity in terms of industry classification and geography, contributing to the frequently large size of CLOs. For example, a NationsBank CLO in October 1997 totaled $4.2 billion.

Chart 4

Outstanding Securitized Assets Issued by Domestic Banks ($ billions)

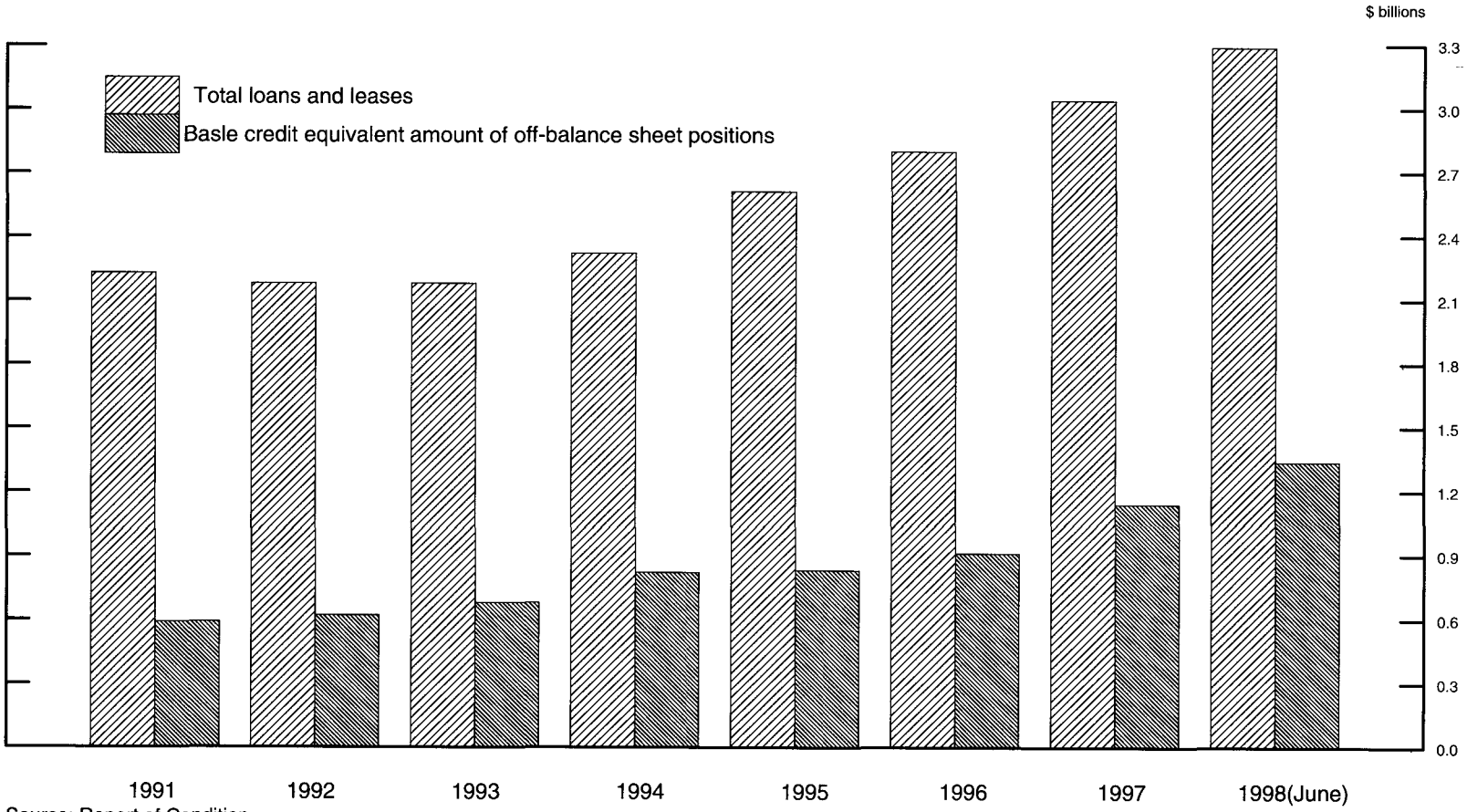


Source: Report of Condition and estimates.

Note: CLOs were $0.8, 5.6, 7.6, 9.9 and 11.9 billion in the five quarters from 1997Q3.

Chart 5

Measures of On- and Off-Balance Sheet Banking Activities



Source: Report of Condition.

2.1.2 Off-balance-sheet developments

Growth in commercial banks' off-balance sheet activities has been very brisk in recent years. For example, as of June 1998, the notional principal value of banks' interest rate swap contracts was $10,159 billion, up by a factor of more than ten from a decade earlier. One way that has been suggested to measure banks' off-balance-sheet positions relative to their on-balance-sheet assets is to use the on-balance-sheet credit equivalents that banks are required to report for their off-balance-sheet positions under the Basle Accord.[9] Using this measure, banks' off-balance-sheet positions have risen from an amount equal to about one-quarter of total interest-earning assets in 1991 to just over 40% of assets as of June 1998 (Chart 5).

An interesting off-balance sheet innovation of the last few years are credit derivatives, which allow banks to swap credit risk on loans. A seller of credit risk, or "beneficiary," contracts to pay a counterparty, or "guarantor," the interest actually earned on a loan it holds in return for receiving some market rate, frequently one tied to LIBOR. For its part, the counterparty agrees to bear all the risks associated with the loan. Of course, a bank may also acquire risk in this market by entering into such an arrangement as a guarantor. As suggested by the positions presented in Table 2, the credit derivative market appears to have been expanding rapidly in recent quarters, at least as judged by banks' participation in it. Not surprisingly, very large banks are major players. As a group, they were in net beneficiary positions at the end of the third and fourth quarters of 1997, but were essentially balanced for the first two quarters of this year.

Table 2
Notional value of credit
Derivatives held by banks, in billions of US dollars

Bank group (by assets)	1997Q3		1997Q4		1998Q1		1998Q2	
	G	B	G	B	G	B	G	B
Top 10	12.2	23.8	13.7	39.9	43.7	44.0	44.6	44.8
Next 90	2.7	0.2	0.6	0.4	2.7	0.8	1.8	0.1
All others	–	0.3	–	2.3	–	0.2	–	0.7

G: bank is guarantor; B: bank is beneficiary.

Source: Report of Condition.

Credit derivatives can be viewed from one perspective as an extension of the loan sales market that developed in the 1980s. Banks used this market to buy and sell loan participations, that is pieces of loans that had already been booked, thus shedding or adding risk and diversification to their portfolios. Since this market entailed the actual sale and purchase of loans, it caused some bank borrowers not wishing to see their debt obligations traded to stipulate in loan contracts that their loans could not be sold. Another issue that has complicated the loan sales market is settling the role that purchasers of loan participations have in the event a workout becomes necessary. Credit derivatives allow banks to achieve the same risk and diversification goals while avoiding these problems.[10] However, credit derivatives do of course present both parties in a transaction with counterparty risk.

[9] Boyd and Gertler, op. cit. In most cases, banks are instructed to determine on-balance-sheet credit equivalents by multiplying the face value of notional amounts by a credit conversion factor.

[10] The size of the loan sales market peaked at $80 billion in 1990, according to data on the outstanding volume of loans sold collected in the Senior Loan Officer Opinion Survey. This market has not been surveyed since the early 1990s, so it can't be determined to what extent it has been affected by the development of credit swaps.

2.2 Key legislative developments affecting domestically chartered banks

Two major pieces of legislation affecting banks have been enacted over the last decade.[11] The first revamped the regulatory structure so that regulators' decisions would tend to simulate market responses. The second overturned two federal laws, one that had prevented interstate bank branching and another that had allowed individual states to prevent banking organizations located in other states from establishing banks within their borders.

2.2.1 The Federal Deposit Insurance Corporation Improvement Act of 1991

In response to the banking problems that developed in the 1980s, the US authorities supplemented the Basle Accord with the provisions of the FDIC Improvement Act (FDICIA). The underlying logic of this legislation is to improve regulation by designing it so as to encourage regulators to act in a market-like way, while allowing them to retain necessary flexibility. For example, FDICIA attempts to mimic the market by linking the cost of a bank's deposit insurance to its capitalization. In addition, just as a nonregulated institution lacking the safety net enjoyed by banks would find itself encountering increasing difficulties in raising funds were its capital ratios to decline, regulators under the prompt corrective action (PCA) provision of FDICIA are required to impose controls on banks' deposit-taking activities as capital falls below specified levels.[12] PCA under FDICIA also requires that banks be shut down once capital becomes critically low. Finally, under least-cost resolution, the Act requires the FDIC to close failed banks using the least costly available procedure without regard to the implications for uninsured depositors and other creditors.

This final provision raises the issue of "too big to fail" since it contemplates closing critically undercapitalized banks regardless of size. To address this problem, FDICIA provides that when at least two-thirds of the members of the Board of Governors of the Federal Reserve System and two-thirds of the Directors of the FDIC, in addition to the Secretary of the Treasury (in consultation with the President), determine that least-cost resolution requirements would "have serious adverse effects on economic conditions or financial stability" the FDIC can "take other action or provide assistance as necessary to avoid or mitigate such effects." FDICIA further provides that any insurance fund losses arising from such exceptional actions must be recovered through special assessments on all depository institutions that are members of the relevant fund, with the assessment rate determined by the FDIC and applied to an institutions' total assets (including foreign assets) less total tangible equity and subordinated debt.

2.2.2 The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994

A movement toward interstate banking had been underway for some time prior to the Riegle-Neal Interstate Banking and Branching Efficiency Act, as a growing number of states – frequently as parts of regional compacts – began opening themselves up to each others' banks. Indeed, by 1987, states in which 91.7% of US banking assets were located had enacted provisions allowing some form of out-of-state ownership of banks.[13] This ratio had risen to over 99% by 1992, and the Riegle-Neal Act completed this process by removing all substantial remaining barriers to interstate banking. Under its provisions, adequately capitalized and managed bank holding companies are able to acquire a bank in any state, providing that the

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[11] A third important piece of legislation of the last decade was the Financial Institutions Reform, Recovery, and Enforcement Act of 1989, which, among other things, established the Resolution Trust Corporation to dispose of the assets of failed depositories and set up two separate deposit insurance funds, one for banks and one for thrift institutions.

[12] The use of insured brokered deposits by undercapitalized banks is prohibited, and other banks may accept insured brokered deposits only with an FDIC waiver. Limitations have also been imposed on interest rates paid on such deposits.

[13] The regional movement began in New England and then emerged in the Southeast. It led to the birth of "super regional" banks such as NationsBank. The Bank Holding Company Act had allowed bank holding companies to acquire banks in other states only with the statutory approval of the target state, while the Garn-St Germain Act of 1982 allowed out-of-state holding companies to purchase failing banks.

deposits of the resulting bank holding company do not exceed 30% of total bank deposits in the state of the acquired bank and 10% of deposits nationwide.

The Riegle-Neal Act also addressed interstate branching.[14] The Act allowed, as of June 1, 1997, interstate bank branching to occur through the consolidation of banks in existing bank holding companies or through interstate bank mergers. The Act permitted states to "opt in" or "opt out" of its interstate branching provisions; only two states, Texas and Montana, opted out. De novo interstate branching is still restricted to those states allowing it. Since the Riegle-Neal Act took effect, several bank holding companies have converted their banks into branches. Functionally, these holding companies often had operated their banks as though they were branches in any case. Converting them to branches for legal purposes is more efficient because it allows the elimination of separate boards of directors and other expenses.

2.3 Consolidation of the banking system

As noted, consolidation of the US banking system has been underway for some time. During the 1980s, bank mergers and assets acquired in mergers averaged 435 and $62.7 billion per year, respectively. The frequency of mergers has slowed a bit in the 1990s, to an average of 357 per year, but the average amount of assets acquired per year has jumped, to $148.5 billion (through 1997). Thus, over the 1980-97 period, a cumulative $1,806 billion in bank assets has been acquired through mergers, an amount exceeding a third of all insured commercial bank assets at the end of 1997.

Boosting the dollar amount of assets acquired during the 1990s have been so-called "mega-mergers" of some very large bank holding companies. Examples include BankAmerica-Security Pacific (1992), Chemical Bank-Chase Manhattan (1995), First Union-First Fidelity (1995), Wells Fargo-First Interstate (1996), and NationsBank-BankAmerica (1998). Largely as a result of mergers, the number of multi-bank holding companies has declined from 968 in 1988 to 734 as of June 1998. Over the same period, mergers have been the major factor reducing the number of one-bank holding companies from 4,851 to 4,337 and independent banks from 3,899 to 1,913.[15] Thus, over this period, the number of banking organizations declined more than a fourth, from 9,718 to 6,984.

On a national basis, consolidation has markedly increased concentration in the banking system. For example the share of domestic commercial bank assets held by the top five banking organizations rose from 12.6% in 1987 to almost 24% in mid-1998; for the top 100 banking organizations, these shares rose from 61.9% to 75.4% (Table 3).

There have been several economic forces behind these mergers. Some banks have entered into mergers in order to attain a size that they believe would better allow them to provide certain services efficiently. Securities underwriting and market making, for example, require a certain size to be competitive. In addition, new financial technology is frequently expensive, meaning that it benefits larger banks disproportionately. Credit scoring models, which are used to price consumer loans, mortgages, and small business loans, require large databases. Similarly, securitization programs require a minimum size to be economic, and some tools to improve risk management are more valuable to larger banks (Berger et al. (1999)). Second, natural banking areas frequently did not conform with state boundary limitations, and so the US banking system has been adjusting through mergers to the form it might have taken many years ago had legal constraints on interstate banking never existed. A third factor encouraging mergers has been the move toward generally more efficient banking, as exemplified, for example, by the adoption of more systematic recognition of relative levels of risk in loan pricing (discussed below in Section 2.4). Combined with, and spurred on by, the increased competition made possible by the elimination of barriers to interstate

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[14] It supersedes the McFadden Act of 1927, which had prohibited all bank branching across state lines.

[15] Following the allowance of interstate branching, some multi-bank holding companies have become one-bank holding companies.

banking, these efficiency advances inevitably have revealed some banks to be too weak to survive in the new environment and so made them desirable candidates for takeover.[16]

Table 3
Shares of domestic commercial banking assets held by largest banking organizations, 1985-98
In percent

Year	Top 5	Top 10	Top 25	Top 50	Top 100
1985	12.8	20.4	33.2	45.8	57.9
1986	12.7	20.2	34.1	47.3	60.4
1987	12.6	19.9	34.8	48.5	61.9
1988	12.8	20.4	35.7	51.1	64.0
1989	13.3	21.7	36.9	51.8	64.7
1990	13.1	21.8	37.8	52.7	65.4
1991	16.0	24.4	40.3	53.4	65.5
1992	17.3	25.6	41.8	55.6	67.1
1993	17.6	26.9	43.8	58.0	69.2
1994	18.2	27.9	45.7	59.9	71.3
1995	17.8	28.8	47.5	61.4	72.2
1996	21.1	32.9	51.0	64.3	73.5
1997	22.5	33.8	52.7	66.1	74.6
1998*	23.9	35.4	54.1	67.3	75.4

* June.

Sources: NIC Database and Reports of Condition.

Research based on banking data for the 1980s had suggested that banks' average cost curve was fairly flat between $100 million and $10 billion, and that gains in scale efficiency through merging were relatively small.[17] More recent work, based on data from the 1990s, suggests that increasing bank size up to $25 billion may improve efficiency, and by a substantial amount. The different findings may reflect the larger presence of technology and the reduced influence of geographic limitations in the second study.[18]

Although the increases in national concentration ratios noted above are dramatic, national measures are not generally useful for assessing the competitive effects of mergers. For nationally competitive banking activities, for example, syndicated lending, securities underwriting, and so on, the number of banks operating in these markets is still large and likely to remain so for the foreseeable future. Moreover, nationally active banks face competition from other entities, for example investment banks and foreign banks, as well as from the capital markets.

Rather, competitive issues raised by mergers are generally thought to be limited to local markets. Standard measures of concentration reveal that competitive conditions in local markets have changed relatively little since 1980, despite the substantial reduction in the number of banks over that period.[19] There are a number

[16] If the US banking system is evolving toward a structure that already might exist had it not been for legal and regulatory restrictions, what will that structure look like? One approach to answering this question uses a model of banks' response to earlier partial moves toward deregulation. The model suggests that the United States could end up with about 5,000 or so banks. This result is roughly consistent with the prediction of approximately 4,000 banks obtained by multiplying the number of banks in California, where full statewide branching has been in effect since early in the century, by the reciprocal of its share of assets in the banking system. See Berger et al. (1995).

[17] Berger et al. (1999), p. 28.

[18] Ibid., p. 30.

[19] Two commonly used measures of local competition are the share of deposits held at the three largest banks in urban and rural markets and the Herfindahl-Hirschman index. The former measure has remained steady or declined over the last two decades; the latter measure, the sum of the squares of market shares, has not increased over the same period. See Meyer (1998a).

of reasons why local market competitive conditions appear to have been immune to banking consolidation. First, some mergers are between banks serving different geographic areas. More fundamentally, barriers to entry are not especially high in banking, and de novo banking has been present to one degree or another throughout this period.[20] Third, banks that are acquired by large out of town banks tend to lose market share to local rivals. Fourth, small banks tend to perform very well, even when competing against very large rivals.[21] Finally, vigorous enforcement of antitrust laws has limited the degree of increased concentration resulting from mergers. For example, some mergers are allowed only after the divestiture of banking offices, and the presence of these laws doubtless has prevented some anti-competitive combinations from even being proposed.[22]

If competition has not been significantly diminished at either the national or local levels by the declining number of banks, there are reasons to expect the impact of consolidation on the cost and availability of bank credit to be generally positive. Acquiring banks typically are much larger than acquired banks, and larger banks tend to be more highly leveraged and have greater concentrations of loans than smaller banks (Chart 6). On the assumption that surviving banks in a merger will more closely resemble the acquiring than the acquired bank(s), the leverage of the banking system and its propensity to lend should be raised as a result of mergers. Table 4 illustrates the results of mergers over last few years, excluding mergers between banks in the same holding company. There has been a clear tendency for acquiring banks to be more highly leveraged; they have not consistently had higher concentrations of loans, however.[23]

Table 4
Banks involved in mergers[1]

Characteristics prior to merger	1995		1996		1997		1998[2]	
	S	P	S	P	S	P	S	P
Average assets($ billion)	2.41	0.15	2.20	0.68	3.48	0.43	6.34	0.73
Equity/assets (%)	7.72	8.24	8.42	9.10	8.02	8.76	7.84	9.28
Loans/interest-earning assets (%)	71.0	71.0	76.4	69.4	76.0	76.0	76.9	80.1

S: successor bank; P: predecessor bank. [1] Excludes mergers between banks in the same holding company. [2] First two quarters.
Sources: NIC Database and Report of Condition.

Notwithstanding these reasons to expect that overall credit availability may be favorably affected by bank mergers, questions have been raised about the implications of mergers for the supply of credit to small borrowers. Commercial banks are the single most important source of credit extended to small businesses.[24] Larger banks, however, tend to hold much smaller shares of assets in the form of loans to small businesses than do smaller banks. For example, as of June 1998, the sum of small (under $1 million) business loans and commercial real estate loans as a share of total business and commercial real estate loans at the 100 largest banks, the next 900, and all others were, respectively, 20.9, 48.9 and 81.8%. Thus, one might worry that industry consolidation would constrain lending to small businesses.

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20 There were 400 de novo banks in 1984, but the number fell to under 100 in the early 1990s. With bank profitability again on the rise, de novo banks numbered 207 in 1997. Ibid.

21 Community banking flourishes in California, where statewide branching has been in effect since early in the century. Another example is provided by New York State, where the introduction of statewide branching in 1962 revealed that large banks based in New York City were unsuccessful in competing with small upstate banks. See Mishkin, op. cit., p.16.

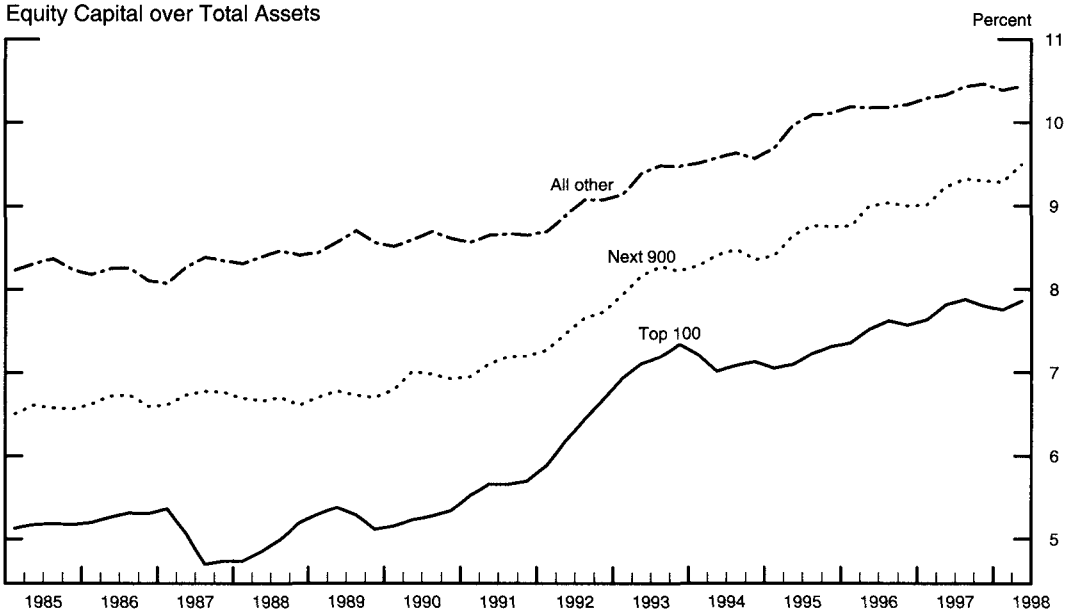
22 See Kwast (1996).

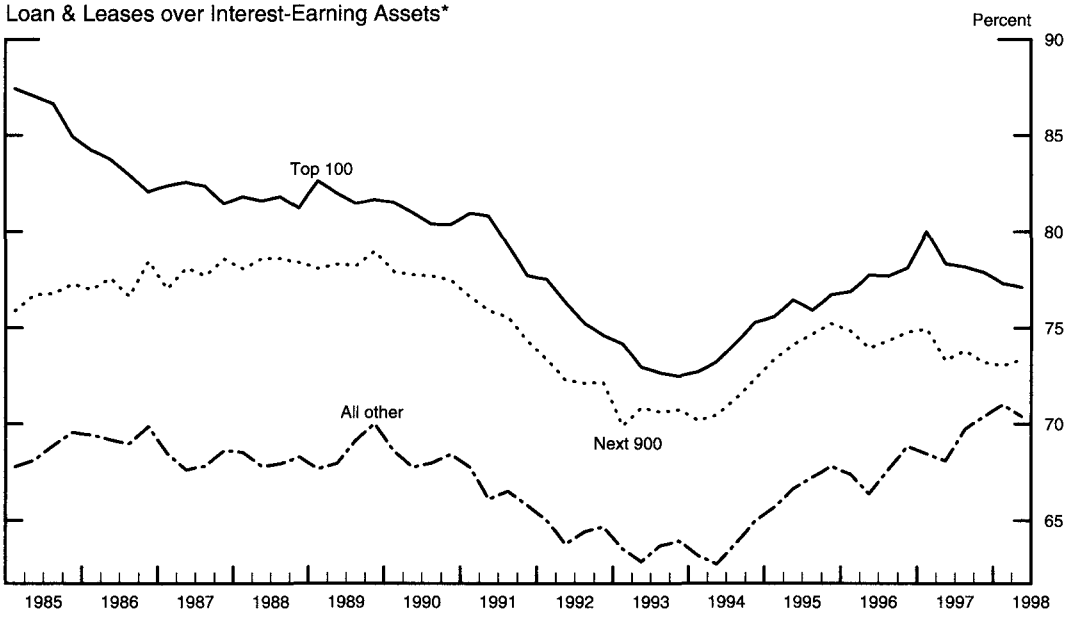
23 Recent studies find that, after merging, banks tend to shift assets from securities toward loans, raise the ratio of assets to equity, and hold more diversified loan portfolios. In addition, the cost of uninsured purchased funds decline, as the market rewards the greater diversification of assets in the merged bank. See Berger (1998) and Akhavein et al. (1997).

24 See Cole and Wolken (1996).

Chart 6

Capital and Lending Ratios By Asset Size of Bank





*Interest-earning assets exclude interbank loans.
Source: Report of Condition.

Of course, a large bank may buy small banks precisely to reach small businesses. In many cases, however, the organizational complexity of large banks suggests that they would incur high costs in dealing with small borrowers in a market served by an acquired bank. On the other hand, large banks may be better able to provide credit to small customers, particularly in times of banking weakness, owing to their advantages as gathers of funds. Evidence obtained regarding these aspects of lending have been mixed, although the most

common findings are that consolidation of large bank organizations tends to reduce small business lending while consolidation of smaller organizations tends to increase it.[25]

Even if credit to small businesses is initially disrupted or even diminished by particular mergers, economic theory would lead one to predict that over time other lenders would emerge to exploit the resulting profitable lending opportunities. This notion is supported by studies that have found that in geographic areas where credit supply to small businesses has been negatively affected by mergers, other local lenders have tended to fill the gap. Another study found that de novo banks tend to lend more to small businesses than do other small banks of comparable size.[26]

Nevertheless, small businesses might be affected in a more permanent way by banking consolidation to the extent that it eliminates banks whose inefficient lending practices had resulted in a tendency to fund low or even negative present value projects.[27] To some degree offsetting such effects of consolidation would be benefits accruing to small businesses from the recent technical advance in lending and credit scoring. As noted, credit scoring models use large databases to predict the outcome (in terms of portfolio performance) of small business loans based on characteristics of the borrowers. By reducing the number of loan officers required to underwrite small business loans, credit scoring models lower the cost of lending to small businesses and so contribute to increased supply.

2.4 Commercial bank profitability

The profitability of US commercial banks underwent a major transformation in the mid-1990s, moving to significantly higher levels not only relative to the difficult years early in the decade but also to longer-term norms (Chart 7). Indeed, the industry's average return on equity over the years 1993 to 1997 was 4 percentage points higher than the average over the forty years from 1948 to 1987.[28] Elevated profits in recent years can be attributed to a number of factors, the most important being the low level of provisioning for loan losses (Table 5). The low provisioning seems to be in step with a decline in banks' overall loan delinquency rate from 6.14% in early 1991 to 2.17% in mid-1998 (Chart 8). The apparent very high quality of most bank loans, particularly those to the business sector, evidently reflects, at least in part, the extended period of economic growth that followed the recession of 1990-91. It may also have been influenced by the substantial tightening of lending standards at the beginning of the decade, although these standards have been eased on balance since 1992.

Bank profits also have benefitted in recent years from net interest margins, which widened to historically high levels earlier in the decade. Although margins have narrowed steadily in recent years, partly reflecting intense lending competition among banks, they have remained somewhat elevated through mid-1998 (Chart 9). The high level of the net interest margin during the 1990s has reflected several factors. First, banks had a particularly strong incentive to keep loan rates high and deposit rates low in the early 1990s, as such pricing served the dual purposes of constraining asset growth and boosting earnings and capital. Despite the competition from money and stock and bond mutual funds, banks have kept yields on core deposits low even after restoring their capital ratios, evidently expecting to benefit from the inertia of some depositors (Chart 10).[29]

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[25] See Berger and Udell (1998).

[26] Ibid.

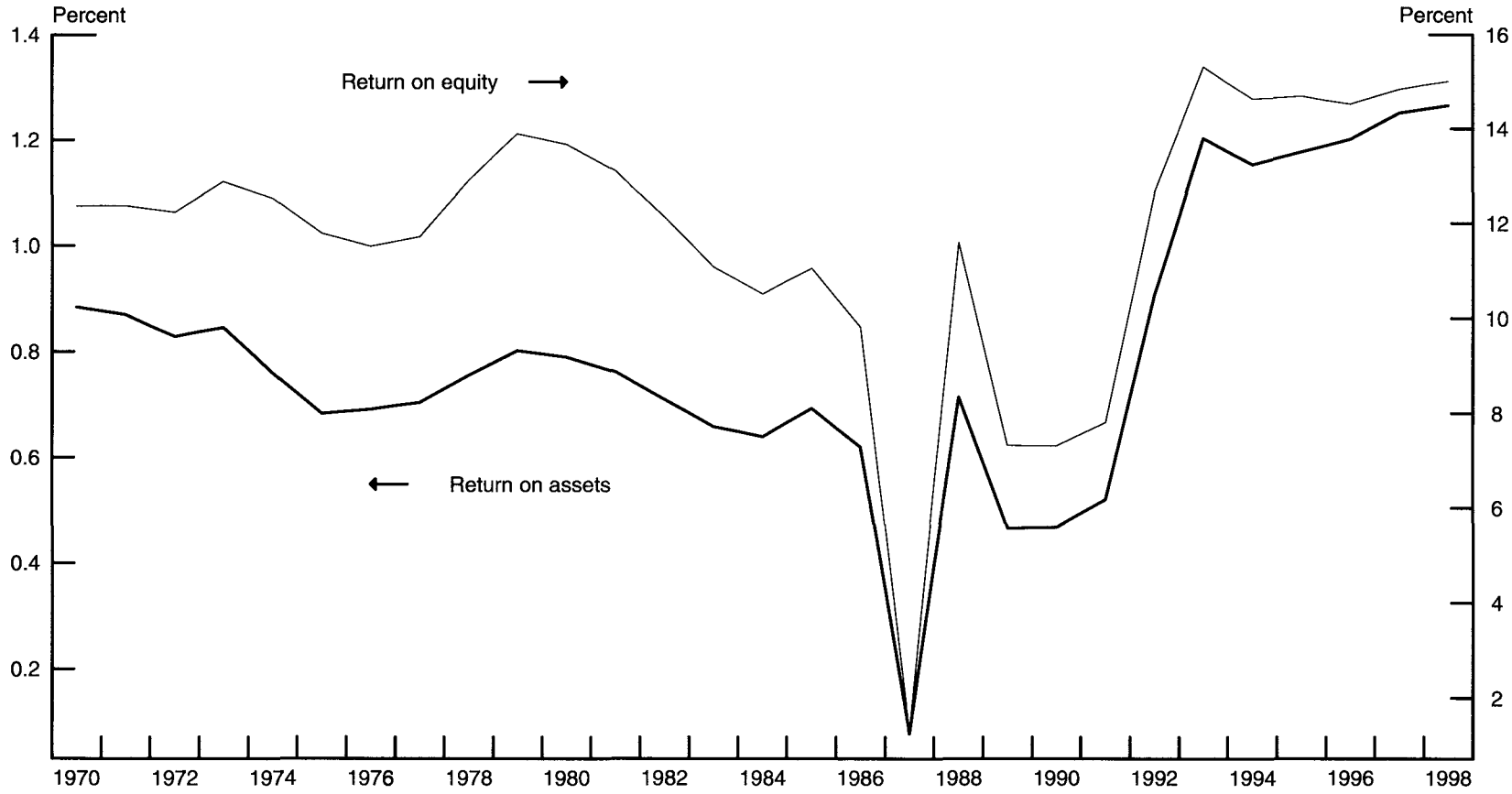
[27] See Gertler (1995).

[28] See English and Nelson (1998).

[29] The retail deposit data shown in Chart 10 refer to the most commonly posted rates and so would not pick up the effects of deposit rate tiering.

Chart 7

Measures of Commercial Bank Profitability

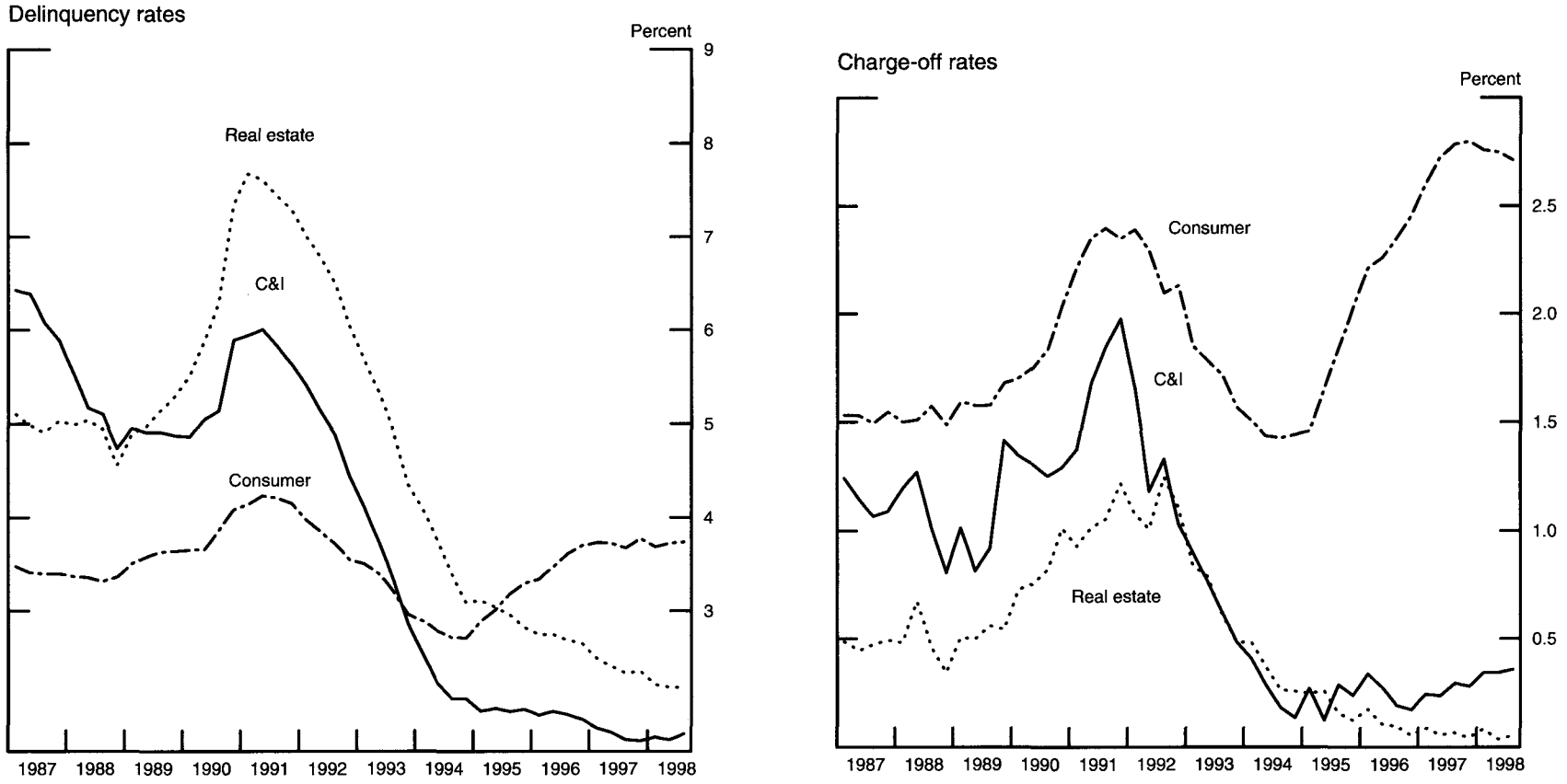


Source: Report of Condition.

Chart 8

Loan Performance at Commercial Banks

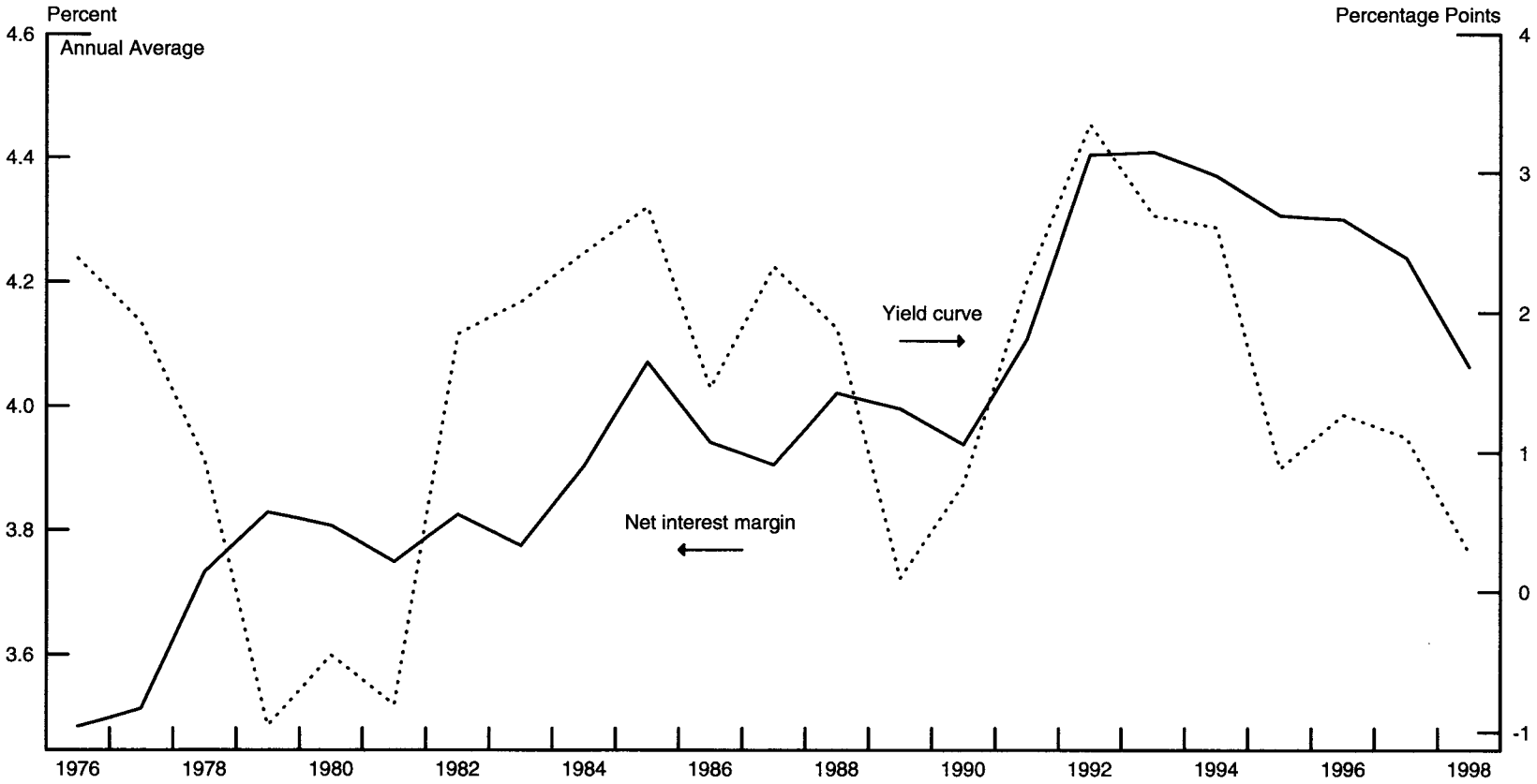
(Quarterly, seasonally adjusted)



Note: Data are from FFIEC's quarterly Reports of Condition. Delinquent loans include those past due 30 days or more and still accruing interest, as well as those on nonaccrual status. Charge-off rates are annualized, net of recoveries.
Source: Report of Condition.

Chart 9

Net interest margin* and slope of the yield curve**

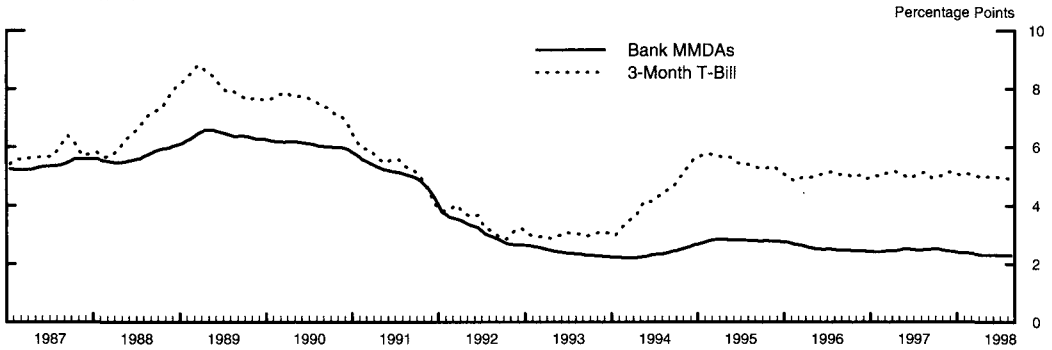


*Net interest margin is net interest income divided by interest earning assets.
**Yield on the 10-year Treasury note less the coupon-equivalent yield on the 3-month Treasury bill.
Source: Report of Condition and H.15 statistical release.

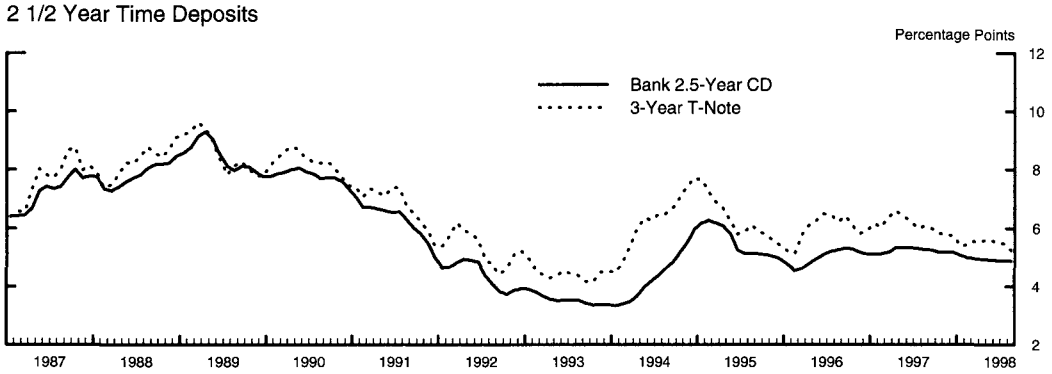
Chart 10

Bank Retail Deposit Rates and Managed Liabilities' Share of Funding

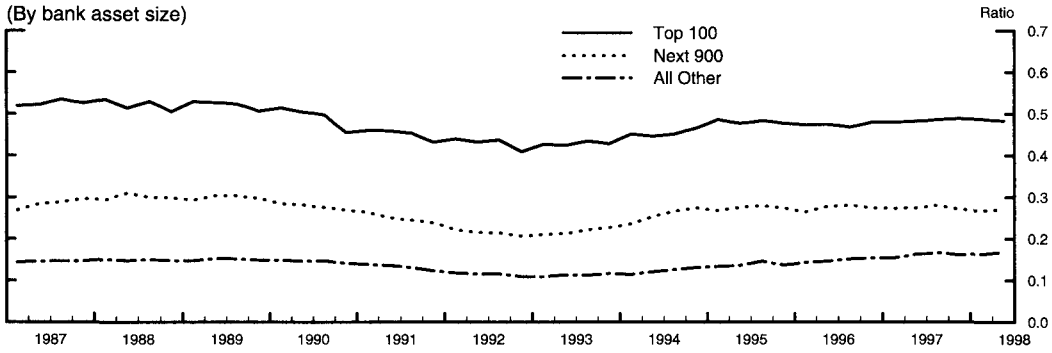
MMDA Rates



2 1/2 Year Time Deposits



Managed Liabilities as a Share of Total Liabilities*
(By bank asset size)



* Excludes trading liablities

Source: Bank Rate Monitor; Report of Condition.

Table 5

Income and expense as a percentage of average net assets

Item	1990	1991	1992	1993	1994	1995	1996	1997	1998*
Net interest income	3.46	3.61	3.89	3.90	3.78	3.72	3.73	3.67	3.51
Noninterest income	1.67	1.81	1.95	2.13	2.00	2.02	2.18	2.23	2.38
Noninterest expense	3.49	3.75	3.86	3.94	3.75	3.64	3.71	3.61	3.63
Loss provisions	0.97	1.03	0.78	0.47	0.28	0.31	0.37	0.40	0.38
Securities gains	0.01	0.09	0.11	0.09	–0.01	0.01	0.03	0.04	0.05
Income	0.68	0.73	1.32	1.70	1.73	1.81	1.85	1.93	1.92
Taxes and extraordinary items	0.21	0.22	0.41	0.50	0.58	0.63	0.65	0.68	0.66
Net income	0.47	0.52	0.91	1.20	1.15	1.18	1.20	1.25	1.26
Dividends	0.42	0.46	0.41	0.62	0.73	0.75	0.91	0.90	0.73
Retained earnings	0.05	0.05	0.49	0.58	0.42	0.43	0.30	0.35	0.53
Memo item:									
Return on equity	*7.31*	*7.80*	*12.64*	*15.32*	*14.63*	*14.69*	*14.53*	*14.84*	*15.01*

* First half, at an annual rate.

Source: Report of Condition.

Second, the net interest margin subsequently was supported by a cyclical shift in the banking system's portfolio from securities to higher yielding loans as the economic recovery took hold and credit demands rose. Third, banks have been funding a greater share of assets with capital than they did in the early 1990s, and dividends to equity owners are not included in interest income. Finally, banks' interest earnings have benefitted from the better loan pricing procedures they have developed. A key element has been the movement toward assigning risk ratings to loans and setting hurdle rates of return for various risk categories of loans sufficiently high to cover the cost of capital assigned to these categories.[30]

One factor that has been commonly cited by financial analysts for the widening of the net interest margin in the early 1990s was the very low levels to which monetary policy had pushed short-term interest rates and the resulting steepness of the yield curve at that time. In response to widespread imbalances in the economy, which Chairman Greenspan characterized as creating "50 mile an hour headwinds" holding back economic growth, the federal funds rate was lowered from about 83% in early 1990 to 3% in late 1992 and kept at that level until early 1994. Long rates also fell, but by much less. The resulting steep yield curve suggests that banks may have earned substantial profits by funding longer-term securities with short-term liabilities. However, an analysis of the historical relation between the net interest margin and either the slope of the yield curve or changes in the slope does not support this interpretation (Chart 9). The alternative explanation cited above, that banks were pricing assets and liabilities at that time with an eye toward restoring badly eroded capital positions, seems more persuasive.[31]

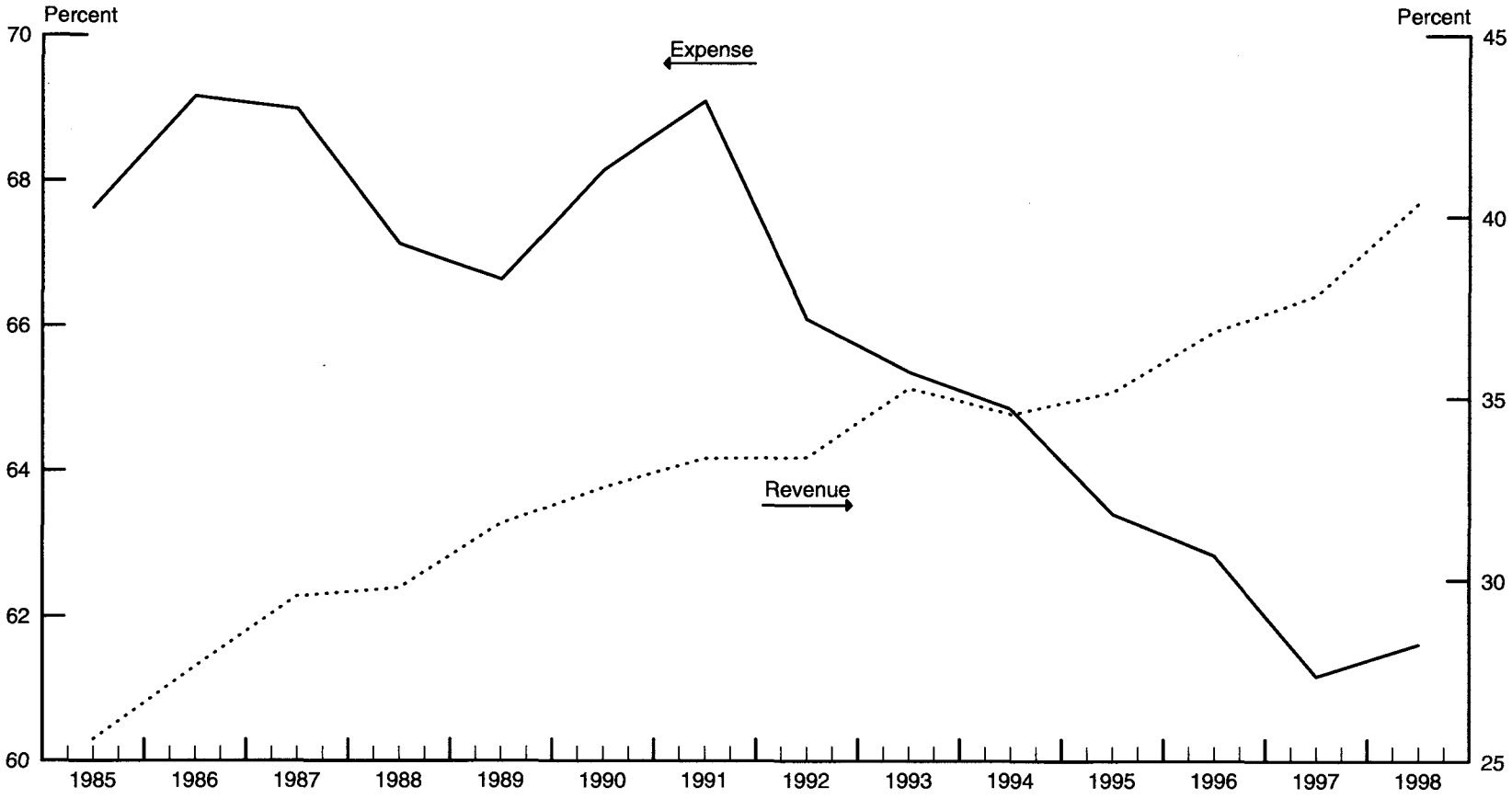
It is interesting to note that since 1993, banks of all sizes have moved steadily, albeit modestly away from core deposits – largely retail transaction and savings deposits, which tend to be held in amounts under $100,000 and thus are fully insured – and toward managed liabilities – uninsured nondeposit instruments and large time deposits, which are insured only for the first $100,000 (Chart 10). Banks' success in increasing their reliance on uninsured liabilities in an era of mandatory least cost resolution may reflect in part comfort provided by banks' strong capital positions. Indeed, cognizance of the need to attract uninsured liabilities at a reasonable cost under the provisions of FDICIA helps to explain banks' decisions to keep capital ratios generally high.

[30] See Treacy and Carey (1998) and Brady et al. (1998).

[31] See English (1996) and English and Nelson, op. cit., pp. 401-2.

Chart 11

Noninterest Expense and Noninterest Income As a Percent of Total Revenue



Source: Report of Condition.

Also contributing importantly to banks' high profitability in recent years has been steady rises in the share of total revenue accounted for by noninterest income even as noninterest expenses, also measured relative to revenue, have trended down (Chart 11). The rise in noninterest income reflects banks' shift toward off-balance- sheet and other fee-generating activities. Credit card fees, mortgage servicing fees, fees from the sale and servicing of mutual funds, ATM surcharges, and income from securitized loans have all been important contributors to bank fee income. Trading revenues are also included in noninterest income; while highly variable from quarter to quarter, these revenues have generally trended higher over the decade.

Table 6
Share of US bank assets at foreign offices and share of income from foreign operations
In percent

Share	1993	1994	1995	1996	1997	1998
Assets	12.2	13.2	13.6	14.8	15.0	15.0[1]
Income	16.3	11.9	11.6	12.0	10.3	11.9[2]

[1] June. [2] First half; compares to 15.4% for the first half of 1997.

Source: Report of Condition.

Noninterest expenses have been held down by restraint placed on labor and occupancy costs. Since the mid-1980s, for example, employment has declined 2% and the number of bank offices has increased less than 20% while revenue, adjusted for inflation, rose 60%. In other words, average revenue per employee increased more than 60% while revenue per office rose more than 30%. In addition, inflation-adjusted occupancy cost per bank office fell over this period.[32]

Table 7
Country exposure of US banks
In billions of US dollars

	June 1982			March 1998		
	Money center	Other large	All banks	Money center	Other large	All banks
	(1)	(2)	(3)	(4)	(5)	(6)
Total	204	66	344	368	75	479
To troubled areas*	52	17	87	100	19	132
To Japan	20	9	42	29	5	39
Memo items:						
Exposure as % of capital						
*a. to troubled areas**	*191*	*135*	*131*	*81*	*26*	*37*
b. to Japan	*73*	*70*	*64*	*23*	*7*	*11*

* 1982: Latin America and Eastern Europe; 1998: Latin America, Eastern Europe and Asia, excluding Japan.

Source: FFIEC E.16 Release.

Until very recently, bank profits have been boosted by strong earnings from foreign operations. Just over 10% of bank income last year derived from foreign operations, somewhat below the previous several years even though the share of assets at foreign offices rose slightly, to 15% (Table 6).[33] The weakening of

[32] English and Nelson, p. 403.

[33] Relatively few very large banks account for the bulk of the US commercial banking industry's activities abroad; some of these banks hold very substantial shares of their assets overseas.

foreign earnings of late has reflected economic problems in Asia. Banks doing business abroad continue to be vulnerable to problems in Asia and other troubled areas. Exposure to such regions is notable for some banking groups, but distinctly less than it was in the 1980s. As of March 1998, exposure to Latin America, Eastern Europe, and Asia (excluding Japan), expressed as a percentage of capital, was 37% at all banks (Table 7). Money center banks were much more prominent, at 81% of capital. In June 1982, exposure of money center banks (to Latin America and Eastern Europe) stood at 191% of capital; for all banks, this measure was 131%.

3. Regulatory implications of the developments of the 1990s

The exceptional health of the banking system, at least as reflected in data through mid-1998, has so far left the new features of FDICIA basically untested. In recent years, only a few small banks have failed. Nevertheless, concerns about some other aspects of the regulatory structure, in particular the "one size fits all" aspect to the Basle 8% risk-based capital requirement and the resulting incentive to engage in regulatory capital arbitrage, have grown. At the same time, the growing size and complexity of some banks has added to regulatory challenges. Also, pressures have continued to mount to alter the structure of the banking system to allow more competition between banks, securities firms, and the insurance business. This section reviews some problems associated with the current regulatory structure and then looks ahead to the banking system that would emerge if current legislation, The Financial Services Act of 1998 (H.R. 10), or something like it, becomes law.

3.1 Banking issues that have emerged following FDICIA

3.1.1 Implications of regulatory capital arbitrage

As noted in Section 2, techniques used by some banks to reduce their capital levels relative to the risk they hold, such as by securitizing loans, cast some doubt on a literal reading of their capital ratios, a key trigger mechanism to many of FDICIA's provisions. The regulatory response to this development has been to convey to bank examiners and to commercial banks themselves the full implications of regulatory capital arbitrage. The vehicle for doing this is "Supervision and Regulation (SR)" Letters, sent out by the Board's Division of Supervision and Regulation to Federal Reserve examiners and to the banks they examine. For example, an SR letter dated July 11, 1997, included the following statement:

> *"Supervisors and examiners should review the substance of secondary market transactions when assessing underlying risk exposures. For example, partial, first loss direct credit substitutes providing credit protection to a securitization transaction can, in substance, involve much the same credit risk as that involved in holding the entire asset pool on the institution's balance sheet. However, under current rules, regulatory capital is explicitly required only against the amount of the direct credit substitute... Supervisors and examiners should ensure that banking organizations have implemented reasonable methods for allocating capital against the economic substance of credit exposures...*
>
> *If, in the supervisor's judgment, an institution's capital level is not sufficient to provide protection against potential losses from such credit exposures, this deficiency should be reflected in the banking organization's CAMEL or BOPEC ratings."*

Thus, examiners are directed to make judgmental adjustments to banks' capital needs and assign CAMEL ratings appropriately. Such a flexible approach in effect allows banks to adjust their capital on some loans below the 8% Basle requirement as long as this seems appropriate to their examiners. According to the information on capital ratios contained in Table 8, which are adjusted for examiner ratings, to date at least regulatory arbitrage has not significantly eroded the banking system's capitalization.

Table 8
Distribution of bank assets by capital status*
As a percentage of industry assets

	1990:Q1	1993:Q3	1998:Q2
Under-capitalized	32.6	8.9	0.1
Adequately capitalized	36.8	17.8	1.3
Well capitalized	30.5	73.3	98.5

* Adjusted for examiner ratings.

3.1.2 Bank consolidation and mega-mergers

Mergers of very large banks raise special questions of supervision. Steps the Federal Reserve has taken in response to the recent rash of such mergers include formal efforts to coordinate state and federal supervisory activities, reviews of staffing requirements to ensure that personnel are properly trained to deal with evolving financial techniques and instruments used by very large banks, and continued reliance on other agencies in the case of some nonbank activities carried on within bank holding companies.[34] In addition, Federal Reserve supervision has become more "risk focused" in recent years, particularly regarding large and complex organizations. This has meant putting relatively less emphasis on balance sheets and asset quality measures and more on institutions' risk management policies and procedures, including associated information systems and internal controls. Indeed, bank examiners now separately evaluate a bank's risk management as part of the overall management component of their CAMEL rating.[35] In short, greater attention is being paid to the roles of banks' senior managements and boards of directors.

3.2 Looking ahead

3.2.1 Market-driven regulation using mandatory subordinated debt

Recently, regulators have begun to express interest in the possible benefits of requiring banks, particularly large banks, to issue some minimum amount of subordinated debt.[36] Several regulatory benefits are seen to derive from such a step. Subordinated debt holders own an uninsured instrument whose value can fall to zero if a bank fails but, unlike the value of equity, cannot rise to share in extraordinary gains that might derive from a bank's risk taking. Hence, the presence of investors holding a bank's subordinated debt (particularly if they don't also hold its equity) could work to limit its incentives for risk taking. Secondly, the yield at which such debt can be issued by individual banks (or the price at which it trades if a liquid market in this instrument were established), would provide information on the market's view of the bank's riskiness that, in principle, regulators could use to price deposit insurance or trigger other regulatory mechanisms. Some proposals for mandatory subordinated debt would make it a much more powerful regulatory tool by setting a ceiling rate, relative to a riskless Treasury instrument, at which banks are allowed to issue it.[37] In this case, market perceptions about an institution's riskiness would limit its size, or could even force its liquidation.

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[34] Meyer, loc. cit. pp. 15-17.

[35] Mishkin, p. 20. Four aspects of risk management are evaluated: the quality of oversight provided by the board of directors and senior management; the adequacy of policies and limits established to control all activities that present significant risk; the quality of risk measurement and monitoring systems; and the adequacy of internal controls with respect to fraud.

[36] See Meyer (1998b).

[37] See Calomiris (1997) and Walls (1998).

Thinking about proposals for mandatory subordinated debt is in its early stages at the regulatory level. There likely would be practical problems to overcome in order to implement such a proposal. For example, at the end of 1997, subordinated debt issued by commercial banks amounted to $62 billion, or 1.2% of assets. This is a bit below the low end of the range of required levels of subordinated debt in various proposals.[38] Moreover, much of banks' subordinated debt apparently is held by their parent holding companies, as opposed to the market participants who would have to be involved for the suggested benefits to materialize.[39]

The doctrine of prompt corrective action has some interesting interactions with mandatory subordinated debt proposals. For example, if subordinated debt holders were fully confident that a troubled bank would be closed while its net worth was still positive, the debt's price would be virtually immune to changes in the bank's perceived health. Conversely, shifts in the market's assessment of the likelihood of implementing PCA successfully would presumably affect the yield on troubled banks' subordinated debt. Moreover, yields on the subordinated debt of banks the market believed to be "too big to fail" might be less responsive to changes in their perceived health than would be true of other banks. Another complicating factor is that the spread of the rate on a bank's subordinated debt over a riskless rate is susceptible to shifts in investor demands both for the subordinated debt or the riskless instrument for reasons that are unrelated to changes in the condition of a particular bank (for example, liquidity demands for the riskless instrument owing to some economic shock).

Finally, the proposal to set a regulatory ceiling on the rate at which subordinated debt can be issued relative to the rate on a riskless security raises the issue of how the maximum allowable spread between the two rates is to be set. Doing so would be a crucial regulatory decision, since it could essentially determine the trade-off between a desire to avoid discouraging financial intermediation and other banking practices that are sometimes risky but on balance beneficial, on the one hand, and a need to protect the safety and soundness of the banking system and prevent abuse of the safety net, on the other. In this respect, the ceiling rate is analogous to capital requirements: they may fail to protect the safety and soundness of the banking system if set too low but would tend to discourage desirable and productive bank lending if set too high. Our ongoing experience with the banking system's and regulators' responses to the Basle Accord on required capital levels, specifically the emergence of regulatory capital arbitrage, seems very instructive here. While this practice can be viewed with some concern, its "safety valve" feature has been seen as valuable.[40] Because it is not clear that such a safety valve would emerge in the case of the proposed interest rate ceiling for subordinated debt, it would be all the more important that the ceiling be fixed at an appropriate level.

3.3 Expanding banking activities: The Financial Services Act of 1998 (H.R. 10)

As noted in the first section of this paper, the nonbank subsidiaries of bank holding companies have grown faster than their bank subsidiaries over the past decade, largely owing to the growth of "section 20" subsidiaries, which carry on underwriting activities for corporate debt and equity.[41] Pressures on regulators to expand what banking organizations are permitted to do have been evident for years, and they have mounted recently along with the acceleration of change in financial technology. On May 13, 1998, the House of Representatives passed a bill addressing these problems, H.R. 10. While the bill does not allow

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[38] See Hancock (1998).

[39] Some proponents of mandatory subordinated debt argue that its owners should not have direct or indirect interest in the stock of the banks that issue the debt. Ibid.

[40] Meyer (1998c).

[41] The Federal Reserve Board gave some bank holding companies limited authorization to underwrite corporate debt and equity in so-called section 20 subsidiaries in 1987. Initially, gross revenues from underwriting ineligible securities were capped at 10% of the subsidiary's total gross revenues. This ceiling was subsequently raised to 25%.

a FHC to mix banking and commerce, its essential feature is the provision allowing banking organizations to enter into the businesses of securities and insurance underwriting. Further, it would require that this be done using the structure of the bank holding company.

The Act provides for the establishment of financial bank holding companies (FHCs) whose subsidiaries, in addition to commercial banks, could include securities firms that underwrite debt and equity and insurance subsidiaries that underwrite insurance.[42] To qualify as a financial holding company, each of the bank holding company's depository institution subsidiaries must be well capitalized and well managed.

The Act also establishes a new type of financial institution, the Wholesale Financial Institution (WFI). WFIs would be prohibited from accepting retail or FDIC-insured deposits, but would have access to the discount window and the payments system. WFI holding companies would be able to engage in the same activities as FHCs except that they could not own insured banks or savings associations, other than certain limited-purpose institutions. There is some scope for commercial activity, since a company that becomes a WFI may retain any commercial holdings it holds as of the date on which the Act becomes law.

Supervision would employ the "umbrella" concept – the Federal Reserve would have supervisory authority over all bank holding companies, but its authority over their nonbank subsidiaries would be limited, and these would be supervised on a functional basis by appropriate regulators; for example, securities subsidiaries of a FHC would be supervised by the SEC. H.R. 10 also requires the Secretary of the Treasury to conduct a study and prepare a report to Congress concerning the impact of the bill on the Community Reinvestment Act.[43]

4. Implications for monetary policy

The changes that have affected the US banking system over the last decade appear to have fairly limited implications for the techniques used to implement monetary policy as well as for its transmission to the economy.

4.1 Implementation of monetary policy

Controlling the federal funds rate. The Federal Reserve carries out its monetary policy through open market operations that affect the supply of reserves in the banking system relative to the demand for them and hence exert a substantial influence over the federal funds rate, the price of these reserves in interbank markets. One development that initially raised some concerns about the adequacy of control over the federal funds rate is banks' use of deposit "sweep" arrangements to reduce their levels of required reserves.[44] In addition to fulfilling reserve requirements, banks hold reserves to meet clearings against their accounts at the Federal Reserve. With required reserves reduced, reserves became less able to cushion against adverse clearings. The resulting increase in the likelihood that adverse clearings would force banks to scramble to

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[42] Other activities that would be permitted to financial bank holding companies: merchant banking activities; any activity in the United States that the Federal Reserve Board determines is usual in connection with banking overseas; and any other activity the Board determines to be financial in nature or incidental to financial activities.

[43] The Community Reinvestment Act of 1977 (CRA) calls on the federal banking agencies to encourage the institutions they supervise to help meet the credit needs in all sections of the local communities they are chartered to serve and requires the agencies to make public records of compliance with the CRA and to take into account CRA performance when considering applications for mergers and acquisitions.

[44] Sweep accounts link checking accounts, with a reserve requirement of 10%, with money market deposit accounts (MMDAs), which have a reserve requirement of zero and which allow up to 6 withdrawals per month. In a manner invisible to the account holder, the bank automatically sweeps all funds over some minimum level in the checking account into the MMDA. Funds are shifted back into the checking account to prevent its close-of-business balance from falling below zero. Through August 1998, checking accounts totaling about $298 billion have been converted into sweep accounts.

find balances to avoid overdrafts could potentially make the federal funds rate more volatile.[45] Indeed, volatility did rise for a short time in the early 1990s, but since then banks have become more adept at working with lower reserve balances.

The role of M2. The relation between M2 and income became less predictable for a period in the early 1990s, as M2 velocity rose even as interest rates and the opportunity cost of M2 declined. This shift is likely to be in part attributable to growth of mutual funds, which compete with the components of M2 as vehicles for household savings. Although there has since been some re-establishment of a predictable relationship among M2, its opportunity cost, and income, it remains too weak to allow M2 to be considered as a monetary target or indicator. This influence of mutual funds on the behavior of M2 can be viewed as one in a long series of institutional changes beginning in the mid-1970s that have acted to place limitations on the monetary aggregates as guides to monetary policy.

4.2 The transmission of monetary policy

Some of the channels through which monetary policy is transmitted may have been strengthened somewhat, on balance, by the changes in the banking system and by the developments elsewhere in the financial sector over the last decade. For example, the increased securitization of loans has probably made some loan rates more sensitive to market developments, since loans must be competitively priced to be sold in capital markets. Thus, some bank borrowers may now find the cost of credit more sensitive to changes in monetary policy than previously. Also going in the direction of strengthening the effects of monetary policy actions has been growth of securities and equity holdings as a share of household wealth. This development should reinforce the "wealth effect" of monetary policy actions. For example, between 1988 and 1998, the ratio of household wealth to disposable income is estimated to have risen from 5.0 to 5.6. Moreover, the share of household wealth that is financial, including equity, has risen from about 71 to 80%. Thus, changes in the price of financial assets resulting from changes in monetary policy are likely to produce larger effects now than they did a decade ago.

Working in the other direction has been the weakening effect of the expansion of securitization on the "credit" channel of monetary policy. The credit channel focuses on the unique nature of some bank loan assets and asserts that, because central banks operate through the commercial banking system in their open market operations, banks and at least some of their customers are affected by changes in monetary policy by more than is captured in the resulting increase or decrease in short-term interest rates. The ability to securitize more and more bank assets, however, provides a way for banks to arrange for the provision of credit without having to expand their balance sheets. In addition, the Federal Reserve lowered to zero the reserve requirement on all nontransactions deposits in the early 1990s as part of its efforts to stimulate bank lending and economic activity at that time.[46] Thus, banks have substantial scope to raise funds to support asset expansion at the margin that is independent of the level of reserves in the banking system.

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[45] Part of the solution to the problem which lower required reserves has caused for clearing needs has been for banks to hold additional reserves in the form of required clearing balances. These are reserves banks agree to hold voluntarily and that earn interest in the form of credits used to defray some costs of Federal Reserve services (such as check clearing). The statutory and clearing balance requirements are met on a two-week average basis, so that low reserve levels on a particular day can be made up for with higher holdings on another day of the maintenance period. Clearing needs, by contrast, must be met on a day by day basis.

[46] The reserve requirement on nonpersonal time deposits was reduced from 3% to zero, effective December 27, 1990. The reserve requirement on transactions deposits was reduced from 12 to 10%, effective April 2, 1992.

5. Conclusions

The US banking system has changed considerably over the last decade. It has simultaneously become more competitive and more profitable. While the length of the economic expansion following the 1990-91 recession evidently has given important support to banks' earnings, the numerous facets of the overall rise in profitability – lower loan provisioning, wider interest margins, and steady improvements in noninterest revenues and expenses – suggest some fundamental advances in the way many banks are managed. Increased competitive pressures associated with the persistent advance of interstate banking, culminating in the Riegle-Neal Act, doubtless have helped to raise managerial standards, and average performance levels ought to rise also as a result of less efficient banks being acquired by more efficient competitors. Banking also has been improved by the spreading practice of assessing and pricing loans on the basis of relative risk. Recent setbacks in Asian and other markets indicate that bank profits will fall from their lofty recent levels, at least for a while. Even so, the extended period of strong profits has contributed to high capital ratios, as have regulatory pressures. Changes to the regulatory structure contained in FDICIA – making it more market like – have made it harder for banks to take advantage of the safety net and made it more likely that troubled banks will be closed in a timely fashion.

While changes to the US banking system over the past decade have had only limited implications for monetary policy, they have raised a number of important regulatory questions. Banks' efforts to engage in regulatory arbitrage points up the problem inherent in setting appropriate capital standards in a broad fashion, and how to alter or replace the Basle 8% risk-based capital requirement is an area of much ongoing work. A step that has already been taken is allowing banks to use internal Value at Risk models to calculate risk-based capital requirements against specified risks in their trading accounts. This approach may point the way for further reliance on internal models, although much more work needs to be done before this can happen.[47] Another possible tool for improving regulatory control is the use of mandatory subordinated debt. Here, too, more work is necessary.

Mega-mergers, the growing complexity of banking, and pressures to expand banking powers, vividly illustrated in the Citicorp – Travellers Group merger, raise other regulatory issues. The direction the solutions take may already be foreshadowed in the concept of risk-focused regulation and the legislative ideas contained in H.R. 10. The need to address these problems likely will guide much of the research/regulatory agenda at the Federal Reserve and elsewhere over the coming decade.

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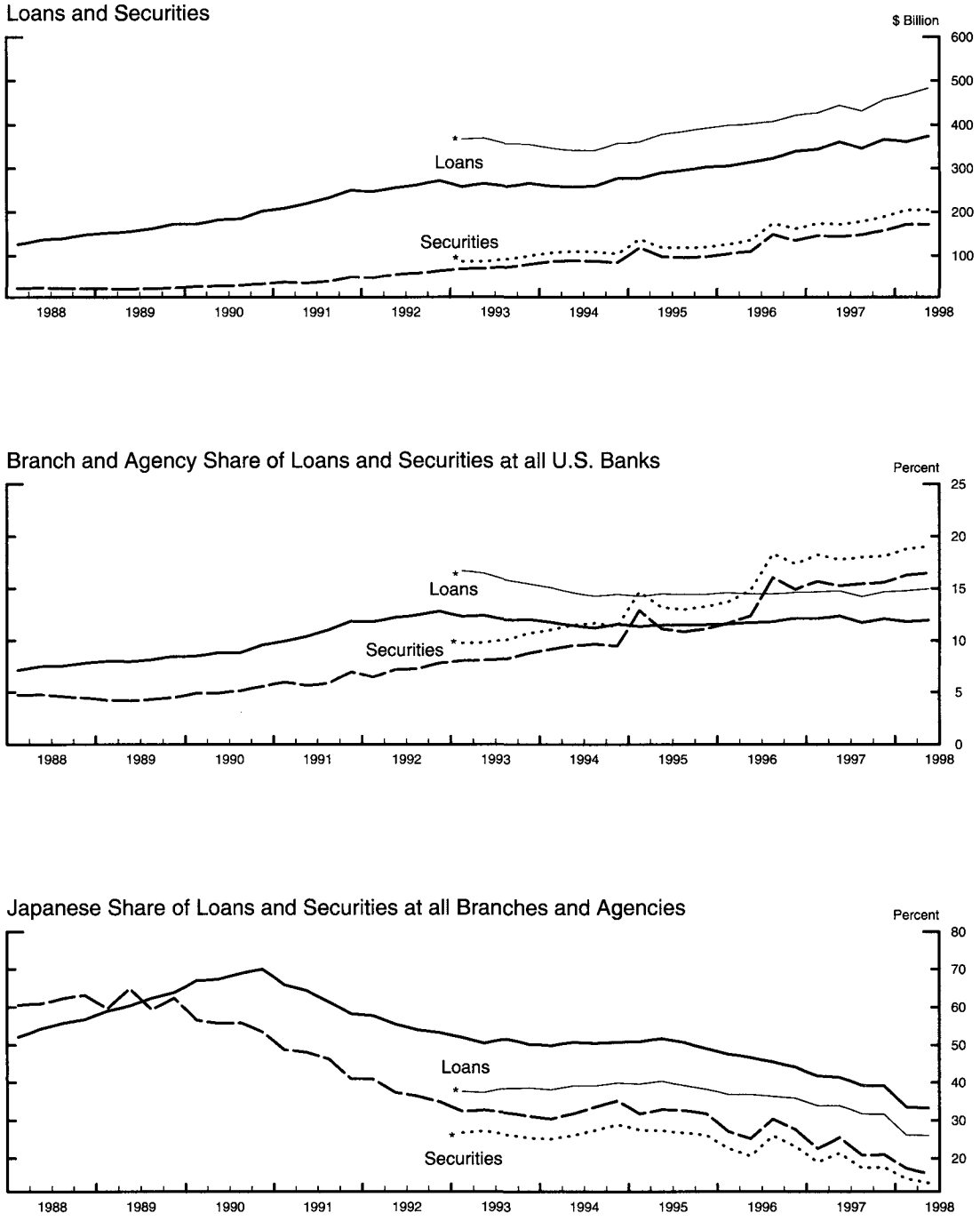
[47] See Mingo (1998).

Appendix: loans and securities at US branches and agencies of foreign banks, 1988-98

The amount of bank credit supplied by US branches and agencies of foreign banks over the last decade has been distorted by shifts in the early 1990s of assets from the Caribbean offices of these institutions to their

Chart A-1

U.S. Branches and Agencies of Foreign Banks



Note: Securities are adjusted for the effects of FIN39.
* Includes loans and securities held at Caribbean offices managed or controlled by U.S. branches and agencies of foreign banks.
Source: FFIEC 002/002S.

US offices.[48] Much of the growth in branch and agency loans and the consequent rise in the share of these loans relative to loans made at all US banks – domestically chartered banks plus US branches and agencies of foreign banks – during the years 1990-92 reflect these shifts (Chart A-1). Balance sheet data for the Caribbean offices of branches and agencies only became available in 1993. Since then, the share of loans at branches and agencies relative to all US bank loans (inclusive or exclusive of claims on US nonbank residents booked at the Caribbean office) has declined on balance, although it has been fairly steady in recent years. The composition of branch and agency loans by nationality of parent bank has shifted, however, with the share of Japanese banks declining markedly, evidently in reflection of capital constraints at their parent banks.

In contrast to loans, the share of securities at branches and agencies has risen since 1993, particularly in recent years. This recent growth has been concentrated at several large European branches and agencies and has been in largely in their trading account securities.

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[48] The shift was a response to the Federal Reserve's reduction from 3% to zero in the reserve requirement on nonpersonal time deposits in December 1990. US branches and agencies are subject to reserve requirements, but their offshore offices are not. Branches and agencies often use their US offices to offer the banking services of their offshore offices to their US customers. A remaining incentive to book business at offshore offices is state and local taxation. See Terrell (1993).

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Corporate governance and bank profitability: empirical evidence from the Italian experience

Andrea Generale and Giorgio Gobbi[1]

1. Introduction

Beginning in the early nineties the vast majority of Italian banks have been affected by a fall in profit margins. A decline in net income from traditional banking business, downward rigidity of operating costs and an increasing share of gross income offset by loan losses have been system-wide trends due in part to structural and external factors. Tendencies, similar in nature if different in timing, emerged in the banking systems of most major countries as a consequence of liberalisation and deregulation. The magnitude of the profit reduction and the persistence of poor profitability nevertheless suggest that the problems of Italian banks stemmed not only from structural factors but also from significant inefficiencies in management. It has been argued that, in the years preceding the profit decline, public ownership of a very large part of the banking system had weakened incentives for the efficient use of real and financial resources. The structurally high profit margins of that era may have enabled banks to compensate for their inefficiencies despite intensifying competition. In short, the adjustment of the Italian banking system could have been hindered by problems of corporate governance, some of them a legacy of the past.

This paper offers an empirical test of this hypothesis, collating two information sets: differences in profitability between Italian banks from 1984 to 1996 and changes in top management during a much briefer period, 1994-96. Like those of other countries, the Italian banking system features broad dispersion in return on assets, due to differences in business specialisation, degree of competition in market segments and, at least in part, differences in both allocative and operating efficiency.

To pinpoint the role of operating efficiency, we have conducted an econometric exercise relating profits to a set of variables that can be interpreted as indicators of efficiency, controlling for the effects of specialisation and market composition. In particular, we have considered two set of variables, one designed to capture banks' capacity and incentives for risk management and one to measure efficiency in the combination of productive factors. To test the hypothesis that inefficiencies, and hence differentials in profitability, are linked to differences in ownership, we also introduced stylised variables for corporate governance, such as type of ownership and stock exchange listing. The methodology differs from the standard one for estimating efficient frontiers in that it permits direct identification of the determinants of differences in profitability. Estimates derive from a fixed-effect panel model. To assess the effect of the governance variables, in addition to gauging their contribution to the individual component of each bank not explained by the other regressors, we analysed their correlation with the most significant indicators of efficiency. This procedure is justified by the pronounced stylisation of the information on governance, which makes it impossible to capture the real diversity of systems.

Finally we analyse the relationship between the earnings performance of banks and changes in top management. The issue is important for two reasons: first, in a system in which banks are directly or indirectly owned by the state, it is likely that managers face different incentives and constraints from those faced by managers in the private sector. If profit maximisation is not the only objective of the leading shareholder, the expected negative relationship between profitability and management turnover will probably be weakened. Second, the period under study was marked by a considerable

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deterioration in average bank profitability. As a result, banks began a process of restructuring that, in addition to promoting the supply of innovative services and cost containment, probably affected the quality of top management.

The paper is organised as follows: in Section 2 we briefly review the main arguments of the theoretical and applied literature on corporate governance in banking. Section 3 analyses profit differences among banks both descriptively (Section 3.1) and econometrically (Sections 3.2 and 3.3). Section 4 examines changes in top management, while Section 5 concludes.

2. Banks' efficiency and corporate governance

The relationship between systems of corporate governance and business efficiency is a theme that has attracted economists ever since neoclassical theory was judged inadequate to describe the constraints and purposes of entrepreneurs. Analysis of the various mechanisms by which corporate governance is exercised becomes relevant given two conditions: an agency problem generating conflicting interests between the various parties involved (owners, managers, creditors, employees); or transaction costs so high as to prevent resolution of conflicts by contract between the parties (incompleteness of contracts).[2] The most commonly studied conflicting interests are those of providers of finance (owners and creditors) on the one hand and management on the other and those of suppliers of finance enjoying different preference (equity and debt capital). In the former case, the problem is to oblige management to pursue maximisation of the value of the firm rather than personal advantages. In the latter, differing positions in case of liquidation create differing preferences on risk-taking. Specific forms of ownership correspond to different degrees of informational asymmetry. The problem of monitoring management decisions is presumably much less severe when ownership is concentrated and more severe when shareholding is diffuse. It also varies in severity between financial systems and firms.

Interest in corporate governance in banking has increased of late, chiefly because of the transformation of the financial system in many countries (Prowse (1997)). Banks share with non-financial firms the same sort of governance problems such as the control of shareholders on the management's choices (Tonveronachi (1997)). On the other hand, banking intermediation is based on funds raised from a myriad of small depositors with neither the incentive nor the capacity to gather information or to act to modify management decisions. In most countries, depositors are protected by deposit insurance schemes and their interests are represented by supervisory authorities in a position to intervene if the bank's performance is not satisfactory. The safety net for depositors may set incentives for the banks to exploit deposit protection schemes (and/or lending of last resort). Conversely, the threat of intervention by the authorities, which can foster changes in control, may be one factor in banks' achievement of efficiency (Dewatripont and Tirole (1994)).

Empirically, the case for studying corporate governance in banking is related to the dispersion of profit margins within most national systems. Figure 1 shows the average values of each of the three thirds of the distributions of return on assets for banks in the main European countries and the United States. The differences reflect differing business specialisations (sometimes due to regulation), out of equilibrium adjustment processes and differences in allocative and operating efficiency.[3] However,

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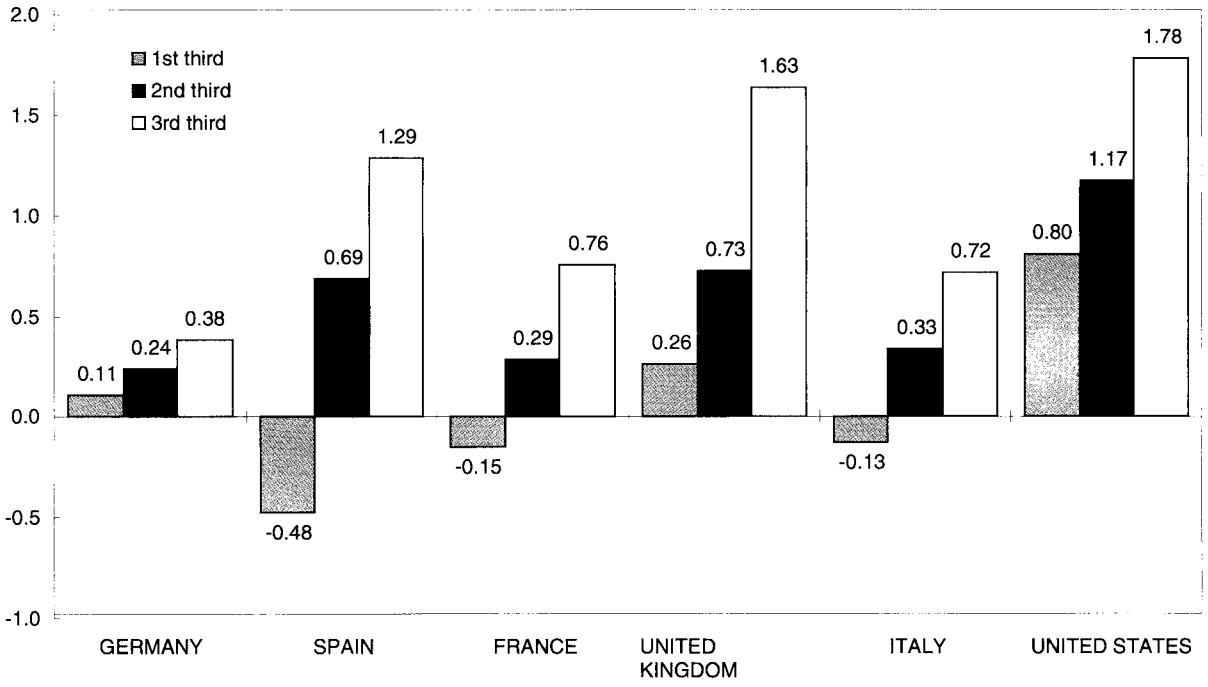
[2] For a comprehensive survey of the literature on corporate governance see Shleifer and Vishny (1996). The incomplete contract approach is discussed in details in Hart (1995).

[3] Studies of the determinants of bank profitability in Europe (Conti, Ossanna and Senati (1997); Angeloni, Generale and Tedeschi (1997); Generale (1996)) have found significant differences between countries in terms of the composition of margins and costs. In particular, Conti et al. propose a tripartite classification of banking systems according to market structure and regulation: the Latin model, characterised by high net interest margins and inefficiency in controlling costs; the northern European model, operating on narrower margins but more efficient; the Anglo-Saxon model, specialised in supplying innovative services. The completion of the single European market in banking is already blurring the

differences in both profit and cost efficiency on the order of 20% between banks in the same country have been documented by numerous empirical studies.[4] Berger and Mester (1997) investigated the correlation of the efficiency scores for US banks with a number of variables proxying for organisational form and corporate governance. In particular, they considered banks' positions in holding companies, whether parent banks in the holding companies are listed on the stock market, the concentration of ownership and the proportion of stock owned by board members. They found that banks in holding companies and banks listed in the stock market display higher cost and profit efficiency while the ownership variables are not correlated with efficiency scores.

Figure 1
International comparison of distribution of banks' profits
Percentage of total assets, averages for each profit class



Source: Based on BankScope – Bureau Van Dijk data, for 1993-95, on a sample of banks with total assets of more than $1 billion ($5 billion for the United States).

A different strand of the literature has focused on the degree of separation between ownership and control in large corporations with diffuse shareholding, which implies differing preferences between management and shareholders. Gorton and Rosen (1995) empirically check whether the decline in profitability suffered by US banks during the eighties should be blamed on problems of moral hazard involving the owners or on problems of corporate control. In the case of moral hazard, the decisive factor is the owners' incentive to make high-risk loans when a deposit protection scheme is in place and the value of the bank is declining. In the case of control problems, it is the incentives for management that underlie the granting of increasingly risky loans. For this to occur, the manager must hold enough equity to be able to determine strategy but not enough to suffer a serious personal loss if the risky project fails. Gorton and Rosen find empirical evidence for this last effect which contrasts

differences between national banking systems. Some patterns also recur across countries; in particular, banks with a high *ROA* also tend to have a high net interest margin, whereas low *ROA* tends to be correlated with high cost ratios.

4 For the United States, see Berger and Humphrey (1992) and Berger and Mester (1997); for Italy, see Conigliani (1984), Martiny and Salleo (1997), Resti (1997) and Gobbi (1995).

with previous findings. Saunders, Strock and Travlos (1990) found that banks with an owner more powerful than the managers display a propensity to take greater risks.

Finally a line of research investigated on the effects of the different ways in which management discipline is enforced. One mechanism is corporate take-overs. Schranz (1993) examines the relation between profitability and take-over regulation in different parts of the US, finding empirically that banking profits are higher in the states where take-overs are more frequent.[5]

The recent literature on Italian banks has focused on the ownership structures and, in particular, on the issue of efficiency of publicly owned banks compared to private ones. Bianchi, Di Battista and Lusignani (1997) examine the relation of several corporate governance indicators to banks' performance. They find that publicly owned banks are outperformed by private ones by each of the yardsticks considered. De Bonis (1997) shows that many performance indicators are worse for publicly owned banks even excluding the large crisis-ridden banks in the South. Among private banks several studies have found evidence that those organised in the legal form of cooperative banks are better managed. For example, in the analysis by Farabullini and Ferri (1997) of the ex ante probabilities of underperformance among southern banks, cooperative banks turn out to be less likely to perform poorly.[6] Among publicly owned banks the savings banks are local institutions that have now mostly come under the control of major banking foundations whose role is still debated. Moreover, until recently, saving banks' organisational structures have been more similar to those prevailing in the public administration than in other publicly owned banks. The effect of the stock market in controlling management is less clear: Bianchi, Di Battista and Lusignani (1997) find little support for a market discipline effect of stock exchange listing. Owing to the paucity of detailed information less attention has been paid to other aspects of organisational structure and corporate governance.

This brief survey of the literature suggests the shape of our empirical analysis in Section 3. First, it takes the type of ownership into account. Evidence already available shows that the performance of public sector banks is less satisfactory. Within this group, however, we look in particular at the savings banks; among private banks we examine the cooperative banks, which are characterised by widely diffuse ownership and stability of control. A second element that should theoretically capture the way in which governance is exercised is stock exchange listing and the position within holding companies. A further relevant factor is the relation between corporate governance and the bank's propensity to exploit deposit protection schemes (and/or lending of last resort). For US banks, there is a close correlation between the composition of ownership and the amount of excess risk exposure. For Italy, we need to test whether the indicators proxying for the degree of allocative inefficiency are correlated with type of ownership. To capture these inefficiencies, one must also take into account the level of capitalisation, which is the link between corporate governance and the exercise of prudential supervision. Capital inadequacy may trigger intervention of the authorities and will very likely foster a revision of the system of governance, interacting with the bank's performance. Finally, our analysis will consider the structure of the markets in which banks do business, as this is an exogenous constraint on management decisions.

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5 Schranz also notes that "When take-over activity is restricted, increased use of other mechanisms that provide an incentive to maximise firm value, such as concentration of equity ownership and management ownership of stock, is observed. However, these alternative methods have a smaller effect on profitability and do not completely compensate for the absence of an active take-over market." On this, see also James (1984).

6 On the cooperative banks (*banche popolari*) see De Bonis, Manzone and Trento (1994). On the mutual banks (*banche di credito cooperativo*), see Padoa-Schioppa (1997). De Bonis et al. note that "In cooperative enterprises, the compromise between safeguards for the shareholders and certainty for managers is based on the powerful bonds of trust among the members, reinforced by the homogeneity of the groups involved, often by their links with the local community and with mutual societies. The incentive mechanism appears to be based on these elements of trust and participation rather than on the external control of the financial markets. Shared values, mutual acquaintance, the regular encounters characteristic of the cooperative culture form a deterrent to management abuses."

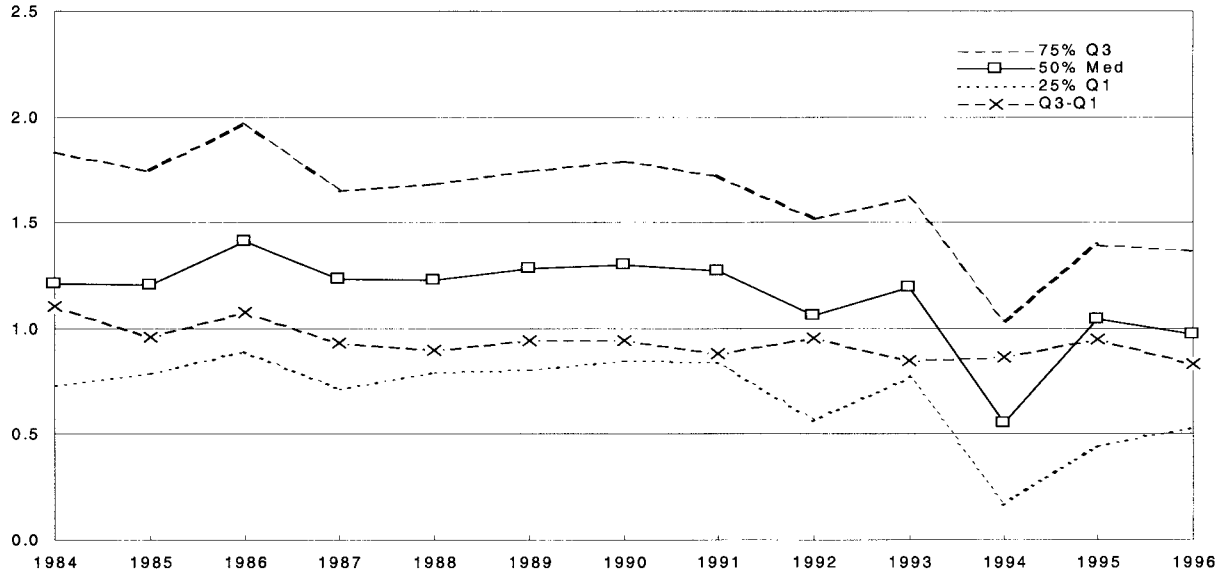
3. Profitability of Italian banks

3.1 Differences in profitability among banks: some facts

To examine the differences in profitability of Italian banks in greater detail, we utilised a larger, more representative sample than that used for the international comparison shown in Figure 1. We have included the banks in the sample used for the construction of the monetary and financial aggregates in Banca d'Italia statistics, but have excluded the branches of foreign banks in Italy, central credit institutions and mutual banks (*banche di credito cooperativo*) because of their very specific lines of business. The data come from supervisory returns and from the reports to the Central credit register. The profit-and-loss and balance-sheet figures of the former special credit sections are merged into those of the institutions to which they belonged for the entire period under review. The sample ranges from a maximum of 316 banks in 1984 to a minimum of 209 in 1996 and refers to the period from 1984 to 1996.

The ratio of profit before tax to total assets was selected as the indicator of profitability.[7] Figure 2 shows the median and the difference between the other two quartiles. In the period considered, the average difference between the third and fourth quartiles was a little less than 1 point: the return on assets of the bank at the 75th percentile of the distribution averaged 2.5 times that of the bank at the 25th percentile. Income before tax was determined by subtracting operating expenses and net value adjustments and readjustments to assets (mainly arising from loan losses) from gross income. For descriptive purpose, we considered the average values for banks within the three groups, ordered according to the profitability indicator. To simplify the exposition, we further aggregated the data into three relatively homogeneous periods: 1984 to 1987, when administrative constraints on lending were phased out; 1988 to 1991, marked by the rise of competitive pressures in the fund-raising and lending markets; 1992 to 1996, distinguished by the sharp contraction in banks' profit margins.

Figure 2
Dispersion of ratio of profits to assets



[7] We chose it for two reasons. First, there are marked differences in the rules laid down by tax law and the Civil Code for drawing up annual accounts and the rules changed during the period considered. Second, as loss-making banks do not pay income tax, differences in profitability are attenuated if net profit is adopted as the indicator. In this study we also performed descriptive and econometric analysis using *ROE* (the ratio of net profit to capital plus reserves) as the indicator of profitability. As the results are very similar, we opted only to present those for pre-tax *ROA*.

In each of the three periods, the most important determinant of the dispersion of profits was gross income and, within it, net interest income (Table 1). Banks with high net interest income generally also had high income from services and trading. Differences in gross income were generally not offset by differences in operating expenses. The disparities in operating expenses between groups of banks tended to diminish over time. The qualitative findings obtained by comparing the groups of banks are confirmed by correlation analysis. The correlation coefficient between gross income and profit before tax is positive, high and statistically significant in each of the three periods considered, whereas there is no correlation between operating expenses and profit before tax (Table 2). The component due to value adjustments, and thus indirectly to loan losses, is important but not large enough to reverse the rankings established with reference to net income.

Table 1

Profit and loss accounts for groups of banks*

As a percentage of average balance sheet total

	1984-87			1988-91			1992-96		
	I	II	III	I	II	III	I	II	III
Net interest income	3.04	3.36	4.34	2.99	3.33	4.19	2.45	3.07	3.57
Net income from trading	0.60	0.47	0.60	0.38	0.40	0.51	0.35	0.41	0.47
Other income	0.65	0.53	0.63	0.48	0.53	0.62	0.56	0.68	0.80
Gross income	4.30	4.36	5.57	3.85	4.27	5.33	3.36	4.15	4.84
Operating expenses	3.08	2.39	2.90	2.68	2.58	2.85	2.41	2.57	2.64
of which: staff costs	*2.11*	*1.52*	*1.82*	*1.82*	*1.62*	*1.78*	*1.60*	*1.55*	*1.61*
Net income	1.22	1.97	2.67	1.16	1.68	2.48	0.95	1.58	2.20
Value adjustments and provisions	0.63	0.73	0.75	0.66	0.60	0.53	0.87	0.63	0.72
Profit before tax	0.59	1.24	1.92	0.50	1.09	1.96	0.09	0.95	1.47
Profit after tax	0.31	0.67	1.04	0.27	0.60	1.01	–0.12	0.45	0.62
Memorandum items									
Average balance sheet total	25,189	14,786	7,686	38,205	22,628	9,545	80,604	27,611	17,021
Bad debt ratio (%)	7.00	5.06	5.18	6.52	3.87	3.61	9.33	5.31	4.78
Share of interest-bearing assets acquired with own funds (%)	4.21	5.9	10.21	2.67	5.09	9.74	0.08	4.98	8.69
Capital and reserves/Balance sheet total (%)	3.51	5.74	7.11	5.44	6.51	8.23	6.24	7.04	9.72
Average return on interest-bearing assets (%)	12.61	13.47	13.24	12.37	12.54	12.57	10.68	11.02	10.94
Average cost of funds (%)	9.31	9.81	8.94	8.64	8.62	7.73	7.34	7.33	6.85
Staff costs per employee (millions of lire)	61.59	58.63	57.07	89.99	84.95	83.82	113.09	107.64	103.49
Asset per employee (billions of lire)	2.92	3.87	3.14	4.96	5.24	4.7	7.09	6.93	6.42

* Banks are grouped into thirds in each period according to the distribution of pre-tax profits. In each period the data for banks involved in mergers and acquisitions are consolidated. Ratios for each group were obtained by consolidating the data of the banks therein.

The fact that the differences in profitability are captured mainly on the income side whereas cost ratios do not diverge appreciably from bank to bank is subject to two diametrically opposite interpretations. The first one is that, with technology used and cost factors being equal, the banks with the highest margins are those operating in the least competitive markets. Hence their higher profits are comparable to monopolistic rents that presumably translate into wider spreads between lending and deposit rates. The second one is that the services supplied by banks differ sharply and require

different "technologies". The more profitable banks supply higher value-added services involving high costs. The less profitable banks show they are inefficient by incurring costs virtually equivalent to those borne by the profitable ones but not matched by products of comparable quality. The two interpretations, which are not mutually exclusive, can be examined in the light of the principal characteristics of the banks classified in each third of the sample.

Table 2

Correlations between profits before tax and some performance indicators*

	1984-87		1988-91		1992-96	
	r	p-value	*r*	p-value	*r*	p-value
Net interest income	0.60	0.00	0.60	0.00	0.45	0.00
Gross income	0.53	0.00	0.52	0.00	0.45	0.00
Operating expenses	–0.01	0.80	0.06	0.30	0.05	0.50
Staff costs	–0.05	0.34	0.04	0.54	0.00	0.98
Value adjustments and provisions	0.04	0.45	–0.07	0.22	–0.56	0.00
Average balance sheet total	–0.25	0.00	–0.27	0.00	–0.25	0.00
Bad debt ratio	–0.25	0.00	–0.31	0.00	–0.50	0.00
Interest-bearing acquired with own funds	0.45	0.00	0.54	0.00	0.68	0.00
Capital and reserves/Balance sheet total	0.48	0.00	0.48	0.00	0.48	0.00
Staff costs per employee	–0.22	0.00	–0.16	0.00	–0.26	0.00
Assets per employee	–0.09	0.10	–0.13	0.03	–0.11	0.12
Number of banks	309		274		225	

* Profit before tax and profit and loss accounts items are expressed as percentage of average balance sheet total. Assets and staff costs per employee are converted into logarithms.

In every period, larger banks are prevalent among the less profitable institutions. Since larger banks generally operate in more competitive markets, as is confirmed by the data on rates of return on earning assets and the average cost of funds, this might argue in favour of the first of the two aforementioned hypotheses. However, differences in average spreads explain much but not all of the difference in net interest income between the groups of banks; around one third of the difference is attributable to the acquisition of earning assets with the banks' own funds. Not only are the more profitable banks more strongly capitalised, they also have a smaller share of their capital tied up. From the accounting point of view, this is due largely to the lower incidence of bad debts on assets; from the economic point of view, the causal relationship could run in the other direction, i.e. the more strongly capitalised banks have a larger incentive to make an efficient selection of customers and higher net interest income therefore reflects greater allocative efficiency.

The less profitable banks have higher staff costs per employee in each of the periods considered, owing in part to a larger proportion of managers among staff. Differences in productivity, measured by assets per employee, do not appear to be closely correlated with profitability; however, they are significant when we control for bank size. The indicators of operating efficiency would appear to corroborate the second of the two hypotheses set out above.

Overall, simple examination of the data indicates a high dispersion of profitability in the Italian banking system. This situation pre-dates the decline in profit margins that began in the nineties. Descriptive analysis enables us to attribute the differences observed in profitability to operating and allocative inefficiencies; however, it does not allow us either to quantify their effects or to assign part of them to different aspects of corporate governance. In the section below we explore the question further with an econometric exercise.

3.2 A simple model to account for profit dispersion

The aim of the following analysis is to verify whether the differences that still exist in the Italian banking system in terms of size, geographical market and mix of services are able to explain the dispersion of the performance indicators and how much weight, if any, should be assigned to specific components directly correlated with individual banks' efficiency. If such components play a role, it will be necessary to complement the analysis by investigating their relations to the variables attributable to corporate governance.

A widely used measure of the inefficiency of banks amounts to considering the deviation from an efficiency frontier obtained by estimating a cost or profit function. The problem with this approach is that the estimation of inefficiencies requires very restrictive assumptions about the structure of the markets, banks' product mix and production technologies. In particular, one has to assume that banks are price-takers in both output and input markets, an hypothesis which seems particularly strong for analysing the evolution of the Italian banking system in the last decade. On the output side, several studies have documented an increase in competition during the eighties, spurred by the reform in the regulatory framework. This would imply that, for most of the period covered by our analysis, banks had some power to fix interest rates on loans, deposits and commission fees.[8] On the input side, the far most important non-financial factor is labour whose remuneration is the result of a two-stage bargaining process between unions and bankers' associations: one at the national level and the other at the individual bank level. The dispersion across banks of unit labour costs is therefore related to within firm bargaining powers as well as to productivity and staff skills.[9] It is thus possible that some banks may have been less efficient in managing human resources.

Given these problems we preferred to use a reduced-form specification of bank profits, with the aim of directly identifying the main determinants of the differences in profitability.

In accounting terms, profits are represented by the identity:

(1) $\pi = pq - wk$

where π stands for profits, q and k are vectors of the products and factors of production, and p and w are vectors of their respective prices. Assuming that the technology used by the banks can be described in terms of the transformation $k = f(q)$, an individual bank's profits can be written as:

(2) $\pi_i = p_i q_i - w_i F(q_i) + \varepsilon_i$

where ε_i represents a stochastic disturbance having the usual properties.

The differences among banks can stem from: (i) structural differences in the types of products they offer or the markets they serve; or (ii) inefficiencies both on the income side (allocative inefficiencies) and on the cost side (x-inefficiencies). To take account of these factors, (2) can be rewritten as:

(3) $\pi_i = (p_i + \eta_i)\, q_i - w_i\, [F(q_i) + \gamma_i\, q_i] + \varepsilon_i$

where η_i is a set of variables capturing the allocative inefficiencies and γ_i are variables capturing the operating inefficiencies. No assumption is imposed a priori on the structure of the markets, so that p_i and w_i remain specific to the structure of the bank, with differences between banks reflecting differences in market structures and in the quality of the services supplied.

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[8] The competitiveness of loan markets has been investigated, among others, by Ferri and Gobbi (1992) and Angelini and Cetorelli (1998) and changes in the deposit market by Focarelli and Tedeschi (1992); Focarelli and Tedeschi (1994) and Farabullini and Gobbi (1996) report quantitative estimates on the downsloping trend of unit commission fees. Ferri and Gobbi (1997) review the main regulatory changes since the early 1980s.

[9] The bank specific components of staff expenses display an upward trend since the early 1980s (ABI, (1998)).

After specifying the variables that proxy for the factors described in (3), it is possible to obtain an equation of bank profits for econometric estimation. The variables used in the estimation (Table 3) can be grouped in four categories: (i) indicators that proxy for the degree of competitiveness, risk and financial depth of the geographical markets in which the individual bank does business; (ii) variables that proxy for the type of products offered; (iii) indicators of allocative efficiency; and (iv) variables correlated with operating efficiency.

Table 3
Definition of variables

Variable	Definition	Units
ROA	Profit before tax/total assets	%
lta	Log of assets deflated using GDP deflator	Assets: billions of lire
lta2	*lta* squared	
freec	(Interest-bearing assets (IBA) – interest-bearing liabilities)/IBA	%
freec2	*freec* squared	
badd	Bad debts/total loans	%
badm	*badd* due to market specialisation	%
bads	*badd–badm*	%
cap	Capital and reserves/Total assets	%
cpe	Deflated staff costs per employee	Staff costs: millions of lire
man	Management personell/Total staff	%
cpes	Staff costs/Total operating expenses	%
tape	Total assets per employee (deflated)	Billions of lire
bspread	Average differential between lending rates and yield on Treasury bills	%
bherf	Average Herfindahl concentration index	%
bcreva	Ratio between loans and value added	
bvabr	Value added per branch (logs, deflated)	Value added: billions of lire
popbr	Log of number of inhabitants per bank branch	
ltls	Medium and long-term loans/Total loans	%
lfas	Loans/Financial assets	%
nins	Non-interest income/Gross income	%
*du*84-95	Time dummies	

Market-geographical segmentation is particularly relevant in Italy for two reasons. First, the differences in regional economic and financial structures are large and have substantial effects on banking markets. Second, banks differ widely with respect to the geographical penetration, ranging from virtually the whole country to a few provinces. We have therefore chosen to take account of geographical difference by using the nearly 100 provinces as local markets and computing for each bank a set of indices reflecting the average conditions of the markets in which it operates. Given a variable I_j defined for province j (e.g. per capita value added or Herfindahl index of concentration of lending), for bank i we have the weighted average:

$$I_i = \Sigma_j s_{ij} I_j$$

where s_{ij} is the share of bank i loans granted to customers located in province j in total loans granted by bank i.

The *geographical* variables that we have actually used are: the Herfindahl index of concentration of lending (*bherf*) and the average differential between lending rates and Treasury bill rates (*bspread*) as proxies for the degree of competition in local markets; the ratio of bad debts to total loans (*badm*),

which measures the riskiness of the market; the ratio of loans to value added (*bcreva*), the value added per bank branch (*bvabr*) and the number of inhabitants per bank branch (*popbr*) were used as proxies for the extent of bank penetration of the market. As stated the variables at individual bank level were calculated as weighted averages using the bank's share of loans in each province as weights, except in the case of *badm*, which also takes account of specialisation by sector and size of the customer base.

The variables of *business specialisation* are the ratio of loans to interest-bearing funds (*lfas*), the ratio of medium and long-term loans to total loans (*ltls*), and the ratio of income from services to gross income net of dealing income (*nins*).

Three regressors were used as proxies for the level of *allocative efficiency*. The difference between a bank's bad debt/loan ratio and *badm*; this is denoted as *bads* and shows the quality of the loan portfolio compared with the average for banks operating in the same markets. To take account of the way a high level of capitalisation affects allocative efficiency by reducing moral hazard problems, we used the ratio of capital and reserves to total assets (*cap*); we controlled for the free capital effect by using the ratio of the difference between interest-bearing assets and liabilities to interest-bearing assets (*freec*). *freec* actually plays a dual role: first, it serves to control for the accounting effect that free capital reduces the cost of funding; second, a large share of own capital invested in financial assets may signal a suboptimal use of capital. For this reason we have also introduced the square of *freec* (*freec*2).

The variables measuring *operating efficiency* are staff costs per employee (*cpe*), assets per employee (*tape*), the ratio of managerial personnel to total personnel (*mans*) and staff costs in relation to total operating expenses (*cpes*).

Six *organisational form and corporate governance dummies* were used as proxies for corporate governance: private sector bank, listed bank, institutional form of the bank (cooperative bank, savings bank), membership of a banking group and position in the group (parent company/simple member), presence of an executive committee, and dummy for former special credit institutions.

Regarding the interpretation of these indicators, it is well established in the literature that a publicly owned bank may be managed for objectives other than profit maximisation; moreover, where public ownership is predominant, the strategic conduct of private owners as well may deviate from the aims of maximising profit and raising operating efficiency. However, other aspects of corporate governance have to be considered in describing the conduct of a bank. For example, stock exchange listing, which guarantees more stringent control by the markets and should mitigate the tendency to deviate from objectives of efficiency even where banks are publicly owned. The dummy for institutional form (cooperative bank, savings bank, special credit institutions) is designed to identify a specific model of governance in the case of cooperative banks and investigate savings banks in the light of the discussion in Section 2. Position in the group is important to capture intra-group efficiencies of scope; more simply, it can capture the entry of banks in very critical conditions into the group. The dummy for the executive committee is designed to distinguish banks by the existence of this body, which may be viewed as a go-between for settling conflicts between owners and managers.

The estimation was made using a fixed-effect unbalanced panel model, and included controls for the time dimension. The coefficients of the ownership variables were obtained with the procedure described in Hsiao (1986).[10] In principle, if bank inefficiency depends on the form of ownership, this

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[10] Consider the model:

(1f) $y_i = e\,\mu + Z_i\,\gamma + X_i\,\beta + e\,\alpha_i + u_i$

where, given N individual observations and T temporal observations, y is a vector Tx1 of the dependent variable, μ is a constant, Z is a matrix of individual characteristics that do not vary over time, X is a matrix of the variables that change over time and between individuals, α is a specific/individual effect and u is random error. In the presence of a correlation between the X regressors and the individual effect, the OLS and GLS estimations produce distorted and inconsistent results (Hausman and Taylor (1981)). In order to overcome this problem, the fixed-effect estimation transforms the equation into deviations from the individual mean. Although the results are not distorted, it is not possible to estimate the effects of the variables that are fixed over time and, therefore, the parameters of γ. One way to overcome this difficulty is to estimate (1f) with a fixed-effect OLS, obtaining:

should be captured primarily by the corporate governance dummies. In reality, the highly stylised nature of the ownership indicators prevents us from capturing the actual control arrangements within each of the groups identified with dummies. It is therefore possible that in the panel model the greater variability of the efficiency indicators would produce an imprecise estimation of the effect of the corporate dummy. In order to verify the indirect effects of these indicators on profitability, a correlation analysis was conducted on some of the regressors used in the panel.

3.3 Results

The study examined the period between 1984 and 1996.[11] A total of 330 banks were analysed, of which 192 were present throughout the entire period. The estimations were conducted using the ratio of gross income to total assets (*ROA*) as the dependent variable. In order to check for the presence of size effects, the regressors include the log of total assets (*lta*), inserted also as a square (*lta*2).

The explanatory power of the panel, measured with a R^2 of 0.38,[12] is satisfactory although, in agreement with most studies of bank profitability indicators, not extremely high (Table 4). As regards the *geographical* variables, *badm* is statistically significant with the expected negative sign: a differential in the ratio of bad debts to loans in the bank's reference market of a similar size to that between North and South (about 15 percentage points) reduces *ROA* by about 0.6 points. Among the variables correlated with the competitiveness of banking markets, *bspread* is significant and negative. This regressor probably captures the greater riskiness of markets with a wider differential between the lending rate and the T-bill rate. The concentration variable (*bherf*) and the variables that approximate the extent of bank penetration of markets are not significant. Their effect is probably captured by *badm*.

Of the variables for *business specialisation*, only *ltls* is significant with a negative sign, owing to the lower profitability of medium and long-term lending. Among the *operating efficiency* variables, *cpes* is significant and positive. A dual interpretation is possible. One is that rigidities in the use of labour have meant that investment in physical capital has not translated into a reduction in staff costs (Martelli (1987)). Alternatively, a high proportion of other costs may indicate unproductive expenditure. Per capita staff costs are negative and highly significant, indicating that any benefits deriving from the use of more highly qualified personnel are more than offset by the increase in costs. This is confirmed by the fact that the ratio of management-track personnel to total staff enters with a negative sign. The productivity indicator (*tape*) is positive and significant.

The measures of *allocative efficiency* are all significant. For *bads* the negative sign indicates that banks that took on a higher-than-average level of risky credit were not able to compensate with sufficiently high lending premiums;[13] in other words, the increased riskiness seems to be related to poor borrower selection rather than to conscious portfolio decisions. The signs of the variables for capitalisation confirm that they reflect greater allocative efficiency. As regards the size variable, an increase in scale appears to be associated with a decline in *ROA*.

(2f) $y^*_i - x^*_i \beta = \mu + z_i \gamma + (\alpha_i + u_i^*)$

where the * indicates mean values. Estimating (2f) by OLS after having substituted the estimates of β obtained with (1), it is possible to recover the values of γ. This two-stage procedure is consistent when N tends towards infinity and α is not correlated with z. In the latter case, Hausman and Taylor (1981) solve the problem by a procedure that employs two-stage least squares (2SLS) and uses the elements of the vector x that are not correlated with α as instruments. In this work, we focus on estimating equations (1f) and (2f).

[11] See Section 3.1 for a description of the sample.

[12] The significance of the regressor coefficients does not change significantly when checked for heteroskedasticity in the error.

[13] See Focarelli (1996) on the relationship between bank lending rates and credit risk.

Table 4
Panel analysis on bank profitability
Fixed effect estimate

	Dependent variable: *ROA*			
	Coefficient	**Standard error**	***t***	***P>|t|***
lta	–1.330	0.232	–5.726	0.000
lta2	0.062	0.014	4.276	0.000
freec	0.051	0.004	12.819	0.000
freec2	–0.001	0.000	–7.309	0.000
bads	–0.055	0.003	–18.041	0.000
badm	–0.042	0.006	–7.630	0.000
cap	0.025	0.007	3.704	0.000
cpes	0.028	0.003	11.009	0.000
cpe	–0.649	0.129	–5.012	0.000
man	–0.014	0.005	–2.510	0.012
tape	0.419	0.104	4.039	0.000
bspread	–0.056	0.023	–2.425	0.015
bherf	–0.314	0.492	–0.639	0.523
bcreva	–0.107	0.106	–1.013	0.311
bvabr	0.149	0.461	0.322	0.747
ltls	–0.004	0.002	–1.964	0.050
lfas	–0.135	0.217	–0.621	0.535
popbr	–0.002	0.471	–0.004	0.997
mins	0.001	0.002	0.373	0.709
*du*85	–0.003	0.050	–0.058	0.954
*du*86	0.247	0.062	3.993	0.000
*du*87	0.032	0.065	0.494	0.622
*du*88	0.051	0.078	0.655	0.513
*du*89	–0.033	0.098	–0.340	0.734
*du*90	–0.006	0.107	–0.055	0.956
*du*91	–0.017	0.114	–0.145	0.884
*du*92	0.026	0.110	0.240	0.810
*du*93	–0.042	0.121	–0.345	0.730
*du*94	–0.574	0.125	–4.599	0.000
*du*95	–0.143	0.137	–1.045	0.296
*du*96	0.036	0.143	0.250	0.803
constant	8.203	2.205	3.721	0.000
Number of observations: 3501		Number of banks: 330		
R^2 within: 0.38		Adjusted R^2: 0.376		
F(31, 3469): 62.5		Root MSE: 0.563		

The estimates of the effects of the indicators approximating the corporate control structure (*corporate dummies*, Table 5) show that cooperative banks are more profitable.[14] As regards banking groups, only the parent company has an increased *ROA*, indicating that the group strategy does not favour all

[14] The tables show a number of regressions to avoid multicollinearity problems between the dummies, such as between private banks and cooperative banks.

Table 5

Correlation between individual effect and corporate governance dummies

Variable	Specification I				Specification II				Specification III			
	Coeff.	Std. Err.	*t*	*P*>|*t*|	Coeff.	Std. err.	*t*	*P*>|*t*|	Coeff.	Std. err.	*t*	*P*>|*t*|
constant	0.144	0.112	1.280	0.200	0.017	0.104	0.170	0.860	0.206	0.104	1.970	0.040
dupri	0.088	0.087	1.010	0.310								
quo	0.073	0.128	0.570	0.560	0.138	0.122	1.130	0.250	0.088	0.130	0.670	0.500
duex	–0.203	0.104	–1.940	0.050	–0.160	0.100	–1.590	0.110	–0.211	0.104	–2.020	0.040
dugr	–0.074	0.097	–0.760	0.440	–0.074	0.093	–0.790	0.430	–0.070	0.097	–0.720	0.470
ducapo	0.314	0.128	2.440	0.010	0.315	0.123	2.550	0.010	0.307	0.128	2.380	0.010
dics	–0.095	0.135	–0.700	0.480	0.003	0.130	0.020	0.970	–0.137	0.134	–1.010	0.310
dupop					0.367	0.089	4.120	0.000				
ducas									–0.016	0.095	–0.170	0.860
Number of observations: 208												
F(6, 201)	2.330				5.150				2.150			
P > *F*	0.034				0.000				0.050			
R^2	0.065				0.133				0.060			
Adj. R^2	0.037				0.108				0.032			

Dummies *dupri* = private bank; *dugr* = group member; *dupop* = cooperative bank
quo = listed bank; *ducapo* = group parent; *ducas* = savings bank
duex = executive committee; *dics* = former special credit institution

member banks equally, probably because of differences in their starting positions, especially risk levels.[15] Banks with an executive committee to reconcile the demands of owners and managers have a lower *ROA*. There are two possible explanations for this. One is that the increase in the number of corporate bodies may slow the decision-making process for major changes in corporate strategy; alternatively, the establishment of an executive committee may be associated with banks which already had lower-than-average profitability and for which it was necessary to create a "crisis" committee to mediate between owners and management in the process of revising bank strategy. The coefficients for the other corporate dummies are not statistically significant.[16] As regards the private bank dummy, it is likely that these banks' superior performance is already captured by some of the regressors used in the panel to approximate allocative and operating efficiency. In particular, the indicator of specific bad debts for these banks was significantly lower than average (Table 6), as was that for per capita staff costs. Conversely, savings banks and the former special credit institutions are less efficient than the average bank, both in terms of allocative and operating efficiency. In contrast to what we might have expected on the basis of theoretical considerations, the results of listed banks are not significantly higher than average.

Overall, even though the findings are only partial, given that corporate governance structures are highly stylised, the results indicate that private banks, cooperative banks and the parent companies of banking groups are more profitable than average. In particular, it emerges that the relationship

[15] Berger and Mester (1997) found that: "Banks in holding companies tend to have higher levels of profit efficiency than independent banks, and their cost efficiency is significantly greater as well." As much as the situation of US holding companies differs from that of Italian groups, Berger and Mester offer a possible explanation for the superior profit performance of the parent company: "A potential explanation may be a form of the efficient structure hypothesis – more efficient banking organizations may tend to acquire other banks, ... and the holding company is the vehicle that allows them to do it."

[16] In order to check whether overlapping between the corporate dummies and efficiency indicators would distort the results of the former, the panel was also estimated excluding the latter. The results confirm those presented here, with no significant changes in either the sign or the significance of the dummy coefficients.

Table 6

Correlation between some proxies for allocative and operating efficiency and corporate governance dummies

Variable	Specification I			Specification II			Specification III		
	Coeff.	*t*	*P*>|*t*|	Coeff.	*t*	*P*>|*t*|	Coeff.	*t*	*P*>|*t*|
					Left-hand side variable: bads				
constant	–2.719	–2.040	0.040	–3.491	–2.710	0.000	–4.898	–3.970	0.000
dupri	–2.131	–2.060	0.040						
quo	0.389	0.250	0.790	–0.241	–0.150	0.870	0.599	0.380	0.690
duex	–0.165	–0.130	0.890	–0.078	–0.060	0.950	–0.125	–0.100	0.910
dugr	4.463	3.870	0.000	4.351	3.750	0.000	4.543	3.920	0.000
ducapo	–2.314	–1.520	0.130	–2.164	–1.410	0.150	–2.196	–1.440	0.150
dics	3.051	1.900	0.050	3.488	2.160	0.030	4.662	2.920	0.000
dupop				–1.178	–1.060	0.280			
ducas							2.202	1.940	0.050
Number of observations: 208									
R^2		0.065			0.104			0.116	
Adj. R^2		0.037			0.078			0.090	
					Left-hand side variable: cpe				
constant	–2.158	–90.890	0.000	–2.161	–96.740	0.000	–2.268	–106.210	0.000
dupri	–0.098	–5.360	0.000						
quo	0.081	2.990	0.000	0.043	1.660	0.090	0.098	3.700	0.000
duex	–0.011	–0.530	0.590	–0.017	–0.780	0.430	–0.012	–0.580	0.560
dugr	–0.011	–0.570	0.560	–0.016	–0.790	0.420	–0.005	–0.280	0.770
ducapo	0.051	1.890	0.060	0.056	2.130	0.030	0.056	2.130	0.030
dics	0.188	6.570	0.000	0.184	6.610	0.000	0.271	9.820	0.000
dupop				–0.119	–6.230	0.000			
ducas							0.127	6.510	0.000
Number of observations: 208									
R^2		0.356			0.383			0.393	
Adj. R^2		0.337			0.365			0.374	
					Left-hand side variable: freec				
constant	6.577	5.640	0.000	6.511	5.810	0.000	5.778	5.390	0.000
dupri	–0.307	–0.340	0.730						
quo	–1.380	–1.030	0.300	–1.482	–1.120	0.260	–0.940	–0.700	0.480
duex	1.889	1.740	0.080	1.889	1.740	0.080	1.767	1.640	0.100
dugr	–2.407	–2.380	0.010	–2.422	–2.400	0.010	–2.273	–2.250	0.020
ducapo	–2.773	–2.080	0.030	–2.754	2.060	0.040	–2.791	–2.100	0.030
dics	–3.720	–2.640	0.000	–3.690	–2.630	0.000	–3.050	–2.190	0.020
dupop				–0.259	–0.270	0.780			
ducas							1.616	1.640	0.100
Number of observations: 208									
R^2		0.149			0.148			0.159	
Adj. R^2		0.123			0.123			0.134	

Note: For a description of the variables, see Tables 3 and 5.

between the indicators used to describe the form of corporate governance (the corporate dummies) and profitability is weak, while the main determinants of performance differences are allocative and operating inefficiency. Nevertheless, as shown in the auxiliary regressions between indicators of allocative and operating efficiency and the corporate governance indicators (Table 6), there is a positive relationship between the efficiency indicators examined and private ownership, but a negative one for savings banks. The interaction between profitability, efficiency and corporate governance was therefore examined both directly and indirectly: first, the additional explanatory power of the governance dummies was measured after checking the different levels of bank efficiency. Second, it was shown that the significance of some of the efficiency indicators that explained differences in profitability varies depending on the governance structure of the bank. The

limitation of the exercise and, at the same time, a starting point for further research, is the fact that the dummy variables used to distinguish between various bank governance models do not capture differences within groups: even between banks with a given governance structure (for example, public-sector banks) there are significant differences that the form of ownership alone probably does not reveal.

4. Turnover in top management and bank performance

This section analyses the relationship between the earnings performance of banks and changes in top management, albeit only for a short period (1994-96).[17] The issue is important for two reasons: first, in a system in which banks are directly or indirectly owned by the state, it is likely that managers face incentives and constraints which differ from those faced by managers in the private sector. If profit maximisation is not the only objective of the leading shareholder, the expected negative relationship between profitability and management turnover will probably be weakened. Second, the period under study was marked by a considerable deterioration in average bank profitability. As a result, banks began a process of restructuring that, in addition to promoting the supply of innovative services and cost containment, probably affected the quality of top management.

Table 7
Change in banks' management

	Total sample		**Public banks**		**Banks with *ROA* > 0 in period 1994-96**	
	No. of banks	**%**	**No. of banks**	**%**	**No. of banks**	**%**
			1994			
Stability	152	69.1	61	61.6	136	70.8
Partial change	55	25.0	30	30.3	46	24.0
Total change	13	5.9	8	8.1	10	5.2
Total	220	100.0	99	100.0	192	100.0
			1995			
Stability	162	73.6	67	69.1	147	76.6
Partial change	46	20.9	24	24.7	38	19.8
Total change	12	5.5	6	6.2	7	3.7
Total	220	100.0	97	100.0	192	100.0
			1996			
Stability	168	76.4	74	77.1	153	79.7
Partial change	42	19.1	18	18.8	33	17.2
Total change	10	4.6	4	4.2	6	3.1
Total	220	100.0	96	100.0	192	100.0

Our analysis focuses on changes in the president and managing director (or general manager). Changes in management posts other than natural turnover were studied for each pair of adjacent years.[18] Turnover may be partial (either the president or the managing director leaves) or total (both leave). The data show that in 1994, the top management of 152 out of the 220 banks examined was

[17] See Ferri and Trento (1997) for a study of management changes in banks between 1940 and 1995.

[18] In order to take account of the fact that changes in top management usually take place in conjunction with annual general meetings, the measurement of annual turnover considers permanence in the position until June of the following year.

completely stable (69%; Table 7); 25% experienced partial turnover while the remainder replaced both of their top managers. The proportions are virtually the same in the second two-year period.

The intensity of turnover is represented by an indicator that takes a value of zero if there was no change or only one partial change over the whole 1994-96 period and a value of 1 if there was more than one partial change or at least one total change.

Banks with an indicator value of 1 had a significantly lower *ROA* on average than the most stable banks as early as 1990 (Table 8). In 1994 the mean *ROA* was 0.73 for the stable banks and 0.02 for those that had experienced management turnover;[19] mean *ROE* was 3.1% for stable banks and -3.9% for the others. The credit risk faced by the least stable banks was higher for the entire period: in 1994 their ratio of bad debts to loans was 13.7%, compared with 8.9% for the stable banks. Analysis of the other performance indicators shows that the lower profitability of the less stable banks can be attributed to a smaller contribution from gross income and higher charges for risky assets.

Table 8
Change in banks' management and performance
Differences between averages*

Year	Event	No. of obs.	*ROA*	*ROE*	Bad debts to loans ratio
1990	0	156	1.53	13.2	6.3
	1	61	1.18	9.9	8.6
Student-T			3.3*	3.4*	–1.9***
1991	0	155	1.44	12.2	6.4
	1	61	1.14	8.7	8.9
Student-T			2.3**	3.3*	–1.8***
1992	0	157	1.24	7.4	6.5
	1	61	0.74	4.1	9.1
Student-T			2.7*	2.7*	–2.0**
1993	0	158	1.32	6.3	7.3
	1	62	0.77	1.9	10.3
Student-T			3.8*	3.3*	–2.4**
1994	0	158	0.73	3.1	8.9
	1	62	0.02	–3.9	13.7
Student-T			3.5*	3.0*	–3.4*
1995	0	158	1.18	5.6	9.2
	1	61	0.05	–5.8	14.9
Student-T			4.8*	3.6*	–3.6*
1996	0	158	1.16	5.8	10.9
	1	60	0.37	–0.7	16.2
Student-T			5.0*	3.2*	–2.9*

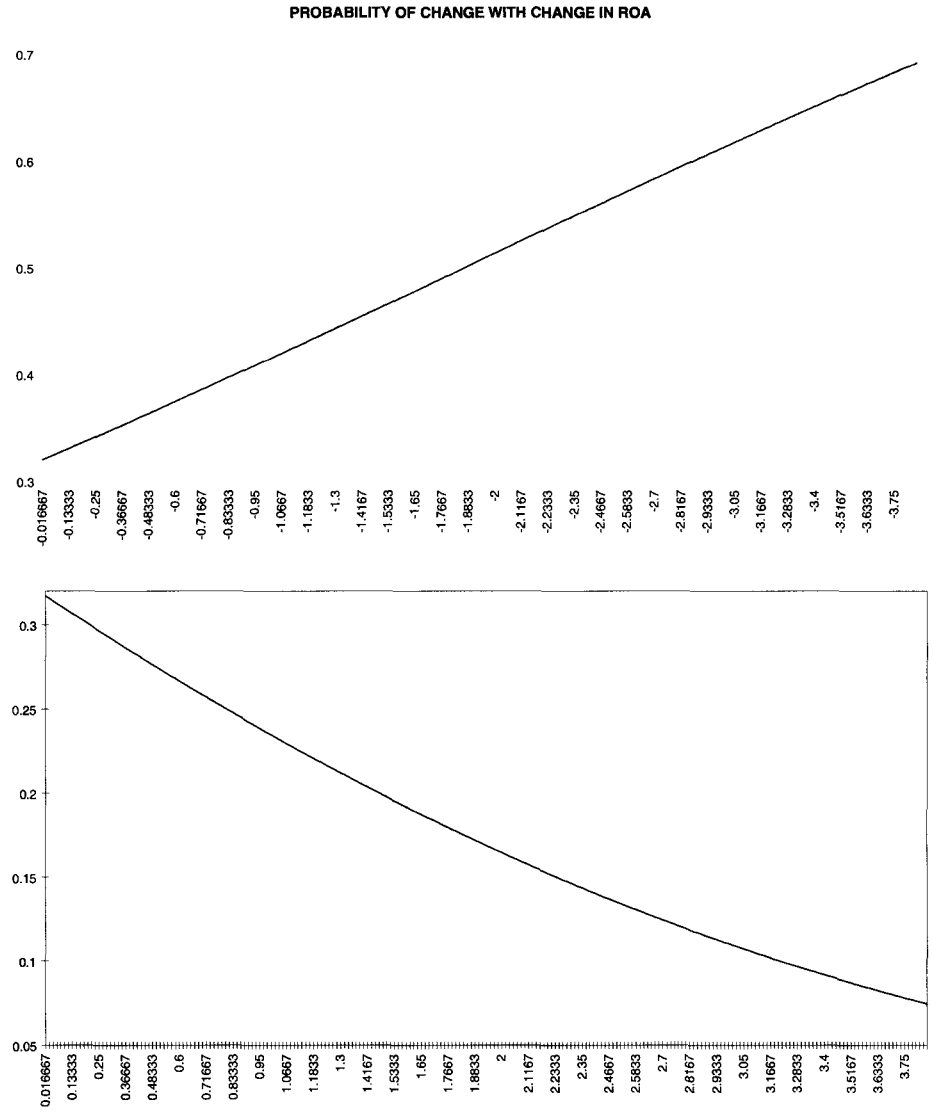
* Event 0: stability; 1: change. The data on change are for 1994-96. * Significant at 1%; ** significant at 5%; *** significant at 10%.

In order to quantify the effect of management turnover on performance differences, we adopted a probit model that estimates for the entire period the probability that a management change will occur following a change in *ROA* or the ratio of bad debts to total loans. The results show that higher *ROA*s are associated with a lower probability of management change; at the same time, as the ratio of bad

[19] The result is not substantially changed by the presence of outliers: in 1994 the median *ROA* for stable banks was 0.75, compared with 0.29 for those that had experienced a change.

debts increases, the probability of a change in management also rises. Figure 3 shows the probability of management turnover in relation to variations in the profitability indicator, which is the most important determinant. The probability that a bank with a *ROA* close to zero will undergo a management change is about 30%, while that for banks with a *ROA* over 1% is less than 10%.

Figure 3
Estimate of probability of management change



Probit estimate

	Coefficient	Standard error	*z*	*P*>|*z*|
roa94	–0.252	0.0988	–2.55	0.01
bad94	0.034	0.0135	2.47	0.01
constant	–0.815	0.1907	–4.27	0.00

Number of observations	=	220
*chi*2 (2)	=	23.59
prob > *chi*2	=	0.0000
Pseudo R^2	=	0.0902
Log Likelihood	=	–119.03172

The analysis reveals the existence of a mechanism for correcting management action: if results are below average, punishment is meted out in the form of removal. Nevertheless, the findings must be treated with caution, as the observation period is quite short. This distorts probability estimates since nothing can be said about past events: if a bank changed its management in 1993, it would probably show up as stable in 1994. In addition, the analysis does not exclude the possibility of an inverse relationship between turnover and performance: it is likely that a certain degree of stability is needed to pursue consistent strategies and, therefore, achieve satisfactory incomes. This is supported by the fact that the less stable banks continue to record unsatisfactory profitability in the years following the change.[20]

In conclusion, our analysis indicates that a relationship does exist between profitability and changes in top management. However, the link appears to be weak, given the low explanatory power of the probit analysis. Moreover, as shown in Table 7, the fact that, at least for the available sample, the expected differences in the strength of the relationship between public and private banks did not emerge, shows a marginally higher rate of turnover for public-sector banks. Consequently, the probit analysis that distinguished between the effects of the determinants of the change according to whether the bank was private or public did not reveal significant differences in the estimated probability.

Finally, future analyses of the relationship between management turnover and bank profitability should throw light on the relationship between turnover and performance and verify whether banks that have experienced changes in their top management record significant variations in performance after enough time has passed for the strategy introduced by the new management to be implemented, which was not possible in this case owing to the brevity of the time period considered. Such a study would enable us to establish a symmetry of behaviour: on the one hand, the existence of punitive mechanisms for managers that are incapable of generating satisfactory returns; on the other, an evaluation of the effects of change on managerial efficiency.

5. Conclusions

The main results of the econometric estimates confirm that the indicators of both allocative and operating efficiency contribute significantly to explaining the dispersion in profit rates. Specifically, the banks with higher-than-average credit risk, adjusting for customer composition, did not succeed in compensating with sufficiently high lending premiums. Even controlling for the share of funds directly invested in interest-bearing assets, the more highly capitalised banks have higher profits; the correlation may be interpreted as a sign that those banks have greater incentives for efficient risk control. We find an inverse correlation between profitability and per capita staff costs, indicating that the benefits from the use of more costly and hence presumably more skilled human resources are more than offset by the additional cost. Under-utilised productive capacity at the microeconomic level is captured in the estimates as a high positive value of the coefficient measuring productivity, i.e. the volume of lending per employee. Finally the stylised variables for corporate governance have limited explanatory power; but it is confirmed that private banks, including the cooperative banks (*banche popolari*), have higher profitability, thanks in part to better operating and allocative efficiency.

The analysis of management changes finds a weak, though statistically significant, correlation between the bank's profitability and the probability of replacing top management. In view of the short period covered, the results must be handled with caution, but they do suggest the limited effectiveness of the corrective mechanisms for management action. In any case, no appreciable differences are found in this sphere between banks of differing ownership structure.

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[20] In this case too, however, the length of the observation period affects the results and it is likely that more years are needed to observe improvements in performance.

All in all, our analyses pinpointed a significant component of banks' performance that relates to management inefficiencies. The differences due to form of ownership are significant but smaller than those captured by the efficiency indicators. These results, which are consistent with those of other recent studies, should be appraised in the light of three considerations. First, corporate variables have both a direct effect on profits, in that they capture differences between banks that are not explained by the efficiency variables, and an indirect effect, through their interaction with the latter. Second, however, the stylised corporate governance variables only very crudely capture differences in the relationship between management and ownership; even among banks with the same type of governance (e.g., public banks) there are significant differences not reflected solely in the form of ownership. Third, the process of change initiated with privatisation is only marginally captured; as the analysis of top management turnover shows, it takes a period longer than that covered here for the effects to emerge.

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Restructuring of the Belgian banking sector and financial stability

Thierry Timmermans and Philippe Delhez*

1. Introduction

Over the past two decades banking has undergone similar changes in most market economies: deregulation, disintermediation, internationalisation and technological innovations have all helped to intensify competition in ever more globalised financial markets. But the banking sectors of the various developed countries still have widely differing characteristics, even within the European Union.

The introduction of the euro in January 1999 will blur this diversity. The element of segmentation due to national currencies will disappear and EMU will also be a catalyst to extend or reinforce current trends. The fact remains that it is from their current specific structures that the various national banking sectors must adapt in order to meet these new challenges.

This paper will first examine the distinctive characteristics of Belgian banks, then detail the types of responses that they are attempting to make to the changes in progress and finally highlight some of the implications for the prudential authorities.

2. Distinctive characteristics of Belgian banks

2.1 Type of business

As the single currency will compel the Belgian banking sector to fit into a larger whole, it seemed appropriate to compare, as far as possible, this sector's position with that of four neighbouring countries – Germany, France, the Netherlands and the United Kingdom – and the average for these countries. These countries are in any case some of Belgium's main commercial and financial partners. It turns out that the balance-sheet and trading structure of Belgian credit institutions is markedly different from that of the four neighbouring countries (Table 1).

For one thing, interbank operations account for 41% of liabilities against an average of 26% in the other countries. Corresponding assets are 33% of the balance-sheet total in Belgium against only 23% in the other countries. Belgian credit institutions therefore have a large net debit position on interbank operations. This structure has a negative impact on the profitability of the sector, which funds part of its lending to customers by means of relatively costly resources.

The size of interbank operations in Belgium results in part from the high degree of openness of the economy, as evidenced by the presence of numerous branches and subsidiaries of foreign banks. These institutions, not all of which have a traditional deposit-taking network, account for a proportion of interbank operations that is substantially greater than their share in the overall balance sheet of all banks established in Belgium. In addition, they mainly carry out these transactions in foreign currencies, as reflected in the high volume of operations transacted with non-residents. These operations represent respectively 39% and 43% of claims and liabilities in the Belgian banking sector as a whole, against 19% and 21% in the other countries.

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Table 1
Credit institutions' balance-sheet structure
At end-1996, in percentages of balance-sheet total

	Belgium	Germany	France	Netherlands	United Kingdom	Average of other four countries
Assets						
Interbank lending[1]	33.0	23.6	38.8	17.2	12.5	23.0
Loans	31.9	53.5	36.3	64.0	55.3	52.3
Stocks and shares	29.9	20.4	18.9	16.2	18.5	18.5
Other assets	5.2	2.4	6.0	2.6	13.7	6.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
of which: claims on non-residents	*38.9*	*19.4*	*19.0*	*23.8*	*n.a.*	*20.7*[2]
Liabilities						
Capital and reserves	2.5	4.1	4.1	4.1	4.2	4.1
Interbank borrowing	41.2	26.6	39.9	23.4	12.9	25.7
Non-bank deposits and commitments	48.9	61.7	46.9	58.5	67.0	58.5
Other liabilities	7.4	7.6	9.1	14.0	15.9	11.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
of which: liabilities to non-residents	*43.3*	*14.8*	*18.4*	*24.5*	*n.a.*	*19.3*[2]

[1] Including assets in cash and with the National Bank of Belgium. [2] Germany, France and Netherlands only.
Source: OECD.

The high share of interbank liabilities and liabilities to the rest of the world is also in part explained by the recycling, through the Belgian banking sector, of Belgian franc funds collected by foreign, particularly Dutch and Luxembourg, credit institutions. Many Belgian investors place part of their savings with these institutions to avoid withholding tax on investment income.

The second major characteristic of the balance sheet of Belgian banks is the relatively high level of securities, mainly public debt securities, representing 30% of assets against 19% in the other countries. Conversely, the share of loans is proportionately smaller for Belgian banks (32%) than for the other countries' banks (52%). Belgian individuals have a relatively low level of indebtedness while companies are mainly family-run small and medium-sized businesses which prefer to be self-financing rather than borrow from banks.

The composition of Belgian banks' assets enables them to make do with a lower percentage of capital since claims on the government are exempted from the capital requirements imposed by EU directives, while interbank lending is subject only to a lower ratio. Capital and reserves are thus only 2.5% of banking liabilities in Belgium against 4.1% in the other countries.

Belgian banks' expansion policies have long been centred on developing a highly dense distribution network in order to maximise collection of private savings, as shown in the profit and loss account structure (Table 2). On average, from 1990 to 1996, staff costs were equivalent to 43% of banking income, 6% above the other countries. In addition, banking income remains firmly reliant on traditional intermediation. Over the same period interest income accounted for 75% against 67% for the other countries' banks, which are more advanced in developing alternative sources of income.

Table 2
Credit institutions' profit and loss account structure
Averages for 1990–96, in percentages of bank income

		Belgium	Germany	France[1]	Netherlands	United Kingdom[2]	Average of other four countries
1	Net interest income	74.9	77.2	63.7	68.7	58.4	67.0
2	Other net income[3]	25.1	22.8	36.3	31.3	41.6	33.0
3	Bank income (1+2)	100.0	100.0	100.0	100.0	100.0	100.0
4	Staff costs	43.2[4]	39.3	36.8	37.9	35.8	37.5
5	Other operating costs	25.9[4]	24.3	31.4	29.5	28.7	28.5
6	Provisions	13.6	15.7	21.1	8.4	16.3	15.4
7	Profit before tax (3–4–5–6)	17.3	20.7	10.6	24.2	19.3	18.7
8	Tax	5.5	11.3	4.4	6.9	7.2	7.4
9	Profit after tax (7–8)	11.8	9.4	6.2	17.3	12.1	11.3

[1] Adjusted to exclude in 1994 a large bank that recorded an exceptional loss. [2] Commercial banks only. [3] Includes commissions, results of foreign exchange and trading business, income from shares and financial fixed assets, proceeds of disposals of investment securities, and other operating income. [4] For 1990–92, commercial and savings banks only.

Source: OECD.

2.2 Importance of strategic risk

Over the past few years, the Belgian banking sector has been characterised by a fair degree of stability, there having been no disaster or generalised crisis. Traditional risks, in particular credit risk, were generally well controlled. As was seen in the preceding section, it is true that Belgian banks enjoy a fairly solid asset structure. Claims on the government predominate, thereby reducing the relative share of claims on individuals and companies and limiting provisioning. Between 1990 and 1996 provisions accounted for only 13.6% of banking income against 15.4% in the other countries.

In return for more limited risks, credit institutions have had to content themselves with fairly low profitability. They have, however, partially succeeded in offsetting this handicap by greater leverage (ratio of total assets to capital). Credit institutions have thus maintained a return on equity which is comparable to that in the other countries despite the fairly low level of their return on assets (Graph 1).

However, the lower capitalisation of Belgian banks has drawbacks. It curbs the possibilities for developing operations with private customers that require greater capital cover. It complicates the financing of costly programmes to introduce new technologies that can only be justified by sufficient profitability. And it exposes Belgian banks up to greater shareholder pressure and increases the likelihood of their being viewed as potential takeover targets by their competitors.

In this environment the main risk likely to affect Belgian banks' stability is strategic in nature. The disintermediation and internationalisation of financial flows, the emergence of new technologies for distributing banking products and the introduction of the euro are forcing credit institutions to review their business. This effort at adaptation is made more difficult by limited capitalisation and low overall profitability. Banks might thus be driven to adopt strategies which are too risky or unsuitable.

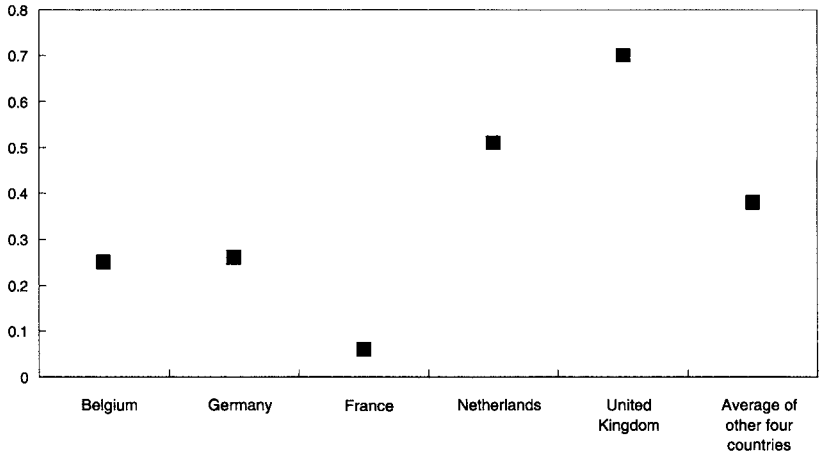
Faced with these challenges, credit institutions are in very different starting positions. Belgian banks' profitability is widely dispersed: whereas almost a quarter of Belgian banks enjoyed a return on equity greater than 12% in 1997, 30% of banks had a return on equity of less than 4% (Graph 2). Moreover, it was the small banks that suffered most from insufficient profitability. This is clearly not an absolute rule: some small institutions enjoy high profitability by focusing on business segments with high added value. In most cases, however, small Belgian credit institutions confine themselves to providing fairly standard services. A large part of their operations consists in taking deposits through traditional savings products and using them to fund investment in public debt securities.

Graph 1

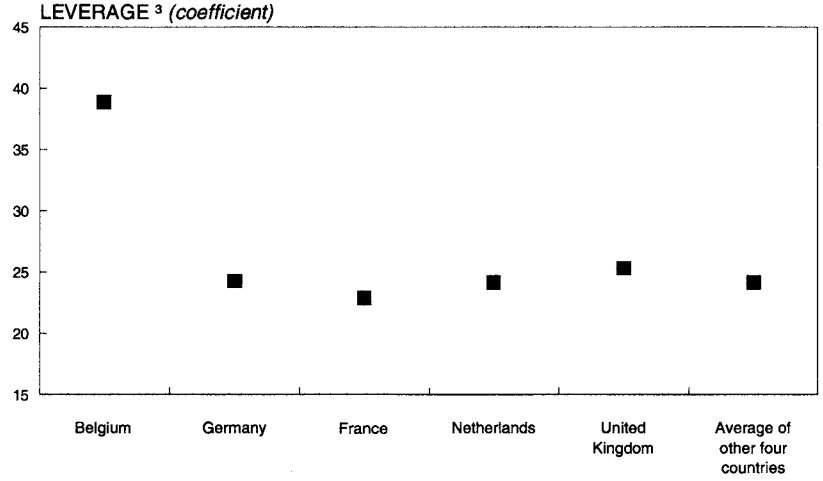
INDICATORS OF BANKS 'PROFITABILITY'[1]

(averages for 1993 - 96)

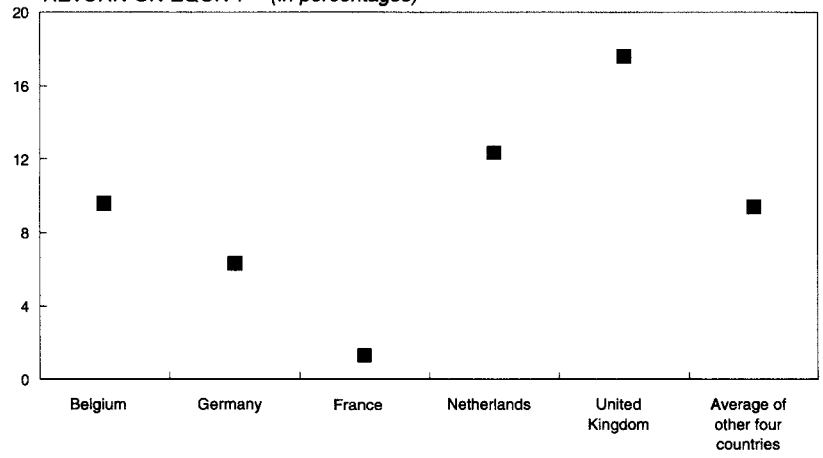
RETURN ON ASSETS [2] *(in percentages)*



LEVERAGE [3] *(coefficient)*



RETURN ON EQUITY [4] *(in percentages)*



Source: OECD.

[1] All banks, except for the United Kingdom (commercial banks only). Figures for France are adjusted to exclude in 1994 a large bank that recorded an exceptional loss.

[2] Profit after tax as a percentage of total assets.

[3] Ratio of total assets to capital.

[4] Profit after tax as a percentage of total capital.

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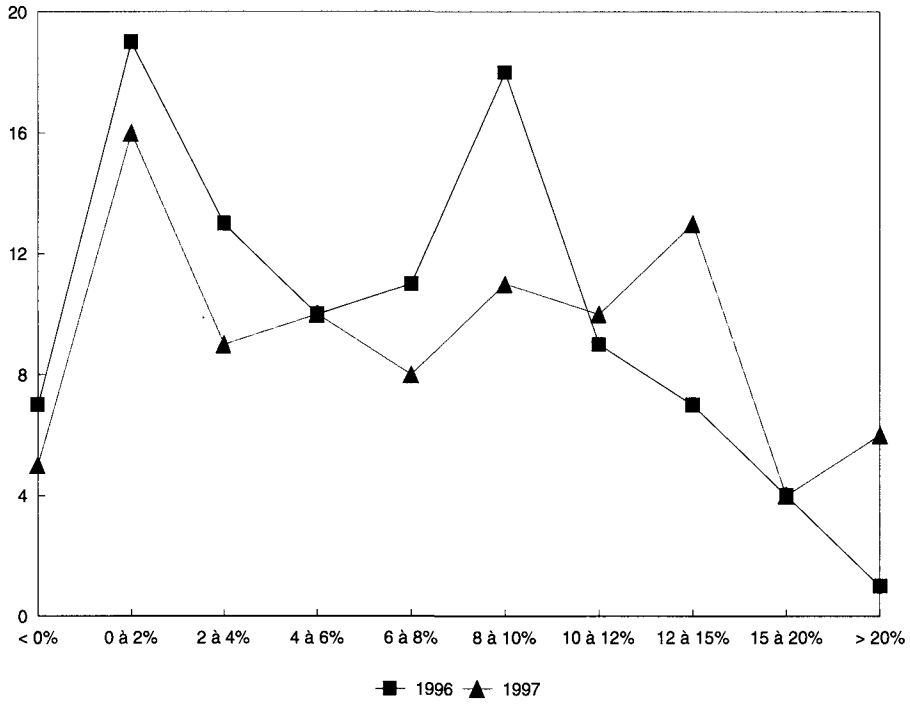
Graph 2

DISTRIBUTION OF RETURN ON EQUITY* OF BELGIAN-LAW CREDIT INSTITUTIONS

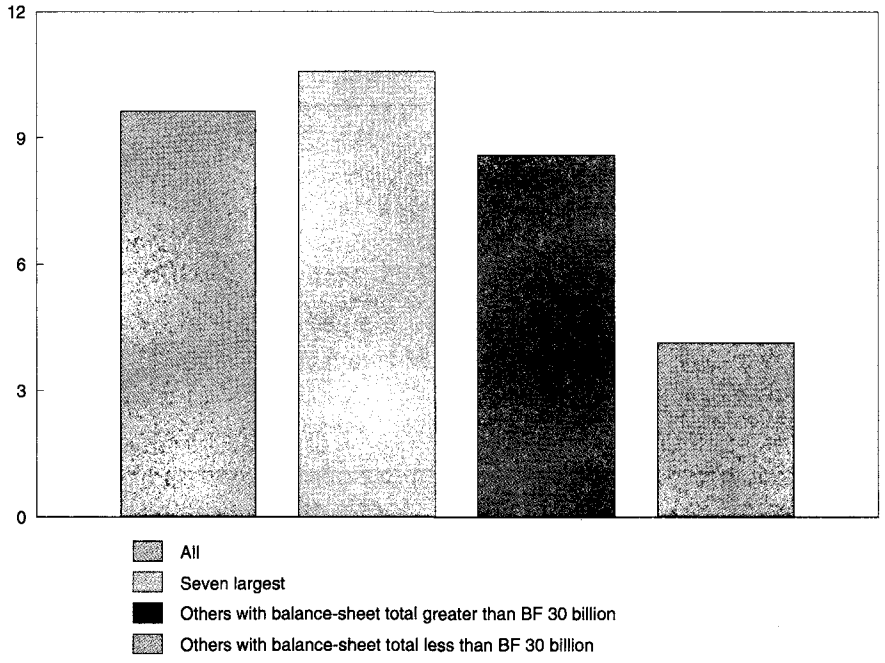
(Number of institutions and percentages)



Source: Banking and Financial Commission.

RETURN ON EQUITY* OF BELGIAN-LAW CREDIT INSTITUTIONS BY SIZE

(In average percentages for 1993-97)



Source: National Bank of Belgium.
** Profit after tax as a percentage of capital.*

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Different problems arise for large Belgian banks which enjoy markedly higher profitability than their smaller competitors. In the Belgian market, most of these large institutions have traditionally sought to present themselves as universal banks offering a full range of banking products to every type of customer. However, to be able to do this on a European and even a worldwide level, such a policy entails attaining a substantially greater size.

Large Belgian banks are thus confronted with a choice. If they wish to continue offering a full range of services, they will have to pursue a policy of external growth by mergers and acquisitions. However, the difficulty in reaching and maintaining the size required to realise this aim could induce them to opt for specialisation in certain types of business or in certain geographical markets.

3. Types of responses to changes in progress

Some of the transformations affecting the banking sector are not recent. In fact, credit institutions started their efforts at adaptation several years ago.

In the first instance, these efforts were mainly aimed at integrating developments under way within the context of existing business. Whereas this type of reaction was often effective in the past, it is not certain that it will continue to be appropriate, given the acceleration and multiplication of changes in progress.

It is therefore important to distinguish between banks responses, responses on the form of "internalisation" within existing structures and responses changing business structures.

3.1 Integration within existing structures

3.1.1 Integration of disintermediation

Retail banking was undoubtedly the first activity affected by changes in the financial system. This is not surprising in view of the high rate of saving in Belgium and the importance of this activity to Belgian banks, whose main macroeconomic role is to channel the financial surplus from households to finance the government.

From the early 1980s the internationalisation of markets induced individuals to diversify their investments. This behaviour was reinforced by tax considerations, depositing money abroad being a convenient way of avoiding withholding tax on interest income. This competition from foreign institutions was accompanied by competition within the Belgian banking sector itself. The liberalisation of markets brought about the demise of the more or less formal systems of restrictions on rates that existed in Belgium within the framework of the *Comité de concertation pour l'harmonisation des taux d'intérêt créditeurs* (consultative committee for harmonising creditor interest rates) and the *Comité d'examen des conditions débitrices* (committee on lending terms).

Belgian banks therefore sought to offer new investment products which, while being more attractive to their customers, still guaranteed them a stable source of income. This reaction paved the way for the exponential growth in mutual funds.

For investors, this type of investment offered possibilities of diversification into numerous different categories of assets and geographical markets. Mutual funds also enabled individuals to benefit from professional management of their assets. As for the banks, they were able to collect substantial investment and management commissions which acted as a substitute for the margin on traditional intermediation. The success of investments in mutual funds also relied on tax advantages. Insofar as investors opt for the capitalisation system, the mutual funds procure income in the form of tax-free capital gains.

The success enjoyed by mutual funds is clearly illustrated by the changes in the investment channels used by individuals for their assets. Between 1980 and 1997 the share of financial assets held directly

with resident credit institutions fell from 54.8% to 37.9%, while the share of assets in mutual funds rose from 0.5% to 11.0% (Table 3). Almost all these mutual funds are set up, marketed and managed by Belgian banks even though they are often registered under Luxembourg law for tax reasons.

Table 3
Structure by investment channel of individuals' financial assets
At year-end, in percentages of total

	1980	1990	1997
With resident credit institutions	54.8	45.2	37.9
Notes and ordinary deposits	17.7	12.3	8.6
Regulated savings deposits	18.4	14.1	15.2
Fixed-income securities	18.7	18.8	14.0
With institutional investors	7.7	13.4	21.7
Mutual funds	0.5	5.3	11.0
Insurance companies and pension funds	7.2	8.0	10.7
On the Belgian financial market	27.4	24.9	19.9
Fixed-income securities	10.1	5.8	2.1
Shares	17.3	19.1	17.8
quoted	3.1	4.8	3.9
unquoted*	14.3	14.3	13.9
By other channels (mainly abroad)	10.1	16.5	20.5
Total (in billions of francs)	5,723	14,492	23,173

* Mainly securities issued by family-owned small and medium-sized companies.
Source: National Bank of Belgium.

It can thus be seen that, until now, disintermediation has scarcely represented any threat to Belgian banks. On the contrary, it was a development that they turned to their profit in response to foreign competition. This competition has been lively over the past few years and explains the increase in the share of individuals' investments placed outside the Belgian financial market which amounted to 20.5% at the end of 1997 against 10.1% in 1980.

The rapid expansion of mutual funds also enabled Belgian banks to develop synergies with other business. The experience acquired was thus utilised to market life assurance products, bancassurance representing a strongly growing segment in Belgium. Mutual funds also represent an important outlet for commercial paper and asset-backed securities, which several Belgian banks are endeavouring to develop.

3.1.2 Integration of new technologies

In order to collect individuals' savings, Belgian banks set up a very extensive branch network, which peaked at the end of 1990, with 1,025 branches per million inhabitants against only 451 in the other countries (Table 4). Such a density could be justified up to a point in a context where price competition was suppressed. This encouraged banks to seek other comparative advantages and the proximity provided by a large number of branches was one way of setting oneself apart from the competition.

Deregulation of the financial markets has made this approach all the more questionable since it has been accompanied by the introduction of new technologies, opening up alternative possibilities for distributing banking products. In this matter as well, Belgian banks have until now reacted by integrating changes into their existing structures.

Table 4
Distribution networks
Number per million inhabitants

	Belgium			Average of other four countries		
	1990	1996	% change	1990	1996	% change
Branches	1,025	747	–27	451	406	–10
Number of employees	7,926	7,560	–5	7,865	7,545	–4
ATMs	94	414	340	218	407	86
POS terminals	2,828	7,997	183	1,384	6,569	375

Sources: BIS and OECD.

The emergence of new technologies has of course resulted in a reduction in the number of branches. Nonetheless, the number has remained high and, at the end of 1996, there were still 747 branches per million inhabitants against 406 in the other countries. Moreover, this drop has not been accompanied by a corresponding reduction in employment in the banking sector.

In fact, technological innovations have led not so much to a pure and simple substitution of ATMs for ordinary branches as to the development of a new distribution circuit, complementing the traditional network.

In a first phase, ATMs, mainly of a universal type, and POS terminals were used to increase the role of banks in payment circuits to the detriment of banknotes. In a later phase, banks mainly increased the number of ATMs which are solely accessible to customers of the institution that installed them. This reversal was the result of the major institutions' becoming aware of the existence of externalities associated with networks of universal ATMs. Following the example of the larger banks, small credit institutions saw such ATMs as enabling them to offer access to an entire network for which they bear only a minimal share of the installation and management costs. Furthermore, private ATMs allow a fuller range of operations to be carried out than standard ATMs whose functions are limited to cash withdrawal and the checking of account balances. All types taken together, at the end of 1996 the number of ATMs installed was more or less the same in Belgium as in the other countries: around 400 per million inhabitants.

In addition, the narrowness of the national market and the magnitude of investments to be authorised for the development of a network, at a very early stage, encouraged Belgian banks to co-ordinate the introduction of new technologies. This approach led to the formation of a joint venture, Banksys, which manages the system of ATMs and POS terminals. The existence of this structure has enabled the creation of synergies and the acquisition of know-how in secure electronic payments as well as a more rapid development of new products such as the Proton electronic purse, which is likely to be distributed on a much greater scale than just the national market. The Proton card is being marketed in several foreign countries through international partners.

3.2 Change in business structures

While it has had positive effects, the integration of changes in existing structures has not prevented a deterioration in Belgian banks' results. The overall interest margin has continued to decline and remains much lower than in the other countries (Graph 3). Despite its growth, non- interest income still represented only some 30% of gross income in 1996, a figure that had already been reached in 1990 in the other countries.

In many respects, the banking sector is thus handicapped in facing up to structural changes which the introduction of the euro will accelerate and intensify. This is leading banks to consider more profound changes to their business structures.

Graph 3

INDICATORS OF BANKS' INCOME AND COST STRUCTURES

(In percentages)

Source: OECD

[1] Net interest income as a percentage of balance-sheet total.
[2] All banks, except for the United Kingdom (commercial banks only). Figures for France are adjusted to exclude in 1994 a large bank that recorded an exceptional loss.

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3.2.1 Reduction of costs and changes to the network

The most immediate need is to reduce costs and efforts are already being made in this regard. Operating costs have been appreciably reduced, from 72.3% of gross income in 1990 to 65.7% in 1996. However, this drop took place from an unfavourable position in relation to the other countries and could, moreover, be explained in part by a temporary growth in income (cf. Section 3.3).

Given the surplus capacities mentioned in Section 3.1.2, a reduction of costs will without doubt involve a modification of the network structure. New methods of remote access to banking services are now being developed. However, the introduction of PC and Internet banking systems necessitates sizable investments. In view of these costs, many banks will undoubtedly find it increasingly difficult to simply juxtapose new technologies and old networks.

Strategic choices must therefore be made. While some banks continue to offer all access possibilities, others will choose to become more selective. Large institutions might also prefer to develop certain specific methods of distribution through subsidiaries. A subsidiary of this type has recently been set up in the form of a direct bank operating by telephone only, without a traditional branch network.

Two factors could, however, complicate the implementation of these cost-reducing programmes. The first is the social environment. The relatively high level of unemployment in Belgium means that staff cuts create an obvious image problem for credit institutions. As a result of the economic climate, the improvement in banks' profitability would aggravate this image problem. The second challenge is the necessity of linking a quantitative reduction to a qualitative improvement in the workforce. The transformation of banking business requires increased and diversified skills which it may be difficult to assemble and keep if the social climate deteriorates.

Furthermore, in some areas, such as IT, a labour shortage is emerging. The adaptations required by the introduction of the euro and the year 2000 issue mean that banks are competing with other business sectors in the market for IT specialists. Using subcontractors can only be a partial solution: for credit institutions, it raises specific problems of control and dependence on external suppliers.

3.2.2 Adaptation of the product range

As seen above Belgian banks have made use of disintermediation to protect their retail banking business. Disintermediation of financial investments could, nonetheless, take other forms that are more difficult for banks to "internalise". Thus, constraints faced by social security systems will undoubtedly accelerate the development of pension funds.

More generally, the introduction of the euro will further intensify the competition that prevails for most banking business. Financing operations carried out by Belgian banks remain focused on the government, which offer less potential for developing collateral business than does financing companies. Furthermore, company financing mainly comprises small and medium-sized companies as Belgium has only a small number of large multinational companies which might serve as a bridgehead for their own expansion abroad.

On the other hand, these small and medium-sized companies offer possibilities for developing investment banking business, in particular initial public offerings of previously family-owned capital. Likewise, the very high individual saving rate constitutes a base for private banking business.

However, as these are relatively new activities for many credit institutions, they need to develop specific skills. In addition, a large number of banks are contemplating similar diversification plans in these business niches. There is therefore the risk of a whole group of banks entering these markets and canvassing the same types of customer.

Risks linked to herding are undoubtedly most evident in respect of operations in international markets. The growth in lending by Belgian banks to emerging markets provides an illustration of this. These banks were late arrivals in these markets, where they did not generally have a historical presence. In 1996 and early 1997 they sharply increased their volume of lending, mainly short-dated and to the banking sector. In the short term this structure enabled a more rapid reduction of positions in response

to the crisis in South-East Asia. However, in the longer term this stop-go approach will not facilitate the structural development of new business and the establishment of lasting relationships.

3.2.3 Tie-ups with other credit institutions

Reducing costs and diversifying business are strategies that can be pursued individually. They can also be implemented by way of tie-ups with other credit institutions. Such grouping operations started in the small bank segment many years ago. The number of credit institutions with majority Belgian participation fell from 117 in 1980 to 63 in 1997; in the same period, however, the number of subsidiaries and branches of foreign banks rose from 59 to 71. But from 1996 the scale of operations changed decisively. In three years the structure of each of the nine largest Belgian banks was radically transformed:

- CGER, SNCI and Générale de Banque were grouped together in stages under the aegis of the Fortis holding company, itself the result of a tie-up between the Belgian insurance company AG and the Dutch insurance company AMEV;
- Crédit Communal de Belgique formed with Crédit Local de France the Dexia banking group;
- BBL was taken over by the Dutch bank ING;
- the banking group CERA, the financial group KB Almanij and the insurance group ABB merged within the KBC group; and
- BACOB took over the business of Paribas Belgium and Paribas Netherlands.

These large-scale operations are still too recent to allow an assessment of their results in terms of income growth and cost reduction. The increase in size, however, should provide the institutions concerned with various benefits, such as a more extensive division of labour and a more efficient organisation of resources. It will also be possible to write off investment expenditures necessitated by new computer technologies on a large number of operations. Furthermore, offering a wider range of services will enable better exploitation of potential synergies and increase customer loyalty.

However, the timing of these operations is a source of concern. The groupings took place at a later date than in some neighbouring countries, in particular in the Netherlands, such that they are combined with an acceleration of structural changes, the introduction of the euro and the year 2000 issue. These various problems must be tackled together with the organisation and management of mergers and acquisitions. In Belgium, these often take place under complex conditions that make it more difficult to reconcile cultures and harmonise procedures.

3.3 Interaction between structural changes and economic environment

While Belgian credit institutions, like all their European counterparts, have to make difficult strategic decisions, they have, over the past few years, been able to benefit from favourable macroeconomic conditions. First, the improved economic climate has helped confine credit risks. Second, the transition to a low-inflation environment, a prerequisite for the introduction of the euro, has brought about a sharp fall in both short-term and long-term interest rates.

This generalised downturn in rates has temporarily enabled Belgian banks to increase income derived from their major activity of transforming short-term liabilities into longer-term assets. It has also allowed high capital gains to be made on public debt securities portfolios. Over the past three years these capital gains have represented on average 8.5% of Belgian banks' gross income (Table 5). However, this proportion only corresponds to booked capital gains. In Belgium, the principle of marking to market does not apply to the component of portfolios held for investment rather than trading purposes (a component which represents over 90% of total portfolios). For this reason, most Belgian banks have considerable latent capital gains on their fixed-income investment portfolios.

Paradoxically, these good macroeconomic conditions have not just had positive consequences. They have, of course, been beneficial for institutions which embarked on their strategic reorientation at a

sufficiently early stage. For many banks, however, they may have contributed to reducing the sense of urgency. Thus some credit institutions may have been tempted to put off their efforts at adaptation, not sufficiently realising the temporary nature of the growth in certain sources of revenue.

Table 5
Capital gains/losses on securities portfolios shown in Belgian banks' profit and loss accounts
In billions of francs

	1993	1994	1995	1996	1997
Trading portfolio[1]	8.9	–1.0	8.0	8.0	5.4
Investment portfolio[2]	26.3	18.5	31.3	31.6	44.7
Total	35.2	17.5	39.3	39.6	50.1
Total, as a percentage of bank income	7.9	4.0	8.4	7.7	9.4

[1] Realised capital gains/losses, plus positive or negative differences in valuation. [2] Realised capital gains/losses.
Source: National Bank of Belgium.

Paradoxically, these good macroeconomic conditions have not just had positive consequences. They have, of course, been beneficial for institutions which embarked on their strategic reorientation at a sufficiently early stage. For many banks, however, they may have contributed to reducing the sense of urgency. Thus some credit institutions may have been tempted to put off their efforts at adaptation, not sufficiently realising the temporary nature of the growth in certain sources of revenue.

Even if the downward trend in rates in Europe does not come to an end, it may at least slow down sharply. Although credit institutions profit from falling rates, they are penalised when interest rates are maintained at a low level, due to a compression of the interest margin obtained on liabilities such as sight and savings deposits that are remunerated at below-market rates or not at all.

Those negative effects linked to a low level of rates might be compounded by the negative effects of a potential reversal in economic activity, which would be all the more harmful for banks if they result from developments in the financial sector of the economy (stock market falls, financial and banking crises in Japan and in numerous emerging markets, etc.).

The short-term favourable effects of the drop in rates on profitability have perhaps deluded not only the banks but also the financial markets themselves. These two consequences may indeed be linked. Faced with shareholder pressure, many banks have underlined the improvement in their results. This type of reaction has not been limited solely to Belgian banks but has been a much more general phenomenon. It has often led banks to set ambitious objectives with a view to better positioning themselves in the face of the wave of mergers and acquisitions. The financial conditions in which some of these grouping operations were realised were clearly based on the achievement and maintenance of high profitability.

A large number of European credit institutions thus aim to match the levels of profitability attained by the US banks, for which the average return on equity is currently in the order of 20%. It is, however, questionable whether it is realistic to envisage maintaining such results on a lasting basis, when the long-term rate for risk-free investments has fallen well below 5% and, for a large amount of its business, the banking sector has undoubtedly reached maturity.

4. Implications for the prudential authorities

In view of the specific context in which Belgian banks have to adapt their structures and business, two major themes will guide the action of the prudential authorities.

4.1 Surveillance of strategic risk

The first concerns the attitude to be adopted by the supervisory authorities in the face of strategic risk. Selecting a strategy constitutes the fundamental task of a credit institution's senior management. Directly involving the authorities in this process would be not only inappropriate but also dangerous since it might entail certain liabilities in the event of failure of the options suggested.

At the same time, the prudential authorities cannot completely dissociate themselves from these decisions which will condition the nature and extent of risks incurred by banks.

The main protection resides in the quality of management. The Belgian authorities have always rightly attached great importance to the licensing terms for credit institutions and to the quality and expertise of senior management. This emphasis on essentially qualitative criteria must be strengthened and extended to all banking activities. The various types of banking risks cannot be exclusively measured on the basis of numerical indicators; they must also be evaluated by taking account of the degree of development and precision of the control procedures set up in the institutions themselves. It must be acknowledged, however, that this approach is less easy than a quantitative examination since it entails the assessment of essentially intangible elements.

Without interfering in the running of banks, prudential supervisors could regularly discuss with credit institutions the strategic directions adopted and verify the adequacy of existing structures to the strategy envisaged. Such a suggestion would undoubtedly be controversial. However, it could be argued that simply organising such discussions would in itself force certain banks, particularly the smallest, to devise precise strategies and be aware of the demands associated with them. The dangers of incompatibility or emergence of excess capacities could thus be better appreciated. The emphasis could also be put on the nature and quality of the various sources of profit, bearing in mind their risks and potential cyclical character.

4.2 Cooperation between prudential authorities

The second theme follows naturally from the numerous mergers and acquisitions that have recently taken place in Belgium. These operations are only a manifestation of a more fundamental internationalisation of financial markets, and have, for some years now, been of concern to the various prudential authorities. Harmonisation measures have progressively been developed, particularly in the form of the Basle Committee's recommendations and EU directives.

Beyond these formal rules, exchanges of information and cooperation procedures between authorities have increased. These efforts must be intensified and expanded since tie-ups between financial institutions are taking on new forms by the day. In this matter Belgium is most particularly concerned by two major developments.

With Fortis and Dexia, the Belgian banking sector is directly involved in two of the three large cross-border groups that have recently been created following mergers between large banks of different nationalities (the third being Merita-Nordbanken which groups a Swedish bank and a Finnish bank). Such operations raise specific questions in respect of surveillance that are very different to those related to mergers between entities from the same country or mere acquisitions of foreign banks. It seems all the more important to develop appropriate control procedures since there is a high probability that such mergers will increase.

In addition, a large number of Belgian credit institutions have diversified into insurance in a big way. Although the development of bancassurance has by no means been limited to Belgium, the magnitude assumed by this type of diversification highlights the particular need to ensure better coordination between the authorities responsible for controlling financial activities that are sometimes very different in nature.

These two examples could obviously be supplemented by many others. Thus the recent upheavals in several Asian financial centres and in Russia are sufficient evidence that cooperation cannot be restricted to a limited number of countries but must be extended to emerging markets.

5. Conclusion

While the Belgian banking sector has not been sheltered from the numerous convulsions that have affected worldwide financial markets, it has until now shown a fair degree of stability. There has been no disaster or generalised crisis. This solidity is largely explained by the fairly traditional structure of Belgian banks' business. Assets comprise a very high proportion of interbank claims and public debt securities, reducing the relative share claims on individuals and companies.

The effects of this structure are positive in terms of risk but negative in terms of return. Belgian credit institutions have to make do with lower profitability. In financial markets in relative equilibrium, such a handicap can be offset fairly easily by reduced capitalisation, enabling a reasonable return on equity to be guaranteed despite a low return on assets.

But the margin for manoeuvre becomes much narrower when the markets are undergoing, as is currently the case, profound transformations. Banks have to diversify business, search for new markets and make heavy investments to improve the quality of services offered. They must also position themselves in the face of the wave of mergers and acquisitions. In such an environment, the main risk incurred by Belgian credit institutions is clearly strategic in nature. They must embark on a major effort at adaptation with limited capitalisation and fairly low profitability, while seeing that an appropriate strategy is selected.

This challenge is not new, as Belgian banks have already had to adjust to several changes. Until now this adjustment mainly took place within the context of existing business structures. Banks have thus juxtaposed several of the new banking distribution technologies and their traditional network and have also managed to integrate the phenomenon of disintermediation by turning it to their advantage. The development of mutual funds in particular has substantially enabled banks to maintain their market share in collecting savings.

But this process of adaptation by "internalisation" has its limits. The introduction of the euro will accelerate and intensify the changes under way, forcing banks to reconsider the very structure of their activities. The structure of the network and the adequacy of capacities will need to be reconsidered. New techniques will need to be explored.

These strategic measures may be undertaken on an individual basis or through mergers and acquisitions. Unlike the operations of the previous 15 years, which had mainly affected smaller institutions, the banking groupings of the past three years have been large-scale since they have involved each of the nine largest institutions active in the Belgian market.

Any change in strategy in itself raises difficulties of implementation which might be sharply accentuated by the recent development of the economic environment.

Over the past few years all European banks have been able to do business in especially favourable conditions. The transition to a low-inflation environment, imposed as a prerequisite to the introduction of the euro, has brought about a generalised fall in both short and long-term interest rates. The downturn in rates has temporarily enabled banks to increase earnings from maturity transformation and to achieve high capital gains on their securities portfolios.

But these favourable conditions are transitory. Stabilisation of rates at a low level has the effect of compressing the margins obtained on the reinvestment of resources with low interest rates such as sight deposits.

Those negative effects linked to the structure of rates might be compounded by a potential reversal in economic activity, which would be all the more harmful for banks if they result from developments in the financial sector of the economy (stock market falls, financial and banking crises in Japan and in numerous emerging markets, etc.). This deterioration in the environment could especially penalise the credit institutions that have put off reorienting their strategy. The organisation of a structural change

which has for many banks taken the form of complex mergers and acquisitions will have to be combined with the management of a crisis in the financial markets, the introduction of the euro and the year 2000 issue.

These developments initially suggest that the prudential authorities need to monitor strategic risks. Without interfering in the running of banks, they should verify the adequacy of existing structures to the strategies envisaged by way of regular discussions with the senior management of credit institutions.

Insofar as mergers and acquisitions have the effect of blurring both geographical barriers and distinctions between categories of business, prudential authorities must also intensify their cooperation. Belgium offers two examples of situations where the need for coordination among supervisory authorities will make itself felt particularly: the formation of cross-border groups by merging large institutions of different nationalities and the growth of bancassurance.

The restructuring of the Swiss banking system

Christian Braun, Dominik Egli, Andreas Fischer, Bertrand Rime and Christian Walter

1 Introduction[1]

1.1 The Swiss banking system

The Swiss banking system is characterised by universal banks. With the exception of insurance, which needs a special license, any authorised bank may offer the entire range of banking services. In practice, however, only the largest banks are truly universal banks. Most smaller banks are more or less specialised. Up to 1994, official statistics classify eight different kinds of banks: Cantonal banks, big banks, regional banks, Raiffeisenkassen, other Swiss-owned banks, foreign banks, finance companies, and private banks. At the end of 1994, the category "finance companies" was eliminated. The companies belonging to this category had to either become banks or exit the market. As Table 1 shows, most former finance companies became foreign banks.

The big banks conduct virtually all banking activities, and played an important role in the domestic as well as the international markets even prior to the merger of UBS and SBC. The cantonal and regional banks concentrate their businesses to the domestic market and, although also being universal banks, tend to emphasise mortgage lending. The same can be said for the Raiffeisen banks. Private banks engage mostly in portfolio management, while foreign banks are specialised in foreign-exchange trading, trade finance, underwriting, securities trading, and portfolio management. Finance companies have been involved in various kinds of capital market and lending activities.[2]

1.2 Restructuring of the industry

Table 1
Number of banks and finance companies, 1984-97

	84	85	86	87	88	89	90	91	92	93	94	95	96	97	Increase 1986-97
Cantonal banks	29	29	29	29	29	29	29	28	28	28	27	24	23	23	–21%
Big banks	5	5	5	5	5	5	4	4	4	3	3	3	3	3	–40%
Regional banks	216	215	214	213	212	209	203	188	173	154	134	122	114	112	–48%
Raiffeisen banks	2	2	2	2	2	2	2	2	2	2	1	1	1	1	–50%
Other Swiss–owned banks	82	85	88	91	89	91	92	92	93	87	86	84	81	80	–2%
Foreign banks	119	120	125	128	133	135	142	146	148	156	153	155	157	152	28%
Finance companies	103	112	119	130	133	137	130	112	101	79	71				–31%
Private banks	24	24	24	23	22	22	22	19	18	18	17	17	17	16	–33%

Sources: Swiss National Bank, Das schweizerische Bankwesen 1993 (p.22), Die Banken in der Schweiz 1996 (p.21), corrected by majority holdings: SVB by CS since 1993, SoBa by SVB since 1995, Neue Aargauer Bank by CS since 1995, Bank Wartau-Sevelen by SBV since 1995, Bank in Gossau by SBV since 1995, CEPY by Banque Cantonale.

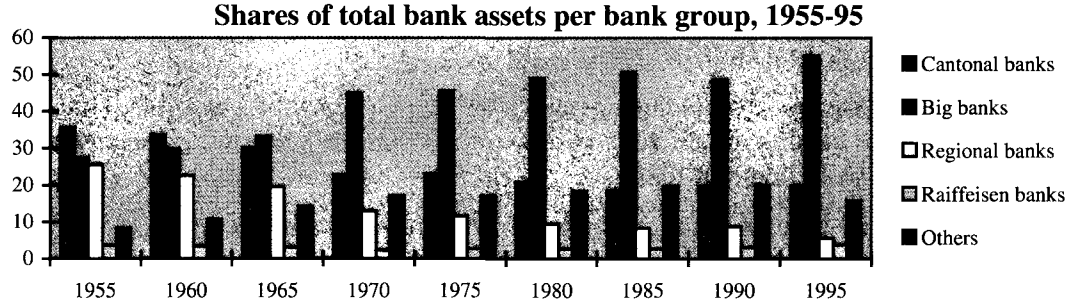
[1] This section was written by Dominik Egli.

[2] For more comprehensive surveys of the Swiss banking structure see Birchler and Rich (1991) or Meier and Mathinsen (1996).

Table 1 lists the evolution of the number of banks and finance companies from 1984 to 1997. As the raw numbers indicate, the Swiss banking industry has undergone a strong concentration process. Out of 29 cantonal banks, 6 were taken over or merged, nearly half of the regional banks disappeared, and the number of big banks effectively diminished from 5 to 3. The process has not come to an end yet, as becomes clear with the merger of UBS and SBC in July 1998. The new UBS is presently the second largest financial institution in the world. The decline of the number of Raiffeisen banks from 2 to 1 has resulted from the merger of the two central institutions in 1994. The evolution of the number of foreign banks and finance companies are mostly due to regulatory changes (see above), while the number of private banks has declined by one third.

Figure 1

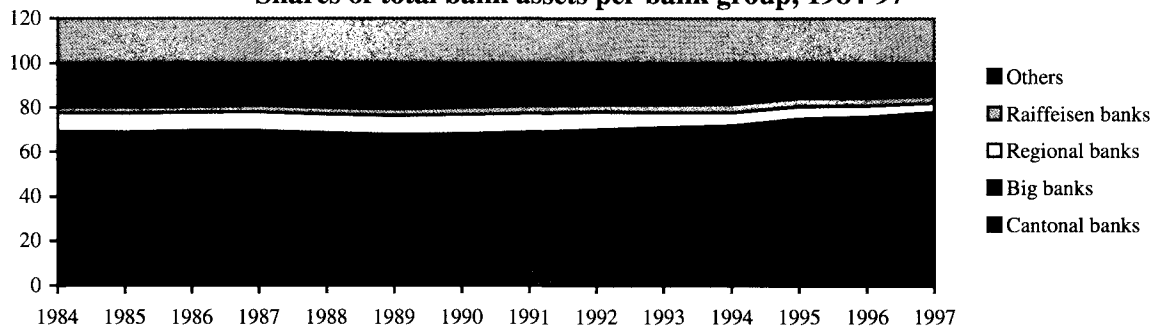
Shares of total bank assets per bank group, 1955-95



Raw numbers only tell part of the truth, and one is wondering how the shares of total bank assets of the different groups evolved over the same time horizon. As Figure 1 shows, in the long run, we observe a striking increase in the significance of the big banks, whereas the importance of the cantonal banks and especially of the regional banks has sharply declined. As Figure 2 indicates, this process is continuing. The big banks' share in total assets rose by about ten percentage points between 1993 and 1997 with the losers still being the regional and the cantonal banks.

Figure 2

Shares of total bank assets per bank group, 1984-97

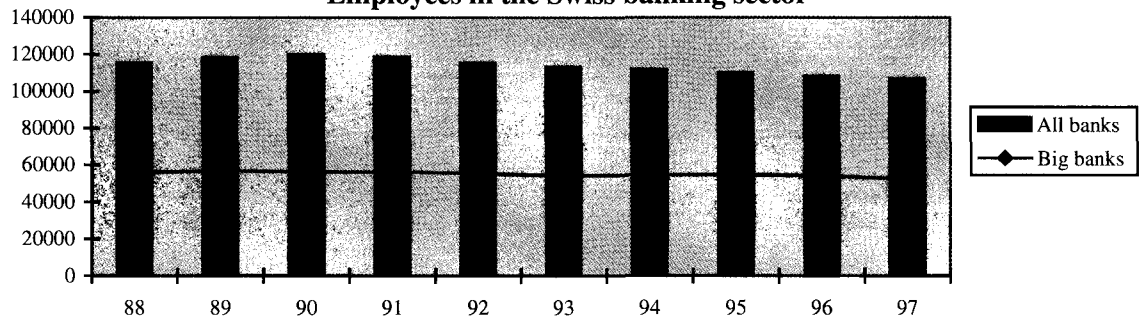


The data also show that the fall in the number of regional and cantonal banks was accompanied by a declining importance of these subgroups for the Swiss banking sector, while that of the big banks rose sharply.

Figure 3 shows the impact of the concentration process on domestic employment in the Swiss banking sector. Over the last decade, overall domestic employment in the sector has decreased by 7.2%, in the big banks by 5.2%. Employment at Swiss banks abroad has nearly doubled, mostly due to the foreign expansion of the big banks. Overall, the Swiss banking sector in 1997 employed 1.75% fewer people than in 1988.

Figure 3

Employees in the Swiss banking sector



The new UBS plans to reduce overall employment by 13,000 persons, of which 7,000 in Switzerland. Relative to 1997, this amounts to a ceteris paribus reduction of 10.9% of total employment of the Swiss banking sector, 6.6% domestic and 47% foreign.

Another fact worth mentioning is the insertion of Winterthur Versicherung into the Credit Swiss Group, with the latter becoming one of the world's largest all finance corporations.

Last but not least, PTT, the Swiss mailing company, recently started to extend its financial services. Under the heading "postfinance", PTT now offers life insurance and three investment funds. PTT maintains 3,700 branches and settles 70% of the intra-Swiss remittances.

2 The impact of the restructuring on monetary policy[3]

The restructuring of the Swiss banking system in the 1990s has not resulted in any fundamental changes in the SNB's medium-term strategy for monetary policy. The greater concentration of the banking system particularly among the largest banks, however, raises questions concerning the implementation of policy, in particular with respects to liquidity management and lender of last resort.

2.1 Liquidity management

The current medium-term monetary policy strategy of the SNB is framed around a 5-year target growth path for the monetary base.[4] The multi-annual strategy, covering the period from the end of 1994 to the end of 1999, envisages an annual average increase in the seasonally-adjusted monetary base of 1%. The growth path represents an "ideal" trend that would result if inflation remained stable at roughly 1% and real GDP growth corresponds to its potential of 2%. Within this framework, giros have a dual function. First, they act as an instrument in the SNB's efforts to control the monetary base. Expected giro levels are set consistent with the SNB's projected level of the monetary base for the next quarter. Second, giros serve as an indicator in the very short run. The daily evolution of giros provides the SNB information so that it can respond quickly to changing liquidity demands and thus prevent too pronounced swings in the overnight rate.

The banks' demand for giros arise from their settlement needs and the restriction that all banks in Switzerland are subject to liquidity requirements that can be fulfilled either through giros, postal

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[3] This section was written by Andreas Fischer.

[4] See Rich (1997) for a discussion concerning the history of monetary targeting in Switzerland. The monetary base is the sum of the notes in circulation plus the reserve accounts of the banking system with the SNB (called giro accounts).

checking accounts or vault cash. The largest share of the required reserves of the large Swiss banks is held in the form of giros and postal checking accounts. From time to time, the large Swiss banks may abruptly shift their liquidity needs from giros to postal checking accounts or the other way around. The idiosyncratic substitution of liquidity positions may be interpreted as a shock by the SNB, because it is difficult to identify the source of the sudden shift in demand for giros, which may stem from real factors or from the substitution between giros and postal checking accounts. The inability to identify the shock immediately stems from the fact that the SNB and the market do not know the total liquidity position on a given day. Although the SNB knows the giro and the level of notes on a daily basis, it receives the positions of the postal checking accounts with a lag of one month. If the large shifts in the giro demand are not properly identified, a shock manifests itself in the overnight rate, which can spill over also into short-term interest rates. As a result, there is the danger that the substitution between giro and postal checking accounts may have a more prolonged effect on short-term interest rates than is desired. Under such circumstances of uncertainty, the substitution in the liquidity positions, which are often a function of the size of the bank, forces the SNB to smooth interest rates more than it initially intended.

Recently, the SNB has introduced a repo market, which is open to a wide range of banks operating in Switzerland. Thus far, the repo market is dominated by the large Swiss banks. The current structure of this market implies that large shifts in liquidity positions among the large banks can still occur.

2.2 Lender of last resort

The trade-off between the moral hazard cost of the lender-of-last-resort-role and the benefits in preventing financial crises has greater repercussions when the banking system is dominated by a small number of actors. The recent merger between UBS and SBC has elevated concerns of "too-big-to-fail" within the Swiss banking system. Mergers of this size could also have indirect consequences for the future behaviour of other financial institutions. Knowing that the central bank will prevent a financial crisis if it appears imminent encourages other financial institutions to undertake less precautionary measures against systemic risks. Although the SNB is not legally responsible for monitoring banks in Switzerland, it has stepped up its efforts to gather information of banking activity.

3 The impact of the UBS merger on systemic stability[5]

3.1 Introduction

The dominant position of the new UBS in all important domestic bank operations (especially domestic lending and retail banking), and the likelihood of the bank becoming even more internationally oriented than it already is, raises questions concerning systemic stability. Systemic stability is an issue since a banking failure can cause social costs well beyond the private costs. Social costs appear when banks, which are tightly linked with other market agents go bankrupt. In Switzerland, this primarily applies to the two (formerly three) big banks, which are not only linked with each other (through the interbank market, reputational externalities, joint operations, etc.), but also have close ties to other Swiss banks and the Swiss corporate and household sectors.

The effective or presumed system-level relevance of individual banks leads to the so-called "too-big-to-fail" (TBTF) problem; i.e. expectations by market agents that banks with system-level relevance can rely on government aid if they get into financial difficulties. These expectations act to stabilise the system in the short term, as they reduce the risk of a run on the banks. At the same time, they create a competitive advantage for the affected banks through lower refinancing costs. However, they have a series of negative side effects. One effect is the distortion of competition due to the implicit

[5] This section was written by Christian Braun and Christian Walter.

guarantee, which is equivalent to a government subsidy through the transfer of assets from the government to the shareholders of the banks in question. A second effect is the hampering of market discipline, caused by the risk-independent rates for borrowing by these banks. This effect leads to a long-term increase in systemic risk. In Switzerland, such TBTF expectations focus primarily on the big banks. Both big banks are regarded as warranting a rescue bid because of their size and the extent of their ties to other market agents.[6]

Through the merger, two of the banks with system-level relevance now form a single bank. This increases the risk to the system by further reducing the scope for diversification at the level of individual banks. Although the market share of the new UBS is likely to be less than that obtained by simply adding the market shares of the two partners in the merger, its market shares in the domestic interbank, lending and deposit-taking businesses will be well above those of the previous market leaders. A failure of the new bank certainly would cause external costs on a previously unknown scale.

Assuming that a payments crisis at the new UBS would result in promises of government aid, there would be potentially massive transfer payments at the expense of the federal budget. Because of the particular nature of the subject, however, it is impossible to estimate the funding required. In any event, the present regulatory system with its weaknesses of early recognition of problems and lack of obligation to intervene at an early stage, offers no guarantee that a UBS with payments problems, and the resulting government bailout, would imply only a minimal burden to the national budget. For instance, a 3% deficit in cover for liabilities would leave a shortfall of around CHF 20 billion (about 5% of GDP)!

The decisive question for the purposes of system protection is the size of the potential risk posed by the new UBS. A central factor here is the bank's business strategy. It is, of course, difficult at present to assess the new bank's characteristics in terms of risk tolerance, quality of risk control and capital adequacy. It can, however, be said that the management is aiming at ambitious returns on equity. In the short term the potential for cost savings in domestic retail banking should make it possible to achieve above-average returns. In the long term, however, a marked rise in the return on equity is dependent on a permanent increase in the ratio between growth in cash flow and growth in equity. Although a long-term increase in return on equity is consistent with capital market equilibrium, it does imply a permanent increase in risk; i.e. a permanent increase in the volatility of returns.

Table 2
Relationship between return on equity and systematic volatility

Activity	Beta	Return (%)	Systematic volatility (%)
Full-service banking	0.97	9.8	19.4
Retail banking	1.09	10.5	21.8
Investment banking (national)	1.16	11.0	23.2
Institutional asset management	1.21	11.3	24.2
Private banking	1.31	11.9	26.2
Investment banking (global)	1.51	13.1	30.2

Sources: Matten (1996), p. 97, and own calculations.

Table 2 above illustrates the increase in volatility of returns associated with an increase in return on equity. It shows three ratios for international banks grouped by their primary activities. The first shows the sensitivity of share prices of the banks involved to changes in the corresponding market

[6] The actions of the central bank in the "Chiasso affair" at Credit Suisse in the seventies are, at the very least, not inconsistent with this assessment.

indices. For example, a value of 1.2 for this ratio (known as the beta in financial theory) means that a 1% change in the relevant market index will on average result in a 1.2% change in the same direction in the share price. A central result of financial theory is that the expected return on a share is an increasing function of the beta. The second ratio in the table shows the return to be expected on the basis of the beta, based on the parameters for the Swiss stock market,[7] while the third ratio shows the systematic volatility in the return on equity. This is the portion of the fluctuation in return on a share which is due to changes in the market as a whole. These changes cannot be avoided by portfolio diversification. The systematic volatility of a share is the product of the beta and the volatility of the market index.

According to the table, the increased emphasis on asset management and international investment banking proposed by the new UBS, is consistent with a long-term increase in the return on capital employed. It does, however, imply an increase in the systematic volatility. It is important to note that the systematic volatility is simply the volatility caused by the market as a whole; there is also a company-specific component, which is likely to be substantial for the new UBS for some time.

Greater fluctuations in returns for the new UBS (compared with that of its two constituent banks) is a matter of concern in terms of systemic stability. Thus, from a static point of view, there is now an increased risk of a very large financial group becoming insolvent. Risk control at the new UBS will be of vital importance to the resulting potential risk. A sound risk control culture at all levels and in all business areas and markets is crucial to meet the risk management requirements of the new UBS.

3.2 Implications for bank regulators

So far, the Swiss Federal Banking Commission (SFBC) has not paid special attention to the unique position of the big banks in terms of system protection. The most important element in bank regulation, capital adequacy, does not distinguish between banks with system-level relevance and those without. The SFBC has also devoted only a minor part of its resources to supervise the big banks, although these banks not only occupy a special position in terms of risk to the system but also have a more complex risk profile than other banks. However, the SFBC has recently announced plans to strengthen the supervision of the big banks.

The SFBC's proposed concept for the supervision of the big banks involves three elements: first, strengthening internal and external auditing; second, closer contact between the SFBC and the managements of these banks; and third, increased on-site inspections, also involving the banks' foreign branches.

These measures are to be welcomed. They will enable the SFBC to form its own picture of the risk-generating processes within these banks. They should also enhance the ability of the SFBC to identify problems at an early stage. In addition, the Swiss National Bank has, as lender of last resort, a pre-eminent interest in the solvency of the big banks. However, based on experience in other countries, it is not clear whether the proposed measures alone will be sufficient to limit the systemic risks – and the potential costs to the public sector – to an acceptable level. Hence, additional measures, e.g., mandatory early intervention, might be worth considering.

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7 For the calculation of returns and systemic volatility, the risk-free Swiss interest rate is assumed to be 4% while the risk premium and volatility of the Swiss equity market are put at 6% and 20% respectively.

4 The impact of the UBS merger on competition in retail banking[8,9]

4.1 Introduction

On 1st July 1998, the UBS and the SBC, two of the three Swiss big banks, merged to form the new UBS. The announcement of the merger in December 1997 triggered a heated debate about its competitive impact. On the one hand, two economists from the University of Lausanne (Damien Neven and Thomas von Ungern-Sternberg) forcefully argued that the merger would have a severe impact on competition in the retail banking segment, especially for loans to small and medium-sized enterprises (see Neven and von Ungern-Sternberg (1998) and von Ungern-Sternberg and Neven (1998)). On the other hand, two expertises requested by the UBS countered Neven and von Ungern-Sternberg mainly on their definition of the relevant markets as local (see Volkart (1998b) and Watter (1998)). Since relevant data are not publicly available, the discussion was partly based on plausibility grounds, partly on sheer assertions.

In May 1998, the Wettbewerbskommission, the Swiss antitrust agency, decided to force the new UBS to sell 25 branches as well as two subsidiary banks, namely the Banco Gottardo and the Solothurner Bank. The UBS will have to make a list of 35 branches out of which a potential buyer can pick 25 branches at will. The list of the 35 branches will have to be accepted by the Wettbewerbskommission. The UBS has to consider branches in the three main language regions and in eight specified regions which are critical from an antitrust point of view. In addition, UBS has to maintain credit lines to those clients which had loans at one of the merged banks at least up to year 2004. Last but not least, the UBS is not allowed to quit partnership agreements in infrastructure enterprises.

In this study, we will investigate the competitive impact of the merger empirically. The two main questions we will look at are:

- What is the impact of the merger on concentration in the Swiss retail banking sector?
- What are the expected consequences of the change in concentration on competition in the Swiss retail banking industry?

To answer the first question, we have computed the Herfindahl index and the three-firm concentration ratio for the product groups "loans and mortgages" and "savings deposits". In order to estimate the impact of the merger we have compared the concentration indices for 1997 with the indices which would have prevailed if the two banks had been merged already at that time. The analysis shows a considerable impact of the merger for both concentration indices and product groups, especially in cantons with previously low concentration indices.

In order to answer the second question (i.e. the possible impact of the merger on competition), we have estimated the relationship between concentration and prices for the period 1987 to 1997. We will take two different points of view about the impact of concentration on competition. First, we analyse how concentration interferes with prices *between the cantons*. Second, we examine the relationship between concentration and prices *over time*. We call the former "canton-analysis", the latter "time-analysis".

For both approaches, we have tested three hypotheses. First, the contestable-market hypothesis which suggests no relationship between concentration and prices, in our case interest rates. Second, the structure-performance hypothesis which suggests a negative (positive) relationship between concentration and deposit (loan and mortgage) rates. Third, the market-efficiency hypothesis which suggests the opposite relationship. From an antitrust-policy point of view, the rejection of the

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[8] This section was written by Dominik Egli and Bertrand Rime.

[9] We would like to thank Jean-Marie Antoniazza Robert Fluri and Susanne Ziegler-Peter for excellent data assistance and Urs Birchler for helpful discussions.

structure-performance hypothesis would indicate that the merger has no negative impact on competition.

Our main results can be summarised as follows:

- The canton-analysis shows that the efficient-market hypothesis cannot be rejected for deposits as well as mortgages for small cantons, whereas the contestable-markets hypothesis cannot be rejected for both products for medium and large cantons.
- The time-analysis shows that the structure-performance hypothesis cannot be rejected for deposits, especially for large cantons. For mortgages, the contestable-market hypothesis cannot be rejected.

These results suggest that antitrust policy should concentrate on changes of concentration indices, and not on absolute levels. An extrapolation of these results on the UBS merger, however, should be made with caution. Our estimations are based on a period with more or less steady changes of concentration. Overall, these changes are of the same magnitude as the impact of the UBS merger. However, the merger is a one-time shock, not a steady change. As we will argue below, the merger might considerably influence the game oligopolists play in Swiss retail banking markets.

4.2 Definition of relevant markets for deposits, loans and mortgages

In our empirical analysis we will look at two product groups relevant for households and small businesses: (1) loans and mortgages, and (2) savings deposits.

For antitrust considerations, defining the relevant geographic market is of considerable significance. By construction, the Herfindahl index is higher for narrowly defined markets. Consequently, merging banks tend to define their market broadly,[10] while antitrust agencies stick to more narrow definitions. As noted by Simons and Stavins (1998), the US agencies, "consider a local, economically integrated area to be a banking market. In practice, this usually means a city, a metropolitan statistical area, or a rural county." Similarly, the German Bundeskartellamt chose a very close definition in evaluating the competitive impact of the merger between the Bayrische Volksbank and Hypobank in Bavaria. Such small markets as the towns Kempten, Augsburg or Rosenheim have been defined as relevant markets.

The fact that anti-trust agencies define local markets as relevant does not necessarily indicate that this is economically appropriate. We therefore investigate the theoretical considerations which should govern the definition of relevant markets as well as the empirical findings on these questions.

The appropriate definition of a market depends on the products in consideration. Kwast, Starr-McCluer and Wolken (1997) indicate that related market power problems in the banking industry are only to be expected for "locally limited products". In their view, locally limited products are those consumed by households and small businesses. It still remains to define the products actually falling into this category, and what "locally limited" exactly means. Without doubt, today a household has the opportunity to buy and sell stocks not only via the bank at its residence. It can also open a deposit account at a bank located at a more distant place. Similar considerations count for other banking products. However, the question is not where consumers and small businesses could do their business, but where they actually choose to do so. In the following, we will give some theoretical arguments as to why we think the products chosen are carried out locally, and will review the evidence. This is followed by a discussion of the geographical definition of markets we have employed.

Loan and mortgage markets are characterised by asymmetric information, and based on this, banks can be seen as delegated monitors (Diamond (1984)). Monitoring is less costly the closer a bank and its customers are located. Different regional markets can have distinctive characteristics, which create a potential for economies of scale in information gathering.

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[10] In the application for the merger, UBS defined the relevant market for loans as the national market (Watter 1998).

Depositors use their deposit accounts not only for savings but also for payment services. The closer the bank, the lower are the transportation costs. Also, reputational effects can provide incentives for depositors to prefer local banks.

Additionally, combining loans or mortgages and payment services at the same branch helps the bank to get information about a specific customer and improves monitoring quality, from which both parties may profit. It may also reduce the transactions costs of the customer.

Based on US data for 1992 and 1993, Kwast, Starr-McCluer and Wolken (1997) report that 97.5% of households and 92.4% of small businesses using financial services had at least one account at a local depository institution, which for 96.5% and 93.5% was the primary account. In contrast, only 20.2% of households and 8% of small businesses had accounts at non-local depository institutions. By "local", the authors mean within 30 miles of residence or headquarters. The services most likely to be purchased locally are checking, savings and money market accounts, lines of credit, and certificates of deposit. Moreover, the authors examine the degree of clustering of financial services by households and small firms at their primary bank. Interestingly, clustering occurs for those services that are predominantly purchased locally, from which Kwast, Starr-McCluer and Wolken (1997) conclude that "a strong circumstantial case can be made that small businesses, as well as households, frequently tend to cluster their purchases of certain financial services at a local depository institution. Unlike households, the cluster for small businesses appears to include not only asset services, but also important credit and non-financial management services" (p. 988f). These results confirm those of an earlier study by Elliehausen and Wolken (1990). Rhoades (1996a), surveying the available evidence, concludes: "Evidence indicates that local market areas are generally the appropriate focus for analysis of the competitive effects of bank mergers. In particular, surveys of both households and small businesses point strongly toward the relevance of geographical markets" (p. 344).

The relevant market definition can change over time. What immediately comes to mind are electronic banking, ATMs and the like. Electronic banking has the potential to significantly reduce information and transaction costs for some products like checking and savings accounts. Their short- and medium term impact should, however, not be exaggerated. Electronic banking today is still relatively costly. One needs a PC and an access to the Internet, and the ability to use these tools. It will certainly take decades until most customers have equipment, skills and enough confidence to move to electronic banking. In addition, electronic banking does not reduce information costs for products where the bank has to rely on information about local markets. In these cases, the advantages of clustering services still induce customers to stick to the local bank, even if some services could also be provided electronically by a distant bank. It might be the case that the customers will do part of their banking business electronically, but this will not influence the relevant market definition as long as the customers do not switch to a more distant bank. On the possible influence of ATMs, Rhoades (1996a) concludes: "ATMs are not a substitute for a branch and are not the broad-based retail platform for the delivery of banking services that will ultimately constitute retail electronic banking" (p. 353).

Securitisation of loans and mortgages might also reduce the monitoring incentives of banks. But since the incentive to monitor only vanishes after the securitisation of a loan or a mortgage, and the success of a securitisation hinges on the reputation of the bank engaged, the influence is unlikely to be particularly important.

For Switzerland, an additional argument against a narrow definition of the relevant markets is that the merger will challenge the dominant positions of the cantonal banks.[11] Since interest rates for the UBS services are set nationwide, the ability of the local banks to exploit market power is reduced. Although it might be true that the UBS will set nationwide interest rates, not leaving at least some room to branch managers to adjust to local conditions would simply not be profit-maximising. It is hard to believe (and in times of shareholder-value maximisation also hard to justify) that a bank would refrain from making profits.

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[11] Cantonal banks are state owned, and have to take public interests into consideration.

The theoretical and empirical considerations indicate that the relevant markets for savings deposits, loans and mortgages are local markets. The appropriate definition of "localness" remains a critical point. The German Kartellamt, for instance, takes towns with less than 100,000 inhabitants as local centres. As indicated above, Kwast, Starr-McCluer and Wolken (1997) define local markets as a circle around the banking institution with a radius of 30 miles. For Switzerland, data for similarly narrow markets are not available, but we dispose of data at the canton level. The Swiss cantons differ substantially in size and population density. Most of them have more than 100,000 inhabitants and a good part of them also have more than one central town which satisfies the definition of local markets according to the Bundeskartellamt.

4.3 The impact of the UBS merger on concentration

Table 3 shows the number of banks active in each of the Swiss cantons. Clearly the canton Zürich, the centre of the Swiss financial system, hosts the largest number of banks. A lot of private banks are located in Geneva, while only few banks are active in the smaller cantons like Uri, Schwyz, Ob- and Nidwalden and the two Appenzells.

Table 3
Number of banks active in each canton, 1997

Zürich	63	Glarus	7	Appenzell AR	7	Vaud	28
Bern	44	Zug	8	Appenzell IR	4	Valais	9
Luzern	14	Freiburg	17	St. Gallen	25	Neuchâtel	7
Uri	5	Solothurn	14	Graubünden	10	Genève	55
Schwyz	8	Basel-Stadt	18	Aargau	19	Jura	9
Obwalden	6	Basel-Land	7	Thurgau	7		
Nidwalden	5	Schaffhausen	14	Ticino	31		

These figures are only indicative of the concentration of the banking systems by canton. More informative concentration indices are the three-firm index C3 and the Herfindahl index H. The three-firm concentration index is equal to the sum of the three highest market shares in the market under consideration. If the C3 index is 100, there are at most three banks active in the market. The Herfindahl index sums up the squares of the market shares. It can take values between 0 and 10,000. The upper bound is reached when there is a monopolistic bank. For a market with two equally large banks, the H index is 5,000, for three equally large banks 3,333. In a market where a large bank has a market share of 80% and two smaller banks have market shares of 10%, the H index is 6,400. Note that for all these cases, the C3 index is 100. The H index therefore entails more information than the C3 index.

Table 4
Number of cantons with Herfindahl indices for different ranges

	Loans and mortgages			**Savings deposits**		
	1987	**1997**	**UBS**	**1987**	**1997**	**UBS**
0-1,800	6	3	0	6	3	1
1,801-2,500	9	11	7	8	11	8
2,501-3,200	1	2	6	1	2	6
3,201-10,000	10	10	13	11	10	11

Our data stem from the yearly reports of the banks to the Swiss National Bank. Table 4 shows the number of cantons with Herfindahl indices for different ranges.

For both product groups, the number of cantons with Herfindahl indices of less than 1,800 has decreased in the last decade. The merger reduces the numbers to 0 and 1, respectively. At the other end of the spectrum, in about 40% of the cantons the Herfindahl indices exceed 3,200 after the merger.

Table 5 shows the increase in the Herfindahl index implied by the merger, again for different ranges.

For about half the cantons, the Herfindahl index rose by more than 200 points and for roughly one fifth by more than 600 points. These are considerable numbers.

Another interesting question concerns the relationship between the level and the increase of concentration implied by the merger.

Table 5
Increase of Herfindahl indices due to the UBS merger
Number of cantons with increases of different ranges

	Loans and mortgages	**Savings deposits**
0-199	10	13
200-399	6	5
400-599	3	4
> 600	7	4

As Table 6 shows, those cantons with an increase in concentration of less than 200 have pre-merger Herfindahl indices higher than 1,800, most of them even higher than 3,200. Conversely, those cantons with an increase of more than 600 predominantly had low pre-merger levels. The merger therefore reduces the dispersion of concentration between cantons.

Table 6
Relation between pre-merger levels and increases of Herfindahl indices
Number of cantons

		<200	**201-400**	**401-600**	**>600**
Savings deposits	0-1,800	0	1	1	0
	1,801-2,500	4	2	1	3
	2,501-3,200	1	1	0	2
	3,201-10,000	8	1	0	1
Loans and mortgages	0-1,800	0	1	1	1
	1,801-2,500	2	3	1	5
	2,501-3,200	0	1	1	0
	3,201-10,000	9	1	0	0

As another piece of information, we compare market size, measured by population size, with the Herfindahl indices after the merger. Table 7 shows the ranges of the indices for the cantons with less than 200,000 inhabitants, a criterion that half the cantons meet.

Obviously, the Herfindahl indices for the small Swiss cantons are very high, but the importance of market size is spectacular.

Table 7
Herfindahl indices after the merger for cantons with a population under 200,000
In parentheses: all cantons

	Loans and mortgages	Savings deposits
0-1,800	0 (0)	0 (1)
1,801-2,500	2 (7)	2 (8)
2,501-3,200	1 (6)	2 (6)
3;200-10,000	10 (13)	9 (11)

In the United States, the decision to investigate the impact of a merger on competition relies on DOJ Merger Guidelines. According to the Guidelines, a merger potentially harms competition if the Herfindahl index after the merger is higher than 1,800 *and* the merger leads to an increase of the index of at least 200 points. In case both criteria are met, the federal agencies and the Department of Justice analyse the impact of the merger under consideration. By doing so, they take possible mitigating factors into account, such as competition from thrift institutions and credit unions, the ease of entry, the attractiveness for entry, possible efficiency improvements implied by the merger, and the number of firms remaining in the market (Simons and Stavins (1998)). If a merger is considered anticompetitive, the merging bank is required to divest branches and offices as a condition for approval. As von Ungern-Sternberg and Neven (1998) report, the US antitrust agencies already forced the merging banks to sell branches in cases the Herfindahl index rose over 2,300. In some cases, where the concentration was already high before the merger, the index was still close to 3,000 after branches had been sold, and all the agencies could do was to prevent an even higher concentration. The US agencies not only analyse planned mergers, but also provide support for banks planning to merge, thereby reducing the number of cases they have to analyse for approval.

To conclude, if the Wettbewerbskommission had based its decision on the standards used in the United States, it would, without doubt, have had to take serious actions.

To our knowledge, the C3 index is nowhere used as a basis for policy considerations. Nevertheless, it is informative to look at. Qualitatively, however, the results are the same as for the Herfindahl-indices, so we have left the tables for the Appendix.

4.4 The impact of concentration on competition

We approximate the impact of concentration on competition by investigating the relationship between concentration and interest rates for savings deposits and mortgages.

The literature offers three possible effects that concentration can have on prices. The structure-performance approach which takes concentration as exogenously given. Based on the banking-model of Klein (1971), Hannan (1991a) shows that higher concentration allows the firms to exploit market power and thus leads to less favourable prices for consumers.

The efficient-structure hypothesis, pioneered by Demsetz (1973), takes concentration as endogenous. Firms differ by exogenously given efficiency levels. Firms with high efficiency levels set lower prices and gain higher market shares. If there are economies of scale, banks in cantons with a small number of large banks produce more efficiently than banks in cantons with an atomistic banking sector. In the absence of market power, this leads to a higher concentration ratio and more consumer friendly prices in the cantons with only few banks. In the same vein, banks in large markets could provide their services more efficiently than banks in small markets. In addition, a high dispersion of efficiencies leads to a high dispersion of market shares, which, in itself, results in a higher Herfindahl concentration index compared to an industry with low dispersion of efficiencies.

The contestable-markets theory (Baumol, Panzer and Willig (1982)) defines sustainable market equilibria as a situation when no entry would be profitable given the equilibrium price. Due to the threat of entry, the firms in the market are not able to exploit their market power in a sustainable equilibrium.

The three theories have different implications for the relationship between concentration and prices. According to the structure-performance hypothesis, there is a negative (positive) relationship between concentration and deposit (loan) rates. Conversely, the market-efficiency hypothesis implies a positive (negative) relationship between concentration and deposit (loan) rates, while under the contestable-markets hypothesis there is no relationship between concentration and loan (deposit) rates.

Besides the three theories stated above, our results might be explained by other factors specific to the Swiss banking system. First, the state-owned cantonal banks are major players in most cantons. Most of them were founded in the second half of the 19th century, with the main goal to intensify competition. Subsequently, this goal has been considerably diluted. Instead of intensifying competition, the cantonal banks had to pursue public interests such as providing mortgages and loans at favourable rates. One way to achieve these goals is to set consumer friendly interest rates. In cantons, where the cantonal bank has a high market share, this effect may lead to a positive (negative) relationship between concentration and deposit (mortgage) rates (market-efficiency hypothesis). In addition, as the cantonal banks are not necessarily profit maximisers, they do not try to exploit their market power. This serves as an alternative explanation for the absence of a relationship between concentration and interest rates (contestable-markets hypothesis). Second, the Swiss big banks are active in all cantons and set national reference rates for some products. In the absence of regional discrimination, prices will probably not depend on local concentration in those cantons where the big banks dominate the market (contestable-market hypothesis). For savings deposits, the possibility of cantonal discrimination can be excluded as the big banks offer the same rate in all cantons. For mortgages, the fact that the big banks set national reference rates until 1997 does not exclude cantonal discrimination, as market power related margins may have been absorbed in risk premia.

As already said in the introduction, we use the decade prior to the UBS merger to discriminate between the three hypotheses. This will allow us to make predictions concerning the impact of the merger on future interest rates in the Swiss retail banking industry. There is an important caveat, however. The changes in concentration in the past decade have been gradual, whereas the merger implies a quite abrupt shift in industry structure. Moreover, the game played in the local oligopolies may change in the future as the new UBS becomes the biggest player in some cantons where it formerly only ranked in second or third position.

4.5 The model

The general specification of the model is as follows (see Hannan (1991a)):[12]

(1) $rL_i = \alpha_0 + \alpha_1 \cdot CONC_i + \alpha_2 M_i + \alpha_3 B_i + \varepsilon_i$

(2) $rD_i = \beta_0 + \beta_1 \cdot CONC_i + \beta_2 M_i + \beta_3 B_i + \upsilon_i$

where rL_i denotes the loan rate of bank i, rD denotes the savings deposits rate, $CONC$ a concentration index (either the Herfindahl or the C3 index), M a vector of market characteristics and B a vector of bank characteristics.

As mentioned earlier (see Section 4.1), we estimate the relationship between interest rates and concentration (i) between the cantons and (ii) over time, based on pooled data. For the canton analysis, we introduce period specific intercepts. By doing this, we control for periods' idiosyncrasies,

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[12] Hannan (1991b) suggests introducing market share together with its interaction with concentration in the estimated equation. Our estimates based on this second specification do not differ substantially from those obtained with equation (1) and (2), although colinearity problems appear because of the interaction term.

such as the level of the competitive reference rate and the national average of the cantonal concentration indices at a given time. Under this first approach, the coefficient of the concentration index will capture the impact of changes in concentration from one canton to another, without respect for the national trend in concentration. For the time-analysis, we include canton-specific intercepts. This allows us to control for cantons' idiosyncrasies, such as the average level of concentration in a canton over the reference period. Under this second approach, the coefficient of the concentration index will capture the influence of the variations in concentration over time, without respect for the average level of concentration in a canton over the reference period.

The approach traditionally employed in the empirical industrial organisation literature is cross-section analysis. Examples for the banking industry are Evanoff and Fortier (1988), Berger and Hannan (1989), Hannan (1991a) and Neuberger and Zimmerman (1991). Recently, the traditional approach has come under attack, mostly because market idiosyncrasies are difficult to control for and questions the appropriateness of static comparisons between markets. Under the term "the new empirical industrial organization", Bresnahan (1989) proposed to investigate market power by time-series analysis. Examples for the banking industry are Hannan and Liang (1991) and Simons and Stavins (1998). By pooling the data, we are able to apply both approaches with the same data set.

Besides these formal considerations, cross-section and time-series analyses lead to different policy conclusions. A positive relationship between concentration and prices in a cross-section study indicates that antitrust policy should be intensified in markets with high concentration. A positive relationship in a time-series analysis, however, indicates that antitrust policy should intervene in cantons where concentration is increasing.

Equations (1) and (2) suggest that savings and mortgage rates depend on concentration as well as on variables specific to banks and cantons.

To control for canton-specific characteristics, we introduce the number of per capita bank offices and average per capita income as explaining variables. Per capita bank offices (*PCBO*) reflects the relative availability of bank offices and can be seen as a measure of competition in the banking market. If more offices mean greater competition, higher deposit rates and a positive sign are expected. Alternatively, a higher number of offices per capita enhances a bank's ability to deliver services. Transactions costs and, perhaps, information costs seem to be important for customers and convenience of location can then be seen as a form of product differentiation (Rhoades (1996b)). The variable thus approximates the convenience and service differentials between cantons, and the expected sign of the variable is negative for savings deposits. Finally, the number of offices per capita can be used as a proxy for strategic barriers to entry established by incumbent banks (branch proliferation), as noted by Gilbert and Matutes (1993). In case of branch proliferation, we expect a negative impact of *PCBO* on savings deposits rates. The average per capita income (*INC*) measures the relative wealth of bank customers. Wealthy customers may have attractive investment opportunities, which increases the price elasticity of deposit supply and reduces the market power of local banks.

To control for bank-specific characteristics, we introduce a dummy variable *CANT* which reflects the state guarantee for cantonal banks. *CANT* is unity for cantonal banks and zero otherwise. It is expected to have a negative sign for savings and deposits, as investors demand a lower risk premium for banks liabilities guaranteed by the state. *NUMB*, the number of branches a bank has in a specific canton, serves as a proxy for the convenience and service components of a bank's product. Banks may offset lower deposit rates by the advantages of an extensive network of branches. The average salaries of a bank (*SAL*) is introduced for the same purpose, namely as a proxy for the quality of a bank's service. The expected sign of *SAL* and *NUMB* for savings and deposits is negative. Finally, the variable *SIZE* (total assets) serves as a measure of a bank's size, which may be considered an indicator of a bank's health. Better health leads to lower demanded risk premia and, therefore, to lower deposit rates. Bank total assets also influence operating and refinancing costs.

For mortgages, we additionally have to control for credit risk. An increase of the risk of mortgage lending is expected to lead to higher risk premia, which induce higher mortgage rates. As a proxy for the risk, we use the ratio of provisions to total assets (*RPRO*).

4.6 The data

We use end-of-year interest rates for savings deposits and mortgages at cantonal and regional banks for the period 1987 to 1997. Our database does not cover banks operating in more than one canton, which excludes the big banks. All bank-related data stem from the Swiss National Bank database "IPSO" while the data on population and income stem from the "Annuaire statistique de la Suisse".

4.7 Relationship between concentration and prices between cantons

In this section, we examine the relationship between concentration and interest rates based on their variation from one canton to another. For this approach, the three hypotheses are:

- Contestable-markets hypothesis (H0): differences of concentration between cantons have no impact on savings deposits and mortgage rates;
- Structure-performance hypothesis (H1): differences of concentration between cantons have a negative (positive) impact on savings deposits (mortgage) rates;
- Market-efficiency hypothesis (H2): differences of concentration between cantons have a positive (negative) impact on savings deposits (mortgage) rates.

A confirmation of H1 would have two implications for anti-trust policy. First, it would indicate that the national concentration indices underestimate the possible impact of concentration on interest rates. And second, it would indicate that anti-trust policy should be intensified in cantons with high concentration indices.

4.7.1 Specification of the model

By inserting the control variables mentioned above into equations (1) and (2), we get the following specifications for savings deposits

$$(1') \quad rD_i = \beta_0 + \beta_1 CONC_i + \beta_2 PCBO_i + \beta_3 INC_i + \beta_4 NUMB_i + \beta_5 SAL_i + \beta_6 SIZE_i + \beta_7 CANT_i + \upsilon_i$$

and for mortgage rates

$$(2') \quad rL_i = \alpha_0 + \alpha_1 CONC_i + \alpha_2 PCBO_i + \alpha_3 INC_i + \alpha_4 NUMB_i + \alpha_5 SAL_i + \alpha_6 SIZE_i + \alpha_7 RPRO_i + \varepsilon_i$$

where $CONC_i$ is the concentration indicator (Herfindahl index or C3 index) for the product under consideration. The intercepts act as proxies for the rate of an alternative competitive financing source, or a competitive investment opportunity of the bank. Hannan (1991a) uses a similar approach in his empirical analysis of the US loan market.

Equations (1′) and (2′) are estimated separately for the years 1989, 1993 and 1997, and on a pooled basis for 1989-97. In the latter case, the intercepts are estimated separately for each year to control for periods' idiosyncrasies.

4.7.2 Results

Tables 8 and 9 present the results for savings deposits and mortgage loans

For savings deposits, the coefficients of both concentration indicators are positive and significant at the 1% level in the pooled estimates. In the cross-section estimates, the relationship between concentration and savings deposits rates is also positive, but only at the 5% significance level.

Table 8

Estimation results for savings deposits rates

	Herfindahl index				C3 index			
	1989	**1993**	**1997**	**1989-97**	**1989**	**1993**	**1997**	**1989-97**
Intercept 1989	3.88			4.03	3.89			3.99
	(39.25)			(68.37)	(39.95)			(66.47)
Intercept 1991				5.21				5.17
				(87.27)				(84.36)
Intercept 1993		3.75		3.89		3.73		3.85
		(22.7)		(65.10)		(21.39)		(62.23)
Intercept 1995				2.95				2.90
				(49.57)				(46.55)
Intercept 1997			2.11	1.93			1.94	1.88
			(16.73)	(29.04)			(13.48)	(27.41)
Concentration	**0.271 ***	**0.477 ***	**0.889 ****	**0.497****	**0.517***	**0.284**	**0.753 ***	**0.360 ****
	(2.13)	**(2.13)**	**(3.34)**	**(5.74)**	**(2.01)**	**(1.22)**	**(3.06)**	**(4.25)**
Per capita bank offices	0.292*	0.353	-0.00353	0.0883	0.277*	0.313	-0.108	0.0340
	(2.34)	(1.87)	(-0.30)	(1.29)	(2.09)	(1.59)	(-0.88)	(0.47)
Average income per capita	-2.82E-06	4.80E-06	-3.50E-06	1.08E-06	-2.73E-06	4.07E-06	-6.39E-06	-3.60E-10
	(-1.64)	(1.56)	(-1.44)	(1.00)	(-1.29)	(1.13)	(-2.18)	(-0.28)
Bank assets	1.27E-09	6.64E-11	5.23E-09	7.74E-11	6.87E-10	-3.95E-10	4.36E-09	-4.35E-10
	(0.18)	(0.01)	(0.80)	(0.03)	(0.09)	(-0.04)	(0.67)	(-0.15)
Average salary of employees	0.00392**	-0.00218	-0.000210	-0.000184	0.00360**	-0.000245	-0.000185	-0.000208
	(3.98)	(-1.63)	(-0.68)	(-0.62)	(3.64)	(-1.83)	(-0.59)	(-0.70)
Number of branches	-0.000409	0.000223	0.000874	0.001511**	-0.003602**	0.00207	0.000946	0.00144**
	(-0.36)	(1.15)	(1.06)	(2.77)	(3.64)	(1.06)	(1.14)	(2.62)
Cantonal bank dummy	-0.101	-0.304**	-0.305**	-0.214**	-0.0802	-0.282**	-0.281**	-0.196**
	(-1.72)	(-3.24)	(-3.46)	(-6.02)	(-1.36)	(-2.94)	(-3.23)	(-5.48)
Adjusted R^2	0.071	0.083	0.147	0.947	0.055	0.065	0.135	0.946

In parentheses: t-values Student. * or ** indicate that the coefficient is significant at the 5% or 1% level respectively.

Table 9

Estimation results for mortgage rates

	Herfindahl index				C3 index			
	1989	**1993**	**1997**	**1989-97**	**1989**	**1993**	**1997**	**1989-97**
Intercept 1989	5.85			5.88	5.89			5.95
	(47.44)			(98.99)	(46.91)			(98.04)
Intercept 1991				7.10				7.18
				(118.72)				(116.07)
Intercept 1993		6.19		6.05		6.28		6.12
		(25.18)		(101.13)		(27.08)		(98.98)
Intercept 1995				5.44				5.54
				(92.43)				(88.68)
Intercept 1997			4.27	4.53			4.12	-1.27E-08
			(62.73)	(71.51)			(49.67)	(-0.13)
Concentration	**-0.492****	**-0.581***	**0.15**	**-0.50****	**-0.279***	**-0.662***	**0.17**	**-0.421****
	(-3.58)	**(-1.98)**	**(0.53)**	**(-6.02)**	**(-2.04)**	**(-2.11)**	**(0.68)**	**(-4.86)**
Per capita bank offices	0.0256	-0.146	0.0862	-0.0277	0.0495	-0.0646	0.0696	0.0192
	(0.19)	(-0.51)	(1.48)	(0.40)	(0.33)	(0.27)	(1.18)	(0.27)
Average income per capita	-3.58E-07	-2.43E-06	-2.02E-06	2.27E-07	-5.14E-08	1.35E-06	-2.62E-06	1.74E-06
	(-0.18)	-0.52()	(-1.50)	(0.20)	(-0.02)	(0.27)	(-1.80)	(1.33)
Bank assets	-1.87E-08*	-1.44E-10	5.74E-09*	-9.15E-10	-1.9E-08*	-1.12E-09	5.80E-09*	-9.27E-10
	(-2.24)	(-0.01)	(2.51)	(-0.32)	(-2.25)	(-0.08)	(2.54)	(-0.33)
Average salary of employees	0.00131	6.44E-05	-7.26E-08	-6.82E-08	0.00173	3.52E-08	-1.51E-07	-1.27E-08
	(1.10)	(0.03)	(-0.81)	(-0.67)	(1.44)	(0.17)	(-1.11)	(-0.13)
Number of branches	0.00219	0.000904	-0.0015**	0.000218	0.00226	0.00108	-0.0013**	0.000216
	(1.71)	(0.32)	(-3.18)	(0.38)	(1.72)	(0.38)	(-2.97)	(0.38)
Ratio of provisions to total assets	-14.61	2.90	12.06**	0.033	-17.16	4.74	13.41**	0.0383
	(-1.66)	(0.28)	(2.83)	(0.49)	(-1.92)	(0.47)	(3.09)	(0.56)
Adjusted R^2	0.122	0.036	0.21	0.900	0.055	0.042	0.21	0.899

The results for mortgages mirror those for savings deposits. The coefficient of the concentration indices are negative and significant at the 1% level in the pooled data estimations and negative and significant at the 5% level in the cross section estimations for each year.

The positive (negative) and significant relations observed between concentration and savings deposits (mortgages) rates lead us to reject the structure performance paradigm for both products. Our results are compatible with the market-efficiency as well as the hypothesis of consumer friendly pricing by dominant cantonal banks. However, the results could also be driven by differences in market size due to our definition of cantons as relevant markets. In order to discriminate between these hypotheses, we have performed additional tests.

4.7.3 Testing the hypothesis of consumer friendly pricing by cantonal banks

In the case of consumer friendly pricing by cantonal banks, the positive (negative) relationship between savings deposits (mortgages) rates and concentration should be observable only in markets where the cantonal bank has a dominant position. To test this hypothesis, we create two dummy variables, *MAJ* and *MIN*, which reflect the dominance of the cantonal bank and enter directly in interaction with the concentration indices. *MAJ* is unity when the cantonal bank controls more than half of the market and zero otherwise. [13] Conversely, *MIN* is unity when the cantonal banks controls less than half of the market and zero otherwise.

Table 10
Estimation results for data pooled over the 1987-97 period

	Savings deposits		Mortgages	
	Herfindahl	**C3**	**Herfindahl**	**C3**
Intercept 1989	4.03	3.99	5.87	5.96
	(67.44)	(65.56)	(97.89)	(96.23)
Intercept 1991	5.21	5.17	7.10	7.18
	(86.20)	(83.36)	(117.94)	(113.17)
Intercept 1993	3.89	3.84	6.04	6.13
	(64.15)	(61.38)	(100.39)	(96.81)
Intercept 1995	2.96	2.90	5.44	5.53
	(49.12)	(46.12)	(92.02)	(85.72)
Intercept 1997	1.93	1.88	4.53	4.62
	(28.87)	(27.17)	(71.17)	(68.16)
MAJ x Concentration	0.501**	0.357**	-0.547**	-0.413**
	(5.75)	(4.20)	(-6.02)	(-4.42)
MIN x Concentration	0.562**	0.345**	-0.710**	-0.402**
	(3.28)	(3.54)	(-3.72)	(-3.40)
Per capita bank offices in canton	0.0814	0.0393	-0.00566	0.0146
	(1.16)	(0.53)	(-0.08)	(0.19)
Average cantonal income per capita	9.99E-07	-2.90E-07	9.42E-07	1.61E-06
	(0.91)	(-0.22)	(0.75)	(1.13)
Bank assets	2.46E-10	-5.24E-10	-1.48E-09	-8.46E-10
	(0.08)	(-0.18)	(-0.52)	(-0.29)
Average salary of bank employees	-0.000176	-0.000213	-2.001E-08	-1.35E-08
	(-0.59)	(-0.71)	(-0.21)	(-0.14)
Cantonal bank dummy	-0.215	-0.196**		
	(0.91)	(-5.47)		
Bank number of branches	0.00147**	0.00146**	0.000334	0.000206
	(2.65)	(2.63)	(0.58)	(0.36)
Ratio of provisions to total assets			0.0372	0.0377
			(0.55)	(0.55)

[13] Obviously, introducing only one dummy variable would suffice as the two dummies sum to unity. The two specifications lead to identical results. Our approach, however, makes the interpretation of the results easier.

The modified specification for savings deposits can thus be written as:

$$rD_i = \beta_0 + \beta_1 MAJ \cdot CONC_i + \beta_2 MIN \cdot CONC_i + \beta_3 PCBQ_i + \beta_4 INC_i + \beta_5 NUMB_i + \beta_6 SAL_i + \beta_7 SIZE_i + \beta_8 CANT_i + \upsilon_i$$

and for mortgages as:

$$rL_i = \alpha_0 + \alpha_1 MAJ \cdot CONC_i + \alpha_2 MIN \cdot CONC_i + \alpha_3 PCBQ_i + \alpha_4 INC_i + \alpha_5 NUMB_i + \alpha_6 SAL_i + \alpha_7 SIZE_i + \alpha_8 RPRQ_i + \varepsilon_i$$

According to the results in Table 10, the coefficients of both concentration indicators remain positive and significant at the 1% level for savings deposits and mortgages, independently of the dominance of the cantonal bank. The hypothesis of consumer friendly pricing by dominant cantonal banks can therefore be rejected. The remaining hypotheses compatible with our results are thus the efficiency paradigm and the possibility of a bias related to differences in cantons' size.

4.7.4 Testing for the influence of canton size

To test the possibility that the relationship between interest rates and concentration is biased by differences in size between the cantons, we have divided the 26 cantons into three classes according to their population. The "large" class contains the cantons with more than 300,000 inhabitants (8 cantons), the "medium" class cantons with population between 300,000 and 100,000 (9 cantons) and the "small" class with the remaining 9 cantons with less than 100,000 inhabitants.

Tables 11 and 12 present the results for both products: to save space, we display only the coefficient of the concentration indices and the F- and p-values based on a Wald test of the null hypothesis that concentration has no impact on interest rates.

Table 11
Savings deposits: separate estimates for cantons stratified by size

		Herfindahl			C3		
		Small canton	**Medium canton**	**large canton**	**Small canton**	**Medium canton**	**large canton**
MAJ x Concentration	Coefficient	1.09 **	0.209	0.22	0.98 **	0.398	0.32
	F-value	13.83	0.28	0.52	12.24	1.43	0.11
	probability	0.0002	0.6034	0.4778	0.0005	0.2302	0.7447
MIN x Concentration	Coefficient	1.23 *	0.296	-1.11 **	1.01 **	0.443	-2.11 *
	F-value	4.22	0.17	11.89	7.46	1.26	4.44
	probability	0.0399	0.6845	0.0006	0.0063	0.2606	0.0350

* or ** indicate that the coefficient is significant at the 5% or 1% level respectively..

Table 12
Mortgages: separate estimates for cantons stratified by size

		Herfindahl			C3		
		Small canton	**Medium canton**	**large canton**	**Small canton**	**Medium canton**	**large canton**
MAJ x Concentration	Coefficient	-0.75*	0.046	0.138	-1.39 *	0.103	-0.0310
	F-value	3.73	0.10	0.61	4.59	0.18	0.09
	probability	0.0495	0.745	0.4345	0.032	0.672	0.7591
MIN x Concentration	Coefficient	-1.63*	0.332	-0.171	-1.75 *	0.213	-0.145
	F-value	3.90	1.78	0.81	4.65	0.58	1.87
	probability	0.04821	0.1824	0.3628	0.0315	0.4448	0.1717

* or ** indicate that the coefficient is significant at the 5% or 1% level respectively..

Interestingly, concentration has a positive (negative) and significant impact on savings deposits (mortgages) only in small cantons, regardless of the dominance of the cantonal bank. No significant relationship is observed in medium-sized cantons. In large cantons, we find a negative relationship between concentration and savings deposits rates when the cantonal bank is not dominant.

4.7.5 Interpretation of the results

Our results support the efficiency paradigm for savings deposits as well as for mortgages, but only in small cantons. A possible explanation is that economies of scale quickly disappear with size. In large cantons, banks operate with high volumes (CHF 1,400 million average credit volume per bank); i.e. on the segment of the cost curve where economies of scale may have been exhausted. In that case, differences in bank size and, accordingly, in bank concentration may be unrelated to cost efficiency and to prices. Conversely, in small cantons, banks operate with lower volumes (CHF 500 million on average); i.e. on the segment of the cost curve where economies of scale may be present. Small cantons with larger banks and more concentrated systems may therefore present a higher level of efficiency than small cantons with low concentration, which implies a positive relationship between concentration and deposit (mortgage) interest rates. In medium-sized cantons, both the structure-performance and the market-efficiency hyotheses are rejected. In large cantons, finally, the structure-performance hypothesis cannot be rejected for savings deposits when the cantonal bank is not dominant. For mortgages, the absence of a significant relationship leads us to reject both the structure-performance and the market-efficiency hypothesis.

The reliability of our results is reduced by several factors. First, we do not dispose of data for banks active in more than one canton, which excludes major players like the big banks. This omission does not affect the analysis for the market segment of savings deposits, as the big banks set uniform national rates for this product. For mortgages, however, the publication of a national reference rate does not exclude the possibility of cantonal discrimination, as margins related to market power may be absorbed in canton-specific risk premia. A more rigorous analysis of competition in the mortgage market would therefore require the inclusion of big banks' interest rates stratified by cantons. Unfortunately, this statistic is not available. Second, our market definition was imposed by data constraints and therefore contains some arbitrariness. In particular, the cantonal market definition may be too narrow for small cantons and too broad for large cantons. Third, the control variables did not perform well in explaining cantonal and individual bank idiosyncrasies. Hence, misspecification cannot be excluded. Fourth, the dominance of the cantonal banks in the majority of the cantons reduces the pertinence of the test of the structure performance paradigm based on the absolute level of concentration.

Our results contrast sharply with those obtained in similar studies for the United States, which generally support the structure performance paradigm for retail banking products. Hannan (1991a) finds that the C3 index has a positive and significant impact on commercial loans of less than 100,000 dollars, while Neuberger and Zimmerman (1991) observe a negative and significant impact of the C3 concentration ratio on negotiable order of withdrawal deposit accounts and money market deposit accounts. Using data from 1996 data, Radecki (1998) finds a positive impact of concentration on savings rates at state levels, but no impact at local levels. In addition to the aforementioned drawbacks in our database, two main elements may explain the observed differences between the United States and Switzerland. First, the regional segmentation of the banking market may be less pronounced in Switzerland; distances are shorter, there are no legal restrictions to bank entry in the cantons, and the big banks may help equalising the cantonal level of competition by setting national reference rates. Second, the domination of the cantonal bank reduces the relevance of the level of concentration in tests of the structure performance paradigm.

4.8 Relationship between concentration and prices over time

In this section, we test whether changes in concentration over time have had an impact on savings

deposits and mortgages rates. A similar approach has been used by Simons and Stavins (1998) in their study of the impact of mergers on MMDA and CD's interest rates in the United States.

We conduct two tests. The first is specified in relative terms. It determines whether deposit (mortgage) rates decrease (increase) by more than the national average in those cantons where concentration increased by more than the national average. Using this approach, we can omit including a competitive reference rate as control variable (alternative refinancing source or investment opportunity). This constitutes a substantial advantage, given the difficulty of identifying an appropriate reference rate for instruments without explicit maturity like savings deposits and mortgages. The main weakness of the relative test is its inability to capture the impact of changes in concentration on prices when concentration indices follow a similar trend in all cantons.

For the relative test, the hypotheses are:

- Contestable-markets hypothesis (H0): changes of concentration over time differing from the national average have no impact on interest rates;
- Structure-performance hypothesis (H1): changes of concentration over time differing from the national average have a negative (positive) effect on deposit (mortgage) interest rates;
- Market-efficiency hypothesis (H2): changes of concentration over time differing from the national average have a positive (negative) effect on deposit (mortgage) interest rates.

The second test is specified in absolute terms and attempts to determine whether absolute changes in the concentration indices affect the relationship between deposit (mortgage) interest rates and the competitive reference rate. This approach can identify the impact of concentration on interest rates even in cases where the changes in concentration are similar in all cantons. However, its reliability is reduced by the difficulty of controlling precisely for the competitive reference rate.

For this test, the hypotheses are similar to those above except that for each hypothesis we look at changes in absolute rather than relative terms.

A confirmation of H1 in the absolute or in the relative test would have two implications for antitrust policy. First, it would indicate that changes in the cantonal concentration indices are more relevant than changes in the national indices. Second, it would indicate that policy has to be intensified in cantons where the merger leads to an important increase in concentration index, independently of the absolute level of the indices.

The results of the analysis should not be mechanically extrapolated to make a prediction of the impact of the UBS-merger on competition. As shown in Table 13, the average increase in concentration implied by the UBS merger is similar in amplitude to the variations in concentration observed during the last ten years. Nothing guarantees that the instantaneous change in concentration implied by the merger will have an impact on interest rates similar to changes in concentration of the same amplitude but occurring progressively over a decade.

Table 13

Trends in concentration: comparison between the UBS merger and that of the last ten years

	Mortgages		Savings deposits	
	C3	**Herfindahl**	**C3**	**Herfindahl**
Variation implied by the merger (cantonal average)	0.078	0.041	0.060	0.035
Variation during the period 1987-97 (cantonal average of absolute values)	0.059	0.044	0.048	0.049
Maximal range during the period 1987-97 (cantonal average)	0.081	0.060	0.067	0.063

Our estimation method is pooled data analysis with canton-specific incercepts. The database includes annual observations for the period 1987-97. The pooling of the data over the different cantons increases the degrees of freedom. The inclusion of canton-specific intercepts neutralises the impact of cantonal characteristics, as far as those are stable over time. This means, in particular, that our estimations capture the impact of changes in concentration over time in a different canton, without respect to the average level of concentration in this canton over the reference period.

4.8.1 Specification of the model in relative terms

We use the following specifications for the savings deposits:

$$\tilde{r}\,D_i^t = \beta_k + \beta_1 \cdot \tilde{CONC}_i^t + \beta_2 \cdot \tilde{PCBO}_i^t + \beta_3 \cdot \tilde{WAGE}_i^t + \beta_4 \cdot \tilde{CANT}_i^t + \varepsilon_i^t$$

and for mortgage loans:

$$\tilde{r}\,L_i^t = \alpha_k + \alpha_1 \cdot \tilde{CONC}_i^t + \alpha_2 \cdot \tilde{PCBO}_i^t + \alpha_3 \cdot \tilde{WAGE}_i^t + \alpha_4 \cdot \tilde{RPRO}_i^t + \upsilon_i^t$$

where α_k, β_k are canton specific intercepts and all variables with a *tilde* are defined as deviations from the national mean; for example, $\tilde{r}\,D_i^t = rD_i^t - rD_{CH}^t$, with rD_{CH}^t representing the national mean.[14]

4.8.2 Specification of the model in absolute terms

As said above, the test in absolute terms requires the inclusion of a competitive reference rate as control variable. In the absence of an explicit maturity for savings deposits and mortgages, we proxy the reference rate with a basket of money market and swap rates.

We use the following specifications for the savings deposits:

$$rD_i^t = \beta_k + \beta_1 \cdot CONC_i^t + \beta_2 \cdot PCBO_i^t + \beta_3 \cdot SAL_i^t + \beta_4 \cdot CANT_i^t + \beta_5 \cdot i1m^t + \beta_6 \cdot i3y^t + \beta_7 \cdot i10y^t + \upsilon_i^t$$

and for mortgage loans:

$$rL_i^t = \alpha_k + \alpha_1 CONC_i^t + \alpha_2 PCBO_i^t + \alpha_3 SAL_i^t + \alpha_4 RPRO_i^t + \alpha_5 \cdot i1m^t + \alpha_6 \cdot i3y^t + \alpha_7 \cdot i10y^t + \varepsilon_i^t$$

where $i1m^t$ is the one-month money market rate, $i3y^t$ the three-year swap rates (one year moving average) and $i10y^t$ the ten-year swap rates (one year moving average).

4.8.3 Results

Table 14 presents the results for savings deposits and mortgages based on the test in relative terms. We observe a negative relationship between savings deposits rates and concentration, significant at the 1% level for the Herfindahl index and at the 5% level for the C3 index. No significant relationship emerges between mortgage rates and concentration.

The negative relationship between savings deposits and the Herfindahl index remains significant in the test in absolute terms (Table 15), although at the 5% level only, while the relationship with the C3 index disappears. For mortgages, the test in absolute terms confirms the absence of a significant relationship between concentration and interest rates.

Overall, the results provide partial evidence in favour of the structure-performance hypothesis for savings deposits. Concerning mortgages, none of the concentration indicators have a significant influence on interest rates and we can reject the structure-performance hypothesis for this product.

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[14] The national mean does not include banks active in more than one canton.

Table 14

Test in relative terms

Pooled data estimates with canton-specific intercepts, period 1987-97

All variables defined as deviations from the national mean	Savings deposits		Mortgages	
	Herfindahl	**C3**	**Herfindahl**	**C3**
Concentration	**-1.55****	**-0.565***	**-0.454**	**-0.473**
	(-4.20)	**(-2.12)**	**(-1.11)**	**(-1.43)**
Total per capita bank offices	-0.0268	0.0402	0.00707	0.0177
	(-0.65)	(1.28)	(0.17)	(0.41)
Average salary of bank's employees	-0.000491	-0.000342	0.00465	0.000672
	(-1.01)	(-0.70)	(1.01)	(1.70)
Cantonal bank dummy	-0.0934**	-0.0722**		
	(-3.22)	(-2.74)		
Ratio of provisions to total assets			0.0296	0.0324
			(0.46)	(0.50)
Maximal canton specific intercept	0.734**	0.409**	0.21	0.265
	(5.82)	(4.40)	(1.60)	(1.94)
Minimal canton specific intercept	-0.167*	-0.250*	-0.593**	-0.561**
	(-2.27)	(-2.61)	(-4.76)	(-4.61)
Adjusted R^2	0.267	0.252	0.103	0.106

Table 15

Test in absolute terms

Pooled data estimates with canton-specific intercepts, period 1987-97

	Savings deposits		Mortgages	
	Herfindahl	**C3**	**Herfindahl**	**C3**
Concentration	**-1.19***	**0.142**	**-0.614**	**-0.571**
	(-2.08)	**(0.33)**	**(-1.26)**	**(-1.54)**
Total per capita bank offices	-0.528**	-0.579**	-0.389**	-0.378**
	(-6.13)	(-6.44)	(-5.05)	(-4.96)
Average salary of bank's employees	-0.000979	-0.00100	0.00129	0.00134
	(-1.29)	(-1.32)	(1.49)	(1.42)
1-month interbank rate	-0.818**	-0.812**	-0.806**	-0.808**
	(-35.38)	(-34.05)	(-41.44)	(-41.64)
10-year swap rate (12-month moving average)	-3.58**	-3.58**	-3.14**	-3.12**
	(-30.07)	(-30.07)	(-31.28)	(-31.05)
3-year swap rate	3.99**	3.99**	3.58**	3.57**
(12-month moving average)	(37.04)	(36.73)	(39.31)	(39.25)
Cantonal bank dummy	-0.0837	-0.0848*		
	(-1.95)	(-1.97)		
ratio of provisions to total assets			0.103	0.107
			(1.43)	(1.48)
Maximal canton specific intercept	9.47**	9.09**	9.23**	10.49**
	(24.89)	(20.53)	(42.02)	(31.86)
Minimal canton specific intercept	7.96**	7.67**	10.38**	9.47**
	(29.11)	(19.38)	(33.55)	(31.45)
Adjusted R^2	0.918	0.918	0.878	0.878

4.8.4 Pools including cantons with similar features

As said above, the 26 cantons present a number of specific characteristics, and it may be interesting to conduct separate estimates for pools of cantons with common features. We have divided the cantons into pools of about the same size according to the criteria (i) amplitude of the change in concentration, (ii) correlation between the concentration index and the cantonal bank market share, (iii) population size, and (iv) level of concentration at the beginning of the sample period. The estimation results for each pool are presented in Tables 16 to 19: to save space, we display only the coefficient of the concentration index and its F- and p-values based on a Wald test of the null hypothesis that concentration has no impact on savings deposits rates.

Large variations in concentration are more likely to affect competition as they can modify the game played in the regional oligopolies (emergence of a new market leader etc.). The negative relationship between concentration and savings deposits should be more visible in cantons which experienced large variations of concentration during the reference period. The results in Table 16 confirm this assumption for the Herfindahl index, but are inconclusive for the C3 index.

Table 16
Estimates stratified by the amplitude of the concentration change

Savings deposits		**Variations in Herfindahl index**			**Variations in C3 index**		
		small amplitude	**medium amplitude**	**large amplitude**	**small amplitude**	**medium amplitude**	**large amplitude**
Absolute test	Coefficient	-0.752*	-0.696	-1.28*	-3.91	-3.07*	0.51
	F-value	4.42	0.16	4.28	0.55	2.62	0.99
	Probability	0.0354	0.6860	0.0387	0.4574	0.055	0.3175
Relative test	Coefficient	-0.789	0.246	-1.85**	-2.35*	0.0539	0.124
	F-value	0.30	0.07	12.13	4.69	0.00	0.13
	Probability	0.5822	0.789	0.0005	0.0303	0.9391	0.7209

If cantonal banks are not profit maximisers, the negative impact of concentration on savings deposits interest rates over time should be more pronounced in the cantons where the changes in concentration are not highly correlated with changes in the cantonal bank market share. As shown in Table 17, the hypothesis is supported by the estimations based on the Herfindahl index. For the C3 index, however, the results are inconclusive.

Table 17
Estimates stratified by the correlation between changes in concentration and changes in the cantonal bank market share

Savings deposits		**Herfindahl index**			**C3 index**		
		low correlation	**medium correlation**	**high correlation**	**low correlation**	**medium correlation**	**high correlation**
Absolute test	Coefficient	-4.58**	0.0866	-3.30**	0.172	0.454	-2.92*
	F-value	7.30	0.05	11.02	0.03	0.53	4.05
	Probability	0.0069	0.9409	0.0009	0.8600	0.4673	0.0442
Relative test	Coefficient	-2.61**	-1.43	-0.315	-0.921*	0.209	-0.441
	F-value	10.66	3.50	0.14	3.12	0.22	0.53
	Probability	0.0010	0.0614	0.7189	0.0475	0.6454	0.3903

Concerning canton size, we could expect the negative relationship between concentration and savings interest rates to be more pronounced in large than in small cantons, where increases in concentration might lead to efficiency gains in the presence of decreasing economies of scale. The results for the Herfindahl index confirm this hypothesis, while those based on the C3 index provide no significant results.

Table 18
Estimates stratified by cantons' population size

Savings deposits				**Herfindahl index**		**C3 index**	
		low population	**medium population**	**high population**	**low population**	**medium population**	**high population**
Absolute test	Coefficient	-1.49	-1.36	-0.269*	0.447	0.69	-0.465
	F-value	1.38	0.79	0.39	0.05	1.03	0.55
	Probability	0.24	0.38	0.0328	0.8315	0.3096	0.4578
Relative test	Coefficient	-0.718	-0.782	-1.65**	-1.54	-0.182	0.175
	F-value	0.71	0.68	7.21	2.74	0.17	0.19
	Probability	0.398	0.4102	0.0072	0.0978	0.6843	0.6644

We had no priors about the impact of the initial level of concentration on the relationship between changes in concentration and changes in savings deposits rates. According to Table 19 the negative impact of the Herfindahl index on interest rates is more significant in cantons where the initial concentration level was low. For the C3 index, the negative impact of concentration is more significant in cantons with a medium initial level of concentration.

Table 19
Estimates stratified by the initial level of the concentration index

Savings deposits				**Herfindahl index**		**C3 index**	
		low level	**medium level**	**high level**	**low level**	**medium level**	**high level**
Absolute test	Coefficient	-2.17*	1.67	-1.48	0.650	-1.98*	-1.98
	F-value	4.07	3.61	0.90	1.04	3.94	0.34
	Probability	0.025	0.0572	0.3353	0.3073	0.04717	0.5576
Relative test	Coefficient	-1.78*	0.809	-2.29	-1.22	-0.899	-2.19
	F-value	6.33	1.65	1.68	1.51	3.68	1.48
	Probability	0.01187	0.1944	0.1944	0.2198	0.05492	0.2231

4.8.5 Interpretation of the results

The above results are compatible with the structure performance paradigm for savings deposits, while this paradigm is not supported for mortgages.

The fact that the negative relationship between changes in savings deposits rates and changes in concentration is more pronounced in the cantons which experienced greater changes in concentration or where the changes in concentration were not closely correlated with changes in the cantonal bank market share confers some reliability to our results.

The absence of a significant relationship between concentration and mortgage interest rates is surprising, as this instrument also belongs to retail banking products where we usually suspect regional segmentation and a low contestability of the market. The heterogeneous nature of our

mortgage rates sample, which contains mortgages with variable as well as fixed interest rates, may explain this lack of consistency. The difficulty of controlling the riskiness of lending on a forward looking basis also reduces the reliability of the estimates for mortgages.

4.9 Conclusions

Overall, our study yields ambivalent results on the relationship between concentration and interest rates in the retail banking industry.

On the one hand, the canton-analysis indicates that changes in concentration from canton to canton are positively (negatively) related with savings deposits (mortgages) interest rates, at least in small cantons. This result contradicts the structure performance paradigm and supports the efficiency paradigm. For medium and large cantons, the structure-performance hypothesis has to be rejected.

Based on these results, antitrust authorities should not be too preoccupied with high concentration indices in small cantons, as the efficiency effects of concentration seem to have dominated in the past. In future, however, the high level of concentration in some cantons may generate market power problems if cantonal banks try to exploit their dominant position, or if big banks get a dominant position and switch from the policy of a national interest rate to cantonal discrimination. From that perspective, the recent renouncement of the big banks to publish national reference rates for mortgages increases the scope for spatial discrimination.

On the other hand, the time-series analysis indicates that changes in concentration over time are negatively related to savings deposits interest rates, especially in cantons characterised by large population and low correlation between the concentration index and the cantonal bank market share. For mortgages, we observe no significant relationship between changes in concentration over time and interest rates. Based on these results, antitrust agencies should intervene against increases in the concentration level, especially in large cantons where the efficiency motivation seems less likely.

Several elements can explain the contrast between our results and those obtained for the United States, where the bulk of empirical evidence supports the structure-performance hypothesis for cross-section as well as for time series data, regardless of the size of the market. First, the absence of legal barriers to banks in the Swiss cantons, the shorter distances and the national interest rate policy of the big banks reduce the local segmentation of the Swiss retail banking market. Second, the dominant position of cantonal banks which are not necessarily profit maximisers makes the absolute level of concentration less relevant for the market power issue. Third, in small cantons, the efficiency gains implied by higher concentration may more than offset the negative effects related to market power.

Finally, we have to stress that the apparently harmless effects of absolute concentration indices on competition observed during the last years should not be carelessly extrapolated into the future. First, cantonal banks may get under greater pressure to adopt a profit maximising behaviour and, consequently, to exploit their dominant position. This shift could be triggered by a change of the ownership structure (possible privatisation) or by the abolishment of the state guarantee. Second, the game played in the local oligopolies may change in the future as the new UBS becomes the market leader in cantons where it formerly only ranked in second or third position. Third, we cannot exclude an attempt by big banks to introduce some cantonal discrimination for savings deposits and mortgages. In these three cases, the predictions of the structure performance paradigm could materialise in the cantons with high concentration levels, leading to undesirable effects on mortgages and savings deposits rates.

Appendix: The impact of the merger on concentration, C3 indices

Table A1
C3 indices in different ranges (number of cantons)

	Loans and mortgages			Savings deposits		
	1987	**1997**	**UBS**	**1987**	**1997**	**UBS**
0-69	12	8	2	10	8	2
70-79	5	9	6	6	9	7
80-89	5	4	11	6	4	10
90-100	4	5	7	4	5	7

Table A2
Increase of C3-indices due to the UBS merger in different ranges (number of cantons)

	Loans and mortgages	**Savings deposits**
0-5	9	11
6-10	8	10
11-15	8	5
16-20	1	0

Table A3
Relation between pre-merger levels and increases of C3-indices (number of cantons)

		0-5	**6-10**	**11-15**	**16-20**
Savings deposits	0-69	0	4	2	0
	70-79	3	3	2	0
	80-89	3	3	1	0
	90-100	5	0	0	0
Loans and mortgages	0-69	1	3	3	1
	70-79	2	2	5	0
	80-89	1	3	0	0
	90-100	5	0	0	0

Table A4
C3 indices after the merger for cantons with a population under 200,000
In parentheses: all cantons

	Loans and mortgages	**Savings deposits**
0-69	0 (2)	0 (2)
70-79	3 (6)	3 (7)
80-89	3 (11)	5 (10)
90-100	7 (7)	5 (7)

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Implications of restructuring in the banking industry: the case of Spain

Ignacio Fuentes and Teresa Sastre

Since the late eighties, Spanish bank markets have been undergoing major changes that have affected both their structure and the nature of strategic interaction among Spanish banks. These changes have been a natural outcome of the heightening competitive pressure exerted on all countries' banks by processes such as deregulation, globalisation of financial and economic activities, the development of new technology and the prospects of greater integration of European financial markets.

The main purpose of this paper is to assess the implications of two significant phenomena which have affected the structure of the Spanish banking industry in the nineties: the process of consolidation via mergers and acquisitions and the growing competition in prices, which has been particularly intense in certain market segments. It is widely recognised that this last event has had a strong influence on banks' decisions on interest rates and thus affected the monetary transmission mechanism. However, there are few empirical studies on the effects of competition on banks' interest rates. That might be partly due to difficulties in defining variables that could be used to measure the degree of competition. This task is undertaken in this paper by using the cross-section dispersion of bank interest rates as an indicator of competition in the sector.

The paper also pays attention to the consolidation process that has taken place among Spanish banking firms since the prospect of a more integrated European market was made explicit. The paper assesses the impact of mergers on bank interest rates and on the efficiency, profitability and soundness of the institutions involved in the process.

The paper is organised as follows. Section 1 outlines the most relevant events that have affected the structure and activity of the Spanish banking sector. Section 2 addresses issues related to the consolidation process and the increase in price competition. This section is itself divided in two parts. The first part analyses the effects of consolidation and competition on bank interest rates and the transmission mechanism. The second part widens the range of variables to be analysed by also considering bank efficiency, profitability and solvency.

1. Recent major developments in the Spanish banking sector

The liberalisation and opening up of the Spanish financial system, begun in the previous decade and to be completed with the incorporation into EMU in the coming months, has brought about major changes in banks' operating environment. Such changes have affected both the structure of their business and their profit-generating capacity.

1.1 Disintermediation

One of the consequences of this process has been the substantial widening of the range of financial instruments available to investors. The development of secondary markets and the growing role of financial intermediaries other than banks has set in train a process of disintermediation which is shifting a significant portion of the financial intermediation business towards non-bank institutions.

As can be seen in Table 1, which shows changes in the structure of the financial assets of the non-financial firms and households sector, the share accounted for by deposits in credit institutions has progressively fallen in recent years, while that of other instruments such as variable-yield securities,

especially participations in mutual funds and, to a lesser extent, in products handled by insurance companies, such as pension funds and life assurance has increased.

Table 1
Financial assets of non-financial corporate and quasi-corporate enterprises and households*

	1990	1991	1992	1993	1994	1995	1996	1997
Credit institutions deposits	64.4	63.7	60.5	57.7	57.1	56.1	50.1	43.4
Other deposits	2.3	2.3	3.0	3.3	3.7	4.2	4.2	4.7
Short-term securities and bonds	7.7	6.3	6.4	4.0	3.4	3.8	2.9	2.3
Shares and other equities	16.6	14.5	13.6	14.6	14.3	14.0	16.9	20.6
Mutual funds shares	1.5	4.8	7.4	10.7	11.0	10.9	14.4	17.7
Insurance technical reserves	7.5	8.4	9.2	9.6	10.5	11.1	11.4	11.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Financial assets exclude loans and others.

Source: BE.

This shift has been especially significant in recent years, and there was even a decline in the absolute amount of fixed-term bank deposits in 1997 of more than Pta 2 trillion. Nonetheless, the impact of this disintermediation on banks is actually rather small, since more than 90% of the net asset value of mutual funds is managed by subsidiaries of the banking groups themselves (see Table 2). Accordingly, the income obtained on the management commissions charged by these companies would be part of the consolidated group's income. In 1997, estimated commission income obtained by management companies belonging to banking groups was almost 0.23% of the banking system's average total assets, i.e. almost 10% of net interest income. In 1998, with data to June, the related result would be revenue equivalent to 0.28% of average total assets or almost 12% of net interest income.

Table 2
Structure of mutual funds*

	Billions of pesetas	% of total
Total mutual funds	31,936	100.0
Total managed by deposit institutions	29,784	93.3
Managed by banks	19,925	62.4
Managed by savings banks	9,283	29.1
Managed by credit cooperatives	576	1.8
Managed by other financial institutions	2,152	6.7

* Includes securities funds (FIM) and money market funds (FIAMM).

Source: CNMV.

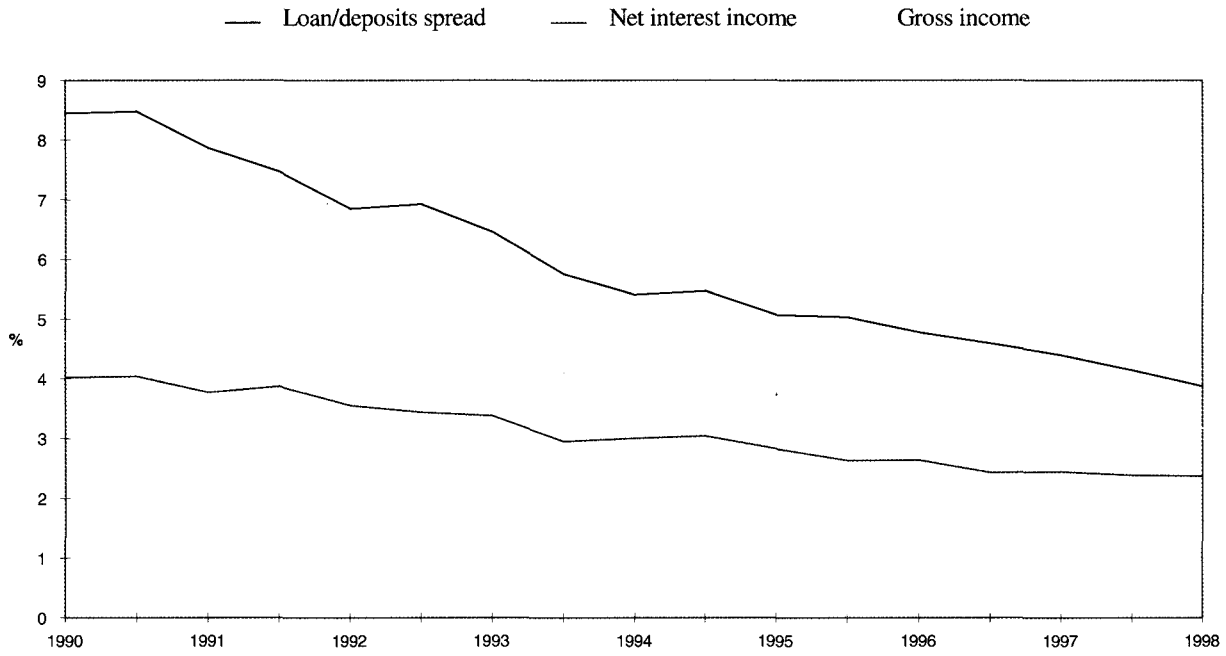
Similarly, part of the disintermediation via insurance companies also remains within banking groups since the major banks have insurance subsidiaries with a significant presence in the market.

1.2 Heightened competition

The liberalisation and opening up of the Spanish financial system has not only affected the structure of business but has also entailed a most notable increase in the levels of competition between banks

both in the markets for credit and in the market for deposits and other bank products. As Graph 1 shows, this process has given rise to a progressive narrowing of the spread between lending and deposit operations, from levels close to nine points to below four points. Along with the shift in institutions' activity from traditional lending-deposit intermediation towards intermediation operations on the money and government debt markets with narrower margins, this narrowing of differentials has substantially reduced banks' net interest income, which has slipped from levels of around 4% of average total assets to below 2.5%.

Graph 1
Deposit money institutions' evolution of operational margins*



* Net interest income and gross income in % of average total assets.

1.3 Changes in the structure of business

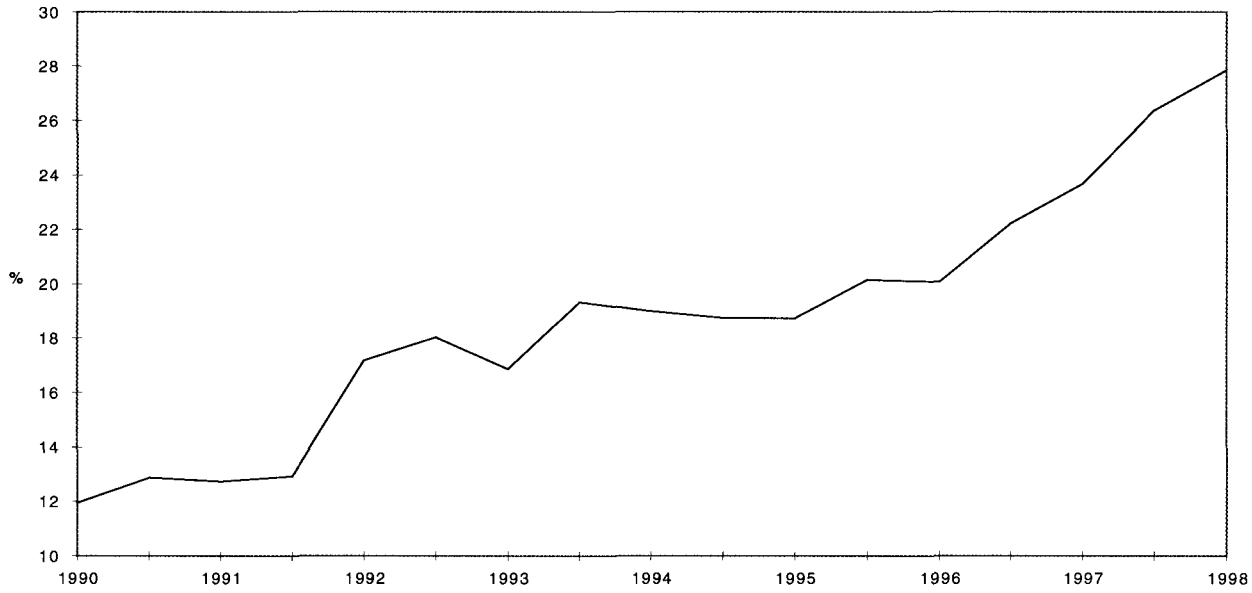
This reduction in interest income has been partly offset by an increase in income from commissions (see Graph 2) due to several factors, including the increase in the levels of the commissions applied, the generalisation of charging for services associated with bank deposits and the shift towards activities which generate income via commissions rather than via interest (the case of mutual funds managed by companies of the group). The increase in commissions, to over 25% of interest income, has meant that the reduction in gross income has been slightly less than that of net interest income, although in the period 1990-98 it moved from 4.6% of average total assets to around 3.2%.

Another of the effects induced by the reform of the Spanish financial system, particularly owing to the disappearance of capital controls, has been a greater openness of domestic banking markets to the external sector. Operations with non-residents denominated in foreign currency have come to account for a greater proportion of the balance sheet (see Graphs 3 and 4).

The greater share of these activities in bank balance sheets came about just after the disappearance of capital controls, in the early nineties. In recent years there has been an increase in external liabilities denominated in foreign currency, reflecting the domestic banks' borrowing operations in international money markets.

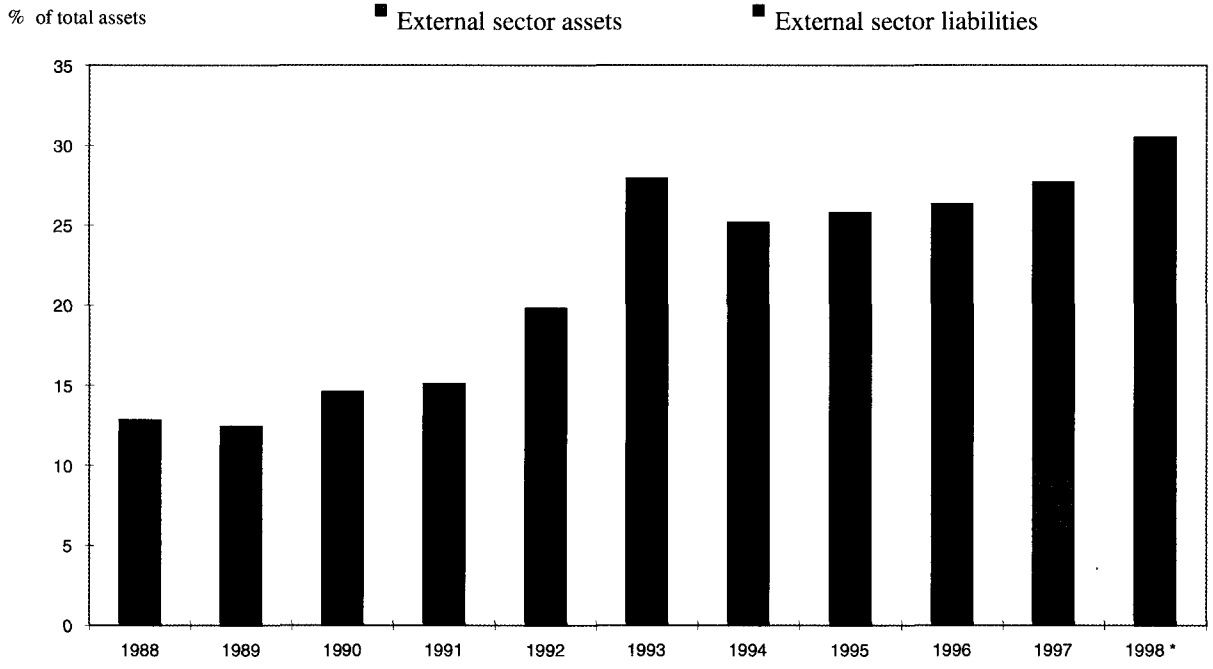
Graph 2

Fees and commissions as a percentage of net interest income



Graph 3

External sector weight in the balance sheet of deposit money institutions

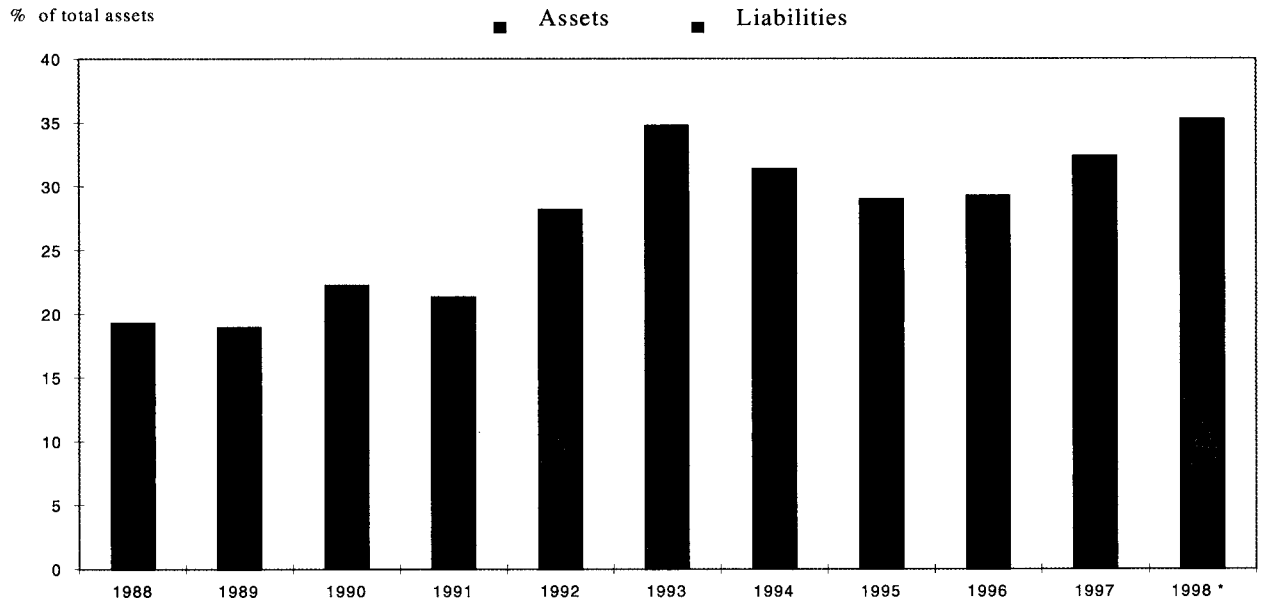


* June.

The new competitive setting has prompted banks to bolster their relationship with non-financial firms by acquiring small strategic stakes enabling them to consolidate financial business with these firms. Thus, equity holdings in non-financial firms have risen from around 2% of total assets in 1992 to

2.7% in 1998. The fact that a bank becomes a shareholder entails a strengthening of links between the firm and the bank and the possibility of capturing the clientele (customers, suppliers and employees) of the investee firm. Moreover, favourable moves in share prices occasionally mean significant capital gains, as has been the case in recent years, when the income from the sale of securities increased significantly.

Graph 4
Assets and liabilities in foreign currencies



* June.

Elsewhere, the incursion onto markets in developing countries (especially in Latin America countries), with less mature markets than that of Spain and with higher interest rates, enables banks to operate with higher margins, thus contributing to increasing consolidated group profits. Investment by Spanish banks in Latin America has mainly been by large banks and has centred on the purchase of majority holdings in banks and other financial institutions operating in those countries. On the latest data available, the total volume of this investment, having amortised the goodwill arising on acquisition, amounted to almost Pta 1 trillion.

1.4 Consolidation of the industry

Various different strategies have been adopted by Spanish banks in tackling the demands of a new operating environment with much stiffer competition from other Spanish and foreign banks as well as from other financial institutions. One such strategy is consolidation via merger and takeover.

The degree of concentration has been increased by the creation of four major banking groups that manage almost 50% of the system's total assets. This has also meant a notable change in the structure of the savings bank sector, with mergers between institutions operating in the same regional markets. The number of savings banks has accordingly fallen considerably, from around 80 in the eighties to 51 in 1997. As to the credit co-operative sector, concentration has also been significant, with their number falling from around 150 in the eighties to 97 last year. As a result of this process the ten biggest banking groups increased their share in the system's total assets from almost 50% in 1992 to over 70% in 1998 (see Table 3). The effects of this consolidation process on the behaviour, profitability and efficiency of institutions is analysed in the following section.

Table 3
Spanish banking system concentration – total assets

	1992		1998*	
	MM	%	MM	%
Deposit money institutions	94,337	100.0	133,537	100.0
Four big banks	28,153	29.8	65,506	49.1
Big ten	46,361	49.1	94,211	70.6

* June.

Source: BE.

2. Analysis of the process of mergers and takeovers in Spain and of heightening competition

The phenomena described in the foregoing section have influenced the behaviour and profitability of Spanish banking institutions and, therefore, have had a certain bearing on the transmission of monetary policy. This section seeks to provide empirical evidence on the implications of two of these phenomena: the process of consolidation via merger and takeover and the increase in competitive pressure in banking markets.

It is worth addressing both issues jointly in view of the apparently countervailing effects that the increase in the degree of competition, on the one hand, and the increase in banks' market power as a result of merger and takeover, on the other, could have on interest rates and on bank profitability.

Mergers and other forms of consolidation may influence bank interest rates insofar as the increase in size and the opportunities for reorganisation involved either may provide gains in efficiency that bear on marginal costs or give rise to increases in market power, or both together. Gains in efficiency would be obtained from moving to a greater scale of activity (if there are economies of scale) and/or owing to the possible reduction of X-inefficiencies, due to inadequate management and organisation of resources that raise costs.

Mergers and acquisitions may give banks the opportunity to re-direct their activity towards business areas that increase income more than costs, thereby achieving an increase in profitability. Some authors have also pointed to a potential effect on banks' capital adequacy insofar as mergers and acquisitions may allow a greater diversification of risk with the same capital base.

Faced with this set of possible repercussions, it may well be asked whether the increase in price competition between Spanish banks since the start of the nineties has been checked, to some extent, by the increase in concentration and the potential rise in market power of the merged banks. It is also worth evaluating whether merged banks have actually obtained gains in efficiency and, if so, whether these have translated into improved profitability.

To analyse these issues two types of methodology will be used. The first, of an econometric nature, is based on estimating interest rate equations with cross-section data. The second consists of a case-by-case analysis of most of the mergers and takeovers that have taken place since 1988.

2.1 Influence on the determination of bank interest rates

2.1.1 Theoretical setting

The estimation of equations that determine bank interest rates is based on the first-order conditions of a Klein-Monti type model, in which intermediaries maximise profits in the current period and have

the capacity to set the price in both the credit and the deposit markets. There is a third and competitive market in which they are not able to influence the price (the interbank or government debt market) and in which they resort to seeking a return on surplus liquidity or borrow funds. Consequently, the latter market is one of adjustment between the market for credit and that for deposits. Under these assumptions, the interest rates on credit and on deposits are determined separately and independently. If, in addition, it is assumed that there is product differentiation and strategic interaction between intermediaries, banks' decisions on prices will depend on the actions of rivals or competitors, so that the elasticity perceived by each bank will be the outcome of the price elasticity of the consumers whose demand it satisfies and the degree of rivalry among market participants.

In addition, one of the features inherent to the credit market is the risk arising from the uncertainty about collecting loan principal and interest. So as to take this aspect into account, the probability of incurring past-due loans which, along with interest rates, determines the expected return on the loan portfolio, has also been introduced into the model.

The overall consideration of these aspects in a current profit maximisation model gives rise to two first-order conditions which, by appropriate assumptions, can be embedded into the following equations:[1]

$$(1) \qquad r_L^i = \beta_0 + \beta_1\, r + \beta_2\, c_L^i + \beta_3\, p^i + \beta_4\, \eta_L^i + \beta_5\, \eta_L^M + \varepsilon_L^i$$

$$(2) \qquad r_D^i = \gamma_0 + \gamma_1\, r + \gamma_2\, c_D^i + \gamma_3\, \eta_D^i + \gamma_4\, \eta_D^M + \varepsilon_D^i$$

where r^i_L is the lending interest rate extended by bank i, r^i_D the deposit interest rate offered by i, r the marginal financial cost (usually some type of representative market rate), c^i_L the marginal operational cost of credit extended by i, c^i_D the marginal operational cost of deposits raised by i, p^i the probability of the typical client of bank i paying back the credit in due time = 1 – average probability of recording past-due loans, η^i_L the elasticity of the demand for credit received by i if competitors do not react (related to consumer characteristics), η^i_D the elasticity of the demand for deposits raised by i if competitors do not react, η^M_L the degree of rivalry among firms in the credit market, and η^M_D the degree of rivalry of firms in the deposit market.

The estimation of these equations has been made with a panel of banks and savings banks. This allows us to control for a series of characteristics proper to each bank which give rise to non-observable heterogeneity and which are included in the individual effects of both equations (ε^i_L, ε^i_D). Thus, included in these effects would be aspects which define the management and organisational framework proper to each intermediary and which, basically, determine the degree of X-inefficiencies. It is assumed that the level of these inefficiencies holds stable over time for each bank.

To obtain equations that may be estimated with the information available, the following assumptions have been made:

- The price elasticity of demand corresponding to each intermediary (η^i_L, η^i_D) either holds stable over time and, therefore, would be captured by the individual effects, or would be dependent on the cycle as well as the specific characteristics of each intermediary market segment. Under this last hypothesis, GDP annual growth rates have been included as an additional explanatory variable in the deposit interest rate equation.
- The most relevant aspects of the multiplicity of interactions between the banks participating in the market for credit and deposits (which are included in the terms η^M_L and η^M_D) may be captured via an indicator approximating the changes over time in the degree of competition in the markets for credit and deposits.

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[1] See Appendix 1 for a more formal presentation of the model.

- Average costs are a good approximation to marginal costs, i.e. most intermediaries operate with constant returns to scale.
- Institutions do not have sufficient information to distinguish between the operating costs arising from their respective activities in the credit and deposit markets, and consequently tend to charge the aggregate of both.

2.1.2 Data used

The variables in equations (1) and (2) have been approximated as follows:

r^i_L by the interest rate on mortgage loans, r^i_D by the interest rate on time deposits with a maturity equal to or more than one year and less than two years, r by the internal rate of return on government bonds with a maturity equal to or more than two years or, alternatively, the three-month interbank interest rate along with the differential between both interest rates, c^i by operating expenses per asset unit, $(1\text{-}p^i)$ by the ratio of past-due loans to total credit extended, and η^M_L, η^M_D by the cross-section dispersion of banking interest rates – the idea is that, as the market becomes more competitive, the dispersion in prices tends to diminish.

In the estimations, interest rates on specific bank operations have been used rather than synthetic interest rates including those on the various credit and deposit-raising operations, so as to avoid potential effects on average rates due to changes in the composition of banking activity.

In principle, all the variables are considered to be exogenous except for the ratio of past-due loans to total credit which is treated as an endogenous variable since it depends on past values of loan interest rates. Therefore, the mortgage loan rate equation is estimated using an instrumental variable method. In particular the generalised method of moments technique developed in Arellano and Bond (1988) is used to obtain valid instruments.

A dummy variable (*FUS*) has been added to capture the possible differential effect of merger processes on the interest rates of the entities resulting from such processes. This dummy takes a value of 1 in these entities during the three years following the merger or takeover date,[2] and a value of 0 in the remaining observations. This dummy has been introduced in two different ways: either directly, so that it affects the individual effects, or interacting it with the indicator of market competition. In the first case, it would reflect the impact on interest rates of organisational changes that could have a bearing on the level of X-inefficiencies, while, in the second instance, it would reflect an effect of consolidation processes on the competitive response of intermediaries.

The analysis does not include all the mergers that have taken place in the period under consideration, since a series of prior conditions had to be met before the merger was included in the analysis.

First, only mergers between deposit money institutions have been taken into account, with all mergers between specialised financial credit establishments or between the latter and deposit money institutions being excluded. The reason for their exclusion is that the motivation for this type of merger was the reorganisation of financial groups further to legislative changes and, therefore, they do not fit into the habitual pattern of mergers between independent entities. For the same reason, other mergers between deposit money institutions as a consequence of internal group reorganisation have also been excluded, as have mergers of foreign banks' branches when this was a consequence of mergers between their parent banks.

A size criterion has also been established so as exclude all those mergers where the entity merged or taken over did not exceed 15% of the total assets of the larger-sized entity. This is to avoid the inclusion of operations in which it is highly likely that major changes will not be detected in view of the small size of one entity in relation to the other.

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[2] There are grounds for believing that some of the possible effects of a merger on interest rates may be of a more permanent nature. However, a majority of studies consider that most of the effects cease after three or four years.

Also excluded are those mergers in which the resulting new entity lasted for less than one complete financial year. Including such mergers would have been impossible, owing to lack of data. If the disappearance of the new entity was the result of a new merger, only the latter operation will be considered.

Lastly, we also decided to exclude one particular operation since, although it met the established requirements, it showed anomalous values for the ratios considered (such as negative net income) and excessive volatility in the ratios relating to balance-sheet structure; accordingly, its inclusion in the sample might have distorted the data.

Applying these criteria, 18 merger operations have been included in the analysis. Of these, two involve large private banks, two medium-sized subsidiaries and the remaining 14 various savings banks. Three of the mergers involve more than two entities, the rest only two institutions.

All the data are annual average values obtained from the information on interest rates provided monthly to the Banco de España by banks and savings banks and from the accounting information included in confidential statements. The sample of intermediaries included in the panel data corresponds to those which have reported interest rates on an ongoing basis. The information covers the period from 1988 to 1997.

Table 4

Mortgage interest rate

Banks and savings banks; incomplete panel

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
FUS	–	–	–	–0.20	–
				(0.9)	
Past-due loans ratio (*R*)	0.01	–	–	–	–
	(0.9)				
[(" ") * *CAJ*][1]	–	0.10	–	–	–
		(6.1)			
Operating expenses	0.36	0.26	0.27	0.27	0.27
per asset unit	(7.8)	(3.3)	(3.2)	(3.3)	(3.1)
3-month interbank rate	0.90	0.87	0.95	0.95	0.95
	(78.7)	(83.1)	(54.2)	(54.4)	(54.1)
(Debt/interbank) spread	0.14	0.13	0.15	0.15	0.15
	(6.7)	(7.1)	(5.5)	(5.4)	(5.4)
Deposit rate dispersion (–1)	2.25	2.06	1.97	1.97	1.96
	(44.0)	(41.1)	(30.5)	(30.5)	(30.3)
[(" ")* *FUS*](–1)	–	–	–	–	0.09
					(1.6)
Variable transformation			**Differences**		
Instruments	*R* (2, all) & X	*R* (2, all) & X	–	–	–
Wald test	22,850	11,591 (5)**	3,810 (4)**	3,848 (5)**	3,978 (5)**
Sargan test	79 (35)**	92 (35)**	–	–	–
Autocorrelation tests					
1st order	–4.0**	–4.4**	–2.6**	–2.6*	–2.6*
2nd order	–0.7	–0.2	–1.7	–1.7	–1.7
Number of firms	128	128	128	128	128
Number of observations	758	758	758	758	758
Longest time period	1990-97	1990-97	1990-97	1990-97	1990-97

Notes: t-ratios are in brackets. Standard errors are robust to heteroskedasticity and serial correlation. * means rejection of the null hypothesis at 5% signifcance level and ** rejection at 1% significance level. Instruments used: all available lags of past-due loans ratio (*R*) dated at *t*-2 (see Arellano and Bond (1988)) plus the remaining regressors (X).

[1] *CAJ*: dummy with ones in the observations corresponding to savings banks.

2.1.3 Results of the estimations

Tables 4 (on the previous page) and 5 present the results of the estimations. They should be interpreted with some caution in view of the scant number of mergers and takeovers in the sample. The key aspects of the results are:

- In general, the competitive response of Spanish intermediaries resulting from consolidation processes is not lower, on average, than that shown by other entities. There are even signs that the response may have intensified in the mortgage market if regard is paid to the sign and the t-ratio of the coefficient of the variable resulting from interacting the competition indicator with the merger dummy variable.
- The potential reductions in X-inefficiencies following consolidation do not appear to have affected the level of either mortgage loan interest rates or deposit interest rates.
- The variable used to approximate changes in the degree of average competition in bank markets has a high explanatory power in the two interest rate equations, indicating the relevance this factor has had in determining Spanish bank rates in the nineties.

The results obtained appear to confirm those from other, more qualitative studies in which significant differences are scarcely detected between the firms resulting from mergers and certain control groups or compared with the remaining market participants. This suggests that mergers and takeovers per se do not in general give rise to differentiated forms of behaviour and that other types of factors determine whether potential effects of a merger arise. Consequently, it is appropriate to supplement these results based in the use of statistical inference with a more detailed analysis of the effects of mergers on profitability and efficiency. The following section undertakes this task, looking into the effects of each of the mergers observed in the sample on the balance sheet of the entities concerned.

Table 5

Interest rate of deposits maturing 1–2 years

Banks and savings banks; incomplete panel

Variables	**(1)**	**(2)**	**(3)**	**(4)**
FUS	–	0.23	–	0.21
		(0.8)		(0.7)
Operating expenses	–0.20	–0.20	–0.21	–0.21
per asset unit	(2.6)	(2.7)	(2.8)	(2.8)
Government debt	0.79	0.79	0.80	0.79
rate (–1)	(35.5)	(35.2)	(35.2)	(34.6)
GDP growth	–0.27	–0.27	–0.27	–0.26
	(19.9)	(18.9)	(19.8)	(19.2)
Deposit rate	–2.19	–2.19	–2.20	–2.20
dispersion (–1)	(22.5)	(22.4)	(22.3)	(22.1)
[(")**FUS*] (–1)	–	–	0.12	0.11
			(1.0)	(0.9)
Variable transformation		**Differences**		
Instruments	–	–	–	–
Wald test	2,013 (4)**	2,062 (5)**	1,998 (5)**	2,095 (6)**
Sargan test	–	–	–	–
Autocorrelation tests				
1st order	–2.9**	–2.9**	–3.1**	–3.1**
2nd order	–0.2	–0.4	–0.4	–0.5
Number of firms	128	128	128	128
Number of observations	758	758	758	758
Longest time period	1990-97	1990-97	1990-97	1990-97

Notes: See notes in Table 4.

2.2 Case-by-case analysis of bank mergers in Spain in the period 1988-97

The case-by-case analysis of mergers compares changes in certain financial ratios of the institution resulting from the merger process with the same ratios calculated for a comparable group, the selection of which will depend, in each case, on the characteristics of the entities that have merged.

2.2.1 Description of the ratios used in the analysis and of the methodology applied

To analyse the impact of mergers on banks, a series of variables has been selected which seeks to measure the effects of the merger on various aspects of their entities' activity. Five groups of indicators are specified. First are those which attempt to measure profit-generating capacity; second, indicators of the level of efficiency and productivity; third, indicators of changes in market share; fourth, indicators of business structure; and lastly, indicators of the level of capital adequacy.

The basic indicators used are as follows:

- **Group 1: profit-generating capacity** as a percentage of average total assets and includes: total income (interest income + commissions + result on financial operations), interest expenses, gross income (total income – financial charges), operating expenses, and net income (total income – interest expenses – operating expenses).
- **Group 2: efficiency and productivity**, which includes: operating expenses/average total assets, operating expenses/total income, efficiency ratio (operating expenses/gross income), productivity per employee (average total assets/number of employees), productivity per office (average total assets/number of offices), and number of employees and offices following merger.

To obtain supplementary information, three additional types of indicators are used, namely:

- **Indicators of market share and total assets growth**, containing growth rate of total assets, and market share in relation to comparable group.
- **Indicators of business structure** based on lending-deposit activity in pesetas as a percentage of total assets.
- **Indicators of capital adequacy**, using capital/total assets.

In each merger, these indicators have been calculated annually for the four years prior to the merger and the four years after, or for those years for which data were available if the subsequent period ran past 1997.

The indicators have been obtained from the information in the financial statements of the merged institution for the period subsequent to the merger and by aggregating the financial statements of the institutions participating in the merger process for the previous period. In each case the values of these indicators are compared with those that would be obtained from a specific control group for each type of entity.

The control groups considered in this study are the group of four major banks in the case of mergers between large banks, the group of subsidiary banks of domestic banks for mergers of this type and the total sum of savings banks for mergers between such institutions.

The comparison is established between the average of the four years prior to the merger with the average of the four years after. The values obtained for each year, are also analysed. The analysis attempts to identify potential improvements for each entity vis-à-vis the control group, with the results being presented as the change in basis points between the difference in the average values of the entity analysed and the control group before and after the merger.[3] A significant improvement[4] in the

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[3] Except in the case of the market indicators, where a distinction is made only between a positive and a negative change, and in the case of changes in the number of employees and offices, where only an increase or a decrease in this number is indicated.

values of a high number of indicators in a specific section would indicate that the merger has proven positive for the entity in that area of activity.

Tables 6 to 8 draw together the results of the analysis conducted, reflecting the changes that have come about in relation to the control group in the indicators considered. Moreover, information is given on the initial situation of the entities taking part in the merger, indicating whether these had higher or lower efficiency ratios than the control group considered.

Table 6

Pre-to-post merger change in performance relative to control group [1]

Profit generating capacity

Number of mergers	Bank (B) or savings bank (SB)	Acquiring firm more efficient	Total revenues in % of ATA	Interest expenses in % of ATA	Gross income in % of ATA	Operating expenses in % of ATA	Net income in % of ATA
12	SB	No	93	–21	72	11	83
8	SB	No	–3	109	105	–26	79
9	SB	Yes [4]	–9	54	45	0	45
7	SB	Yes	–63	120	56	–22	34
13	SB	No	1	–17	–16	42	26
10	SB	No [5]	–26	57	31	–6	25
11	SB	Yes	9	–1	8	2	10
5 [2]	SB	Yes	–49	46	–4	9	5
15	SB	No	46	–51	–5	5	0
3	SB	Yes	–43	40	–3	2	–1
14 [2]	SB	No	8	–35	–27	18	–10
16	SB	Not clear	35	–58	–23	11	–12
2	B	No	66	–43	23	–42	–19
6	SB	Not clear	–4	–35	–39	19	–20
4 [2, 3]	SB	Yes [5]	–43	19	–23	–16	–39
18	B	No	29	21	51	–90	–40
17	B	Yes	–102	–13	–115	55	–60
1	B	Yes	–135	27	–107	36	–72
Summary			8 better (4 SC) 10 worse (6 SC)	9 better (6 SC) 9 worse (4 SC)	8 better (4 SC) 10 worse (5 SC)	11 better (5 SC) 6 worse (4 SC) 1 no change	8 better (5 SC) 9 worse (5 SC) 1 no change

Note: ATA: average total assets; SC: significant change.

[1] The average value for the four years preceding the merger are compared with the average value for the four years after the merger in such a way that a positive sign indicates an improvement and a negative sign indicates a worsening. [2] Mergers between more than two firms. [3] In the post-merger period only three years were analysed due to data problems. [4] Slightly above efficiency ratios values of the control group. [5] Refers to the biggest firm involved in the merger operation.

Source: BE.

[4] A "significant improvement" in an indicator is taken to be a positive change in its average value higher than one standard deviation of the difference vis-à-vis the control group. A "significant worsening" would be a negative change higher than one standard deviation, while relatively insignificant changes would be those in the range of ±1 standard deviation.

Table 7

Pre-to-post merger change in performance relative to control group [1]

Efficiency and productivity ratios

Number of mergers	Bank or savings bank (B/SB)	Acquiring firm more efficient	Operating expenses in % of ATA	Operating expenses in % of TR	Operating expenses in % of GI	Assets by employee	Assets by branch	Employees reduction	Branches reduction
12	SB	No	11	360	1,137	206	–37	No	No
8	SB	No	–26	–226	778	–606	–1,039	No [6]	No
9	SB	Yes [4]	0	–9	602	323	902	No	Yes
7	SB	Yes	–22	–367	276	–744	1,486	Yes [7]	Yes
13	SB	No	42	331	588	1,009	593	Yes	Yes
10	SB	No [5]	–6	–174	283	199	–357	Yes	Yes
11	SB	Yes	2	54	192	96	–305	No	No
5 [2]	SB	Yes	9	–36	216	699	2,384	Yes	Yes
15	SB	No	5	–49	–56	–594	–798	Yes [8]	No
3	SB	Yes	2	–82	53	4,264	2,739	Yes	Yes
14 [2]	SB	No	18	97	–120	417	923	No [9]	Yes
16	SB	Not clear	11	156	–42	518	1,394	No	No
2	B	No	–42	–244	–812	–130	587	Yes	Yes
6	SB	Not clear	19	162	–508	–626	–2,959	No	No
4 [2, 3]	SB	Yes [5]	–16	–242	–588	153	842	No	Yes
18	B	No	–90	–971	–1,216	–1,780	–1,302	Yes	Yes
17	B	Yes	55	230	–334	1,359	3,083	No	No
1	B	Yes	36	15	–521	1,166	3,461	Yes	Yes
Summary			11 better (5 SC) 6 worse (4 SC) 1 no change	8 better (6 SC) 10 worse (6 SC)	9 better (4 SC) 9 worse (5 SC)	12 better (8 SC) 6 worse (3 SC)	11 better (10 SC) 7 worse (6 SC)	9 yes 9 no	11 yes 7 no

Notes: ATA: average total assets; TR: total revenues; GI: gross income; SC: significant change.

[1] The average value for the four years preceding the merger are compared with the average value for the four years after the merger in such a way that a positive sign indicates an improvement and a negative sign indicates a worsening. [2] Mergers between more than two firms. [3] In the post-merger period only three years were analysed due to data problems. [4] Slightly above efficiency ratios values of the control group. [5] Refers to the biggest firm involved in the merger operation. [6] There is an increase in the first year after the merger and a reduction afterwards. [7] After the merger the number of employees decreased but it increased in the following years. [8] It increased in the last years of the post-merger period. [9] In the first year of the post-merger period there was a reduction in the number of employees.

Source: BE.

Table 8

Pre-to-post merger change in performance relative to control group [1]

Other indicators

Number of mergers	Bank or savings bank (B/SB)	Acquiring firm more efficient	Total assets growth rate	Market share	Loans and deposits in % of total assets [10]	Capital and reserves in % of total assets [11]
12	SB	No	Better	Better	–5	21
8	SB	No	Not clear	Worst [6]	1,851	121
9	SB	Yes [4]	Better	Better	–784	440
7	SB	Yes	Worst	Worst	–196	182
13	SB	No	Not clear	Worst [7]	–181	–44
10	SB	No [5]	Worst	Worst	–197	161
11	SB	Yes	Better	Better	–667	–63
5 [2]	SB	Yes	Worst	Worst	–1,162	277
15	SB	No	Worst	Worst	204	–32
3	SB	Yes	Worst	Worst [8]	–1,658	160
14 [2]	SB	No	Worst	Better [9]	772	–21
16	SB	Not clear	Not clear	Better	–513	54
2	B	No	Worst	Worst	525	147
6	SB	Not clear	Worst	Worst	642	–46
4 [2, 3]	SB	Yes [5]	Better	Better	142	9
18	B	No	Worst	Worst	–1,224	203
17	B	Yes	Not clear	Better	–1,574	–460
1	B	Yes	Not clear	Not clear	–819	–83
Summary			9 worse 4 better 5 NC	10 worse 7 better 1 NC	6 increase (3 SC) 12 fall (8 SC)	11 increase (9 SC) 7 fall (4 SC)

Notes: NC: no change; SC: significant change.

[1] The average value for the four years preceding the merger are compared with the average value for the four years after the merger in such a way that a positive sign indicates an improvement and a negative sign indicates a worsening. [2] Mergers between more than two firms. [3] In the post-merger period only three periods were analysed due to data problems. [4] Slightly above efficiency ratios values of the control group. [5] Refers to the biggest firm involved in the merger operation. [6] The average value falls after the merger due to the evolution in the pre-merger period. [7] The drop was just after the merger, in the following years it recovers part of the lost share. [8] There is an improvement just after the merger but in the following years declines to levels below the pre-merger period. [9] There is an increase just after the merger which is lost in the following years. [10] Loans plus deposits in pesetas divided by total assets. [11] Capital, reserves and non-distributed profits divided by total assets.

Source: BE.

2.2.2 *Summary of results*[5]

The results of the analysis do not differ too much from those of other studies on the effects of mergers in Spain. As an examination of Tables 6 and 7 shows, the effects of the mergers on the profit-generating capacity and the level of efficiency of the institutions is not very clear. In some cases signs of improvement are detected in comparison with the control group, while in others these effects are ambiguous and deteriorations are even observed after the merger.

However it may be cautiously ventured that the mergers analysed have a certain favourable effect on financial expenses. This might be related to the increase in market power of some of the institutions following the merger, owing to their market share having risen in their regional area of operation. But, to confirm this supposition, it would be necessary to do a more in-depth analysis. The effect is also counteracted by the negative evolution observed in total revenues, due to the change observed in the balance sheet structure towards a higher proportion of operations with narrower margins (see Table 8), so that the final effect on the gross income is uncertain.

In the majority of the cases analysed there does seem to be a slight improvement in the ratio of operating costs to average total assets. However, the changes are, in many cases, barely significant. If the analysis is limited to those mergers in which significant changes are observed, the results are even more ambiguous.

In a majority of the cases, significant increases in productivity per office and productivity per employee have been detected, due to the combined effect of balance-sheet growth and the reduction in the number of offices and employees. Nonetheless, these increases in productivity have not been clearly reflected in the efficiency ratio (operating costs/average balance sheet) due to the downward rigidity of staff costs and, to a lesser extent, of overheads. In the case of staff costs, this rigidity is explained by the costs associated with making cutbacks, since the compensation paid or the costs arising from early-retirement plans curb the reduction in staff costs. In the case of overheads, the reason could be an increase in some costs associated with the process of internal reorganisation. When analysing the other efficiency ratios used, which relate the level of operating costs to the level of income, the results are less clear because the productivity gain has, in certain cases, had a negative impact on the level of income generation if it has occurred as a consequence of a growth in business areas with lower margins.

When comparing the changes in the number of employees and offices with the growth of total assets after the merger (see Tables 7 and 8), it is clear that in most cases in which there is an increase in market share after the merger neither the number of employees nor the number of offices decreases. Conversely, in all those cases in which there is a reduction in the number of employees and offices, except in one in which the result is uncertain, there is also a slowdown in the growth of total assets and losses of market share. This suggests the existence of two types of mergers: those in which business expansion criteria predominate and others in which criteria of cost cutting and productivity increases predominate. However, the differences between these two groups are not clear, since, as noted above, the reductions in staff and offices are not always reflected in changes in operating costs, so that the difference between the two groups is not very evident when comparing their efficiency ratios.

As can be seen in Table 8, the clearest effect in the mergers analysed is the increase in the capital-adequacy ratio of the merged institutions, due largely to the disclosure in books of reserves upon the revaluation of assets recorded at cost price during merger processes. Although this effect is a purely accounting phenomenon, it is of some importance for the institutions, particularly savings banks, since it allows them to increase their available capital and thus provides a margin for making new investments. It also contributes to improving their financial ratios, which could be reflected in a smaller risk premium and lower financing costs, and thus improve their profit generating capacity.

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5 A more detailed explanation of the main findings of the ratio analysis can be found in Appendix 2.

3. Conclusions

An overall evaluation of the results of the various sections of this paper leads to two types of conclusion.

First, the consolidation of the banking industry does not appear to have affected the growing degree of competition which has been seen in the sector in recent years. In principle, a bigger size offers greater capacity to set prices out of line with the market. But, in an environment characterised by fierce competition, it is probably very costly, in terms of market share, to take advantage of this power. Nonetheless, the general effect does not preclude a significant reduction in interest expenses which has been observed in some takeovers. However, it is not clear if this could be interpreted as the result of an increase in market power or as a strategic decision taken by most banking institutions which have ruled out competing strongly in the deposit market. In a context of considerable shifts in savings from bank deposits to mutual funds, this decision seems to be a sensible way to redistribute competitive pressure among different markets while minimising its negative impact on profitability.

Second, the basic effect of any merger or takeover is to widen the range of strategic alternatives available to a bank, by enabling it to attain a size which, in the absence of the merger, could probably not have been achieved, and by requiring a reassessment of existing organisational arrangements. It seems that in the case of mergers and takeovers in Spain, one can speak of two types: those which have sought to expand business and those which have opted for increases in productivity and improvements in the level of efficiency. The ambiguity of the results obtained in terms of profitability per unit of asset would suggest that it is virtually impossible to achieve both at the same time; i.e. the growth in the gross income of certain merged institutions as a result of a strategy of business expansion is usually accompanied by an increase in operating costs which tend to offset higher income. On the other hand, those institutions which opt for a significant reorganisation, with elimination of duplication in the office network, seem to suffer a loss of income-generating capacity, so that the productivity and efficiency gains are not transformed into improvements in profitability, at least within a four-year period.

In short, although the mergers analysed in this study give no clear results as regards improvements in the profit-generating capacity or efficiency levels of the merged institutions, they can mostly be considered satisfactory from the viewpoint of the banking sector since they have been an instrument for achieving some positive objectives:

- certain reductions in costs, although these have been small;
- implementation of rationalisation plans which, although they have not been immediately reflected in the institutions' profit and loss account due to the difficulties and high costs of staff cutbacks in Spain, have certainly served to improve the competitiveness of the institutions; and
- improvements in capital-adequacy ratios, which have helped to facilitate investment growth. These effects observed in the mergers analysed, have most likely helped put the merged institutions in a better position to confront the growing competition in the financial sector, especially in those cases where merged institutions were of a relatively small size and competitors in the same regional market.

Appendix 1

The group of models that seem most satisfactory for analysing bank interest rate determination are those that consider banks as firms operating in imperfectly competitive markets. Within this group, the "Klein-Monti model" is relatively standard and is frequently used as a reference paradigm for introducing elements of greater complexity.[6]

The Klein-Monti model assumes the existence of two markets, loans and deposits, in which the banks have access to differentiated segments, their customers, in which they are able to maintain a certain amount of market power. There is a third market in which the banks operate as price-takers. In most models this is usually a public or private securities market; however, in the version presented in this paper, banks obtain finance or invest funds on the interbank market at an interest rate controlled indirectly by the Bank of Spain.

According to this version, the balance-sheet constraint of a bank is given by:

$$q\,D + L = FI + D$$

where q is the reserve ratio, D deposits, L loans and FI interbank financing.

The profits of each bank are given by:

$$\Pi = r_R\, q\,.D + r_L L - r\,FI - r_D\,D - C$$

where r_R is the rate of return of reserves, r_L the interest rate on loans, r_D the deposit interest rate, r the interbank market rate and C the operating costs that depend both on the volume of loans and deposits, $C = C\,(L, D)$.

The decision variables for each intermediary are the interest rates on loans and on deposits, r_L and r_D. Once the values of these interest rates are set, demand determines the amount of credit and supply determines the volume of deposits. This in turn requires the maintenance of a volume of bank reserves which, in conjunction with the volume of credit granted, gives the size of the balance sheet. In these circumstances, it is precisely interbank borrowing which adjusts the funds raised on the deposit market to the investment requirements on the lending side.

The decision-making rules that determine the interest rate for loans and deposits are given by the following first-order conditions:

$$\text{(A.1)} \qquad r_L^i = \left(1 + \frac{1}{\eta_L^i}\right)^{-1} \left[r + c_L^i\right]$$

$$\text{(A.2)} \qquad r_D^i = \left(1 + \frac{1}{\eta_D^i}\right)^{-1} \left[r - c_D^i\right]$$

where the i superscript has been added in order to move away from the representative agent framework, and the variables relating to the reserve requirement ratio, which would influence the deposit interest rate, have been omitted, given the insignificant changes in the sample period used in the estimations of this paper. η_L^i and η_D^i denote elasticities of credit demand and deposit supply, respectively, for each intermediary i while c_L^i and c_D^i are, respectively, marginal operating costs of loans and deposits.

According to equation (A.1), the banking firm i sets the lending rate r^i_L in such a way that the marginal income and marginal cost of the loan are equal. The marginal cost is a function of the opportunity cost as reflected by a market rate, such as the interbank rate, and the increase in operating

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6 See Klein (1971) and Monti (1973).

costs derives from raising the volume of loans instead of borrowing on the interbank market. Similarly, equation (A.2) indicates that a banking intermediary i establishes the interest rate on deposits r_D in such a way that there is no difference between raising additional funds in the interbank market or in the deposits market. In the latter case, the marginal cost is the sum of two components: the increase in costs due to the fact that the supply of deposits is not perfectly elastic and the increase in operating expenses produced by increasing the level of deposits.

With both loans and deposits, the response of interest rates to variations in the marginal financial and operating cost is a function of the price elasticity for each of those markets, which, in principle, may vary at any point on the credit demand and deposit supply curves.

The Klein-Monti model assumes that banking intermediaries have market power in both the lending and deposit markets, but rules out strategic interaction between them. Thus, market structure is not fully reflected in their model. To incorporate the possibility that an institution's decisions on prices and volumes depend on actions undertaken by competitors, plus the existence of product differentiation (derived in the case of banking from the fact that the markets served differ between entities), two further variables are added to the model:

ε_L^{ij}, ε_D^{ij}: elasticities of substitution between products of intermediaries i and j in loan and deposit markets; and

e_L^{ij}, e_D^{ij}: changes in the prices of competitor j when i decides to change its prices; i.e. conjectural variations between (i, j) in loan and deposit markets.

In an imperfect competition model with product differentiation in the loan and deposit markets, the factors conditioning the interest rates fixed by banking intermediaries are the following:

$$(A.3) \qquad r_L^i = \left[1 + \frac{1}{\eta_L^i + \sum_{j \neq i} \varepsilon_L^{ij} \, e_L^{ij}}\right]^{-1} \left[r + c_L^i\right]$$

$$(A.4) \qquad r_i^D = \left[1 + \frac{1}{\eta_D^i + \sum_{j \neq i} \varepsilon_D^{ij} \, e_D^{ij}}\right]^{-1} \left[r - c_D^i\right]$$

These equations indicate that the sensitivity of bank interest rates no longer depends solely on the price elasticity of each banking institution's own market as in (A.1) and (A.2) but also on the type of strategic interaction among participants in the same market and the degree to which their products, or different client segments, can be substituted for one another.

Nevertheless, this framework is still insufficient to explain how banks behave, because it fails to take into account the risk inherent in granting a loan because of uncertainty as to whether the interest will be paid and the principal repaid.[7] If this is borne in mind, equation (A.3) allows us to calculate the expected return on the loan portfolio R_L^i:

$$R_L^i = g\left[\underline{r_L^i}, p^i(\cdot)\right]$$

where $\underline{r_L^i}$ is an interest rate vector of $(k \times 1)$ dimension established by the i-th bank for k types of credit

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[7] The findings of Slovin and Sushka (1984) indicate that the most appropriate theoretical framework for presenting empirical evidence on banking firms' performance should combine portfolio theory and price-setting in an imperfect competition market.

in its market and $p^i(.)$ is a non-performing loan probability function, which depends, in turn, on the interest rate on loan ($r^i_L(k)$) for the class k customer and on the overall state of the economy (y).

Under the assumption that the k risk groups into which the customers of a bank can be classified may be represented in the form of an average prototype customer with a binomial probability function that corresponds to the event: payment/non-payment of the loan in due time, the expression (A.3) may be rewritten as:

$$(A.5) \qquad r^i_L = \left[p^i + \frac{p^i}{\eta^i_L + \eta^M_L} \right]^{-1} (r + c^i_L) = \left[p^i \left(1 + \frac{1}{\varepsilon^i_L} \right) \right]^{-1} (r + c^i_L) = c^i_L(.)\,(r + c^i_L)$$

where p^i is the probability of the client of bank i paying for the credit in due time or 1 – average probability of recording past-due loans, ε^i_L the elasticity perceived by bank i in the credit market, η^i_L the elasticity of the demand for credit received by i if competitors do not react (related to consumer characteristics), and η^M_L the degree of rivalry of firms in the market given by $\eta^M_L = \sum_{j \_ i} \varepsilon^{ij}_L e^{ij}_L$.

According to this last equation and to (A.4), banks fix lending and deposit rates in terms of: the marginal financial and operating cost, the price-elasticity of demand, the type of strategic interaction among the institutions operating in the loan and deposits market, the degree of substitution with competing products or markets, and, lastly, the probability distribution of past-due loans.

On the basis of a *first-order approximation* to functions $m^i_L(.)$ and $m^i_D(.)$, which presupposes that the interaction terms (cross derivatives) and the second derivatives of each variable may be omitted (only if η^i, ε^{ij}, e^{ij} and p^i are not interrelated), two linear functions can be specified, one for r^i_L and another for r^i_D, in terms of r, c^i_L, c^i_D, and of the various variables on which the functions $m^i_L(.)$ and $m^i_D(.)$ depend (η^i_L, η^M_L, η^i_D, η^M_D and p^i). The empirical formulation of these functions correspond to the equations (1) and (2) of the main text:

$$(A.6) \qquad r^i_L = \beta_0 + \beta_1\, r + \beta_2\, c^i_L + \beta_3\, p^i + \beta_4\, \eta^i_L + \beta_5\, \eta^M_L + \varepsilon^i_L$$

$$(A.7) \qquad r^i_D = \gamma_0 + \gamma_1\, r + \gamma_2\, c^i_D + \gamma_3\, \eta^i_D + \gamma_4\, \eta^M_D + \varepsilon^i_D$$

Appendix 2

This section contains the main findings of the case-by-case analysis as summarised in Tables 6 to 8. It is divided in three parts each devoted to a specific area of the entities' activity.

Profit-generating capacity

The results for the first group of indicators, which attempt to measure entities' profit-generating capacity, are summarised in Table 6. As can be seen, the results are rather unclear, although there is generally a larger number of cases in which there is a worsening of profit-generating capacity, whatever the indicator used to measure it. Nonetheless, excluding the cases in which changes are no significant reveals some details of interest.

As can be seen, the effects of the mergers analysed appear to have different effects on the course of respectively financial charges and total income, with a higher number of negative changes in the case of total income, while positive changes predominate in financial charges. The improvement in financial expenses may be related to the increase in market power following the merger, owing to a larger market share in the regional area of operation.[8] Negative effects on total income might be related to a shift in the balance sheet structure after the merger towards operations in areas with lower margins such as foreign exchange markets or money and securities market which substitute the traditional lending/deposit activity (see Table 8). More in-depth analyses would, however, be needed to confirm these hypotheses.

Nonetheless, if we analyse gross income margin, the final conclusions are less clear because the trend in total income offsets the improvement recorded in financial expenses. Thus, out of the 9 cases where there were significant changes in gross income, 4 were positive and 5 were negative. When analysing the net income the results are similar; 10 cases with significant changes, 5 of them positive and 5 negative.

Generally, in mergers between banks, the results are worse than in the case of savings banks since in 3 cases there was a significant worsening in profit-generating capacity measured in terms of net income and in 1 case a non-significant worsening. In the group of savings banks, out of a total of 14 cases, there was a significant improvement in profit-generating capacity in 5 cases, no substantial positive changes in 4 cases, no substantial negative changes in 3 cases and a significant worsening of the post-merger situation in only 2. In part, the worse behaviour of banks was the result of a bigger switch in activity towards operations with narrower spreads. As can be seen in Table 8, in all the mergers between banks there are significant reductions in the ratio of peseta lending and deposits to total assets, which is the business area with the highest spreads. The changes in business structure in savings banks were less evident and, although there was generally some switching in activity towards business areas other than traditional ones, the influence of these changes on profit-generating capacity is not clear owing to the low significance of these shifts.[9]

Efficiency and productivity

Table 7 illustrates the results obtained with the second group of indicators, which attempt to measure the efficiency of the institutions. In this case, the results are somewhat more positive, since in most of the cases there were improvements in productivity per employee, productivity per office, and, to a lesser extent, in the ratio of operating costs to average total assets. The effects of the mergers are less clear in the cases of the other two ratios as a consequence of the greater variability observed in the profit-generating capacity of institutions which have been through a merger.

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[8] Many of the mergers analysed are between savings banks, for which the reference market would be the regional rather than the national market, where their share would be much smaller.

[9] The average reduction in the ratio of lending+deposits in pesetas to total assets is 773 basis points for mergers between banks and 125 basis points for savings banks.

Nonetheless, a more detailed analysis shows that, although mergers have a positive effect on the ratio of operating costs to average total assets, in 9 cases, the changes are barely significant. If we only consider those operations in which the effects of the merger are significant, the results are even more ambiguous. In the case of productivity per employee and productivity per office, the situation is more positive as the number of significant improvements is bigger than the number showing a worsening in both ratios.

As changes in gross income were generally larger than changes in operating costs, the efficiency ratio (operating costs/gross income) is more influenced by the changes in the latter variable. There is therefore a significant overlap between those institutions showing improvements in the generation of profits and those showing improvements in the efficiency ratio (see Tables 6 and 7).

What does seem clear is the relationship between productivity per employee and office and the ratio of operating costs to average total assets. Of the 9 cases in which there is an increase in the productivity of both factors, in 8 there is also an improvement in the latter ratio, while in the 4 cases in which there is a fall in productivity levels, in 3 of them there is a deterioration in this ratio.

When analysing the other efficiency ratios, which relate the level of operating costs to the level of income, the positive relationship is less clear. This is because, in certain cases, the productivity gain may have a negative impact on the level of income generation if it has occurred as a consequence of a growth in areas of business with lower margins.

This hypothesis is partly confirmed by the relationship which seems to exist between changes in the ratio of peseta loans and deposits to total assets and the growth of total assets after the merger. In general, mergers in which there is a larger fall in the above-mentioned ratio are those which show the highest growth in total assets. Intermediation activities in the foreign-exchange, money and securities markets are usually operations involving larger amounts than traditional lending/deposit activities and they therefore facilitate growth in total assets, albeit with lower operating margins. As a result, those institutions which have achieved higher rates of growth in their total assets, as a consequence of the shift of activity towards these areas of business, see a reduction in their operating costs in relation to total assets. However, the ratios of their operating costs to income will not necessarily fall, since their income may be affected by the change in the structure of the business.

There does not seem to be any clear relationship between a better ratio of operating costs to average total assets and the reduction in the numbers of employees and offices. In many cases in which the merger involves a reduction in staff, the gains are practically cancelled out by the increase in the costs per employee as a consequence of the impact of severance payments or because the reduction in staff is achieved through early retirement which does not reduce staff costs. A similar situation occurs, although to a lesser extent, when there is a reduction in the number of offices, since overheads per office tend to increase more than the sector average, thus reducing the impact of the saving on operating expenses. This effect could be associated with an increase in overheads due to internal reorganisation of the merged institutions. Of all the cases with a fall in the number of employees after the merger (9 cases), in only 1 was the decline in staff almost entirely reflected in the operating costs. On the other hand, of the 11 cases of reduction in the number of offices, reductions in the network were almost completely reflected in 4.

Improvements in productivity per employee seem to be more closely associated with changes in total assets after the merger than with a decline in the number of employees. In many mergers a fall (rise) in the number of employees does not, as expected, lead to a rise (fall) in their level of productivity. These discrepancies are explained by the subsequent change in total assets, with higher than average growth in those cases in which there was an increase in the number of employees and an increase in productivity and lower growth in the opposite case. However, productivity per office is much more closely related to the change in the number of offices and in 14 cases the expected relationship is observed. This difference is due to the fact that changes in the number of offices are, in general, more far-reaching than staff changes.

In certain cases the rationalisation of the institution has an immediate effect on the productivity ratios in the year immediately following the merger, which then gradually evaporates in subsequent years, as the number of offices or staff increases again. In these cases, the merger could be used to rapidly restructure the resulting institution, which then embarked on an expansion. This outcome only occurs in mergers between savings banks where institutions with a high degree of overlap in their office networks often merge. After such mergers, a sharp fall in the number of offices, and to a lesser extent, of employees, frequently occurs as a result of the reorganisation of the regional distribution network. However, this is followed by increases later on, due to expansion into other regions.

When comparing the changes in the number of employees and offices with the growth of total assets after the merger (see Tables 7 and 8), it is clear that in most cases in which, after the merger, there is an increase in market share, neither the number of employees nor the number of offices decreases (4 cases against 2). Conversely, in all those cases in which there is a reduction in the number of employees and offices, there is also a slowdown in the growth of total assets and losses of market share, except in one case, in which the result is uncertain.

All this may indicate the existence of two types of merger, those in which business expansion criteria predominate (increase in share and more employees and offices) and those in which criteria of cost cutting and productivity increases predominate (reduction in staff and offices even at the expense of losses of market share). However, the differences between these two groups are not clear since, as noted above, the reductions in staff and offices are not always reflected in changes in operating costs, so that the differences between the two groups in changes in their efficiency ratios are not very evident.

There does not seem to be a clear relationship between the previous level of efficiency of the institutions taking part in a merger and the values of the efficiency ratios in the subsequent period. Although, in general, mergers involving institutions which had higher efficiency levels subsequently show efficiency levels above those of the control group, some of the mergers involving institutions with efficiency levels below the average for the sector are those which then show better results in terms of efficiency (mergers 12, 8 and 13). This result may have a certain logic, since the possibility of achieving reductions in costs is greater in less efficient institutions, so that an improvement in the management stemming from the merger may give rise to rapid increases in the levels of efficiency.

Capital adequacy ratio

In relation to the possibilities for balance-sheet growth after mergers, one element which is definitely important is the increase which mergers tend to produce in the value of the capital-adequacy ratio. In fact, as can be seen in Table 8, in 11 of the 18 cases there is an increase in this ratio, of which 9 are significant. The results are even clearer if the situation of the last year prior to the merger is compared with the first after, since in 14 of the 18 cases there is then an increase in the capital-adequacy ratio. To a large extent, these increases reflect the incorporation into reserves of the capital gains arising from mergers, due to the revaluation of assets which were recorded on the books at historical cost. Although they are a purely accounting phenomenon, they widen the possibilities for growth of the institutions by increasing the balance of available eligible capital. This is most important for savings banks since, when they lack capital, they find it more difficult to increase their own funds.

In various of the mergers analysed, the value of the capital-adequacy ratio decreases after the merger. This could indicate that the institutions have taken advantage of the capacity for growth generated by the increase in capital.

There seems to be an apparent relationship between the increase in capital adequacy ratio and profit-generating capacity. Out of the 8 entities posting an increase in their net income as a percentage of average total assets, in 6 there was an increase in the capital adequacy ratio. Yet of the 9 cases where net income deteriorated, the capital adequacy ratio diminished in 5 instances. Possibly, the improvement in entities' capital adequacy may have a positive influence on the cost of resources obtained in the markets, thus contributing to increasing the operating margins of entities with greater increases in their capital adequacy ratio.

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EMU and the structure of the European banking system

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1. Introduction

The advent of the European Economic and Monetary Union (EMU) represents new opportunities and challenges for financial institutions in Europe. The purpose of this study is to assess its importance as a factor provoking changes in banking structure and performance, against the background of the various trends affecting the medium to long-run prospects of the banking industry around the world (liberalisation, internationalisation, technological change, disintermediation, concentration).

There are several different ways to consider these changes. First, EMU may be seen as the extension to the European context of the aforementioned world trends by way of progress towards frontier opening, pressures on regulatory differences, and respect of market principles. Second, EMU may be viewed as a further step in the direction of European economic and financial integration, so that it is difficult to distinguish its effects from those of the Single Market and the Second Banking Co-ordination Directive. In particular, one may argue that one of the major gains of the single currency is that it makes the single market real. Third – and this is the approach chosen in this paper – one can consider that EMU may, in itself, have very direct and specific consequences on the European banking system, for instance by exacerbating underlying trends or even having a catalytic role. Of course, EMU should not be seen as the only driving force behind current developments in the European banking industry. The study attempts therefore to assess the relative impact of Monetary Union and to ponder its effects as compared with the other drivers of change. The analysis distinguishes between the aggregate impact of Monetary Union on the whole EU-wide banking system and its differential effect on national or sectoral components.

The overall conclusion of the study is that EMU may have some important effects on the nature of banking activities and the level of competition, at the retail as well as wholesale level, although there remains some uncertainty, notably regarding: (i) how large are the returns to scale in the different activities; and (ii) how fast are retail markets going to change.

In order to provide a comprehensive assessment of the future of the European banking industry in Stage Three of EMU, it is convenient to follow the standard paradigm – albeit sometimes criticised – in Industrial Economics, namely the Structure-Conduct-Performance approach. As a consequence, the paper studies the effect of EMU on different banking activities, e.g. foreign exchange, money market and payment systems (Section 2), before taking a more comprehensive view of banking strategy and profitability (Section 3).

2. Direct effect of EMU on the structure of banking activities

EMU will probably require significant adjustments in the supply of financial services and banks' products, with possible substitution among activities. In that respect, it may be useful to understand the dynamics of EMU in terms of the creation of a level playing field for market activities, which will foster the convergence of financial structures and help to integrate other asset management activities. This motivates reviewing market and other banking activities successively.

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2.1 EMU and market activities

2.1.1 Foreign exchange transactions

Concerning market activities, the most immediate changes will be seen in the foreign exchange markets, since cross-trades between currencies participating in the Monetary Union will disappear. The need for currency hedging transactions will also decrease, although this process has already started with the reduction of volatility among currencies participating in the ERM, so that the bulk of hedging transactions currently involve the dollar. New activities may emerge, in particular associated with the use of the euro as a reserve currency, although this will only occur as the euro becomes established.

Table 1
Impact of EMU on foreign exchange transactions
Share in total transactions reported by the country (%)

	1	2
	Transactions between DM and EU currencies	**Transactions with non-EU currencies***
United Kingdom	9.5	36.6
Germany	15.4	21.8
France	27.1	13.7
Denmark	13.5	29.5
Belgium	13.5	14.7
Netherlands	21.4	14.4
Italy	17.1	4.5
Sweden	24.4	16.6
Luxembourg	13.0	21.6
Spain	20.4	4.0
Austria	11.3	15.0
Finland	33.5	12.4
Ireland	37.7	9.1
Greece	13.1	22.1
Portugal	26.8	6.7
Total EU 15	13.4	28.3

* Transactions between USD or DM and non-EU currencies + 50% of transactions between non-EU currencies and other currencies than USD and DM.

Sources: BIS (1995 Survey on Foreign exchanges activity) and author's calculations.

Regarding the importance of intra-European cross trades (volumes involved, effects on profits,[2] it is difficult to find reliable information. The main reason is that the US dollar, being a dominant currency, may be used as a vehicle for trades between European currencies, although the DM has progressively become the main vehicle currency for cross-trades in Europe.[3] According to the 1995

[2] In most countries, margins on forex transactions are very low, so that the final reduction in revenues should be limited. Salomon Brothers (1995, quoted by McCauley and White (1997)) estimate that revenues derived from foreign exchange might fall by up to 10%, but this would only imply a 1% reduction in total revenues. However, a distinction has to be made between the wholesale business and retail transactions, which are much more profitable. This may explain differences across countries: in Finland, forex losses would amount to only 2-4% of banks' total income.

[3] The literature on market microstructures shows that forex markets may be viewed as a network between currencies. In order to maximise liquidity, these markets tend to be organised in a hierarchical way, with a limited number of "nodes" (vehicle currencies) connected to the other "satellite" currencies by liquid bilateral markets, whereas exchanges between

BIS survey on forex activity, the share of spot trading involving the dollar against EU currencies in the total turnover of Germany, France and the United Kingdom was 62.8, 55.8 and 53%, respectively, in 1995, while transactions with countries outside the zone cannot be distinguished from those where the USD is used as a vehicle currency.[4] At the same time, forex trading involving the domestic currency against other EU currencies accounted for 3.6% of total forex turnover in the United Kingdom, 15.3% in Germany and 24.6% in France. Keeping in mind that direct cross-trades between EU currencies usually involve the DM, trades between the DM and one of the other EU currencies (including the domestic currency) were 9.5% of total turnover in the United Kingdom, compared to 13.4% at the EU-15 level and 19% for the European Union outside the United Kingdom (Table 1, column 1). This may provide a measure of the immediate effect of EMU as a reduction between 10% and 15% of forex trades in EU countries.[5] A part of this reduction, as estimated on the basis of data for 1995, may have already occurred to the extent that currency traders have reduced their trading and hedging activity as a result of the decrease in volatility and arbitrage opportunities.

The various EU countries also exhibit significant differences among them. In general, financial centres dealing with non-European currencies will be less affected than others. In particular, London is the most active forex market in the world. In 1995, its total turnover in the spot market was six times larger than in Frankfurt and eight times larger than in Paris. In addition, the currencies traded in London are far more diversified than in Frankfurt or Paris, despite the fact that 41.6% of cross-trades between European currencies that involve the DM and take place in Europe originate in London. More generally, in the United Kingdom and Germany, 36.6 and 21.8% of total turnover, respectively, deal with non-European currencies. In the latter case, the importance of non-EU-currency trades is due to the prominent role of the DM, while the corresponding figure is only 13.7% for France (Table 1, column 2).

Concerning the development of new activities, independently of the evolution of forex transactions motivated by speculative objectives, opinions differ widely regarding the expected role of the euro as a reserve and transactions currency. Given the relative autarky of the European Union as a commercial zone, trade invoicing in euro may not be a source of large development in forex activities.[6] However, it is well known that the latter transactions tend to be more dependent on portfolio flows. In addition, if the larger size and lower external trade to GDP ratio in the euro-area induces an increase in the day-to-day volatility of the bilateral euro exchange rates with the dollar and the Japanese yen, derivative markets would develop more significantly. The use of the euro as an international or as a reserve currency will also depend, of course, upon the willingness of investors outside the Monetary Union – both official and private – to hold the currency in their portfolio. To the extent that the euro would rapidly become fully credible, more transactions could effectively take place in euro, providing a competitive advantage to banks in the euro area.[7] The final impact for banks will depend on their ability to reposition themselves for trading the euro against third currencies, although the Asian crisis has made clearer the risks associated with emerging markets. It is possible

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"satellite" currencies imply two transactions involving the vehicle currency on one side (see Hartmann (1996)). The gains from higher liquidity have, however, to be balanced by the need to pay bid-ask spreads twice. An informal survey of practices in EU forex markets has shown that the DM has progressively become the dominant vehicle currency for intra-European spot trades supplanting the USD, with a market share between ½ and ⅔ in the United Kingdom, around ⅔ in France, while most trades would involve the DM for Denmark, Belgium, Austria, and maybe also for Italy and Ireland. On the other hand, Portugal and Greece seem to use the USD more extensively.

4 As a consequence the estimates presented here only provide, ceteris paribus, a lower bound of the reduction in forex activity.

5 The 67th BIS Annual Report estimates that the world forex market could be reduced by 10%.

6 Hartmann (1996), on the basis of several assumptions, estimates that, with 15 participating countries at the start of EMU, 24% of world trade would be invoiced in euro. However, the currency of invoicing may depend on the size of the exporting/importing country, so that the Single Currency Area could induce a larger share of invoicing in euro.

7 If the euro becomes an international currency, Europe-based banks, which will have both assets and liabilities (in particular capital) in euro, may have a competitive advantage over US and "pre-in" global institutions.

that such additional transactions in the foreign exchange market of the euro would be mostly located in London, even if the United Kingdom does not participate in the Union.

2.1.2 Money markets

EMU will have very significant effects on the money markets with the new framework for the implementation of the single monetary policy creating the necessary conditions for the integration of European money markets.

First, the technical infrastructure to support a large European money market will be provided by the interlinking of real-time gross settlement (RTGS) systems through TARGET. Large cross-border payments denominated in euro will therefore be processed as smoothly as if they were domestic payments. Initially designed to carry out the single monetary policy, TARGET might also be available for other kinds of transfers as an alternative to private net settlement or non real time systems (such as the ECU Clearing), mainly at the wholesale level, and should therefore contribute substantially to reducing the kind of systemic dangers to which netting systems are exposed.

Second, the ESCB will rely on monetary policy instruments designed to create a deep and liquid money market at the EU level. As indicated in the "Framework Report" published in January 1997 by the EMI, and explained in more detail in the so-called "General Documentation" published in September 1997, the ESCB will rely on open market operations as well as on standing facilities. The interest rate corridor between the latter (the deposit and the marginal lending facilities) is designed to bind overnight market rates, while leaving significant leeway for banks to manage their interest exposure and thus encouraging market development. The ESCB will also rely on a broad range of counterparties. In addition, the ECB Governing Council has decided to make use of fully remunerated reserve requirements, and the averaging provisions mechanism might be viewed as contributing to increasing the volume of the interbank market. Compared with alternative ways of controlling volatility in the interbank market, reserves with averaging facilities have the advantage of assigning a central role to market forces without requiring the central bank to be frequently active in the market. Equal treatment of counterparties and the reliance on market-based policy instruments are consistent with the requirement, enshrined in the Maastricht Treaty, that the ESCB "shall act in accordance with the principles of an open market economy with free competition".

The single monetary policy will, however, require market participants to adapt to the new environment. First, the harmonisation of Monetary Policy Instruments and Procedures (MPIPs) at the start of Stage Three will have an impact on banks' refinancing. New refinancing operations and facilities are introduced, requiring further adjustment of techniques towards a greater use of interventions at market rates in some countries. Of course, some countries have already made some adjustment (such as the development of the short-term money market in Germany) and changes realised in the past did not prove to be too difficult to implement for many countries. For a few other countries, however, the adjustment is more significant.

Second, in order to accommodate differences in financial structures across countries, two tiers of eligible collateral are to be allowed for monetary policy operations: the first one includes instruments that are common to all countries, while the second comprises assets which are of particular importance for national banking systems and includes marketable and non-marketable financial obligations as well as, in some cases, equities. In the case of Tier 2, the assets and eligibility criteria are established by each NCB, under ECB guidelines and with its approval. This would, for example, allow the inclusion of a relatively large volume of trade bills and bank loans in Germany and France.

Third, one might anticipate that not only the harmonisation effect of the single monetary policy, but also the greater level of competition will progressively reduce arbitrage opportunities linked to liquidity differentials across money markets. However, the US case shows that it has not prevented the development of large money markets. In particular, the decision that the ECB will use reverse transactions as the main instrument for implementing monetary policy might provide a strong incentive for the development of an EMU-wide private "repo" market, where financial and non-

financial entities engage in short-term collateralised refinancing operations for conducting day-to-day treasury management (see Schinasi and Prati (1997)).

2.1.3 Securities markets

EMU will also have an impact on securities markets, where banks, especially the largest ones, are major participants either through the management of their own portfolio or as intermediary in investment banking activities. EMU will create the potential for the emergence of deeper and more liquid financial markets and may also affect the nature of products offered. The development of large European "domestic" markets will provide an opportunity for banks to diversify their revenues towards a larger share of non-interest income.

Regarding the size of financial markets, EMU will offer EU institutions an easy access to a really global financial market and the opportunity to compete on equal footing with US and Japanese banks. Mostly on account of the large size of the EU domestic bond markets (see Schinasi and Prati (1997)), the capitalisation of existing (domestic and international) debt securities and equities in the EU-15 area amounted to 12,500 billions dollars at the end of 1995, as compared to 27,000 billions dollars for the US and Japanese markets taken together. The current process of harmonisation of market conventions and codes of practices (day counts, business days, reference rates...) will not only ensure the continuity of operations when moving to Stage Three of EMU and the smooth functioning of the area-wide money market based on the euro, but will also promote the fungibility of instruments across countries, a necessary condition for the creation of deeper financial markets (see the Giovannini (1997) Report). The greater depth and liquidity of EU markets after the introduction of the Single Currency, as well as the strength and the stability of the euro, would also attract additional investors from outside the euro area.

Regarding the nature of products offered on EU securities markets, EMU may have significant effects. First, one can expect that the disappearance of foreign exchange risk means that credit risk will become more important in relative terms, possibly leading to the emergence of a "credit risk culture" in the management of debt instruments. Investors, as well as banks, may therefore switch from a country to a sectoral approach. In particular, this will be favoured by the implementation of the "no bail-out" clause, which will have an impact on the rating of public debt, in the sense that domestic issues are likely to receive ratings similar to those currently attributed to foreign issues (see BIS (1996)), while, at the same time, fiscal discipline and the strict application of the Stability and Growth Pact should per se reduce credit differentials to a minimum.[8] Where banks hold a significant proportion of government bonds (France, Germany, Belgium and Luxembourg), they will have to adjust their portfolios in the light of perceived variations in this credit risk. At the same time, the zero credit risk weighting for zone A government debt (which includes all EU countries' government debt) in the solvency ratio regimes will provide a strong incentive to invest in government bonds. Investors will also pay more attention to the liquidity characteristics of securities.

Second, one could witness in the very near future the creation of a unified European capital market for prime borrowers, partly as a consequence of international co-operation among European exchanges. Although EMU provides a strong incentive for such a restructuring for "in" countries, other countries like the United Kingdom, but also Switzerland, would be associated. This would include the emergence of a single reference bond yield curve, as well as a European equity market for blue-chip stocks. Such markets would, however, not cover the whole spectrum of issuers, since securities from small and medium-sized companies would probably remain national. The latter compartment of the market will probably remain, to a large extent, separated, since investors' home bias is likely to remain important, because of asymmetric information, tax differences, or attempts by national centres to protect their market shares.

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[8] Differences in rating across Canadian states may be taken as evidence of the likelihood of such an effect, although the effective bankruptcy of a European government would only occur after running through the alternative assistance mechanisms, including those from the IMF.

Third, other markets may also develop. The Stability and Growth Pact will, by constraining fiscal policy and imposing limits on government deficits, reduce governments' recourse to the capital market and thus make room for other issuers. In addition to population ageing, it will put additional pressures on pay-as-you-go pension systems in favour of funded ones. Non-government bond and equity markets should therefore grow, accelerating the general movement towards disintermediation. In addition, to the extent that the operational framework for monetary policy increases the demand for private paper, it will affect financial market structures, by creating the "critical mass", allowing new products to be sufficiently competitive to expand significantly. This will increase the scope for securitisation and might even lead to the emergence of a low-grade bond market in addition to the market for prime borrowers.

Fourth, EMU will also have an impact on derivatives markets. Products linked with short-term interest rates are likely to suffer falls in trading volumes in many cases, since the single monetary policy in Stage Three implies that there will only be room for one leading short-term contract. This may have severe consequences for the 16 European futures or options markets (including Switzerland). As far as long-term contracts are concerned, the coexistence of more than one reference bond market will not be a durable feature, so that one can anticipate either a single contract – although this may imply co-operation between financial centres, as is currently the case between DTB and MATIF for interest contracts – or several identical ones with similar characteristics (margins, opening hours). Banks may have to reconsider their degree of participation in the exchanges providing such derivatives contracts, in particular regarding seat ownership.

2.2 EMU and traditional banking activities

EMU will also have an impact on "core" banking activities, i.e. payment activities, as well as credit and deposit-taking business and may affect the regulatory environment. The analysis below focuses on banks as a whole, leaving to Section 3, the analysis of competition among banks.

2.2.1 Further progress in payment systems

EMU will induce further progress in payment systems, even if technological innovation remains the major driving force, as evidenced not only by electronic money but also by many other money transmission services. For instance, technological innovation may itself be fostered by the transition to the Single Currency. In particular, the liberalisation of telecommunications, favoured by the Single Market that EMU is due to complete, may lead to a more widespread use of phone, PC and Internet banking. Network-based e-money payments may also benefit from a global and highly contestable market. Indeed, some observers expect that, due to the non-availability of euro bank notes during the transition period, electronic money might grow significantly.

Regarding revenues, banks' profitability will be adversely affected since revenues from money transmission services will be reduced with the disappearance of correspondent banking fees derived from intra-European forex operations.[9] In addition, the structure of traditional correspondent banking activities will have to adjust to the new environment. The new payment systems will allow balances associated with correspondent banking to be reduced, but also the rents associated with it. This will mainly affect large banks, which are more significantly involved in such activities, whereas conversely small banks will benefit from competition in payment systems. At the same time, if the euro were to gain an international role, Single Currency area banks will be in a position to increase correspondent banking activity. These changes may also affect former alliances among groups of banks based on correspondent services (see Section 3). Finally, due to the interlinking of national RTGS, payment system at the national level will operate in a much more competitive environment,

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[9] The Boston Consulting Group (1996) estimated that forex fees account for 50% of the $10 billion of intra-European cross-border revenues.

with a possible reduction in the "float".[10] In particular, national RTGS will come under the pressure of corporate clients who wish to take advantage of EMU to organise treasury and risk management on a European scale. Differences across countries may also imply diversion of traffic. Therefore, much of the evolution will depend on the pricing policy of payment operations, characterised by more important returns to scale in wholesale activities than in retail operations.[11] Overall, this background implies that network effects propagated by revenue changes may potentially be significant. In addition, if securities markets are to expand and become more diversified to compete on an equal basis with the United States, securities settlement systems will have to further improve and develop significantly. In that context national securities depositories will face the competition of international depositories (Cedel, Euroclear).

2.2.2 Effects on credit and deposit activities

It is also necessary to study the extent to which EMU will affect traditional intermediation activities. EMU is likely to increase the size of securities markets so that securitisation in the "narrow sense" – i.e. the transformation of banking assets into tradable securities through financial engineering – will make further progress, offering banks more flexibility in terms of asset/liability management. At the same time, with securitisation in the "broad sense" (larger use of instruments tradable in deeper financial markets), the competitive disadvantage of traditional bank intermediation vis-à-vis financial markets and non-banks is likely to increase, with differential effects on deposit collection and credit activities.

On the deposit side, banks are likely to increasingly face competition from institutional investors. Following the disappearance of foreign exchange risk, limits on portfolio diversification by institutional investors, like the "currency matching rules", are likely to be applied only outside the euro area.[12] This will boost the cross-border investment activity of institutional investors. As a consequence of the changing nature of demand, with the greater use of mutual funds, the maturity of banks' deposit-taking may become shorter and deposit collection more costly.

On the asset side, greater competition in the securities business will coexist with the persistence of asymmetric information in lending activities. In the latter case, the need to have a direct link with borrowers means that traditional financial intermediation is likely to remain substantial, in particular lending to small and medium-sized enterprises, for whom access to the securities markets is more difficult. Nevertheless, banks face competition also in their traditional lending activities due to the dramatic reduction of transaction costs and the improved possibilities to evaluate risk brought about by information technology. In the not too distant future, the development of securitisation – fostered by EMU – and the growth of mutual funds may increase the challenge posed to banks by rating agencies using computerised credit scoring techniques. Even for small and medium-sized enterprises (as well as technology firms), increasingly connected securities markets with improved disclosure rules might also diminish the information advantage of banks. In that respect, securitisation in the "broad sense" may reinforce securitisation in the "narrow sense" targeted at small and medium sized companies. As a result, banks may end up with the less profitable fraction of their traditional customers in their portfolio. To counter this risk, banks might therefore decide to "unbundle" their products, and to concentrate on activities where they keep comparative advantages, namely

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[10] According to the Boston Consulting Group (1996), revenues derived from the "float" should be reduced from 10 to 5% of wholesale payment revenues, but they represent a much higher fraction of retail payments.

[11] On wholesale activities, see Bauer-Hancock (1995) for US ACH (Automated Clearinghouse, the US, nation-wide, value-dated, electronic fund transfer system used for recurring consumer and commercial payment). On retail operations, see Humphrey (1994) for a description of the "excessive" use of ATMs in the United States, although "cybermoney" may effectively help reduce costs.

[12] For example, currency matching rules require insurance companies, not to hold more than 20% of their assets in foreign currencies, unless they are matched by liabilities denominated in the same currency. The Single Market and the constitution of international groups of institutional investors have already limited the relevance of such rules.

monitoring borrowers and on the provision of liquidity insurance to them (through back-up lines), without effectively funding the loans (Rajan (1996)).[13] To summarise, banks' competitive advantages are likely to be reduced, while EMU will intensify challenges for assets transformation and uncertainty management.

2.2.3 Liberalisation and harmonisation of the regulatory environment

EMU, by increasing competition among financial systems, is likely to trigger further steps towards the liberalisation of banking regulation. On the one hand, deregulation favours financial innovation and the development of financial markets. In general, it enables other financial and non-financial institutions to compete with banks, thereby increasing disintermediation (see the previous paragraph). On the other hand, if it can be argued that EU directives fostering the Single Market have, in most cases, been implemented in national legislation, there remains scope for further harmonisation in many countries, in particular in the tax and social area, or regarding UCITS and pension funds. In the absence of regulatory harmonisation, each country may try to enhance the attractiveness of its home market by introducing structural reforms that will affect competition. In addition, being more visible in the Single Currency area, regulatory differences will face further pressures leading to their progressive disappearance. It may therefore create a level playing field, via international competition, that would be more favourable to banking activity. In particular, the deregulation of the remuneration of deposits may, in France for instance, enable banks to compete more effectively with MMFs. An associated issue is whether banks organised under private law will not be better equipped than publicly owned or co-operative banks to manage the transition to EMU.

3. Effects on banking strategies and performance

Taking into account possible externalities across activities, we now consider the overall effect of EMU on banking institutions. First, we investigate the strategies that European banks may develop to accompany changes in their basic activities. Second, we assess the effect of EMU on banking profitability.

3.1 EMU imposes new strategic choices

3.1.1 Banking capacities

Concerning banking capacity, it is important to investigate whether banks, facing a larger market as a consequence of EMU, will try to exploit economies of scale or scope in banking activities, if any. The economic literature is not very conclusive regarding the existence of returns to scale at the level of the banking firm. Although the analysis of Section 2 indicates that, in some product lines, there exist potential returns to scale that EMU will help to exploit, the economic literature offers generally conflicting evidence regarding the returns to scale at the level of the banking unit. One of the reasons is that returns to scale in banking may relate not to institutions themselves but rather to processes and functions.[14] It is also interesting to note that returns to scale of non-bank competitors, like pensions

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[13] However, "unbundling" has the additional effect of reducing entry barriers. This may favour the growth of "supermarket banking" (where food retailers offer competitive deposit facilities and an increasing array of other financial services in-house), as in the United Kingdom.

[14] See in particular Llewellyn (1997). Schaffer and David (1986) found evidence of returns to scale in interstate banking for the United States. Periods of branching deregulation were usually followed, as expected, by a significant increase in out-of-state branches (Humphrey (1994)). The conclusion of the subsequent literature is either that scale economies are usually exhausted at a small scale (maximum gains from risk diversification are obtained at a small size and offset by organisation costs, so that fixed costs are a relatively small fraction of total costs), or that evidence of returns to scale are generally based on specification errors (Berger and Humphrey (1991, 1992) and Bauer et alia (1993) find evidence of

and mutual funds are not substantial either (Dermine (1996)). It should be kept in mind, however, that returns to scale may not be very substantial in retail banking, though current measures are not totally reliable, in the sense that they could be influenced by the regulatory environment which is about to change with EMU. The success of possible mega-mergers intended to exploit returns to scale at the EU level would therefore require a substantial reorganisation of banks in order to cut duplicated costs. Otherwise, diseconomies of scale would appear.

There exist clear externalities between activities, although the literature is, again, inconclusive as to whether such economies of scope may justify the existence of large universal banks. While specialist providers are often more efficient than others, there is, at most, evidence of small gains from joint production. It may be useful to distinguish, on the one hand, activities that are more conducive to concentration (liquidity and potfolio management, treasury and dealing activities, payment systems) and, on the other hand, those which do not lead to further concentration. As regards the first type of activities, Vander Vennet (1994) notes that off-balance sheet activity may provide banks with cost economies. There is also anecdotal evidence that returns to scale in money market operations may also imply concentration of other activities. In addition, financial markets induce strong network externality effects, based on liquidity and the supply of infrastructure (experienced labour force, availability of ancillary services).

As a consequence, the concentration of financial centres could have strong effects on the location of banking activity. For instance, if financial markets were mostly concentrated in one location (London, for instance), banks would have a strong incentive to locate their money market activities in this financial centre, so that geographic concentration will also imply a reduction in the number of banks. On the other hand, if financial market activities were to remain spread out in several centres (Frankfurt, Paris), banking location would be more evenly distributed across countries. This trend could be fostered by the decentralisation of monetary policy, since national central banks use institutions active in their own countries as most natural counterparties.

Concerning activities that are less likely to increase concentration, there are other factors that may offset the effects of geographic concentration of money market activities. For instance, a large part of retail banking activities would remain decentralised anyway, although easy remote electronic access would support concentration. Moreover, the US experience shows that, given the progress made by telecommunication technology and the persistence of wage differentials across the EU, banks may choose to locate their most labour intensive activities as well as their back offices outside the main financial centres.

3.1.2 Competition in banking and future prospects

EMU will increase competition among financial institutions and to assess the overall effect of EMU, it is useful to distinguish between wholesale and retail markets. Wholesale markets are already significantly internationalised and competitive, but competition in these markets will nevertheless evolve over time. The single currency implies a further redistribution of banking activities to the extent that competitive advantages, partly based on the existence of national currencies, will disappear. In particular, the "anchoring principle", which is imposed by some central banks and requires domestic financial institutions to lead manage bond issues, will, if maintained, be enlarged to a wider zone, or even disappear.[15] In addition, the main currency-based competitive factor, namely the expertise in the domestic monetary environment will, according to Dermine (1996), disappear. However, other competitive factors are likely to be unaffected by the single currency in the short run.

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diseconomies of scale). Concerning the EU, under the caveat that the number of studies is smaller, similar conflicting results are found. There is evidence of returns to scale in France (Dietsch (1993)) and Italy (Parigi et alia (1992)). However, Lang and Welzel (1995) conclude that scale economies in German banks exist up to a certain size, and Vander Vennet (1994), that, for a sample of EU banks, the average costs are minimised between USD3 and 10 billion.

[15] The anchoring principle, initiated by some central banks to protect their currency, has traditionally restricted the lead management of bond issues to banks incorporated in the country whose currency is being used.

These include the existence of a distribution network of customers, as well as access to information on supply/demand flows, which help to assess the direction of price movements. Regarding mergers and acquisitions, the knowledge of the accounting, legal and fiscal environment also remains an important determinant. However, all these competitive advantages are not irreversible and may be progressively eroded. In addition, in the context of the development of a pan-European trading system linking the different exchanges, the importance of the size factor in terms of market power (i.e. the cumulative advantage of operating on a larger scale through the ability to control a larger market share) indicates that current positions at the national level may be progressively overturned by European or even by other global players, especially US institutions.

Table 2

Internationalisation of European banking networks

Market share of foreign institutions (as a % of total domestic assets)

	Branches from EEA countries			Branches from third countries			Total branches			Subsidiaries from EEA countries			Subsidiaries from third countries			Total subsidiaries			Total branches and subsidiaries		
	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995
BE		10.0	9.1		10.0	7.8		20.0	16.9		8.0	9.8		1.7	1.3		9.7	11.1		29.7	28.0
DE			0.7			0.6			1.4			1.5			1.4			2.9			4.3
GR	4.5	6.9	8.8	9.1	5.2	7.2	13.6	12.1	16.0	0.3	0.7	1.7	0.7	0.2	0.8	1.0	0.9	2.5	14.5	13.0	18.5
FR			3.4			3.6			7.0									5.2			12.2
IE			16.5			1.8			18.3			18.4			3.9			22.3			40.6
IT	1.6	1.0	2.9	0.1	0.4	0.8	1.7	1.4	3.7	0.2	0.5	1.5	0.7	0.9	0.3	0.9	1.4	1.8	2.6	2.8	5.5
LU			20.0			1.0			21.0			70.9			7.8			78.7	91*		99.7
NL	2.7	3.1	2.9	1.3	0.7	0.7	4.0	3.7	3.5	4.2	5.4	3.7	6.5	3.4	2.5	10.7	8.8	6.2	14.6	12.6	9.8
AT	0.1	0.1	0.6	0.7	0.1	0.1	0.8	0.2	0.7		1.2	2.1		1.4	0.7		2.6	2.8	0.8	2.8	3.5
PT	1.6	0.5	3.0	0.0	0.2	0.1	1.6	0.7	3.1	0.0	2.1	4.9	0.6	1.0	1.4	0.6	3.1	6.3	2.3	3.8	9.4
FI			6.5	0.6	0.6																
SE	0.0	0.0	1.6	0.0	0.0	0.1	0.0	0.0	1.7	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	2.5
UK	8.6	14.2	21.7	40.0	34.0	23.2	48.6	48.2	44.9			1.5			5.2			6.7			51.6

Assets of foreign branches and subsidiaries of domestic institutions (as a % of total domestic assets)

DE			9.6			4.8			14.4			6.8			0.7			7.5			21.9
GR	3.0	1.7	2.9	1.1	0.7	0.2	4.1	2.4	3.1	0.8	0.9	2.3	2.5	2.2	1.7	3.3	3.1	3.6	7.3	5.5	6.7
FR			8.0			9.2	0.0	0.0	17.2			7.4			3.5	0.0			0.0	0.0	17.2
IE			11.9			0.8			12.7			6.3			12.9			14.2			26.9
IT		11.0	8.0		7.4	4.7		18.4	12.7		3.2	3.9		0.8	2.1		4.0	6.4		22.4	19.1
LU			0.3			0.7			1.0												
AT		1.7	1.9		1.8	2.8		3.5	4.7												
PT	9.9	12.4	10.3	9.3	5.0	5.2	19.2	17.4	15.5			3.5			3.6	0.0	0.0	8.3	19.2	17.4	23.8
FI	4.0	6.0	4.4	0.1	3.7	4.6	4.0	9.7	9.0	6.5	3.0	0.3	3.0	2.3	0.4	9.5	5.3	0.9	13.5	15.0	9.9
SE		2.4	7.5		1.7	3.0		4.1	10.5												

* 1987 (Source: Steinhert and Gilibert (1989)).

Source: National central banks and supervisory authorities, unless otherwise indicated.

In retail banking markets, changes in competition can be expected to be more pronounced on the liabilities than on the assets side. In particular, remote access to banks in other Member States will become very easy in the context of a single currency and the relevance of branches as distribution centres of deposit products may be reduced. Regarding the assets side, Monetary Union will enable operations in any national market to be financed through deposits obtained in the home country, hence also facilitating the remote supply of financial services. Consequently, competition in some segments of the market is likely to increase. This is the case of activities which are relatively homogeneous and closely related to the deposit function, like consumer credit and standard mortgage loans, as opposed to small-scale commercial and specialised consumer loans, which require more direct contact with customers. On the other hand, there still exist legal, fiscal and institutional obstacles to full integration and these will limit the effects of competition. If one excludes the particular role of countries like Ireland, Luxembourg and the United Kingdom, this explains why the level of internationalisation of

banking networks is currently lower than in the United States, where foreign penetration was around 20% in 1993 (see Table 2 for EU countries and Ettin (1995) for the United States).

Indicators of concentration and contestability

To assess future trends in terms of competition, we rely on two types of analysis: first, we compute concentration indicators at the euro-area level; then, we report results of tests of contestability at the national level but based on rigorous microeconomic foundations. This dual approach is motivated by some of the drawbacks of concentration indicators, i.e. that the market shares of the top five or ten largest institutions are relatively easy to compute but are purely static. In addition, concentration indicators force the analyst to take a stand on the relevant geographic dimension of banking markets in a context where, as indicated above, deposit markets are more likely to extend to the euro area while loan markets may keep some of their local/national features. Finally, only the contestability of retail banking markets is linked to the concentration of the sector due to sunk costs associated with relationship banking -based on reputation and the role of brand names- and asymmetric information. This may not be true for wholesale markets.[16]

Tables 3 and 4 reveal that the level of concentration differs across countries, with a significantly lower concentration in Germany and Italy and, in general, in the larger countries.[17] However, one could characterise European banking markets by a high level of concentration within national boundaries that are scheduled to disappear. Conversely, Euroland is expected, at least at the beginning

Table 3
Indicators of concentration (%) – country analysis

	Total assets				Loans				Non-bank deposits			
	1985	1990	1995	1997	1985	1990	1995	1997	1985	1990	1995	1997
BE	48.0	48.0	54.0	57.0	54.0	58.0	61.0	66.0	62.0	67.0	62.0	64.0
DK	61.0	76.0	74.0	78.0	71.0	82.0	79.0	75.0	70.0	82.0	76.0	72.0
DE	n.a.	13.9	16.7	16.1	n.a.	13.5	13.8	13.7	n.a.	11.6	12.6	14.2
GR	82.1	83.3	75.7	71.0	93.2	89.7	80.8	77.0	89.2	87.7	83.0	79.6
FR	46.0	42.5	41.3	40.3	48.7	44.7	46.8	48.3	46.0	58.7	68.1	68.6
IE	47.5	44.2	44.4	40.7	47.7	42.9	47.5	46.8	62.6	43.7	52.6	50.2
IT	20.9	19.1	26.1	24.6	16.6	15.1	26.3	26.6	19.9	18.6	42.1	36.7
LU	26.8	n.a.	21.2	21.8	n.a.	n.a.	15.1	28.6	n.a.	n.a.	22.5	28.0
NL	69.3	73.4	76.1	79.4	67.1	76.6	78.5	80.6	85.0	79.5	81.9	84.2
AT	35.9	34.6	39.2	48.3	28.9	30.1	34.0	39.3	32.0	32.0	36.4	39.1
PT	61.0	58.0	74.0	80.0	60.0	57.0	73.0	75.0	64.0	62.0	76.0	79.0
FI	51.7	53.5	68.6	77.8	49.7	49.7	60.0	56.2	54.2	46.1	64.2	63.1
SE	60.2	70.0	85.9	89.7	62.6	64.9	90.1	87.8	58.0	61.4	84.3	86.9
UK	n.a.	n.a.	27.0	28.0	n.a.	n.a.	25.0	26.0	n.a.	n.a.	25.0	26.0

Source: National central banks and supervisory authorities, share of the 5 largest institutions in assets/liabilities held by credit institutions.

[16] Applied researchers have not generally been able to show a significant relationship between concentration and profits in banking, nor to identify the true geographic market associated with a given measure of concentration. Following Baumol's (1982) critique that competition depends in fine on the "contestability" of the market (i.e. on the absence of sunk costs), the "New" Industrial Organisation (NIO) literature has argued in favour of a set of tests, based on rigorous microeconomic foundations. In particular, the Rosse-Panzar test relies on the fact that an individual bank will respond differently to a change in costs, depending on whether the bank enjoys some monopoly power or instead is operating in a competitive market (see Schaffer (1994) for a survey).

[17] Table 3 is based on exhaustive information from Central Banks and Supervisory Authorities, while Table 4 is derived from the Fitch IBCA Bankscope CD-Rom (henceforth IBCA). The latter indicators diverge slightly from the former ones since the coverage is partial for small banks – which, however, only represent a small fraction of cumulative assets. They are presented here in order to derive an estimate of the EU-wide level of concentration (last row in each sub-table). See the footnotes to the tables for details. The most substantial divergence between the two tables arises in the United Kingdom, given that the international sector is not considered in IBCA.

Table 4

Indicators of concentration (%) – country analysis (1996)

Total assets

	C5			C10		
	All bks	All bks*	Univ. bks	All bks	All bks*	Univ. bks
BE	68.0	65.3	73.0	84.0	80.7	88.3
DK	77.6	72.3	89.7	92.9	86.6	99.2
DE	24.4	20.9	42.0	38.9	33.2	52.9
GR	83.1	74.8	n.s.	n.s.	n.s.	n.s.
ES	39.3	36.1	42.8	55.1	50.5	59.3
FR	38.2	36.0	49.7	53.4	50.3	60.8
IE	57.0	51.8	n.s.	94.2	85.6	n.s.
IT	34.3	30.9	40.5	50.8	45.8	57.3
LU	30.2	27.2	30.8	48.7	43.7	49.5
NL	62.8	61.1	80.2	83.0	80.7	95.0
AT	52.9	41.5	57.7	73.8	57.9	80.4
PT	61.5	57.0	71.7	84.9	78.7	95.3
FI	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
SE	73.8	70.2	90.9	93.9	89.2	n.s.
UK	50.6	49.0	72.0	65.7	63.7	83.5
EU11	11.8	10.8	16.3	19.3	17.6	25.7
EU15	10.1	9.2	14.6	16.9	15.4	23.3

Off-balance-sheet items

	C5			C10		
	All bks	All bks*	Univ. bks	All bks	All bks*	Univ. bks
BE	79.5	76.4	80.8	92.1	88.5	92.6
DK	85.1	79.2	92.6	93.4	87.0	99.9
DE	41.7	35.7	58.3	57.9	49.5	65.4
GR	85.0	76.5	n.s.	n.s.	n.s.	n.s.
ES	47.6	43.6	54.5	60.0	55.0	71.4
FR	51.9	48.9	65.0	62.0	58.4	73.4
IE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
IT	43.8	39.4	50.5	64.1	57.7	68.9
LU	9.7	8.8	9.7	14.9	13.4	14.9
NL	40.3	39.2	64.3	66.4	64.6	83.3
AT	57.6	45.2	61.5	77.8	61.0	83.1
PT	60.7	56.3	70.4	89.2	82.7	99.5
FI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SE	93.7	89.1	97.8	97.8	93.0	n.s.
UK	77.2	74.8	82.0	83.2	80.7	86.2
EU11	18.9	17.2	23.7	28.4	25.9	32.7
EU15	15.1	13.8	20.1	24.0	21.9	28.3

Loans

	C5			C10		
	All bks	All bks*	Univ. bks	All bks	All bks*	Univ. bks
BE	70.5	67.7	78.6	85.8	82.5	89.6
DK	76.4	71.1	89.1	94.9	88.4	99.7
DE	21.2	18.1	44.3	34.3	29.3	n.s.
GR	83.0	74.7	n.s.	n.s.	n.s.	n.s.
ES	34.5	31.7	37.8	49.7	45.6	55.3
FR	35.0	33.0	50.3	52.6	49.5	54.2
IE	65.3	59.4	n.s.	94.9	86.2	n.s.
IT	33.8	30.4	42.5	50.8	45.7	59.8
LU	26.0	23.3	27.1	52.2	46.9	54.5
NL	62.9	61.2	86.5	87.1	84.8	96.8
AT	44.9	35.2	51.9	66.5	52.2	76.9
PT	53.8	49.9	62.8	84.0	77.9	95.5
FI	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
SE	75.3	71.6	87.8	91.3	86.8	n.s.
UK	56.7	54.9	71.6	75.4	73.1	86.1
EU11	11.0	10.0	16.8	18.6	17.0	27.8
EU15	9.5	8.7	14.7	16.9	15.4	25.1

Securities

	C5			C10		
	All bks	All bks*	Univ. bks	All bks	All bks*	Univ. bks
BE	63.7	61.2	67.1	79.8	76.7	85.5
DK	79.2	73.7	90.4	87.1	81.2	98.3
DE	26.6	22.8	33.3	41.4	35.4	49.7
GR	86.3	77.6	n.s.	n.s.	n.s.	n.s.
ES	45.3	41.6	47.2	57.1	52.4	60.4
FR	40.2	37.8	49.2	56.0	52.7	65.3
IE	48.5	44.1	n.s.	98.3	89.3	n.s.
IT	29.1	26.2	32.2	44.7	40.3	48.5
LU	38.9	35.0	39.8	50.2	45.1	51.4
NL	68.4	66.6	84.9	86.7	84.3	97.4
AT	54.4	42.7	57.9	75.1	58.9	79.8
PT	60.7	56.2	75.6	77.3	71.7	92.7
FI	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
SE	77.9	74.0	93.0	98.2	93.3	n.s.
UK	45.3	44.0	77.5	57.2	55.5	82.6
EU11	11.4	10.4	14.1	18.4	16.8	21.5
EU15	9.8	8.9	12.8	15.5	14.1	19.6

Deposits

	C5			C10		
	All bks	All bks*	Univ. bks	All bks	All bks*	Univ. bks
BE	67.5	64.9	73.5	83.0	79.8	87.0
DK	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE	29.3	25.0	40.2	41.3	35.3	44.5
GR	83.3	74.9	n.s.	n.s.	n.s.	n.s.
ES	36.7	33.6	37.4	50.2	46.1	53.1
FR	42.0	39.5	47.7	54.4	51.2	53.1
IE	49.7	45.2	n.s.	94.4	85.9	n.s.
IT	30.4	27.4	33.3	46.9	42.2	50.9
LU	35.6	32.0	35.8	50.9	45.7	51.2
NL	37.3	36.3	65.3	76.3	74.2	92.7
AT	45.3	35.5	48.5	70.4	55.2	75.4
PT	61.3	56.9	68.1	89.6	83.1	97.2
FI	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
SE	81.9	77.9	91.3	96.7	91.9	n.s.
UK	63.5	61.6	75.4	76.8	74.4	88.7
EU11	12.6	10.6	16.6	19.3	16.2	23.4
EU15	11.0	9.3	14.7	18.5	15.6	21.8

Notes:

n.a.: non available; n.s.: non-significant due to the low coverage of the country in the database. The concentration indicators (C5/C10: market share of the 5/10 largest institutions) are computed using data from Fitch-IBCA for banks with total assets above Ecu 1 billion (indicators "all banks" and "universal banks"), as well as additional information indicating the share of banks with assets above Ecu 1 billion in the total assets of the whole banking sector. The latter information was obtained from National Central Banks (indicators "all banks*").

Formally: "all banks" or "univ. banks" = $\Sigma^{5 \text{ or } 10}_{i=1} Ai / \Sigma^{N1}_{i=1} Ai$, where Ai is the balance-sheet item (total assets, deposits, loans,...) of bank i and $N1$ is the number of institutions with total assets above Ecu 1bn as recorded by IBCA.

"All banks*" = "All banks" x $\Sigma^{N2}_{i=1} Ai / \Sigma^{N}_{i=1} Ai$, where N is the total number of institutions and $N2$ the total number of institutions with assets above Ecu 1 bn.

Sources: Fitch-IBCA Bankscope CD-ROM and author's calculations.

of EMU, to follow the rule of lower concentration in the larger areas. As indicated in Table 4a, based on individual bank data from IBCA, an upper limit for the level of concentration of assets, loans and deposits, measured by the share of the assets of the five largest EU credit institutions in the total cumulative assets of all EU institutions was between 10 and 11% in 1996 (between 16 and 17% for universal banks[18]). This should be compared to 18% in the United States in 1993 (Ettin (1995)). Although one should remain cautious when using figures derived from different sources, this reveals that there may exist some scope for consolidation in Europe.[19] Such a movement towards EU global players also appears in Table 3, since in most countries concentration increased between 1990 and 1997 (and, in many cases, continuously since 1985). In addition, the contestability of retail banking has certainly increased. If, as indicated above, technological change has played a major role in this evolution, EMU will reinforce these trends.

Regarding off-balance-sheet operations and interbank lending, which are more contestable, concentration indicators may explain the incentives for institutions to evolve or enter other national markets. As indicated in Table 4, concentration in off-balance-sheet operations and interbank lending/borrowing also appears to be more pronounced than for other activities. One may therefore anticipate some consolidation in that area. It could, for instance, be argued that an efficient interbank market rarely has more than 10 prominent market makers. In that case, the start of EMU would lead to competitive pressures towards a restricted number of EU-wide money market makers.

On the other hand, to assess the effective level of competition, we implement more formal tests of contestability. The "New Industrial Organisation" literature has stressed the need to test competition by measuring the elasticity of bank revenues to changes in costs, on the grounds that, for monopolistic banking markets, revenues respond less than proportionately to changes in costs. A possible drawback is that these tests are based on reduced-form equations, so that they cannot cope with the regime shift associated with EMU. Consequently, they only provide a measure of the current level of competition in the EU banking system and a benchmark against which the effects of EMU can be tested. Molyneux et alia (1994) conclude that during the period 1986-89, banks in Germany, the United Kingdom, France and Spain earned revenues as if in monopolistic competition, while in the case of Italy, monopoly power is not rejected. For Finland, Vesala (1995) concludes that deregulation triggered a short period of price war among banks but banks later reverted to a kind of monopolistic competition. For the more recent period, De Bandt and Davis (1998) use a sample of banks in France, Germany and Italy during the period 1992-96 and conclude that competition increased during the 1990s, especially in Italy, but that banking markets are still characterised by monopolistic competition.

In conclusion it might be noted that the monitoring of concentration at the EU level and of its impact on competition, through the definition of the appropriate market segments will certainly be a crucial issue in the years to come.

Strategic responses by banks

Against the background of an increase in competition ushered in by EMU, it is important to investigate how banks will react to potential competition. It is not obvious that EMU will induce concentration of all banking institutions. Given the existence of asymmetric information, one possible scenario is therefore the coexistence of a few Europe-based global players, alongside smaller institutions, specialised either in given product groups or in specific regions. It is difficult to predict if, after EMU, banks will prefer to: (i) specialise in specific "niches", involving particular skills; (ii) build new alliances with universal banks either for strategic motives, with a view to limiting entry and softening competition in particular markets, or for technological reasons, mainly to use more efficiently existing banking networks; or (iii) accelerate the movement of concentration to reach a

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[18] Universal banks are defined as commercial, cooperative and savings banks.

[19] Such a movement should be even more pronounced if one takes into account the effects of competition policy which is traditionally more severe in the United States than in Europe.

critical size through mergers and acquisition. There is no dominant model in our view. On the one hand, the experience of the Single Market shows that the last two choices are the most likely to be fostered by EMU. But the motivation for the current wave of mergers in the different EU banking systems may be partly independent of EMU,[20] and new types of alliances may also be fostered by technological change, as indicated above. On the other hand, if there is evidence that successful mergers are a consequence of cost-cutting rather than revenue enhancing strategies, banks may face a dilemma regarding potential returns to scale gains and legal obstacles to restructuring (in particular regarding employment status). The final question is therefore whether EMU will induce a significant development of cross-border mergers. If the motivations are not different from mergers at the national level, the need to accommodate national differences of legal and accounting systems may increase the risk of duplication of costs in the case of cross-border mergers. It is probable that, at least in the short run, the first step will be a consolidation of the banking systems in the smaller countries.[21]

3.2 EMU and the performance of the banking industry

The analysis of the overall effect of EMU on banking performance should distinguish between the short and medium-run effects of EMU on banking profitability. In the short run, EMU will have a limited impact on banks' costs, due to the need to complete the changeover to the euro, while in the medium term, EMU will affect banks' profits, as well as its distribution across institutions.

3.2.1 One-off costs associated with the changeover

In the short run, banks will have to face the one-off costs of changeover. But experts do not fully agree about the importance of those costs. According to estimates by the Fédération Bancaire Européenne, changeover costs, excluding adaptation of national payment systems, would amount to ECU 8-10 billion, or 2% of annual operating costs for three to four years. On the other hand, for firms active in securities business, switchover costs would appear to be small and amount to an average of 0.06% of total operating costs of financial institutions (ISMA (1997)). Such a difference may be explained by the fact that costs are higher for institutions specialised at the retail level, since half of these costs would come from the adaptation of information technology, and the need to offer to retail customers, during services in euro and in national currency, Stage 3A. Securities firms already operate in a multi-currency environment. Various estimates tend to show that smaller and/or more specialised institutions may not always be disadvantaged, although their lower cost of organisation will, in some cases, be more than offset by limited expertise. Adequate planning and timing of the changeover seems to make a difference, since some changes are due to be made independently of the occurrence of EMU, in particular preparations for the year 2000.

3.2.2 Medium-term effects on profitability

From a structural point of view, EMU will create a new environment, which will have positive effects on the competitiveness of EU institutions. It may, at the same time, also increase disparities among institutions.

EMU will have positive effects on the competitiveness of banks. First, the move to Stage Three will help reveal organisational deficiencies at the level of institutions, the solution of which will, in the end, prove decisive in improving the competitiveness of European institutions.

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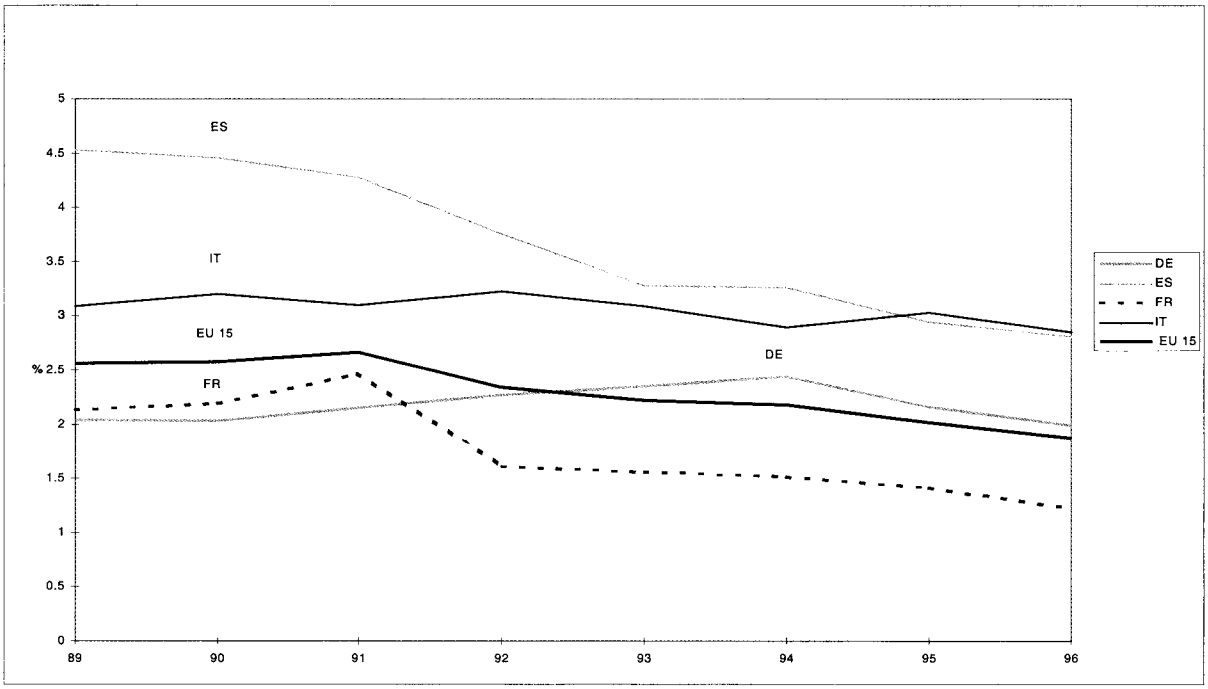
[20] Small banks with a significant presence in local markets have, so far, not been concerned by the rise in M&As.

[21] Recently observed cross-border mergers in Europe (e.g. the merger between Fortis (Netherlands) and Générale de Banque (Belgium), the purchase of BBL (Belgium) by ING (Netherlands) and the merger between Merita (Finland) and Nordbanken (Sweden)) occurred in countries with a relatively more concentrated banking sector and less opportunities for national alliances. See also White (1998) for M&As in banking in 1997/98. The planned purchase of the US investment bank Bankers Trust by Deutsche Bank in November 1998 is no exception to that principle, as it expresses a diversification strategy, rather than a search for scale economies within the euro area.

Chart 1
Bank intermediation margin*
All universal banks



* Net interest revenue/total earning assets.

Sources: Fitch IBCA Bankscope CD-ROM and author's calculations.

Second, from a more macroeconomic point of view, the introduction of a Single Currency in the place of multiple currencies will reduce transaction costs and eliminate the previous foreign exchange risk among the currencies of the euro area. Hence, the commercial and financial unification of the European Union will be enhanced and cross-border trade in goods and services, including financial services, stimulated. This should complement the growth effect associated with the frontier-opening process of the Single Market. In addition, the priority given to price stability in Stage Three should provide an enhanced environment for the production of financial services. Less volatile inflation and interest rates are good for banks' customers, and hence for banks. They will also benefit from higher expected economic growth via lower interest rates supported by a strong euro. Thus, EMU may increase the competitiveness of the whole European banking industry, and in particular of the international banking groups.

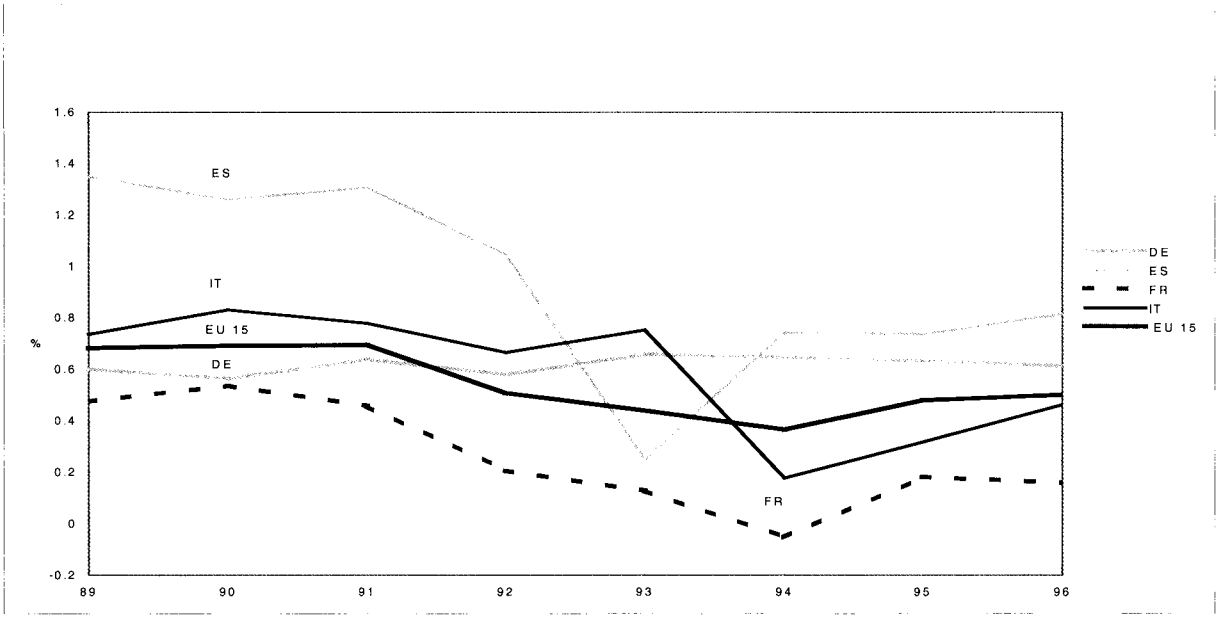
For EU institutions in general, EMU will take place in an environment where intermediation margins and profitability are lower than at the end of the 1980s, marking a reallocation of margins from banks to customers. As indicated in Charts 1 and 2, which are based on aggregate data from IBCA, there is a clear convergence across EU countries and the movement was particularly pronounced in Spain, a country enjoying above average margins in the early 1990s. The improvement in profitability in 1995-96 partly attenuated this movement in connection with the satisfactory performance of securities markets.[22]

However, EMU may not affect all institutions equally. One usual prediction of increasing competition is that some banks will lose and others will gain, as EMU will have the effect of reallocating

[22] Indicators are computed on the sample of banks provided by IBCA (see methodological notes to Table 4 for details), using "ratios of average", i.e. dividing the cumulative sum of profits across banks by the cumulative sum of assets. Formally $(\Sigma^n{}_i P_i)/(\Sigma^n{}_i A_i)$, where P_i is the profit, and A_i the total assets of bank i and n the number of banks.

intermediation margins among banks, which will therefore have to focus even more on non-interest income and fee-generating activities. All banks are not equally prepared to make this transition. The final result might therefore be to introduce more diversity across banks in terms of profitability. Increasing competition will in the short run reduce rents, so that the most X-inefficient banks will show a lower level of profitability. In the medium/long run, this will lead to a restructuring of the banking industry.

Chart 2
Bank profitability*
All universal banks



* Profit before tax/total assets.

Sources: Fitch IBCA Bankscope CD-ROM and author's calculations.

As a test exercise of the possible effects of EMU, it may be worthwhile to consider the distribution of profitability across institutions during the period of implementation of the Single Market programme. Using data from IBCA, we investigate differences in profitability across banks. Profitability is measured by the return on asset (ROAA) or equity (ROAE) and we distinguish between three classes of banks: large banks with total assets above ECU 5 billion, medium-sized banks with total assets between ECU 1 and 5 billion, and small banks (assets below ECU 1 billion). Two separate years are considered, 1994 (Table 5) and 1996 (Table 6), in order to correct for the possible influence of business cycle conditions. We test different hypotheses for our various sub-samples of banks.[23] We first compare, for each country sample, the average profitability to its standard deviation (both unweighted). If the population is normally distibuted, 95% of banks should have their profitability

[23] As we focus on the distribution across institutions the profitability of bank i is P_i/A_i using the same notation as in the preceding footnote. The unweighted average is $(1/n)\Sigma^n{}_i P_i/A_i$.

Table 5

Profitability indicators in 1994

All banks	Total				Banks / < ECU 1 bn				Banks / ECU 1 - 5 bn						Banks / > ECU 5 bn					
	ROAA		ROAE		ROAA		ROAE		ROAA			ROAE			ROAA			ROAE		
	AV	SD	AV	SD	AV	SD	AV	SD	AV	SD	F1	AV	SD	F1	AV	SD	F2	AV	SD	F2
BE	0.42	0.80	7.90	21.30	0.48	0.95	5.01	10.25	0.35	0.38	**	8.35	9.74		0.22	0.13	**	21.95	51.37	
DK	0.54	1.89	2.89	13.44	0.54	1.98	3.01	14.21	0.87	1.68		0.92	10.32		0.16	0.06	**	3.64	0.70	**
DE	0.33	0.60	6.74	5.70	0.33	0.65	6.57	5.49	0.33	0.42	**	7.50	6.92		0.24	0.19	**	6.80*	4.03	**
ES	0.59	2.11	7.42	18.82	0.47	2.74	3.43	14.11	0.74	1.38	**	8.70	15.99		0.65	0.45	**	17.55	30.93	
FR	0.21	4.73	–2.93	46.59	0.25	6.19	–0.24	42.31	0.19	1.34	**	–8.38	57.51		0.02	0.90	**	–1.10	29.17	**
IT	0.33	0.87	1.82	13.34	0.49	0.97	3.26	13.16	0.20	0.76	*	0.86	13.07		0.08	0.56	**	–1.14	14.18	
LU	0.67	1.29	9.76	9.02	0.75	1.49	7.49	8.24	0.60	1.08	*	12.28	10.20		0.46	0.30	**	4.73**	6.09	**
NL	0.63	1.49	8.82	9.32	0.46	0.62	7.30	7.29	0.35	0.46		7.94	6.37		1.83	3.77		17.04	16.99	
AT	0.40	2.69	6.23	21.96	0.49	3.73	4.35	29.10	0.33	0.34	**	8.00	9.01	**	0.22	0.08	**	9.26	10.05	
PT	0.23	1.56	4.72	7.59	–0.01	2.27	1.66	8.15	0.30	0.49	**	5.36	5.85		0.69	0.33		11.10	5.45	
UK	0.75	1.60	6.89	11.20	0.95	1.93	7.22	10.15	0.55	0.73	**	7.60	11.32		0.23	0.50	**	4.25	14.96	
EU 15	0.38	2.29	5.04	20.34	0.42	2.67	5.24	17.15	0.31	1.29	**	3.81	27.44		0.27	0.74		6.60	21.12	**

Universal banks	Total				Banks / < ECU 1 bn				Banks / ECU 1 - 5 bn						Banks / > ECU 5 bn					
	ROAA		ROAE		ROAA		ROAE		ROAA			ROAE			ROAA			ROAE		
	AV	SD	AV	SD	AV	SD	AV	SD	AV	SD	F1	AV	SD	F1	AV	SD	F2	AV	SD	F2
BE	0.37	0.80	5.97	10.51	0.40	1.00	4.43	11.69	0.36	0.39	**	8.23	10.01		0.25	0.12	**	8.48	3.75	**
DK	0.50	1.93	2.40	13.39	0.54	1.99	2.64	13.61	–0.25	0.93		–4.93	15.09		0.21	0.05	**	3.72	0.79	**
DE	0.33	0.55	6.79	5.73	0.32	0.58	6.61	5.44	0.34	0.43	**	7.63	7.03		0.30	0.20	**	7.06	4.63	**
ES	0.53	2.06	7.32	19.21	0.43	2.75	3.38	14.25	0.63	0.96	**	8.89	16.47		0.65	0.45	**	17.72	32.61	
FR	0.12	4.88	–1.51	37.25	0.12	6.60	0.24	28.36	0.12	1.06	**	–5.06	50.63		0.13	0.41	**	2.06	14.36	**
IT	0.35	0.89	1.94	13.89	0.52	0.95	3.61	12.94	0.19	0.81	*	0.69	14.44		0.02	0.61	**	–2.40	15.67	
LU	0.48	0.97	9.62	8.98	0.54	1.24	7.01	7.81	0.38	0.39	**	12.44	10.52		0.46	0.30		14.73**	6.09	**
NL	0.39	0.54	8.58	9.90	0.47	0.66	7.29	7.29	0.25	0.17	**	7.09	6.53		0.26	0.22		19.01	21.49	
AT	0.70	2.12	8.49	15.06	0.99	2.78	8.58	18.03	0.36	0.39	**	7.98	10.59	**	0.22	0.08	**	9.26	10.05	
PT	0.11	1.61	4.07	7.72	–0.17	2.27	0.65	7.42	0.17	0.45	**	4.71	6.51		0.69	0.33		11.10	5.45	
UK	0.43	1.13	6.44	10.18	0.48	1.40	5.35	9.16	0.43	0.55	**	8.48	11.23		0.26	0.49		7.18	12.41	
EU 15	0.33	2.01	5.35	16.46	0.34	2.36	5.35	12.67	0.30	0.72	**	4.77	24.81		0.29	0.46	**	7.13	16.38	**

Notes: Universal banks = commercial banks + savings banks + cooperative banks (countries where the coverage by IBCA is lower than 30 banks are not exhibited). ROAA = return on average asset. ROAE = return on average equity. AV = mean (unweighted)[*:significantly greater than zero at 10% level; **:significantly greater than zero at 5% level]. SD = standard deviation (unweighted). F1 = Fisher one-sided test of difference of variances between banks with assets < ECU 1 bn and assets included in ECU [1 - 5 bn]. F2 = idem as F1 for banks in assets size ECU [1 - 5 bn] and > ECU 5 bn. * = smaller banks have significantly higher variance at 10%. ** = smaller banks have significantly higher variance at 5%.

Sources: Fitch-IBCA Bankscope CD-ROM (unconsolidated accounts) and author's calculations.

Table 6

Profitability indicators in 1996

All banks	Total				Banks / < ECU 1 bn				Banks / ECU 1 - 5 bn						Banks / > ECU 5 bn					
	ROAA		ROAE		ROAA		ROAE		ROAA			ROAE			ROAA			ROAE		
	AV	SD	AV	SD	AV	SD	AV	SD	AV	SD	F1	AV	SD	F1	AV	SD	F2	AV	SD	F2
BE	0.96	3.16	8.93	13.77	0.97	3.15	6.60	9.39	1.33	4.00		11.81	7.81	**	0.21	0.32	**	19.31	32.53	
DK	1.51	1.54	10.47	8.19	1.50	1.36	10.33	8.48	2.78	4.26		11.29**	2.30		0.69**	0.31	**	12.55**	4.68	
DE	0.30	1.34	6.80	4.97	0.31	1.49	6.73	4.73	0.29	0.34	**	6.96	6.05		0.24	0.20	**	7.51	4.88	**
ES	0.98	1.73	10.06	9.76	1.05	2.11	9.59	9.94	0.98	1.18	**	10.65	11.09		0.70*	0.42	**	10.80**	4.89	**
FR	0.10	3.48	1.52	44.05	0.07	4.41	4.04	46.27	0.15	1.65	**	–2.80	46.82		0.07	0.71	**	0.57	17.45	**
IT	1.29	2.31	9.26	14.55	1.57	2.51	11.63	6.65	0.43	0.50	**	4.55	6.48		0.06	1.26		–6.85	45.96	
LU	0.64	1.19	10.70	8.70	0.76	1.50	8.25	7.60	0.42	0.30	**	14.26	10.16		0.54*	0.30		14.91**	4.23	**
NL	2.03	3.95	9.61	6.10	1.85	3.80	8.60	7.13	1.49	3.39		10.44**	4.39	**	0.37	0.54		12.23**	2.76	
AT	0.65	1.78	8.92	12.77	0.93	2.33	10.14	16.54	0.30*	0.16	**	7.04*	4.23		0.24**	0.08	**	8.09**	3.49	
UK	1.70	4.99	11.34	15.78	1.87	5.76	9.91	16.30	1.60	2.76	**	14.21	14.63		0.48	0.47	**	15.80	13.02	
EU 11	0.59	2.27	7.25	21.42	0.66	2.55	7.95	20.73	0.41	1.28	**	5.60	22.90		0.34	1.29		4.90	23.38	
EU 15	0.69	2.45	7.70	20.66	0.78	2.74	8.21	19.94	0.51	1.50	**	6.28	22.44		0.38	1.22	**	6.44	22.49	

Universal banks	Total				Banks / < ECU 1 bn				Banks / ECU 1 - 5 bn						Banks / > ECU 5 bn					
	ROAA		ROAE		ROAA		ROAE		ROAA			ROAE			ROAA			ROAE		
	AV	SD	AV	SD	AV	SD	AV	SD	AV	SD	F1	AV	SD	F1	AV	SD	F2	AV	SD	F2
BE	0.58	1.09	8.20	9.45	0.69	1.33	6.37	9.64	0.46	0.34	**	12.31	8.03		0.24	0.35		10.15	8.98	
DK	1.42	1.06	10.35	7.98	1.45	1.07	10.18	8.12	0.81**	0.24	**	11.83**	1.64	**	0.90**	0.21		15.02**	3.54	
DE	0.31	1.38	6.77	4.82	0.31	1.51	6.75	4.60	0.29	0.35	**	6.88	6.05		0.27**	0.10	**	6.66**	1.96	**
ES	0.96	1.73	10.19	9.93	1.04	2.14	9.62	10.11	0.91	1.01	**	10.67	11.20		0.74*	0.43	**	11.78**	3.94	**
FR	–0.12	3.54	1.06	41.80	–0.30	4.73	2.17	48.27	0.07	1.34	**	–1.08	37.99	**	0.04	0.80	**	2.84	10.28	**
IT	1.36	2.35	9.77	14.65	1.60	2.53	11.84	6.43	0.53	0.31	**	5.98*	3.08	**	0.00	1.39		–9.56	50.63	
LU	0.45	0.52	10.83	8.70	0.44	0.64	8.09	7.42	0.42	0.30	**	14.26	10.16		0.54*	0.30		14.91**	4.23	**
NL	1.11	2.35	7.93	5.39	0.89	1.12	6.77	5.90	0.41*	0.23	**	8.45**	3.97		0.32	0.57		11.95**	3.16	
AT	0.71	1.91	9.12	13.50	0.96	2.38	10.49	16.73	0.30**	0.13	**	6.15**	2.82	**	0.24*	0.08	*	8.09**	3.49	
UK	1.36	4.33	11.06	10.77	1.63	5.10	10.00	10.40	0.63	0.60	**	11.30	12.05		0.83	0.56		20.00**	7.71	
EU 11	0.54	2.03	7.38	20.07	0.60	2.29	7.96	19.89	0.35	0.78	**	6.11	19.09		0.35	1.34		4.43	24.72	
EU 15	0.61	2.07	7.71	19.39	0.69	2.32	8.16	19.09	0.37	0.78	**	6.42	18.92		0.41	1.29		6.00	24.09	

Notes and sources: See Table 5.

appears that in 1994 and 1996, profits were significantly positive only for the largest banks in Germany while it was also the case in 1996 for medium-sized and large banks in Denmark and Austria. Large banks in Belgium experienced significantly positive profits in 1994 only, while Netherlands saw an improvement in the profitability of medium-sized as well as large banks between 1994 and 1996. In Spain, the improvement in 1996 was limited to large banks. Actually, in many cases, the distribution of banks' profitability is not normally distributed, so that the high value of the standard deviation/averages ratio measures the high dispersion of profits among banks. We study, then, more precisely the dispersion of profitability across classes of banks by comparing the standard deviation of profits between small and medium sized banks (Column F1) as well as between medium-sized and large banks (Column F2) using a F-test. It appears that, in most countries, the variability of returns was statistically decreasing across size classes of banks for most countries, with the highest dispersion among banks with assets below ECU 1 billion. It is not clear, however, whether such a result reflects the fact that small banks remained sheltered from competition (i.e. entry barriers enabled them to survive even with a low profitability), or signals more structural problems of lower efficiency of some small banks.[24] Returns on assets or equity, which are more significantly positive for large banks, may tend to favour the second hypothesis. One can therefore expect EMU to further increase the variability of profits across institutions and to foster restructuring of some segments of the market.

4. Conclusion

EMU will certainly have a major impact on the European banking system. Admittedly, banking systems in many countries are experiencing a restructuring phase in response to worldwide trends affecting the industry. However, the single monetary policy will generate new activities, in particular in connection with the emergence of larger and deeper financial markets. This will require changes in the strategic focus of banks operating in the euro area. In addition, competition is likely to increase significantly with the single currency, as one of the major obstacles to financial integration will disappear, although retail banking markets will keep, at least at the beginning of EMU, many of their "local" features, in particular those due to tax differences.

Market participants are adapting their accounting and operational systems and can now define their strategies. One realistic scenario is therefore that the final impact of EMU will be to increase the competitiveness of banks in the Single Currency area and to favour the emergence of some large European-based global banking groups, while, at the same time, smaller institutions may develop profitable "niches". Provided that the supply of financial services is adequately priced ex ante (this would require that not all banks decide to invest in the same sectors and that banks do not lend imprudently to new customers), successful financial institutions will soon reap the benefits of EMU.

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[24] See Davis and Salo (1998).

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Restructuring the Canadian financial system: explanations and implications

Walter Engert, Ben S. C. Fung, Loretta Nott and Jack Selody[1]

1. Introduction

This paper explores the major financial restructuring of the Canadian financial system over the past thirty years, the motivating factors behind this change, and considers implications for monetary policy and financial stability.

Historically, the Canadian financial system was based on five principal groupings of financial institutions: chartered banks, trust and mortgage loan companies, the co-operative credit movement, insurance companies, and securities dealers. In the post-war period, there have been several changes to the Canadian Bank Act in response to market-driven developments in the financial industry. In the second half of the 1980s and early 1990s, major legislative reforms were introduced to accommodate the financial restructuring that was taking place during this time. In 1987, changes to federal and provincial legislation permitted chartered banks to enter the securities industry through subsidiaries, and non-resident securities dealers were generally permitted to operate in Canada. By 1992, further reforms had been implemented, which permitted federal financial institutions to diversify into new financial businesses (including the provision of full consumer and commercial lending powers to trust and insurance companies), eliminated reserve requirements, and permitted banks and loan companies to offer portfolio management advice. Some of these expanded powers could be offered in-house, while others had to be offered through subsidiaries.

There are, at least, three primary factors that appear to have motivated and influenced the financial restructuring process in Canada. The first factor is the information and technology revolution, which has increased the efficiency and competitiveness of global financial markets, and has provided consumers and firms with a wealth of investment and borrowing alternatives at lower costs. The second factor is the changing financial habits of the "baby boom" generation as they go through their life cycle. This demographic shift has recently exerted significant effects on savings behaviour and the structure of financial markets as baby boomers prepare for their retirement. Finally, the third factor is the effect of a volatile inflation and interest rate environment in the past thirty years, which has influenced the way households and firms manage their financial affairs.

These factors, facilitated by financial restructuring and legislative changes, have led to significant changes in the Canadian financial system over the past thirty years. There has been a considerable amount of consolidation owing to a number of mergers and acquisitions within the financial services sector. Consequently, assets have been re-distributed among industry participants, relatively new financial markets, such as repo markets, have become fully developed, and significant improvements have been made in the range of financial investment choices available to consumers, such as mutual funds. Overall, the Canadian financial industry has become a more competitive, innovative and efficient system.

Although there has been a significant amount of financial restructuring in Canada over the past thirty years, there is little evidence to suggest that the monetary transmission mechanism has been affected. Analysis shows that the broad business-cycle characteristics and correlations over the 1990s are similar to those of the 1960 to 1989 period. Neither does an examination of the instabilities in the models used at the Bank of Canada suggest that there has been a fundamental change in the transmission mechanism, although restructuring has affected our monetary data, and hence has forced

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a re-consideration of how we measure money. These findings should not be surprising given that market forces have for many years dominated the transmission of monetary policy effects in Canada, and financial restructuring has reinforced these market forces.

Finally, we consider implications for financial stability. We show that there have been a number of innovations in the supervisory regime during the last decade to maintain financial stability. We point to several influences that are likely to continue to affect financial restructuring in Canada (and in other countries as well). These include the increasing complexity of financial services, the blurring of generic distinctions among financial service firms, greater international linkages, better appreciation of moral hazard, and improved risk-proofing of payments and other clearing and settlement systems. Looking ahead, these trends may result in a more focused mandate for supervisors, and in the use of a more rules-based approach in the conduct of supervision, along the lines of a prompt corrective action regime. Finally, there may be an increased emphasis by central banks on issues related to macro-financial stability.

The paper is organized as follows. Section 2 describes the general framework of the Canadian financial system and outlines the legislative amendments made over the past thirty years. Section 3 explains in detail the primary factors that have affected the financial restructuring process. Section 4 recounts the speed and breadth of financial restructuring that occurred in the late 1980s and 1990s. Sections 5 and 6 explore whether financial restructuring has fundamentally affected the monetary transmission mechanism. And finally, Section 7 considers current trends that may affect financial stability and identifies possible implications of these trends for regulatory practice.

2. Historical background[2]

The Canadian financial system can be considered to be among the most highly developed in the world. Historically, Canadian financial institutions chose to organize themselves in five principal groupings: chartered banks, trust and mortgage companies, the co-operative credit movement, insurance companies, and securities dealers.[3] Traditionally, chartered banks have been involved in personal and commercial lending, as well as personal and business deposit-taking. Trust and mortgage loan companies, as well as co-operative credit movements (credit unions and caisses populaires), primarily specialized in consumer and residential mortgage lending, while at the same time competed with chartered banks for personal deposits. Life insurance companies sold insurance and annuities, and securities dealers were involved in underwriting and selling bond and stock issues.

Unlike some countries, Canadian legislation requires the separation of chartered banks and commercial firms through the absence of both upstream and downstream linkages.[4] Since 1967, Canadian banks have been required to be widely-held, which means that no person or entity can beneficially own more than 10% of any class of shares of a bank. However, after 1980, Schedule II banks, which were a newly introduced class of banks, could be started and owned on a closely-held basis.[5] Trust and loan companies could be closely-held by commercial interests.

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2 This discussion follows Freedman (1992, 1998).

3 Legislative structure supported the financial institutions' desire to specialize in one of these five groupings. More recently, legislation has adapted to support financial institutions as they choose to become less specialized.

4 A "downstream" link refers to a controlling ownership position held by a financial institution in a non-financial corporation. An "upstream" link refers to a controlling position held by a non-financial corporation in a financial institution.

5 A bank where no person or entity can beneficially own more than 10% of any class of shares is referred to in the Bank Act as a Schedule I bank, while a Schedule II bank refers to all other banks where a person can beneficially own more than 10% of any class of shares (defined as a significant interest). However, at the end of the first 10 years of the life of a Schedule II bank, steps must be taken to ensure that no persons holds a significant interest in the bank. Foreign banks and eligible non-bank Canadian financial institutions that are themselves widely-held are not subject to this 10 year limitation.

In terms of regulatory responsibility, the federal government is generally responsible for the banking sector, provincial governments for the co-operative sector (credit unions and caisses populaires) and the securities industry. Trust and insurance companies can be incorporated either federally (and supervised by a federal agency) or provincially (and supervised by a provincial agency), although the vast majority of companies are federally regulated (at least when measured by assets controlled by these companies).

The most interesting regulatory requirement, perhaps, is the inclusion of a "sunset" clause in Canadian banking legislation, which requires a periodic reassessment and updating of the laws governing Canadian banks. This formal process of re-examining the legislative arrangements approximately each decade through the post-war period has lead to some significant revisions to the Canadian Bank Act. Moreover, this requirement has, in part, allowed Canadian financial legislation to respond and adapt effectively to pressures that arose with the evolution of the financial industry.

There are numerous examples of how Canadian legislation has been responsive and adaptive to market-driven developments in the financial industry. In the 1980s, various financial institutions, which historically had specialized in different areas, became interested in broadening their range of permitted activities. In part, this desire derived from their experience with the difficult financial markets of the late 1970s and early 1980s, which left financial institutions concerned that they might not have the flexibility to cope with some of the challenges they expected to face in the coming decade.

As a step towards accommodating this desire, in 1980, during the formal re-examination proceedings of the Bank Act, amendments were made to permit domestic banks to wholly own mortgage loan and venture capital subsidiaries, and their financial service powers were broadened. The mortgage loan subsidiaries could raise deposits that were exempt from reserve requirements, allowing banks to compete more effectively in the mortgage lending market with trust companies, whose deposits were not reservable. At the same time, foreign banks were allowed to establish banking subsidiaries in Canada.[6]

By the mid-1980s, however, several factors began to play an important role in intensifying the pressures for major legislative restructuring. Among some of the more important factors were:

- the need to modernize legislation governing non-bank financial institutions;
- the need to re-examine the business powers for different types of financial institutions;
- the need to deal with concerns of self-dealing, conflicts of interest, and concentration of ownership in closely-held ownership arrangements;
- the need to address concerns about the structure of the deposit insurance system and the adequacy of the supervisory structure, after the costly failure of many trust and mortgage companies, and two small banks, in the 1980s;
- the need for harmonization between federal and provincial regulatory policies; and
- the need to take account of the increased importance of internationalization and securitization.

Although all of these factors contributed in some way to the future process of legislative change, the first three factors were the main catalysts for initiating change, for during this same period, banks were strongly expressing a desire to enter the securities business. This, in part, was a reaction to the trend for large corporate borrowers to move away from bank loans to securities markets for financing. As well, some banks were already engaged in the securities business outside Canada, and viewed access to the domestic securities business as an important means of providing better service to their customers. More generally, it was felt that the entry of Canadian financial institutions into the domestic securities business could provide a new source of capital to support the growing importance

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[6] Foreign banks had already entered Canada as financial corporations and were making loans financed largely through the issuance of commercial paper. They were not subject to the Bank Act prior to 1980.

of that industry. Finally, given that the major institutions would be competing in the same business lines, it was increasingly recognized that reserve requirements, essentially a tax on banks, were a source of competitive inequity.

In response to these pressures, major legislative reforms were introduced and that further changed the structure of the Canadian financial system, which were not triggered by the "sunset" clause. In 1987, changes to federal and provincial legislation accommodated the desire of chartered banks to enter into the securities industry through subsidiaries. Up until this time, banks were permitted to invest in corporate securities for portfolio management purposes, underwrite and distribute government bonds, buy and sell securities on an agency basis, and distribute corporate securities as members of a selling group. However, until the 1987 amendments, they were prohibited from underwriting corporate securities. Also in 1987, legislative reforms were introduced that generally permitted non-resident securities dealers to operate in Canada.[7]

By 1992, the financial restructuring process intensified as major reforms governing all federally regulated financial institutions were implemented in response to developments affecting the entire financial services industry.[8] During the 1980s, trust companies were experiencing an increase in demand for shorter-term savings deposits because of inflation uncertainty and interest rate volatility. They were also concerned that the demand for residential mortgages, the major asset they held, would decline because of demographic factors. To avoid the risk involved in mismatching the terms of assets and liabilities, and to ensure an adequate range of assets in which to invest depositors' funds, these companies sought the ability to invest in floating rate and short-term assets, primarily commercial loans.

Similarly, life insurance companies, in response to changing consumer preferences, were shifting their activity away from traditional life insurance products towards short-term deposit-like instruments, and term and group insurance products. Consequently, they too wished to be able to diversify into assets that better matched their liabilities. In addition, life insurance companies and commercial banks wanted to be able to round out their product lines and compete more effectively for fiduciary business and retirement savings, which were expected to be a growing business.

Therefore, the 1992 amendments covered three broad regulatory areas. First, they allowed for a broadening of business powers so that federal financial institutions could diversify both into new financial and limited non-financial services. Some of these expanded powers could be offered in-house, while others had to be offered through subsidiaries. For instance, banks and life insurance companies were allowed to own trust companies, and banks and trust companies to own insurance companies. In terms of the expansion of in-house powers, trust and insurance companies were given full consumer and commercial lending powers, and banks and loan companies were permitted to offer portfolio management advice. As a result, Canadian financial institutions were able to develop into conglomerates with involvement in a variety of financial areas, but because of limitations on investments in non-financial businesses they could not become (German-style) universal banks. The expansion of business powers accommodated the desire by financial institutions to offer a wider range of products and services that have increased the linkages between Canadian financial institutions.

Second, the 1992 amendments required any federally regulated financial institution with more than $750 million in capital to have 35% of its voting shares widely-held and publicly traded on a Canadian stock exchange within five years of reaching this capital level. However, in some cases, ministerial exemption from this rule is available under the Bank Act.

Finally, the 1992 reforms strengthened corporate governance with new rules on self-dealing, and by requiring financial institutions to establish a Conduct Review Committee, comprised of a majority of

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[7] There were also important changes made to the regulatory framework in 1987, as well as 1995, the most important being the creation of a single supervisory body in 1987, and a clarification of its mandate in 1995. For further details on the supervisory innovations, see Section 7.1.

[8] At this same time, the "sunset" clause which required a periodic re-examination of banking legislation was extended to include non-bank financial institutions, and the re-examination period was shortened from ten years to five.

directors that are not affiliated with the institution, to ensure that procedures are in place for compliance with the new rules on self-dealing. As well, the 1992 amendments required some representation on the Board of Directors by unaffiliated individuals, and enhanced the duties and responsibilities of the board of directors.

Although the 1987 and 1992 legislative reforms were fairly significant, the financial restructuring process for Canada is far from over. In 1996, the Payments System Advisory Committee was established to contribute to the government's examination of issues related to accessibility and the oversight of the payments system. In this same year, the Task Force on the Future of the Canadian Financial Services Sector was established. This committee's broad mandate was to study public policies affecting the financial services sector, and focus their attention on improving the competitiveness and efficiency of the sector in the face of globalization and technological innovations, while at the same time enhance the industry's contribution to job creation and economic growth. As of September 1998, the Task Force has made their recommendations, which will no doubt influence the next set of legislative amendments that will bring us into the next century.

In summary, the Canadian financial industry traditionally was a highly structured system based on five principal groupings of financial institutions. However, as pressures began to intensify for major financial restructuring, and as Canadian legislation adapted to developments in the marketplace, the traditional structure has become blurred. Furthermore, as the tradition of adaptive legislation continues, the financial restructuring process will no doubt continue, which will facilitate the development of a more competitive and efficient financial system.

3. The causes of financial regulatory change

Clearly, there have been numerous changes in Canadian financial regulation. However, these developments have not occurred in a vacuum; on the contrary, they have been motivated by more fundamental influences which are considered in this section. There are, at least, three underlying economic factors that have been the catalysts for financial restructuring in Canada and around the world: (i) the technology and information revolution; (ii) demographics; and (iii) the variability of inflation and interest rates.

3.1 The technology and information revolution

The rapid development of computer technology and with this, the spectacular improvements in the access to worldwide information in the past two decades, is probably the single most important factor facilitating and driving financial restructuring around the world. Technological developments have improved efficiency, and intensified the speed of innovation in terms of new financial products and the delivery of banking services. Furthermore, technology has permitted the globalization of markets and has revolutionized information systems. As a result, this has given households and businesses easier access to financial alternatives.

There have been numerous developments in the financial services sector as a direct result of technological innovations.[9] To begin with, there have been significant improvements in the efficiency of the electronic processing of transactions. These efficiency gains have led to a merging and outsourcing of backroom operation activities of large Canadian banks to take advantage of the economies of scale.

In addition to increasing the efficiency of data processing, the improvements in information technology have facilitated the development of new instruments and markets that permit the disentangling of financial service functions – functions which were once considered largely

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[9] For a more detailed analysis of how technological developments have changed the financial services sector in Canada, see Freedman and Goodlet (1998).

inseparable.[10] As a result, the risk exposure related to various financial services that any individual financial institution faces can now be reduced. For example, it used to be the case that when a bank made a mortgage loan it was responsible for the processing of payments over the lifetime of the loan, and for taking on the credit risk associated with this loan. However, with the development of securitization, a bank can now package the residential mortgages on its books for resale in the form of mortgage-backed securities. The development of the securitization market has allowed institutions to reduce their credit risk and borrowing costs, as well as free up liquidity and capital for other purposes. Repo and foreign exchange swap markets are other examples of ways financial institutions can now unbundle and re-bundle their financial service functions, which enables them to manage their risk more effectively, and in turn permits them to offer their customers a broader range of services.

Although this technological revolution has provided the industry with the means to develop new products and instruments, and has made certain aspects of the sector more efficient, technology and its impact on the availability and accessibility of information has also influenced the financial activities of households and businesses. With ever-increasing financial news coverage and wider access to the Internet, information on alternative investments around the world is now available to households and businesses as never before.

Figure 1
Canadian private non-financial corporations
Bank loans/Total liabilities

Source: Statistics Canada.

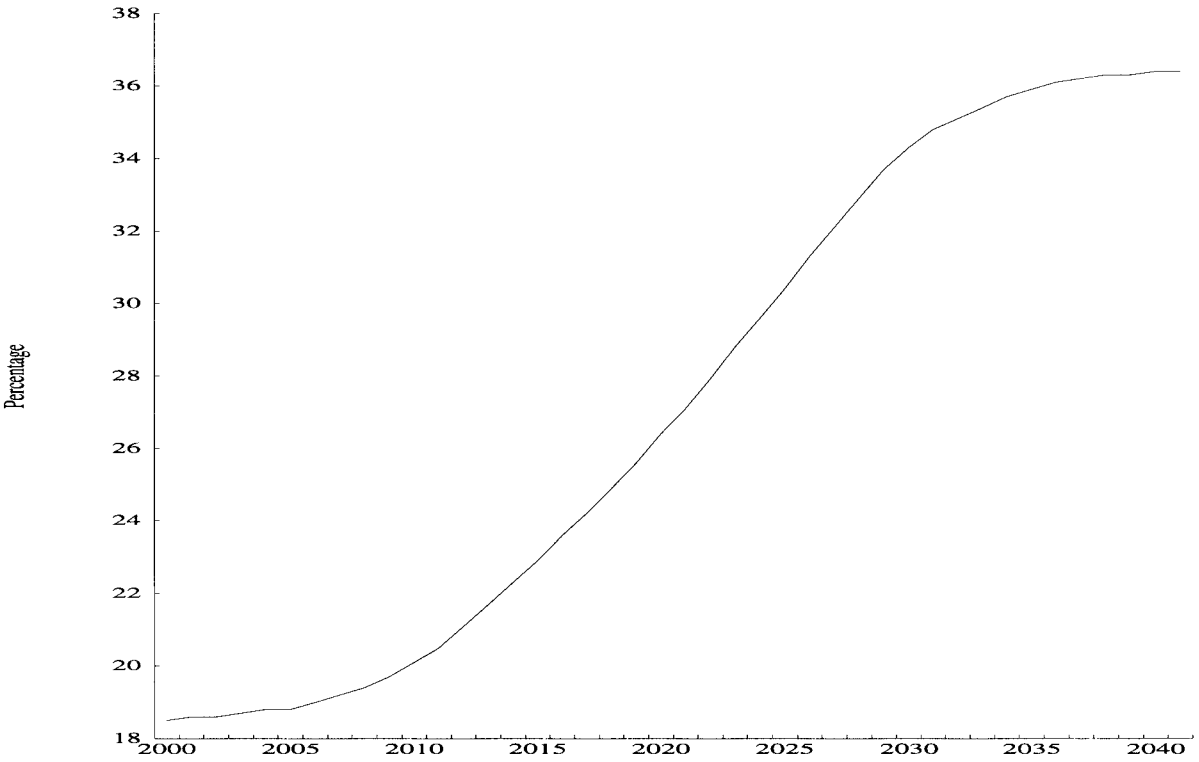
[10] According to Merton and Bodie (1995, p. 5), there are six basic functions provided by the financial industry:
(i) to provide ways of *clearing and settling payments* to facilitate trade;
(ii) to provide a mechanism for the *pooling of resources* and for the *subdividing* of shares in various enterprises;
(iii) to provide ways to *transfer economic resources* through time, across borders, and among industries;
(iv) to provide ways of *managing risk*;
(v) to provide *price information* to help coordinate decentralized decision-making in various sectors of the economy; and
(vi) to provide ways of *dealing with the incentive problems* created when one party to a transaction has information that the other party does not or when one party acta as agent for another.

Furthermore, along with improvements to information availability, technology has provided greater access to global financial markets and alternative methods of financing. As can be seen in Figure 1, bank loans as a proportion of total corporate liabilities have fallen from the mid-1980s, as other instruments such as equity, bonds, bankers acceptances and commercial paper became more important sources of funds for Canadian corporations. Technological improvements have undoubtedly had some effect on the declining rate of bank loans in the late 1980s and early 1990s.

3.2 Demographics and the "baby boom" generation

Along with rapid advances in information technology, a second factor affecting the financial sector has been demographics, particularly the changing financial habits of the "baby boom" generation as they go through their life cycle. In approximately ten years, the first wave of post-war baby boomers will begin to retire. This demographic shift is illustrated in Figure 2, which shows the expected path of the "old-age dependency ratio" (defined as the number of people aged 65 and older divided by the working population, that is, people 18 to 64 years old). As can be seen from the graph, this ratio begins to rise at the turn of the century from its current level of 18% and is projected to be nearly 35% by the year 2035.

Figure 2
Old age dependency ratio in Canada
Retired/Working population



Note: "Retired" is defined as aged 65+, and "working" as 18 – 64.
Source: Official medium growth scenario from Statistics Canada.

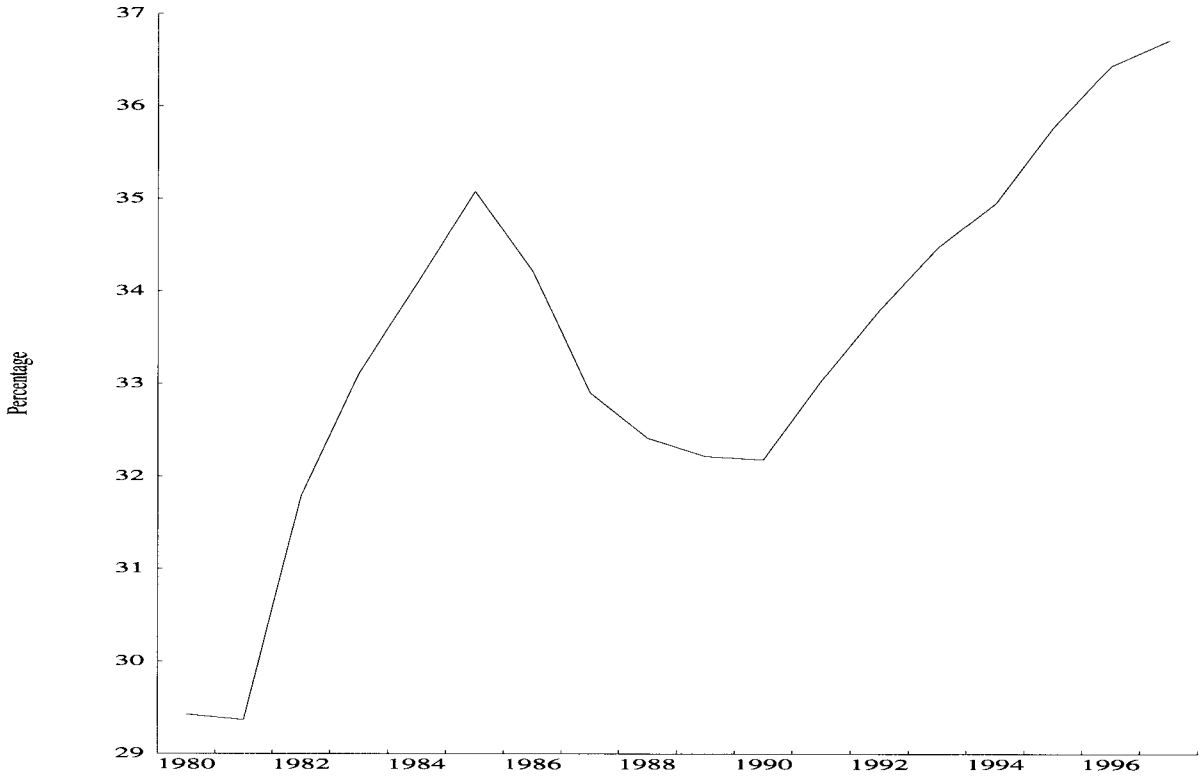
Baby boomers are having significant effects on aggregate savings behaviour and the structure of financial markets.[11] For example, as the ratio of old to young escalates and as fiscal policy has

[11] For a more detailed discussion on the implications of an ageing population for the United States see Cogley and Royer (1998), and for world-wide implications see Bank for International Settlements (1998).

retrenched, there is growing concern about the future of public sector pensions and the adequacy of the social safety net. Under these circumstances, baby boomers are preparing for their futures by increasing their own personal savings through purchases of financial assets. As a result, mutual funds, private pension funds, and other institutional assets are growing in importance.

Trends in the data confirm that Canadians have been increasing their financial asset holdings. As can be seen from Figure 3, the level of financial asset holdings by households as a proportion of total household wealth has risen from 30 to 37% over the past twenty years. Furthermore, it appears that there has been a shift from savings accounts and fixed term deposits to bond and equity mutual funds. As can be seen in Figure 4, savings deposits (notice and fixed term deposits) as a proportion of total personal deposits (which include Canadian Savings Bonds and bond and equity mutual funds) began to drop rapidly during the 1980s as the popularity of mutual funds and other financial assets began to rise. Further evidence of a portfolio shift from savings deposits to mutual funds can be seen in the Canadian broad money aggregates. Figure 5 presents the year-over-year growth rates for M2+, which includes savings and fixed term deposits, and M2++, which also includes Canadian Savings Bonds and mutual funds held at all financial institutions. From this graph, it is clear that mutual funds have become an extremely important savings instrument for Canadian households in the 1990s.

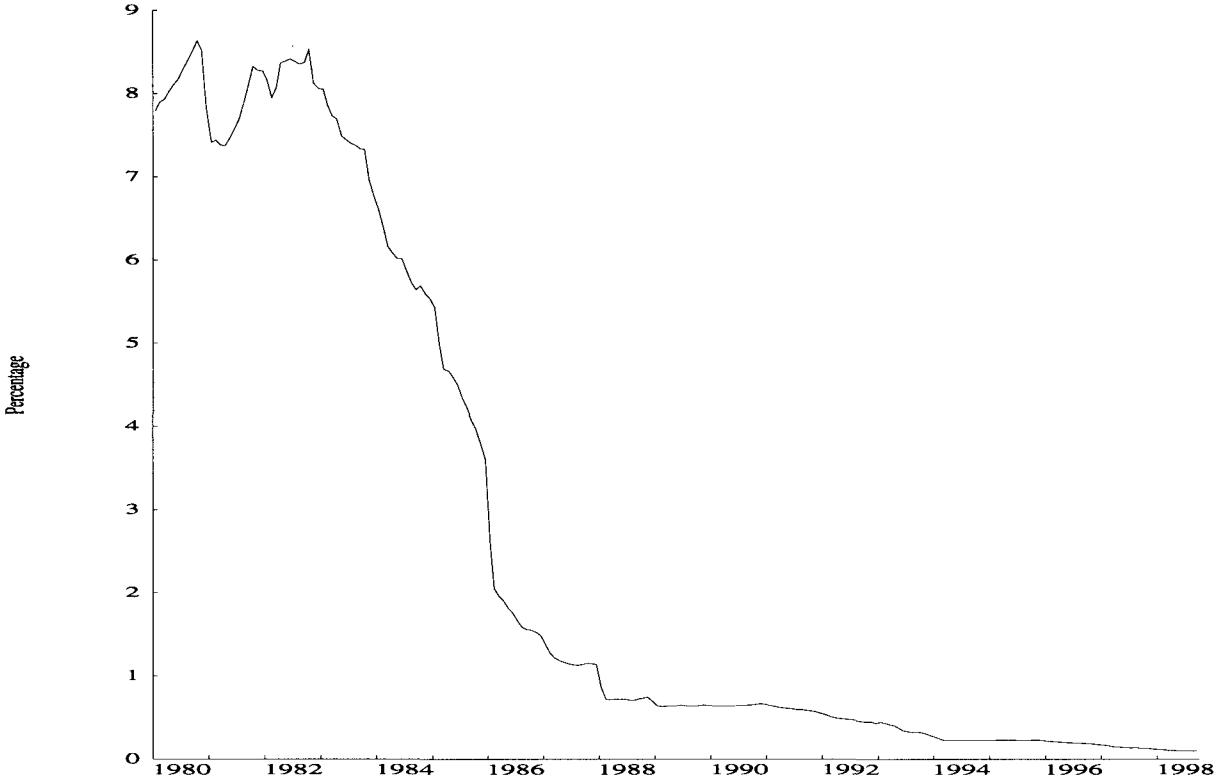
Figure 3
Canadian households and unincorporated businesses
Financial assets/Total assets



Source: Statistics Canada.

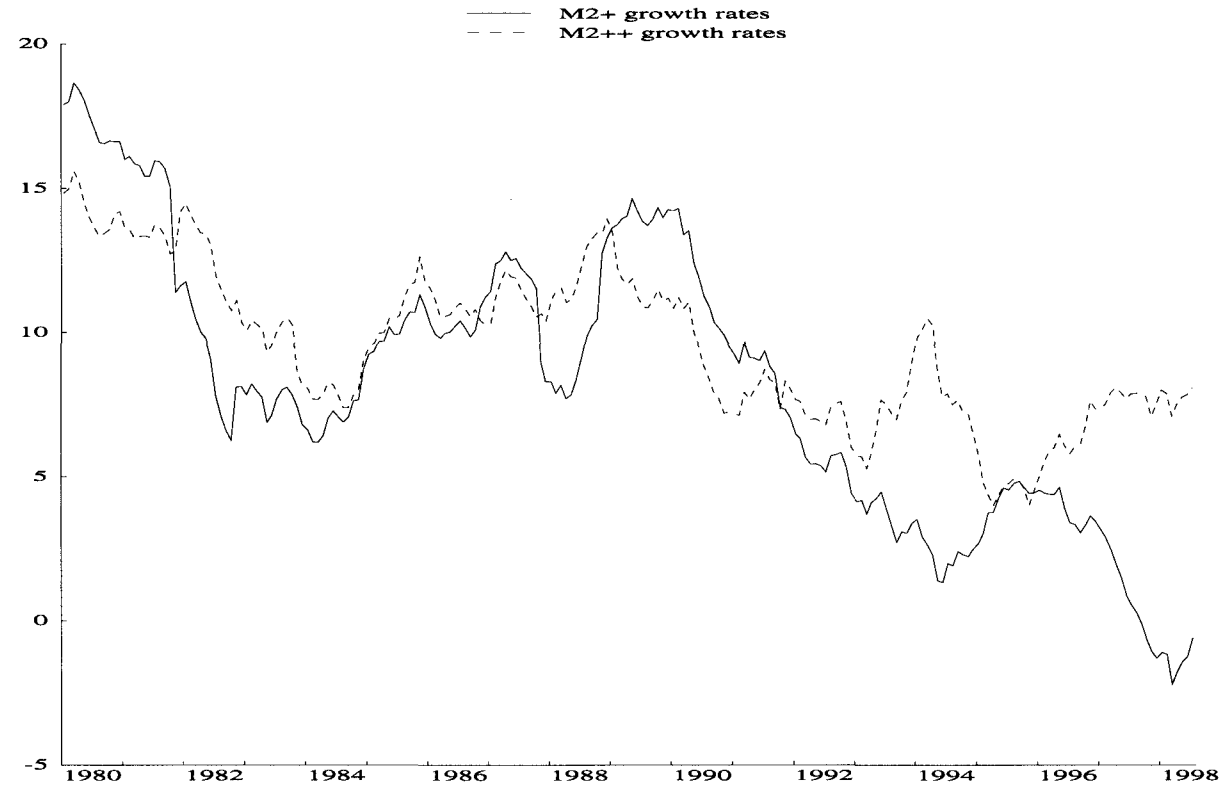
However, as baby boomers prepare for retirement by holding more of their wealth directly in financial form, and less in real assets, this has important implications on the scope and structure of domestic and international financial markets. Beyond the obvious consequences for the pricing and rates of return of financial assets, securities markets have to be highly efficient and developed to meet the demands of the investor. Furthermore, financial institutions have to become more sophisticated in the management of this wealth, and in providing information services that help their clients manage their wealth. Hence, regulatory policies will have to continue to accommodate the ever-changing financial environment in order for financial institutions to continue to meet the demands of their clientele.

Figure 4
Savings deposits as a percentage share of total deposits



Source: Statistics Canada.

Figure 5
Year-on-year growth rates for M2+ and M2++



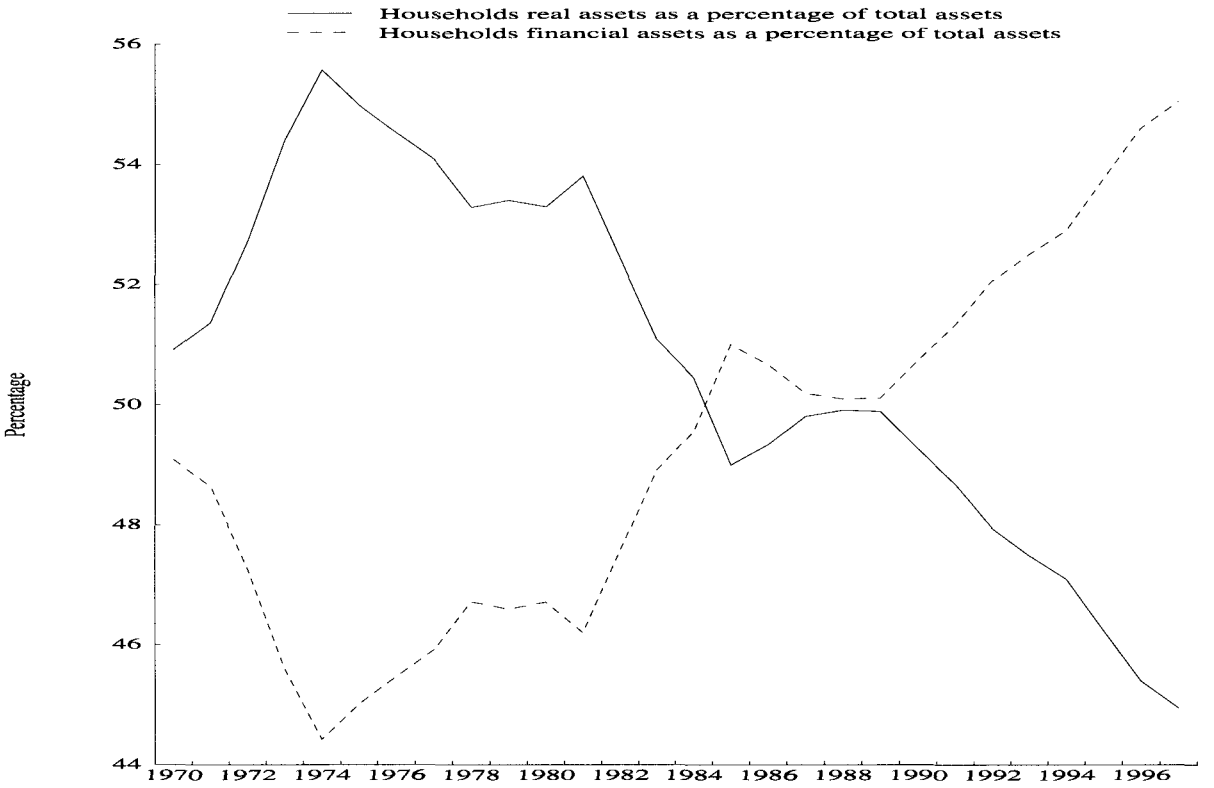
Source: Bank of Canada.

3.3 The variability of inflation and interest rates

In addition to the technological revolution and an ageing population, a third economic factor influencing the structure of the financial sector is the variability of inflation and interest rates. From the period of severe inflation in the 1970s, to high real interest rates caused by domestic and foreign fiscal policy imbalances in the 1980s, to the current period of low and stable inflation in the 1990s, inflation and interest rates have been variable in Canada and abroad. In turn, this has influenced the expectations of consumers and their financial behaviour.[12]

Figure 6 presents real and financial assets as a percentage of total household assets over the past 30 years. As can be seen from the graph, in the 1970s when inflation was high, households tended to invest in real assets such as housing. In the 1980s, with higher short-term interest rates, consumers began to invest in more financial assets, such as short-term government bonds and fixed term deposits. By the 1990s, however, inflation and interest rates were low, and consumers responded by continuing to invest in financial assets, although in riskier forms, such as equities and mutual funds, to achieve better rates of return.[13] Furthermore, as can be seen from Figure 7, at the aggregate level, households are becoming more indebted and therefore, potentially more exposed to volatility in interest rates.

Figure 6
Real and financial assets of households



Source: Statistics Canada.

As the economic environment influences where consumers want to invest their money, this in turn conditions the behaviour of financial institutions. In the 1970s, savers preferred real assets, such as housing, so financial institutions had to be innovative and competitive in the residential mortgage

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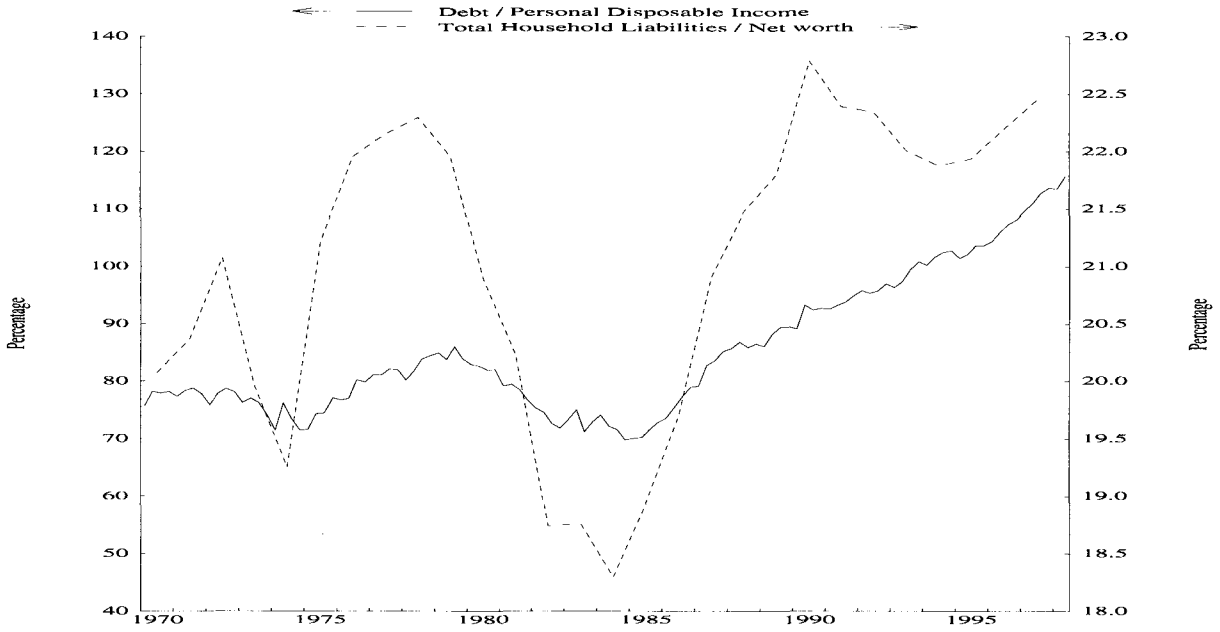
[12] For discussion of the evolution of monetary policy in Canada over the last few decades, see Crow (1988, 1993) and Armour, Engert and Fung (1996).

[13] Other factors, such as demographics and fiscal policy, also influence the financial saving and borrowing habits of households.

market. In the 1980s, short-term bonds and fixed term deposits became more popular and the sector responded by marketing more aggressively on Guaranteed Investment Certificates (GICs) and savings accounts. Currently, in the 1990s, consumers are demanding innovative equity products, and because of changed legislation and advances in information technology, financial institutions can satisfy this demand through their mutual fund products and securities subsidiaries.

Figure 7
Household debt and liabilities



Sources: Statistics Canada and Bank of Canada.

4. The Canadian financial system today

As a result of the financial restructuring and legislative change motivated by these economic factors, the Canadian financial system has significantly changed over the past thirty years.[14] The traditional structure of specialization has eroded as some financial institutions now participate in a wide range of banking, trust, insurance and securities activities. Foreign banks, which were not permitted in Canada twenty years ago, are now allowed to directly participate in the Canadian financial system through subsidiaries.[15] Supervisory agencies have been strengthened through clearer mandates, greater resources and broader powers, and the deposit insurance system has introduced an element of risk-rating in its premium structure.

As an illustration of the striking array of changes in the Canadian financial system over the last 20 years, consider the redistribution of financial intermediary assets among the industry participants. Figure 8 presents the share of financial assets as a percentage of total industry assets from 1980 to 1997.[16] As can be seen from the graph, deposit-taking activities have lost ground to securities activities

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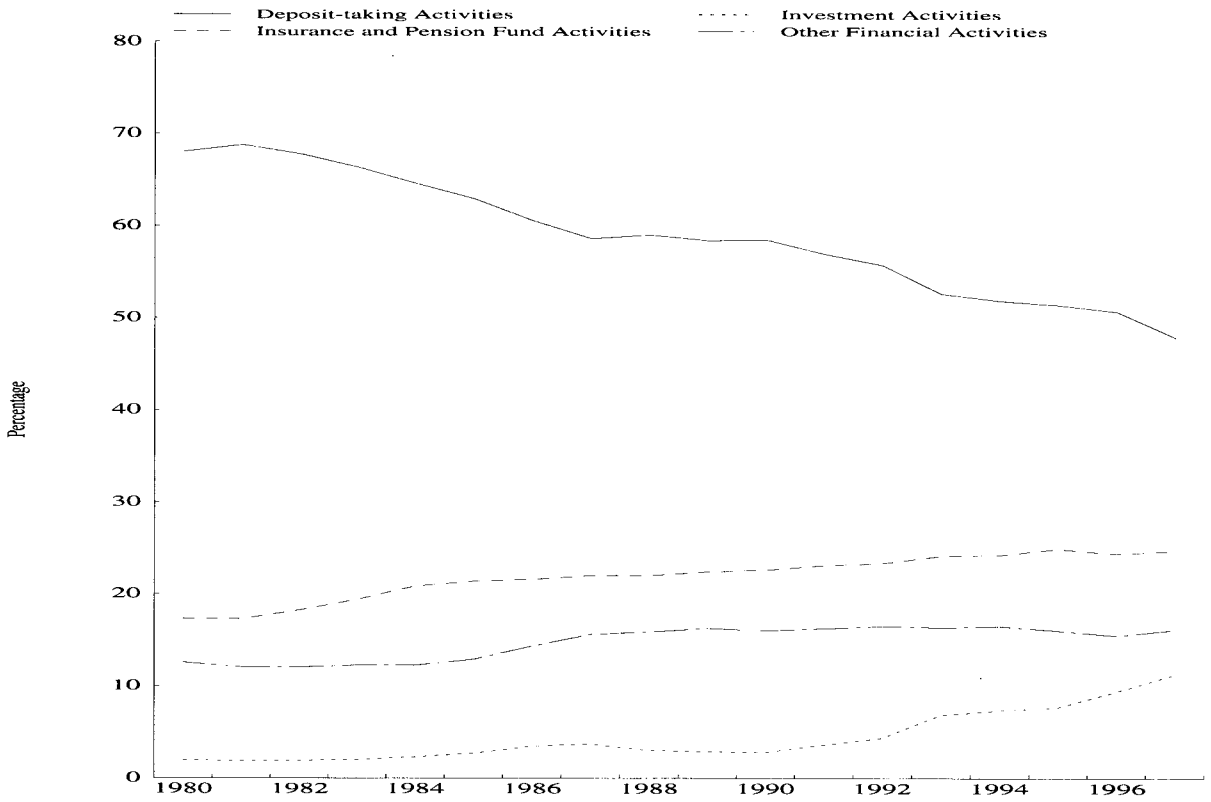
[14] For more information on the structural changes to the Canadian financial system see Chant (1997) and Neufeld and Hassanwalia (1997).

[15] The Canadian federal government undertook to relax restrictions on foreign bank entry, including the commitment to allow foreign banks to branch directly in Canada, during the World Trade Organization financial services negotiations in December 1997.

[16] We only consider the financial assets of the regulated financial institutions.

over the past twenty years.[17] Investment activities have gone from accounting for 2 to 11.3% of total financial intermediary assets in Canada. The fastest growing participants in this sector are mutual fund providers, which have grown from 0.8 to 10.4%. Much of this growth can be attributed to portfolio adjustments out of directly held savings and securities in favour of holdings with professional portfolio managers in order to better diversify risk.

Figure 8
Share of financial industry assets



Source: Statistics Canada.

Furthermore, since the 1987 and 1992 legislative reforms, there has been a considerable amount of consolidation within the banking, trust, and insurance sectors. Table 1 presents summary statistics on the number of entries, exits, mergers and acquisitions for the major Canadian financial sectors. As can be seen from the table, most of the consolidation has taken place in the trust and insurance sectors. Although there were more exits than entries in the trust and loan sector, the most significant changes were brought about through mergers and acquisitions. A large number of acquisitions occurred after 1992 when legislation permitted Schedule I banks to own trust companies. However, there were many acquisitions prior to 1992 by trust and loan companies and other intermediaries, suggesting that financial restructuring was well under way prior to the legislative reforms.

Similarly, the insurance sector has experienced a large number of withdrawals and failures, and an even larger number of mergers and acquisitions. Although the 1992 legislation allowed banks and trust and loan companies to own insurance companies, these institutions have played a small role in the restructuring that has occurred over the years in the insurance sector. Most of the mergers and acquisitions in this industry were among insurance companies alone.

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[17] The national balance sheet accounts published by Statistics Canada for each sector do not include subsidiaries. For example, the deposit-taking institution data do not include the investment dealer subsidiaries, nor do they include assets booked outside of Canada.

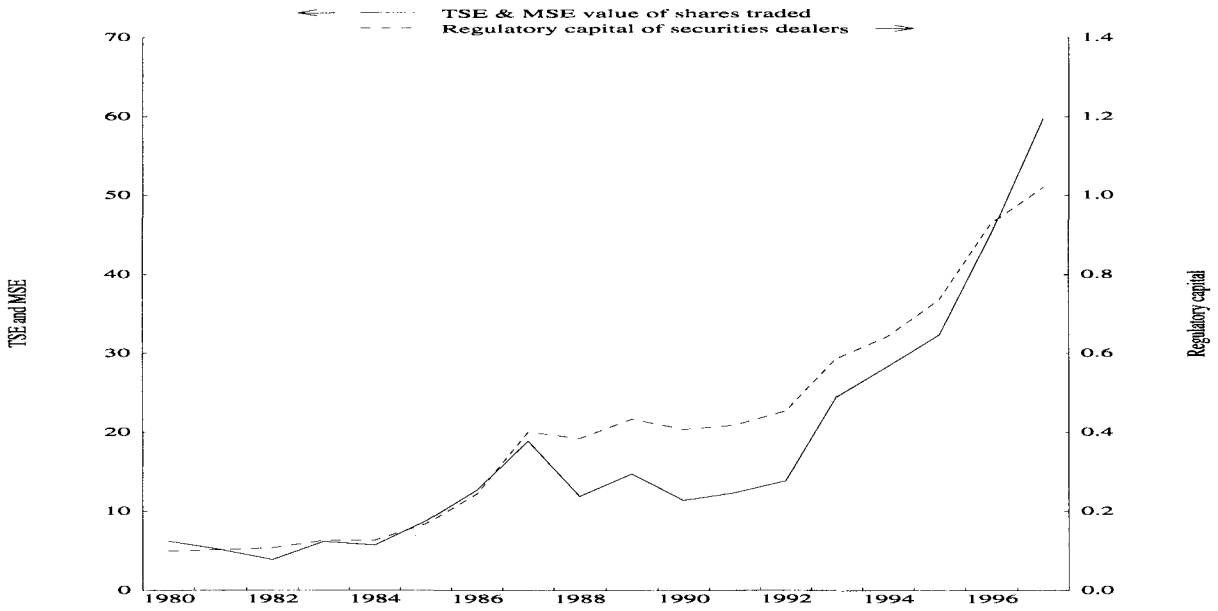
Table 1
Significant developments in the financial-services industry*

Type of institution	Entries since 1992	Withdrawals and closures since 1992	Acquisitions and amalgamations since 1987
Banks	8	10	23
Trust & loan companies	13	15	74
Insurance firms	17	62	107
Securities dealers (since 1987)	47	–	42
Other financial intermediaries	–	–	134

* This table has been updated from Neufeld and Hassanwalia (1997) with estimates based on annual publications from the Canada Deposit Insurance Corporation and the Conference Board of Canada.

As previously mentioned, the securities industry has been growing rapidly with a large number of new entrants, many of which are foreign firms. There has also been a significant amount of consolidation with the major banks taking over most of the large independent securities firms. As can be seen from Figure 9, the amount of regulatory capital in the securities industry has increased, at the same time that there has been a substantial increase in trading volumes on the major Canadian stock exchanges. Furthermore, the merging of the banking and securities industry has allowed banks to offer a range of savings and investment products, as well as investment advice, which further meet the needs of their clientele.

Figure 9
Securities industry indicators
As a percentage of nominal GDP



Sources: Bank of Canada and Canadian Investment Dealers Association.

In summary, the Canadian financial system is much different from what it was twenty years ago. Legislative reforms accommodated this change. Other factors, such as failures, technology and globalization have also influenced the nature and pace of financial restructuring. The most notable structural adjustments have been the dramatic consolidation in the trust and insurance sectors, as well as the rapid growth in the securities sector. As the millennium approaches, and as factors such as technology, demographics, and policy continue to influence economic behaviour, there is no doubt that the very near future will bring further structural adjustments within the Canadian financial system.

In this respect, the recent Report of the Federal Task Force on the Future of the Financial Sector (1998) put forward a number of recommendations that would bring further change to the industry. Notably, the Report promotes increased entry into the industry and more competition through a liberalization of the rules governing the ownership of financial service firms, including banks. It also recommends wider access to the payments system, to accommodate the direct participation of insurance companies, investment dealers and money-market mutual funds in the payments system. The Task Force advocates that deposit-taking institutions be able to lease cars and sell insurance directly in their branches. As well, greater foreign bank entry is encouraged in two ways. First, the Report endorses the government's decision to permit foreign bank branching in Canada, consistent with the WTO agreement on trade in financial services (except for retail deposit-taking). Second, the Task Force recommends the removal of the withholding tax on interest paid to non-residents to facilitate foreign lending to Canadians.

In sum, a fundamental direction of the Task Force Report is to promote greater entry from more diverse sources, and more competition, which would thus accommodate continuing restructuring of the financial services industry in Canada.

5. Implications for the transmission mechanism: the theory

In the previous sections we described the three major factors that have been affecting the Canadian financial system. These factors are encouraging financial institutions to provide new products and services that enable individuals to expand and transform their financial portfolios cheaply and quickly. This broadening of financial markets and activities may have affected the response of individual economic agents to interest rate and exchange rate changes. But access to well-developed financial markets by agents does not mean that monetary policy actions lose their effectiveness. That is, the new products and services offered by financial institutions, and the changes in behaviour that access to these products might produce, do not necessarily diminish the ultimate control that monetary policy has over inflation.

Although, as we will see from the evidence presented in the next section, monetary policy does not appear to have lost its effectiveness as a result of financial restructuring, certain aspects of the transmission mechanism may have been affected in important ways. However, determining those aspects of the transmission mechanism which have been affected by financial restructuring requires the solution to a difficult identification problem. The transmission mechanism may have changed for reasons other than financial restructuring. In the absence of a reliable structural model of the transmission mechanism that includes a well-articulated financial sector, it is difficult to draw firm conclusions, and inferences are unavoidably impressionistic.[18]

One of the most important links between monetary policy actions and inflation involves economic agents adjusting their expenditures in response to interest rate changes. A monetary policy action (e.g., a change in the overnight rate) disturbs the structure of relative prices among assets, and between asset stocks and income flows. Over time, these disturbances change agents' desired structure of asset holding, and in turn agents change their expenditures as they attempt to regain equilibrium. Some of the effects show up in organized financial markets, where they affect borrowing costs, but others involve changes in assets not traded in organized markets – cash balances at one end of the spectrum and consumer and producer durables at the other. Financial restructuring is unlikely to have affected the basic nature of these qualitative features of the transmission mechanism as financial markets and financial decisions in Canada are, and have been, relatively free from artificial distortion.

The basic process of adjusting expenditures can be influenced at the margin by expectations of where interest rates are likely to move. Financial restructuring has resulted in economic agents becoming

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[18] Such a structural model is under development at the Bank of Canada. Early work on this model is described in Hendry and Zhang (1998).

more active in managing their financial portfolios with financial intermediaries taking on more of an advisory and facilitating role. This has made economic agents more aware of changes in financial market variables and may have affected the speed with which changes in interest rates affect expenditures. The effect could go either way, however. On the one hand, the majority of economic agents might view changes in financial prices as largely temporary and maintain relatively smooth expenditure patterns in the face of changing interest rates, at least initially. This would tend to lengthen the time lag between monetary policy actions and changes in inflation. On the other hand, the majority of economic agents might view as permanent the capital gains or losses that result from interest rate changes and adjust expenditures quickly to reflect the perceived change in wealth. This would tend to shorten the time lag between monetary policy actions and changes in inflation. In general, there is no reason to believe that the majority of economic agents will always form expectations in one way or the other, so that the changes in expectations that accompany financial restructuring might make the lag between monetary policy actions and inflation even more variable and unpredictable than it already is.

A second important link between monetary policy actions and inflation involves the exchange rate, which affects the relative price of foreign relative to domestic products, and the relative value of assets denominated in foreign currencies relative to those denominated in the domestic currency. The effects of financial restructuring are likely to strengthen the exchange rate channel, at least to the extent that Canadians previously refrained from diversifying into foreign currency assets owing to a lack of suitable products and services.[19] Given greater accessibility, it is possible that Canadians would increase their holdings of foreign currency assets which will increase the sensitivity of their wealth to exchange rate changes, with potential spillover effects on their expenditure decisions.

To summarize, we do not expect to find that financial restructuring has changed the ability of monetary policy to control inflation in the long run. It might, however, have changed certain aspects of the transmission mechanism. In particular, it might have changed the lag between monetary policy actions, real expenditures and inflation. It might also have made this lag more variable. How important this is for monetary policy is largely an empirical matter.

6. Implications for the monetary transmission mechanism: empirical results

In this section, we examine the evidence to see whether the changes described above have affected fundamentally the monetary transmission mechanism. First, we consider whether the stylized facts that describe the business cycle in Canada have changed in the last decade. Then, we review some simple vector autoregression (VAR) models to see if there is any indication that the economy's response to monetary policy actions has changed with financial restructuring. Finally, we discuss how these financial changes have affected some of the models that inform policy discussions at the Bank of Canada, and how the models are being adapted to these innovations.

6.1 Basic business-cycle data

First, we examine the major stylized facts describing the 1990s and compare these data with those of the preceding decades. If there were marked differences in the broad correlations among the major macroeconomic variables of interest, this would provide an indication that the nature of the business cycle, and perhaps the transmission mechanism, has changed.

Table 2 presents the standard deviations and autocorrelations of key real and nominal variables, as well as their correlation with real GDP. The stylized facts shown here are not suggestive of any change in the cyclical behaviour of the Canadian economy between these two periods. With regard to real

[19] The exchange rate channel of the transmission mechanism encompasses the link between changes in domestic interest rates relative to foreign interest rates and changes in the exchange rate, as well as the link between changes in the exchange rate and changes in imports, exports and the substitution of these for domestic consumption and production.

variables, investment is more volatile than output while consumption is the least volatile, and this is consistent across the two periods. All the real variables are highly positively correlated with output and are highly autocorrelated in both periods. With regard to nominal variables, inflation is about as volatile as money growth, and the short-term interest rate is the least volatile. Moreover, prices become substantially less volatile in the second period, and we attribute this to the success of the Bank of Canada's strategy of targeting a low, stable rate of inflation. We also examined the variability of interest rates, monetary aggregates and credit aggregates from 1961 to 1998, but found no evidence of a trend in the variability of these time series.[20]

In sum, the broadly unchanged nature of these characteristics of the key business cycle data suggest that there has not been any apparent change in the nature of the business cycle or the transmission mechanism in the last decade.

Table 2
Cyclical behaviour of the Canadian economy

Variables	Standard deviation (%)		Correlation with real GDP		Autocorrelation	
	1962Q1–89Q4	1990Q1–98Q1	1962Q1–89Q4	1990Q1–98Q1	1962Q1–89Q4	1990Q1–98Q1
Real:*						
GDP	1.57	1.29	1.00	1.00	0.82	0.82
Consumption	0.70	0.67	0.63	0.58	0.63	0.50
Investment	6.05	4.21	0.87	0.78	0.78	0.71
Hours worked	2.06	1.61	0.87	0.90	0.82	0.82
Nominal:						
M1 growth rate	1.65	1.62	–0.18	-0.44	0.12	–0.04
Interest rate	0.41	0.40	0.29	0.57	0.72	0.78
Prices	1.60	0.92	–0.47	-0.67	0.95	0.86
Inflation	1.97	1.92	0.35	0.08	0.51	0.30

* All the real variables and the price level are logged and then HP detrended. Money growth, the interest rate and the inflation rate are HP detrended. The real variables are in per capita terms. The data on hours worked span the 1976Q1 to 1998Q1 period only.

6.2 VAR-based evidence

It has become commonplace to consider the nature of the monetary transmission mechanism by examining the effect of innovations to a measure of monetary policy on other macro variables of interest.[21] To examine whether the effects of monetary shocks in the most recent decade are different from those seen over the prior thirty years, we perform two exercises: first, for each of these two periods, we examine the impulse response functions (IRFs) from an estimated vector autoregression (VAR); second, we consider the percentage of the variance of major variables of interest that can be attributed to monetary policy, as measured by the variance decompositions from the VAR.

We examine a 5-variable VAR that includes money (M), a short-term interest rate (R), output (Y), the price level (P), and the exchange rate (PFX). Given the relatively short second sample (1990-98), we use monthly data to estimate the model. As well, the VAR is identified by Choleski decomposition due to the relatively short second sample. Output is measured by industrial production (which is available at a monthly frequency), the interest rate by the overnight rate, money by M1, the price level by the CPI (excluding indirect and tobacco taxes), and the exchange rate is measured by the price of foreign

[20] The variability of a variable at any time t is calculated as the variance of the sample up to time t.

[21] See, for example, Sims (1986), Blanchard and Quah (1989), Christiano and Eichenbaum (1992), Cochrane (1994) and Fung (1998).

exchange, that is, the Canadian dollar price of the US dollar. The two sample periods we consider are 1961 to 1989, and 1990 to mid-1998; data on industrial production are available only from 1961. The ordering of the VAR is [*R M Y P PFX*] and the VAR is estimated with six lags.

Figure 10
Impulse response functions to an R-shock for the 5-variable VAR

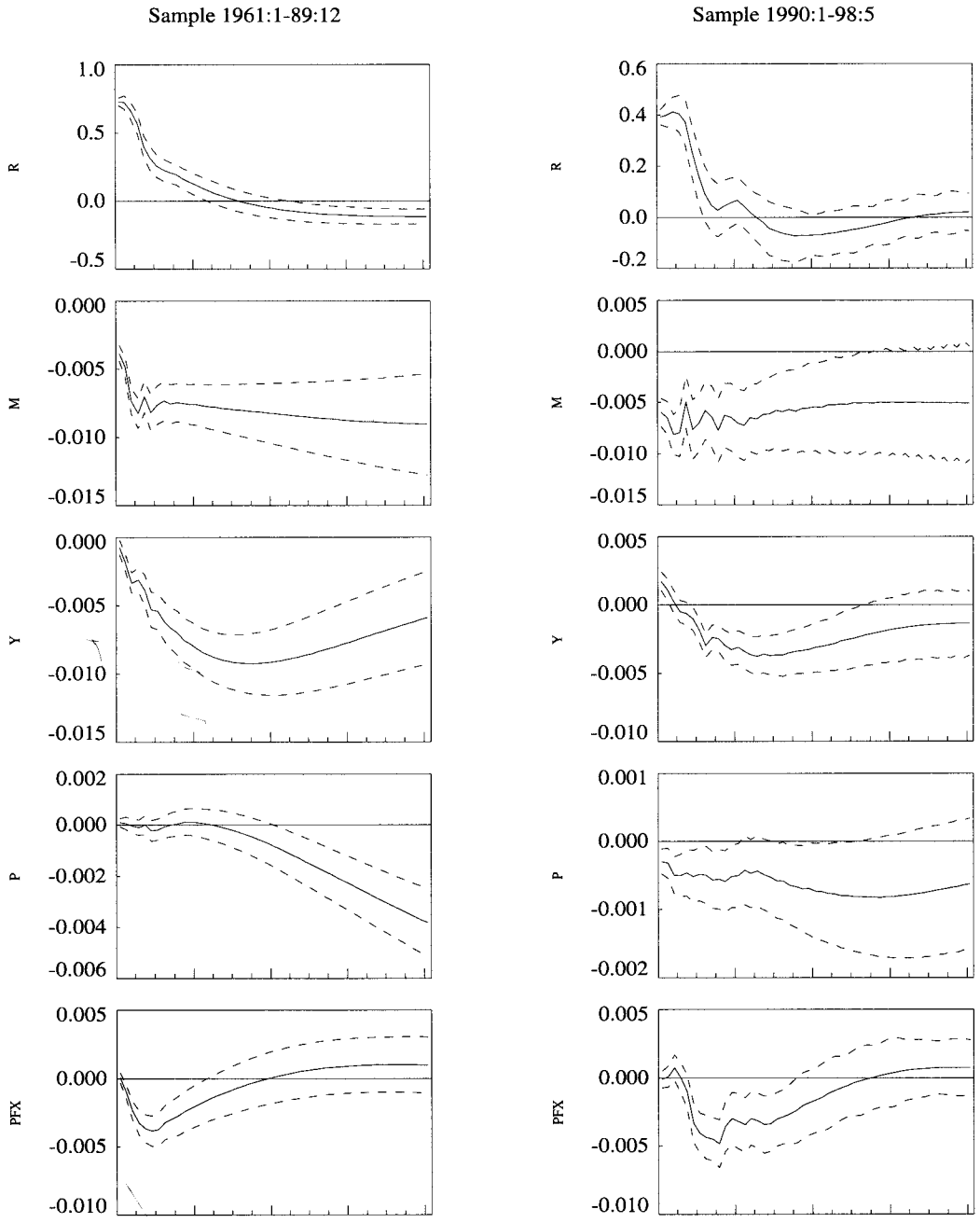

Figure 10 reports the IRFs of a monetary policy shock, represented by an innovation in the overnight rate, over a 48-month period. The solid line is the response function while the two dashed lines are the 1-standard-deviation confidence band (based on Monte Carlo simulations of 100 draws).[22] In both sample periods, after a monetary policy tightening (a positive R-shock), the level of money falls

[22] The results with the monetary policy shocks modelled as innovations to the monetary aggregate (M-shocks) are very similar to those described above, and are not given here.

rapidly, output contracts and there is a temporary decline in the price of foreign exchange, that is, a temporary appreciation of the Canadian dollar. The price response is more sluggish in the earlier period as prices start to decline significantly only after about two years – a fairly standard result. In comparison, the price response in the most recent period is much faster, consistent with increased credibility of monetary policy and a convergence of expectations around the Bank's inflation target.

Table 3 reports variance decompositions for the first sample, 1961 to 1989, and Table 4 for the 1990s. In both periods, most of the variance of output is accounted for by its own shocks, especially over shorter horizons, which is generally consistent with previous studies. For example, in the first sample, the R-shock accounts for as little as 1% of the variation of output at short horizons, and up to 40% after two years. One difference across the two samples is that the R-shock explains more of the price variation in the second period, albeit a relatively small fraction. At the same time, an M-shock explains less of the price variation in the more recent period. Nonetheless, these results provide no compelling indication that the transmission mechanism has changed in a material way in the 1990s.

Table 3
Choleski decomposition 1957:1 – 1989:12

Variance of	Shock and horizon															
	1 month				6 month				1 year				2 year			
	R	*M*	*Y*	*P*	*R*	*M*	*Y*	*P*	*R*	*M*	*Y*	*P*	*R*	*M*	*Y*	*P*
R	100	0	0	0	79	1	6	7	67	4	10	9	56	14	10	8
M	11	89	0	0	34	56	1	1	37	49	3	1	39	40	4	2
Y	1	0	99	0	12	2	83	2	24	3	64	5	40	3	39	8
P	1	1	4	94	1	5	3	88	2	13	3	75	2	32	3	53

Table 4
Choleski decomposition 1990:1 – 1997:12

Variance of	Shock and horizon															
	1 month				6 month				1 year				2 year			
	R	*M*	*Y*	*P*	*R*	*M*	*Y*	*P*	*R*	*M*	*Y*	*P*	*R*	*M*	*Y*	*P*
R	100	0	0	0	80	7	5	3	65	11	9	8	51	12	14	15
M	4	96	0	0	28	62	5	3	32	53	7	6	32	43	10	11
Y	4	4	91	0	7	12	67	7	19	21	45	7	39	22	26	7
P	2	10	3	85	8	10	7	60	13	8	16	50	17	9	18	39

6.3 Model instability and errors

One way that a change in the nature of the transmission mechanism can be revealed is through a breakdown in models that previously seemed reliable. In particular, such a shift could be revealed initially as substantial, sustained prediction errors of the key variables of interest, namely, output growth and inflation. Similarly, there could be significant shifts in model parameters. At the Bank of Canada, there are two broad classes of models that inform our outlook: output gap models and financial indicator models. In the last decade, both of these types of models have been affected by notable instability. In this sub-section, we review the nature of that instability and discuss whether it could be related to financial restructuring.

6.3.1 Output gap models

The expectations-augmented Phillips curve, in which the key determinants of inflation are the output gap and expected inflation, plays a central role in the Bank of Canada's outlook. Yet, despite the

Bank's estimate that there has been considerable excess supply in the economy throughout the 1990s, which should have led to a sustained disinflation in recent years, inflation in Canada has been relatively stable since 1992. However, this model instability appears to have little to do with the recent financial restructuring in Canada; instead, work at the Bank of Canada suggests that there has been a shift in the process that determines inflation expectations.

Fillion and Léonard (1997) provide evidence that inflation expectations were essentially backward-looking in the 1970s, and were consistent with a long-term inflation rate of 4% in the 1980s. However, since about 1993, inflation expectations have been close to 2%. Incorporating these regime shifts, the Phillips curve does a reasonably good job of tracking inflation, including the 1990s. In contrast, a similar model, but with expectations driven exclusively by past inflation, predicts significantly lower inflation rates than those observed in the 1990s.

In sum, with the success of the Bank's inflation-control targets, forward-looking expectations seem to be increasingly anchored to the midpoint of the target range, that is, 2%. Thus, although the augmented Phillips-curve in Canada has shown instability in the 1990s, and was underpredicting inflation, a shift in the inflation-expectations process is the most likely explanation for this instability.

6.3.2 Financial indicator models

To inform the outlook for inflation and output growth, the Bank of Canada also considers several indicator models based on financial variables. One of the models used to forecast output growth is based on the term spread, that is, the differential between the 10-year government bond yield and the 90-day commercial paper rate.[23] Throughout the 1990s, this model overpredicted output, suggesting a change in the link between the term spread and output growth. The shift in the relationship is likely associated with risk premiums during the first half of the 1990s. These greater risk premiums, in turn, are probably related to high government debt and political uncertainty. Another possible explanation of the change in the relationship is that it is non-linear, or that price responds asymmetrically to supply and demand shocks: steeply-sloped yield curves might not have the same magnitude of effect on output as inverted yield curves.

The Bank of Canada also uses money-based indicator models to forecast both output and inflation. Bank staff have estimated a fairly stable long-term relationship between M1, interest rates, output and prices. When this relationship is included in a vector-error-correction model, it can be used to help forecast inflation over the coming two years.[24] The Bank also uses a simple (single-equation) indicator model based on real M1 to forecast near-term output growth.

As might be expected, the performance and interpretation of these models has been affected by the recent financial changes in Canada. Since the early 1990s, the growth rate of M1 has been far in excess of what would normally have been associated with the stable low rates of inflation observed in Canada this decade. And, beginning in the mid-1990s, the basic relationship underpinning this M1 model, the long-run demand for M1, began to break down. Figure 11 illustrates the changes in the coefficients of this money-demand relationship that has occurred in this decade.

This shift in the model seems to be related to several financial innovations and legislative changes that have affected the interpretation and information content of M1. For example, the 1992 legislative amendments eliminated reserve requirements over a two-year phase-out period to address the competitive inequity between banks and other deposit-taking institutions. This legislation meant that banks no longer incurred a cost to be passed on to demand deposit holders through lower interest rates on such deposits. As a consequence, business deposits that would have been placed in notice accounts, and excluded from M1, a decade ago, are now likely being drawn into current accounts in M1.

Another example is the 1987 legislative amendments that permit banks to own securities dealers. As Canadian banks developed investment dealer subsidiaries, the money balances held in investment

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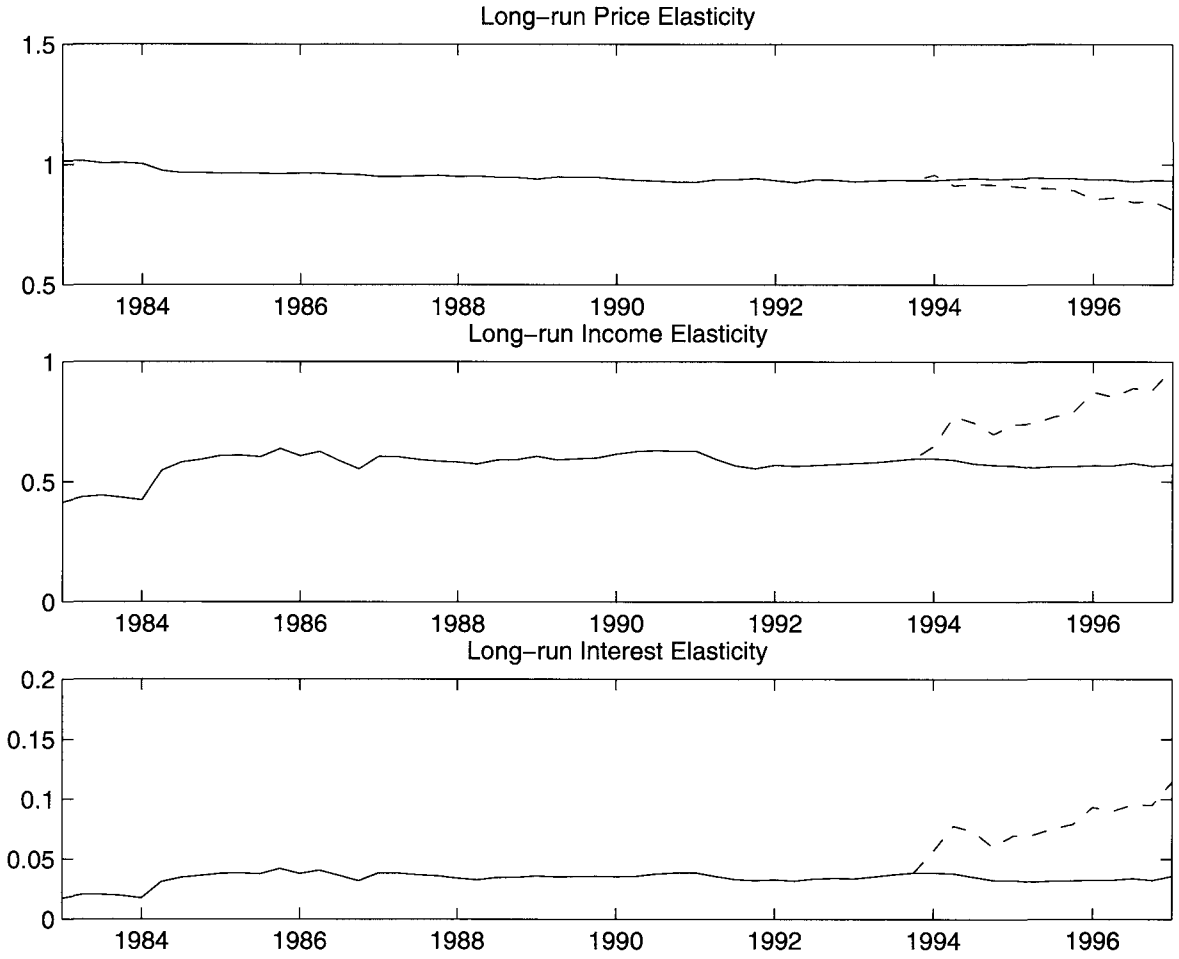
[23] For more details on this model, see Clinton (1995) and Côté and Fillion (1998).

[24] See Hendry (1995), Engert and Hendry (1998) and Fung (1998).

dealer accounts were included in personal demand deposits in M1. These balances are temporary cash balances that may eventually be used to purchase financial assets. However, these accounts pay a rate of return that rivals the money market rate, and often customers use these accounts as a temporary place to park their money during volatile markets. As a result, there has been a discrete shift of deposits into M1, related purely to financial restructuring.

Figure 11
Long-run money demand coefficients*



* The elasticities are estimated from rolling regressions based on Johansen-Juselius cointegration estimation. The dashed lines beginning in 1994 show the effects that the 1990s have had on the elasticities; the solid line plots the estimates from models including dummy variables starting in 1994 to help stabilise the elasticities.

Moreover, improved computer technology has allowed financial institutions to create new deposit products and services. These financial innovations have become increasingly difficult to classify in the standard categories of regulatory reporting systems. For example, banks have developed deposit products that provide all the features of basic chequing accounts, yet the rate of return on these accounts is linked to money market rates. In addition, even though the withdrawal notice requirement has been irrelevant for some time, household transactions balances are being classified both as demand accounts that are included in M1, and notice accounts that are excluded from M1. This has reduced the usefulness of M1 as a measure of transaction balances, at least as defined currently.

Similarly, technology has allowed vast improvements to be made in electronic financial services. The introduction of automatic teller machines, and telephone/PC banking enables customers to transfer their money from savings accounts to chequing accounts in a convenient and inexpensive manner. As a result, a broader measure of money might be representative of transactions money in an electronic

world. This may become an even more important issue should the demand for electronic money and digital cash becomes stronger in Canada.

In the 1980s, the Bank first used M2 and then M2+ as the representative measures of broad money in Canada.[25] However, in the last few years, the relationship between M2+ and nominal spending has become less reliable than in the past. While M2+ grew significantly faster than nominal GDP on average during the 1970s and 1980s, its growth fell short of GDP in the last five years. The main reason for lower-than-expected growth has been the enormous transfer of personal savings into non-money market mutual funds. Given these developments, the Bank of Canada has started to monitor more closely the evolution of alternative measures of broad money that attempt to internalize the substitution between savings deposits and mutual funds, such as M2++.

The bottom line is that our measures of money have been affected considerably by financial innovation and restructuring. As this process undoubtedly will continue into the future, it is important to understand how these activities affect our data, our models, and our interpretations of economic behaviour and the outlook. However, the changes to the money data do not seem to represent a change in the fundamental economic behaviour that underpins the transmission mechanism; rather these changes have affected our ability to measure liquidity and money in the economy.

6.4 Summary

In this section, we considered whether there is evidence that the monetary transmission mechanism has changed in the 1990s. The broad business cycle facts and correlations, inferences from VAR models and the nature of model instabilities tend to suggest that the monetary transmission mechanism has not been materially affected by the financial sector changes occurring in Canada in the last decade. This is not too surprising given that market forces have for many years dominated the transmission of monetary policy effects in Canada, and financial restructuring has reinforced these market forces.

At the same time, these events have affected our monetary data, and our ability to measure the empirical analogues of what we mean by liquidity and money in the transmission of monetary policy.

7. Implications for financial stability

In this section we show how legislation in Canada has responded to financial restructuring so as to accommodate changing business practices, while at the same time providing for effective supervision. Looking ahead, we then identify continuing trends in the financial services industry and point to pressures for regulatory change that might accompany these trends.

7.1 Supervisory innovations

A critical part of protecting financial stability in a rapidly changing world is supervisory innovation. In this respect, there have been several legislative changes to the regulatory framework to keep pace with financial restructuring. For example, prior to 1987, there were two federal supervisory agencies – one for banking institutions and another for non-bank financial institutions. Given that the differences between these industries were disappearing, and that the linkages among them were increasing, these two supervisory agencies were merged into one supervisory body.

As well, the new Office of the Superintendent of Financial Institutions was given new powers, the most significant of which is the power to issue orders of compliance, that is, the power to require an institution to cease activities that the Superintendent considers to be unsound, or to undertake certain

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[25] M2 includes M1 plus personal savings and non-personal notice deposits at chartered banks. M2+ includes M2 plus deposits at near-bank institutions, life insurance company annuities, and money market mutual funds. For a more detailed definition, see Bank of Canada Review: Notes to the Tables, January 1998.

actions which the Superintendent considers necessary for the safety of the depositors using the institution.

In addition, a new inter-agency committee was established, the Financial Institutions Supervisory Committee (FISC), consisting of the Superintendent of Financial Institutions, the head of the Canada Deposit Insurance Corporation, the Governor of the Bank of Canada, and the Deputy Minister of Finance. This committee is to ensure coordination and information exchange on supervisory matters that have implications for solvency, lender-of-last resort activity, and the risk of deposit insurance pay out. Hence, the FISC allows the Superintendent, who is responsible for judgements pertaining to the viability and solvency of financial institutions, to have the benefit of the views of the deposit insurer and the Bank of Canada when making supervisory decisions.

In view of the presence in the financial sector of closely-held ownership, commercial financial links, and common ownership of firms in different sectors of the financial industry, there were also major changes to cope with the potential problems of conflicts of interest and self-dealing. For instance, transactions between a financial institution and related parties are banned, though with some exceptions subject to rules for the oversight of such transactions. Institutions are also required to establish internal controls to screen transactions permitted under exceptions to the general ban. This is to be achieved by enhanced corporate governance, in particular by a strengthened role for the directors of the institution. Also, a director of a financial institution who resigns as a result of a disagreement with the other directors or officers of the company is now required to inform the Superintendent in writing of the nature of the disagreement. A similar provision exists if an auditor of an institution resigns or is replaced.

More recently, in 1995, the mandate of the Office of the Superintendent of Financial Institutions (OSFI) was clarified somewhat to focus on the role of depositor protection. The mandate now recognizes that failures of financial service providers are a part of a system in which reasonable risk-taking occurs, and that financial service providers carry on their business in a competitive environment that requires the management of risk. Equally, these revisions recognized a need for the Superintendent, or an institution, to take prompt remedial measures as an institution's capital becomes impaired. OSFI has published a "stages of intervention" that sets out the nature of the actions that could be appropriate to deal with financial institutions whose capital is declining. One can view this as an attempt by OSFI to reduce the discretion it is prepared to exercise in these cases. Changes also were made to the insolvency provisions governing regulated financial service providers that would permit the closure of such a firm while it still had positive equity. At the same time, these steps toward early intervention and prompt corrective action retained a good deal of discretion for the supervisor in choosing how to respond to a failing institution. Finally, the Canada Deposit Insurance Corporation recently introduced risk-based deposit insurance premiums to try to deal with the moral hazard that can arise in the presence of deposit insurance.

7.2 Current trends that could affect financial regulation

It is likely that economic and competitive pressures from the marketplace will continue to influence the evolution of regulatory policy and supervisory practice. Five broad trends associated with financial restructuring which might influence future regulation and supervision can be identified.

- ***Increasing complexity of financial services and firms***

Financial products have become more complex, and increasingly can be tailored to fit the characteristics and needs of customers. There is greater use of powerful information technology, new analytical techniques (related, for example, to derivative products), and a greater array of customers and counterparties.

- ***Blurring of generic distinctions among regulated and unregulated financial-services providers***

A financial service firm in Canada can provide a full range of products, and there are increased linkages and more transactions among institutions that historically were segmented in different

financial businesses. Also, unregulated firms such as Newcourt – a commercial lending and leasing firm – and GE Capital – have been expanding their activities in the financial services sector.

- ***Increasing international interdependencies***

The globalization of financial markets is producing greater interdependencies between Canadian and foreign financial institutions. For example, the financial needs of large borrowers are increasingly shared among international lenders which increases the need for shared information and risk assessment.

- ***Better appreciation of moral hazard***

Continuing experience with, and research into, explicit and implicit guarantees to the financial sector are leading to a better appreciation of the drawbacks of these guarantees in a complicated financial world. In this regard, supervisors at times have incentives to forbear, that is, not take timely action against failing institutions. This tendency may arise owing to the time-inconsistency of optimal policies, which can arise if supervision is not viewed as a dynamic problem or a repeated game. The tendency to forbearance sets up moral hazard problems, reduces allocation efficiency and provides incentives for firms to seek risk that, over time, undermine financial stability.

- ***Improved risk-proofing of clearing and settlement systems***

In the last 10 years, major clearing and settlements systems, including national payments systems, are increasingly becoming risk-proofed.[26] This development, in turn, is eliminating one of the principal motivations for supervisory forbearance of failing institutions.

7.3 Implications of current trends for regulatory practice

Increasing competition, the growing complexity of financial services and of financial service firms, the convergence of activities of regulated and non-regulated financial service providers, and an increasing risk of extending the safety net under a wider range of activities, suggest that further changes in regulation practice are appropriate.

- ***A more clearly focused supervisory mandate***

It might be helpful for supervisors to pursue a narrow mandate focused almost exclusively on the prudential assessment of financial institutions for the protection of depositors. This would imply that central banks should focus on controlling systemic risk and on contributing to macro-financial stability. As well, it might be helpful to provide supervisors with effective independence along with appropriate accountability mechanisms to government.

- ***Greater clarity of the "rules of the game"***

It might be helpful to limit the ambiguity of discretion and adopt rules-based practices that are transparent and incentive-compatible with market forces and that lead to outcomes that are more certain. For example, this could include a regulatory framework that provided for the exit of capital-impaired firms from the industry before all their equity is exhausted. The rules-based early intervention system associated with the US program of prompt corrective action is a good example in this regard.[27] Risk-proofing clearing and settlement systems can also help in this regard. Systems in which systemic risks have been appropriately dealt with, and in which the outcomes are known in advance should adverse events occur, will also add to system stability. The Lamfalussy Standards promote these types of systems.

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[26] Bank for International Settlements (1990) sets out universally recognized standards for the design and operation of cross-border foreign exchange netting schemes, commonly referred to as the Lamfalussy standards. These standards have been applied to a wider range of systems. For more details on Canada's large-value transfer system, see Freedman and Goodlet (1996). On the mechanics of netting, and in particular, on risk management in netting systems, see Engert (1992, 1993).

[27] This program was set out in the in the FDIC Improvement Act of 1991 (FDICIA). For more details on that program, along with an assessment of its first five years, see Benston and Kaufman (1997).

- ***Improved jurisdictional compatibility***

It may be helpful to ensure international compatibility of regulations in both domestic and international jurisdictions. International compatibility prevents institutions from exploiting the "weakest link" in the regulatory net, thereby enhancing system-wide financial stability.

- ***Increased focus on macro-financial stability***

Over time there may be a need for central banks to increase their focus on macro-financial stability as distinct from micro-financial stability. Micro-financial stability deals with the safety and soundness of individual financial institutions, and is aimed at protecting depositors. Macro-financial stability deals with the inter-relationships among institutions, and is concerned about shocks that can adversely affect a number of institutions in a similar way.

Accordingly, macro-financial stability is aimed at preventing disruptions to financial intermediation that can significantly disrupt macroeconomic activity. Put differently, macro-financial instability occurs when a financial disruption spreads among financial institutions so that it affects financial intermediation sufficiently to disrupt aggregate economic activity, and so undermines economic welfare.[28] Maintaining a distinction between macro and micro-financial stability is useful because ensuring that individual financial institutions are financially sound, and subject to prudent risk-management policies, is necessary, but might not be sufficient, to prevent a disruption in financial intermediation in aggregate. In other words, the systems, conventions and legal frameworks, etc. that link financial institutions are also important to ensuring financial stability.

8. Concluding remarks

In this paper, we provided an extensive review of the financial restructuring that has occurred in Canada over the past thirty years. Generally speaking, this process of restructuring has been associated with reduced barriers to entry into the financial services industry, an expansion of the business powers of financial service providers, and has led to some consolidation within the industry. We also explored the primary factors that have motivated and influenced these financial sector changes, namely, advances in information technology, demographics and the variability of inflation and interest rates.

We then examined whether these changes have affected the monetary transmission mechanism the 1990s. The broad business cycle facts and correlations, inferences from VAR models and the nature of model instabilities suggest that the monetary transmission mechanism has not been materially affected by the financial sector changes occurring in Canada in the last decade. This is not too surprising given that market forces have for many years dominated the transmission of monetary policy effects in Canada, and the financial restructuring has been consistent with this emphasis on market forces. However, these events have affected our monetary data, and how we need to measure the empirical analogues of what we mean by liquidity and money in the transmission of monetary policy.

Finally, we examined the implications for financial stability. We noted that there have been numerous innovations in the supervisory regime to help to maintain financial stability in the last decade. At the same time, we pointed to several factors that will continue to influence financial restructuring, and noted areas where the regulatory arrangements could change so that it continues to accommodate efficiency while ensuring that the financial system is stable and safe.

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[28] Crockett (1997) provides a similar interpretation as he defines financial instability as a situation in which economic performance is potentially impaired by fluctuations in the price of financial assets or in the ability of financial intermediaries to meet their contractual obligations.

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The likely impact of changing financial environment and bank restructuring on financial stability: the case of France since the mid-1980s

Sylvie Matherat and Jean-Luc Cayssials[1]

Part 1: Changes in the banking environment and structures since the mid-1980s

1. Introduction

The structure and operating conditions of the French banking system have undergone far-reaching changes since the Banking Act was passed in 1984.

Among the most significant of these developments have been a transformation of shareholder structures and a gradual return to the private sector. The trend is continuing, since despite these changes the level of concentration in France still remains average.

The banking industry has also been marked by gradual liberalisation and booming capital markets, which have contributed to greater competition against a background of slower economic growth in the early 1990s. Keener competition has hit margins and profitability in the French banking system.

This environment has led to a sharp decline in intermediation business, which has been offset by accelerated growth of trading activities, through the rapid growth of securities portfolios and off-balance-sheet transactions. Another effect of this new environment has been a steadily growing volume of international activity, both in increasingly interlinked capital markets and through the redeployment of foreign investment.

The result has been a change in the composition of net banking income over the last 10 years and greater volatility and sensitivity of results. First, the share of trading activities in net banking income makes profitability more volatile and highly vulnerable to a downturn in capital markets. Second, the growing share of international business creates uncertainty as to the recurrence of profits (the Asian crisis has given a first warning of this).

The new environment has given rise to an unprecedented wave of financial restructuring, an area in which continental Europe seems to have been lagging behind. Paradoxically, the poorer profitability record of French banks had previously shielded them from the trend towards concentration. The return to profitability in 1997, combined with a relatively low stock market capitalisation, has made French banks attractive takeover targets, at a time when the changeover to the euro is likely to further exacerbate competition.

2. The reshaping of the French banking system

The structures of the French banking system have been completely overhauled in the last ten years. Privatisation, which began in the mid-1980s, has been stepped up in recent years, and a movement of concentration is now underway. Some 238 changes in control took place between 1984 and 1997,

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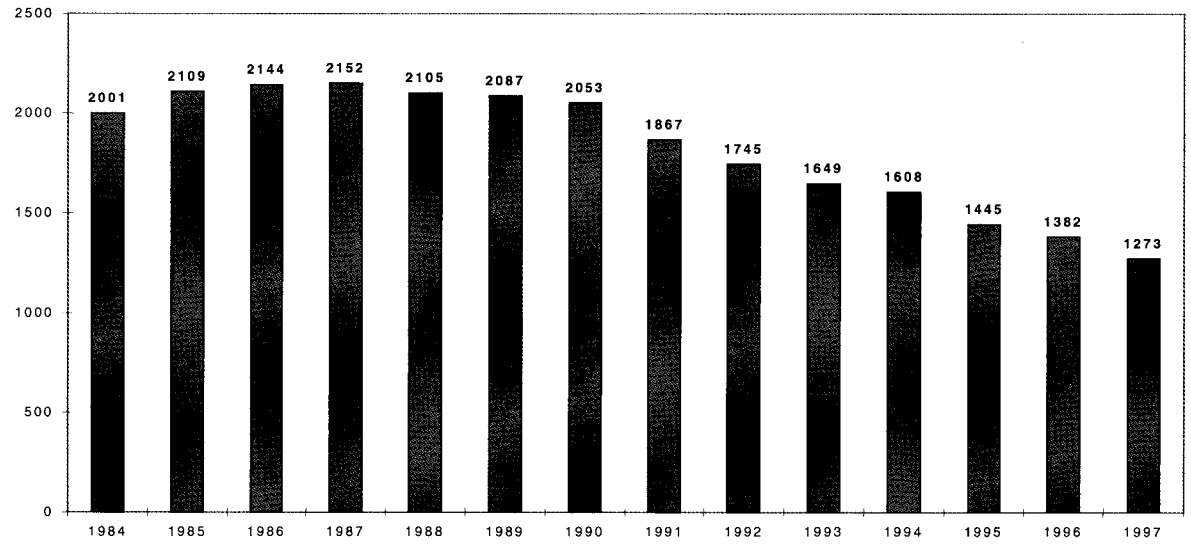
[1] Views presented here are those of the authors and do not necessarily represent the view of the Commission bancaire.

while the creation of new institutions and the disappearance of old ones has been a regular feature of the banking landscape.

2.1 Ongoing renewal of shareholder structures

One of the most striking features of the French banking system has been the sharp drop in the number of credit institutions. Since 1984, the number of credit institutions established in France (excluding Monaco) and authorised by the Credit Institutions and Investment Firms Committee has fallen from 2,001 to 1,273, a drop of more than 36%. After a period of stability lasting until 1990, when there were 2,063 institutions, the numbers have been falling steadily between then and 1997.

Graph 1
Number of credit institutions



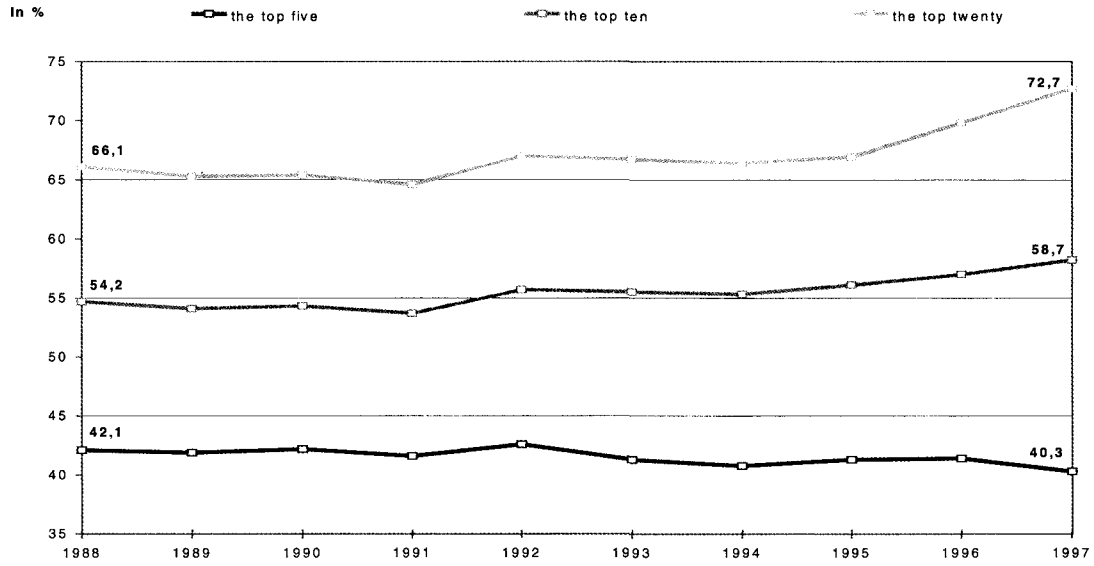
Source: D.E.C.E.I.

Much of this decline has been due either to the discontinuation of business by institutions which, in a climate of keener competition, offered no further growth prospects, or to the consolidation of institutions with similar characteristics. It also reflects large-scale restructuring and renovation of banking structures. Altogether, 688 new institutions were created in twelve years, representing 54% of the total number of institutions by end-1997.

Broadly speaking, the largest institutions have grown bigger in recent years. On a parent company basis, the share of the twenty largest banks in terms of total assets thus rose from 65.1% in 1988 to 72.7% in 1997. The share of the five largest institutions in terms of loans to clients rose from 43.8% in 1988 to 48.3% in 1997, and in terms of funds collected from 61.9 to 68.6% over the same period. It should be pointed out that these indicators are calculated from data compiled on a parent company basis and do not take account of subsidiaries. On a consolidated basis, the same institutions are probably even more dominant.

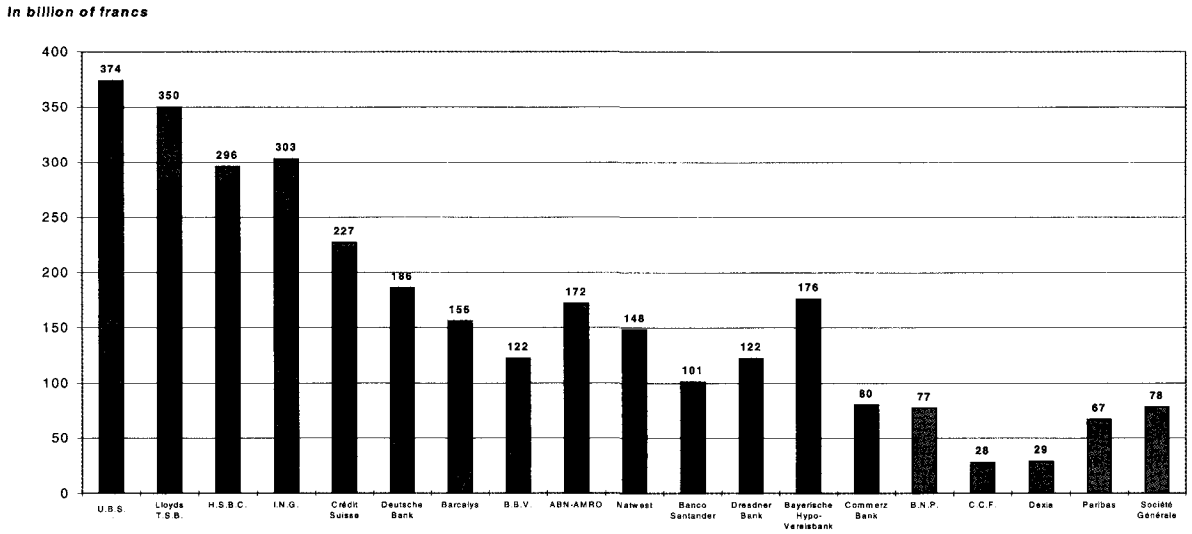
Overall, however, the level of concentration in the French banking system remains average and, with some rare exceptions, there are few French banks sufficiently well-capitalised to confront the major international players. The stock market capitalisation of the world's biggest banks clearly demonstrates this, since French banks lag well behind the major international banks, especially American and British ones.

Graph 2
Share of big credit institutions in total assets



Source: Banking Commission.

Graph 3
Market capitalisation
At 15th September 1998



Source: Bloomberg.

In structural terms, the French banking system has thus been in flux over the last ten years. In particular, this has resulted in deep-seated changes in the classification of banks by type of shareholder, notably the growing place taken by mutual and co-operative banks in a shareholder structure long dominated by the State. Thus the number of publicly-owned banks fell sharply from 112 in 1984 to 30 in 1997 as a result of two successive waves of privatisation, first in 1986-87 and then from 1993. Consequently, a large number of credit institutions left the public sector, either directly or indirectly. At the same time, the number of family-owned institutions also declined from 34 in 1984 to 14 in 1997. This highlights another major change in the French banking landscape, now

dominated by large groups at the expense of small banks whose family shareholders do not have the resources to ensure a durable presence and robust growth.

Table 1
Breakdown of French-owned banks*

Category	1984	1995	1996	1997
Public banking groups	92	34	26	23
Private banking groups	0	66	59	57
Public banking groups excl. major groups	20	7	7	7
Mutual groups	5	17	23	28
Subsidiaries of specialised financial institutions	2	10	9	4
Insurance	10	12	14	16
Manufacturing, retail, etc.	18	29	26	30
Diversified financial groups	9	14	13	6
Shared ownership	18	14	14	14
Family ownership	34	16	15	14
Total	**208**	**219**	**206**	**199**

* Banks where a majority of the share capital is owned by French shareholders.

Source: D.E.C.E.I.

The growing influence of large banks has gone hand in hand with the strengthening of mutual and co-operative groups: the number of banks belonging to mutual groups has risen from 5 to 28. In addition to growing organically, mutual groups have also taken an active part in the reshaping of the French banking system in recent years. The Crédit Agricole group acquired Indosuez in 1997 and Crédit Mutuel acquired the CIC group when the latter was privatised in 1998. The Banques Populaires have also taken successive stakes in Natexis.

As a result of keener competition, all banking groups – whether public, private or mutual – have embarked on major rationalisation programmes. The restructuring of the Caisses d'Épargne involved a series of mergers between 1984 and 1991 designed to create entities of a more suitable size. This movement also had a significant influence on the decline in the number of institutions. Likewise, groups with central organisations encouraged alliances between similar institutions in order to achieve economies of scale and increase technical and commercial efficiency. Furthermore, some institutions seeking to specialise in certain types of activity disposed of their portfolios in sectors where they no longer wished to operate. The Paribas group, for example, sold Crédit du Nord to Société Générale. Conversely, other institutions sought to strengthen their presence in core businesses or to extend the range of services offered to their traditional clients. In a general context of limited market growth, their strategy involved the acquisition of existing institutions, as was the case with Crédit Agricole and Indosuez or Banques Populaires and Natexis.

Another major feature of the transformation in the French banking system is greater openness. The number of foreign-owned banks rose from 140 in 1984 to 187 in 1997. This openness is a direct result of the liberalisation of a system long protected, but now subject to competition and attracting growing numbers of foreign operators. The banking trade has changed (see below), in particular with the rise of trading activities, which are relatively easy to develop for institutions without a network in France. At the same time, major European banks have set out to acquire networks in order to improve their scope of business with non-financial clients. Lastly, the principles of freedom of establishment and the free provision of services within the European Union set out in the Second Banking Co-ordination Directive of December 1989 have established a legal foundation for the single banking market which officially came into existence on 1 January 1993.

2.2 Rationalisation of the French banking system with no loss of capacity

The liberalisation and rationalisation of the French banking system has taken place in an environment infused with the idea of public service. Under these circumstances, it was not inconceivable that opening the sector up to competition would result in a rationalisation of supply leading to the restructuring of networks, as in the United States or the United Kingdom. But although the reshaping of the French banking sector has led to a fall in the number of banks and radical changes in their shareholder structure, it has not entailed a reduction in the supply of banking services. On the contrary, capacity has been maintained or even increased.

First, the number of bank branches nation-wide has remained stable, falling only marginally from 25,782 in 1985 to 25,464 in 1997. At the same time, credit institutions have modernised the services offered to their clients. The number of ATMs, the increasing number of transactions using bank cards and the growth of remote transactions have helped to increase the overall supply of banking services. Likewise, although credit institutions have done much to cut costs and staffing levels, in most cases the number of sales staff has increased.

The preservation of banking capacity, combined with stiffer competition, has resulted in relatively little change in banks' market share, in a context where each institution has fiercely defended its positions. Despite the many changes in the composition of the French banking system, the large groups have thus seen relatively little variation in their market share. In terms of total assets, however, specialised financial institutions have fallen back (from 9.1% in 1988 to 5.3% in 1997), to the benefit of mutual and co-operative banks and savings banks. The mutual and co-operative banks had 16.5% of the market in 1997 compared with 15.9% in 1986, while the market share of AFB banks rose from 54.9 to 60.1% over the same period.

The pace of change in the French banking and financial services sector is thus accelerating, partly because of the vital need to adapt to the globalisation of financial markets, but also because of structural changes in demand such as the stagnation in credit demand and the rising demand for services and advice from both corporate and private clients. The imminent introduction of the single European currency is likely to further amplify these trends.

3. Keener competition, especially in retail banking

The modernisation and liberalisation of financial markets since the mid-1980s have fostered competition from non-banks (UCITS and insurance companies) and the markets. Many administrative barriers that compartmentalised banking business in European countries have been lifted or eased since transposition of the European Directive of 24th June 1988 on the liberalisation of capital movements (lifting of credit and foreign exchange controls, opening and rapid growth of specialised markets like the MATIF, etc.). The effects on traditional banking intermediation have been especially keenly felt, leading to the disintermediation of credit and capital and the "marketisation" of bank financing. The trend was exacerbated by the general sluggishness of the economy in the early 1990s.

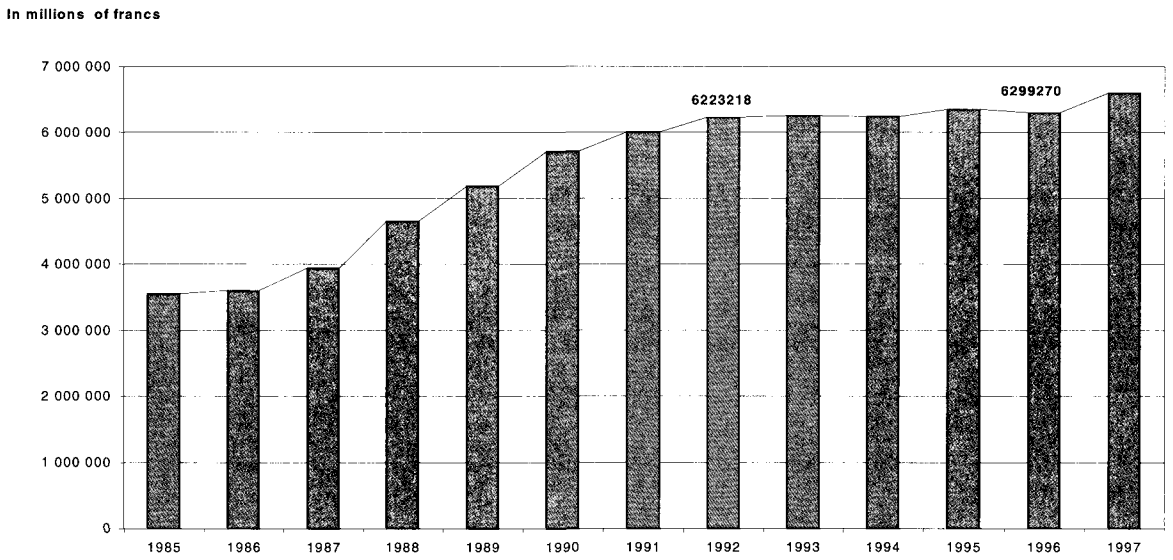
3.1 Competition and the volume of intermediation business

The behaviour of economic agents has changed with the modernisation and expansion of financial markets. Access to capital markets has been made easier, enabling firms to raise funds directly in the markets without going through banks, the traditional intermediaries. The creation and promotion of commercial paper is the most striking feature of this trend, even though some of the paper is bought up by banks. This has resulted primarily in a decline in bank lending as a share of the total financing of the economy, from 70% in September 1993 to 58% in September 1997.

At the same time, economic agents of all kinds have largely favoured a debt-reduction strategy associated with the fall in inflation, creating a context that is hardly conducive to credit demand. As

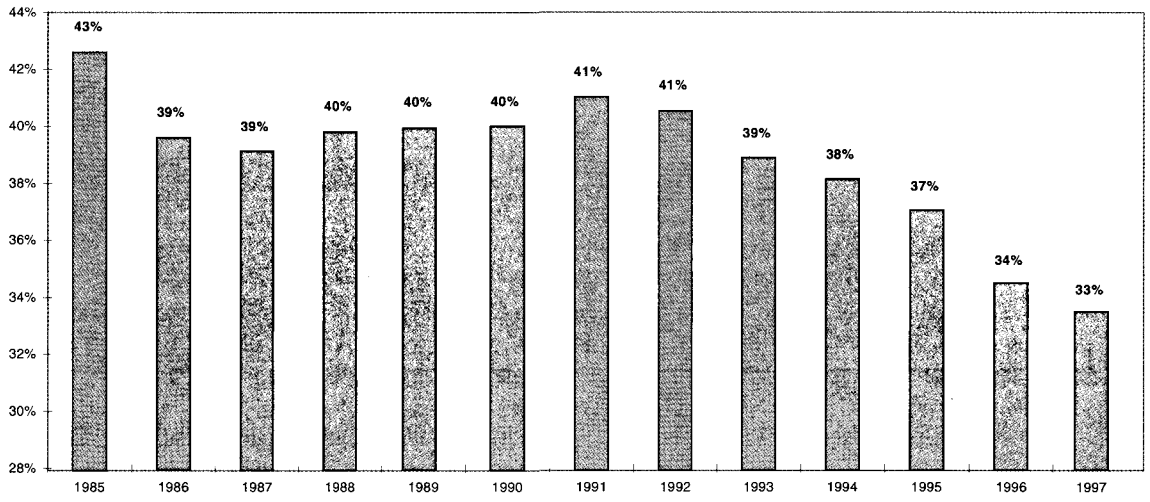
far as possible, firms have preferred to finance their investments out of cash flow, bearing in mind the rise in real interest rates from the early 1990s. In a general climate of uncertainty, households have given priority to precautionary saving. Credit demand, which had been relatively firm until the end of the 1980s, fell back sharply in the early 1990s. Between 1992 and end-1996, outstanding loans to clients in the French banking system as a whole rose by only 1.2% and credit demand did not recover significantly until the second half of 1997. As a result, lending to clients has diminished steadily as a proportion of total assets, falling from 43% in 1985 and over 40% in 1992 to 33% in December 1997.

Graph 4
Customer loans



Source: Banking Commission.

Graph 5
Share of customer loans to total assets



Source: Banking Commission.

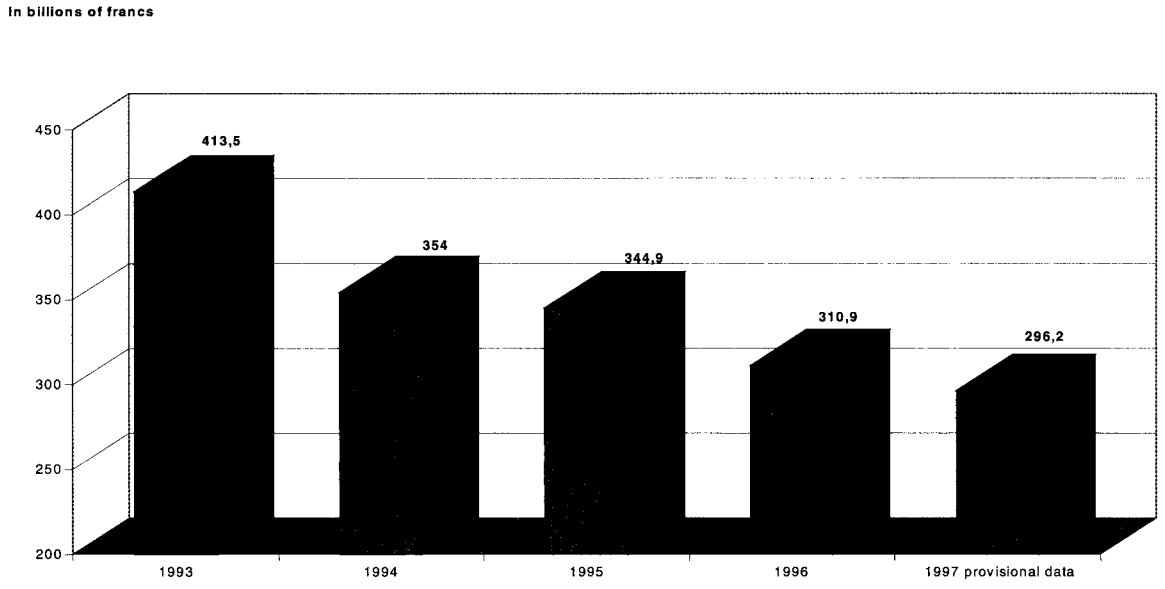
In addition, competition on the liabilities side has been notably increased, especially in connection with the growth in UCITS, which has led to a rise in the cost of bank funds, only partially offset by income from the management of collective investments. Moreover, insurance companies, retailers and other non-banks are becoming increasingly vigorous competitors in the development of financial products.

Lastly, the French banking system has had to adapt itself to an increasingly competitive environment, reflected in the lack of growth in core banking business. This competition from non-banks, combined with the slowdown in credit demand, has had a major impact on both the volume of intermediation business and profitability.

3.2 Competition and the profitability of intermediation business

The profitability of retail banking services has therefore been badly dented in recent years, which has resulted in a major change in the composition of bank income. The net retail banking income has been falling steadily for a number of years, in both absolute and relative terms. In five years, it has fallen from FRF 414 to 296 billion, a drop of over 28%. Despite an appreciable recovery in credit demand, this decline has continued over the past year, though the rate has slowed somewhat to –4.7%.

Graph 6
Earnings on customer loans
All credit institutions



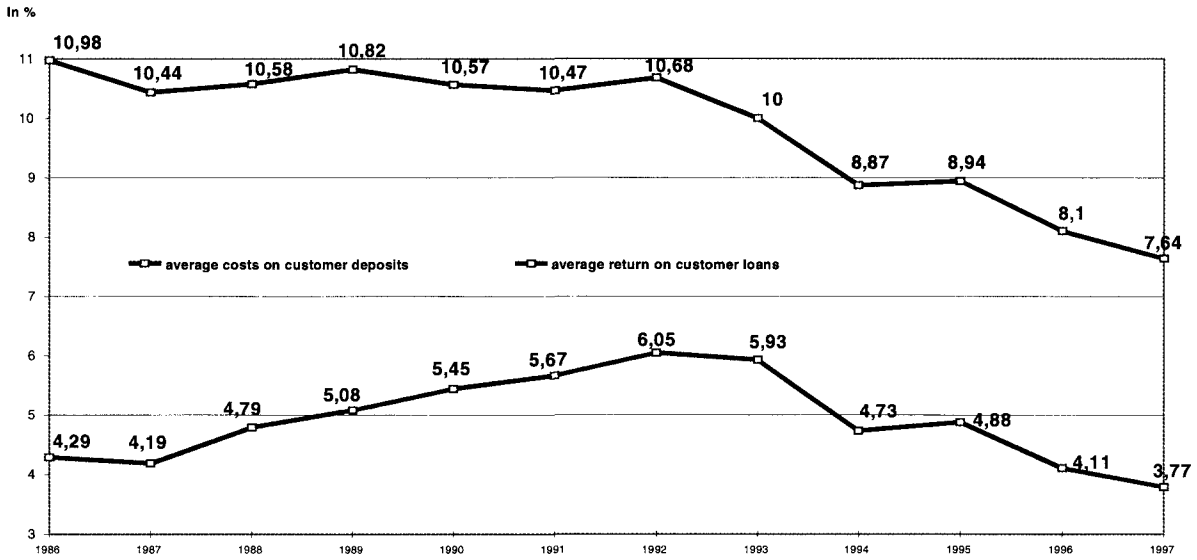
Source: Banking Commission.

The deteriorating profitability of retail banking can also be seen in trends in the average return on loans and the average cost of funds, the latter declining at a slower rate than the former. The average cost of funds fell from 4.29% in 1986 to 3.77% in 1997, a drop of 12.1%, while the average return on loans has deteriorated from 10.98% in 1986 to 7.6% in 1997, a decline of some 30.8%.

However, this trend has been accompanied by a change in the structure of retail banking income, with an increase in the contribution of service charges (for counter services, advice, automated transactions, etc.). The growing share of fees relative to interest margins as a proportion of net banking income has partially offset the low level of net interest income. For the largest three French banks (BNP, Société Générale, Crédit Lyonnais), which form a group with similar characteristics, net fees amounted to 29.5% of net banking income in 1997.

Graph 7

Return on loans and cost of funds

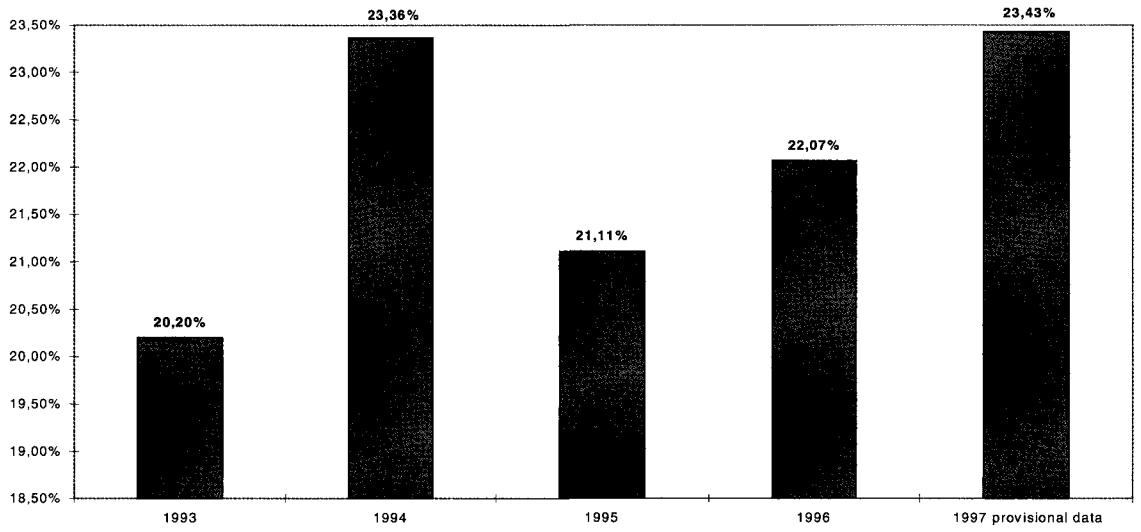


A radical change has thus taken place in the structure of French credit institutions' net banking income. The share of retail banking has declined steadily from 114.1% of net banking income in 1993 to 78.9% in 1997, while net income from trading (off-balance-sheet transactions and securities transactions) has risen sharply. In 1997, profits from off-balance-sheet transactions amounted to over FRF 33 billion. The residual balance from securities transactions, which also includes the charges relating to the debt constituted by securities, fell 19.3% in 1997 to FRF 50.6 billion, compared with FRF 162.5 billion in 1993.

Graph 8

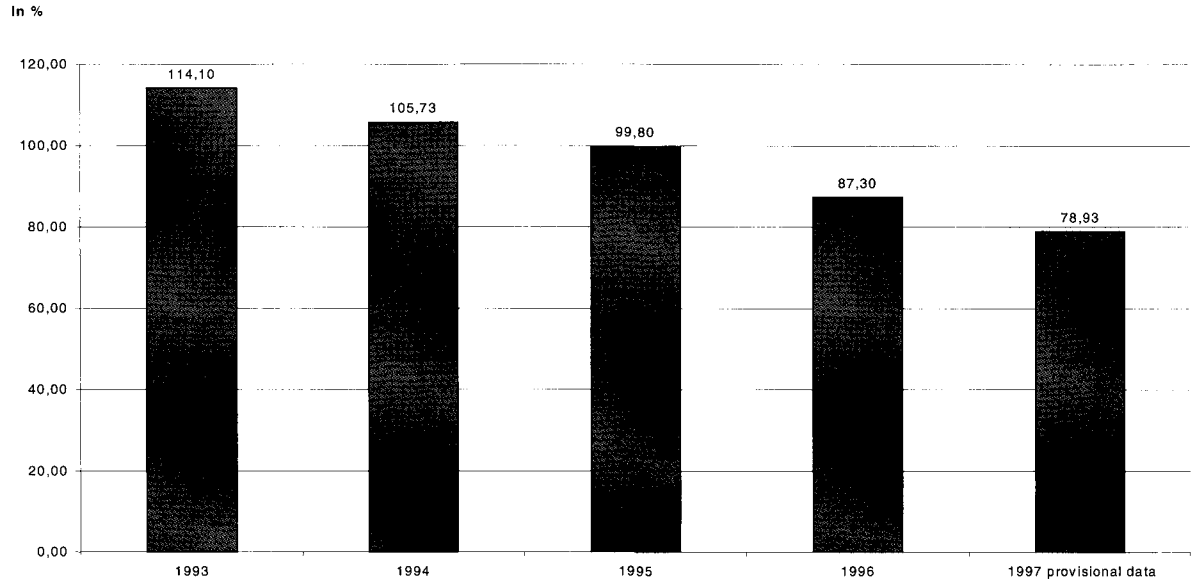
Share of fees in operating income

All credit institutions



Source: Banking Commission.

Graph 9
Share of customer loans in operating income
All credit institutions



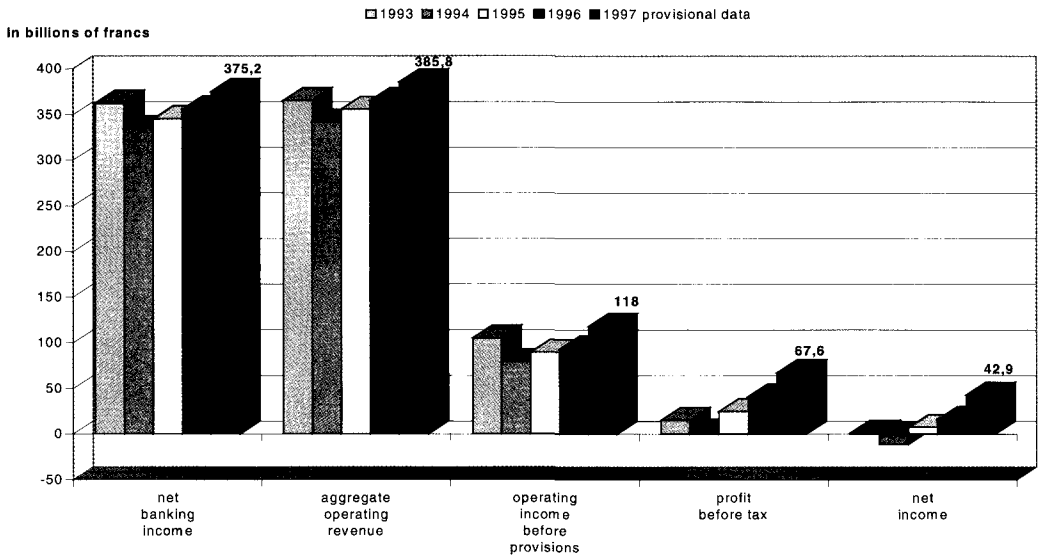
Source: Banking Commission.

4. A return to profitability after the crisis of the 1990s

4.1 A gradual return to a more satisfactory level of profitability

The trend in bank profits over the last 10 years clearly shows the impact of the crisis in the 1990s. The last years of the 1980s were marked by an increase in risks and a substantial rise in the related charges after a strong rise in credit demand. The high level of business failures in France (58,000 a year on

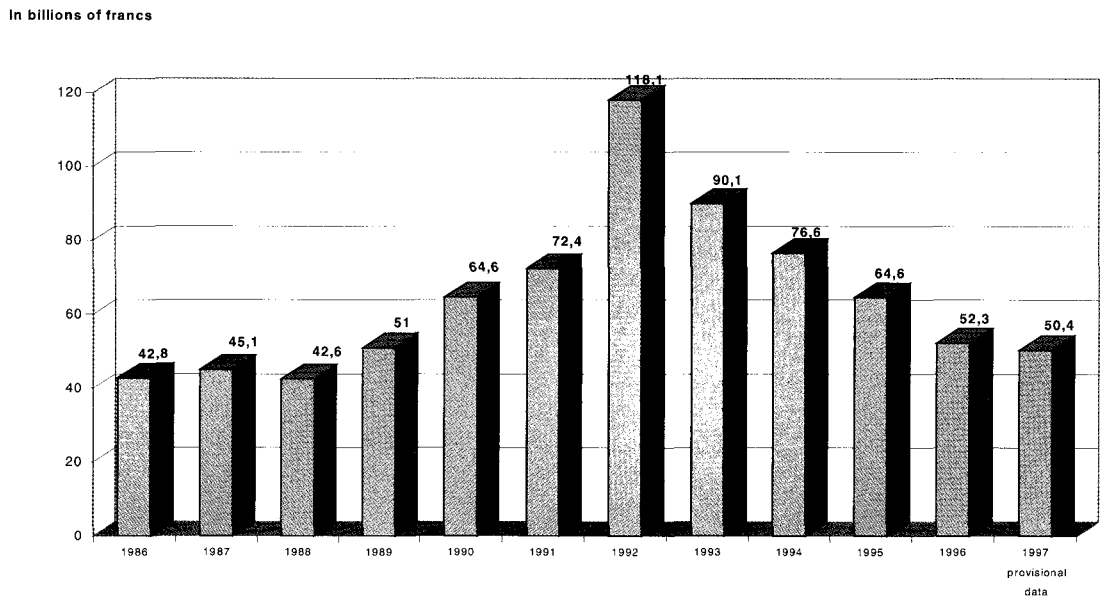
Graph 10
Earnings
All credit institutions



Source: Banking Commission.

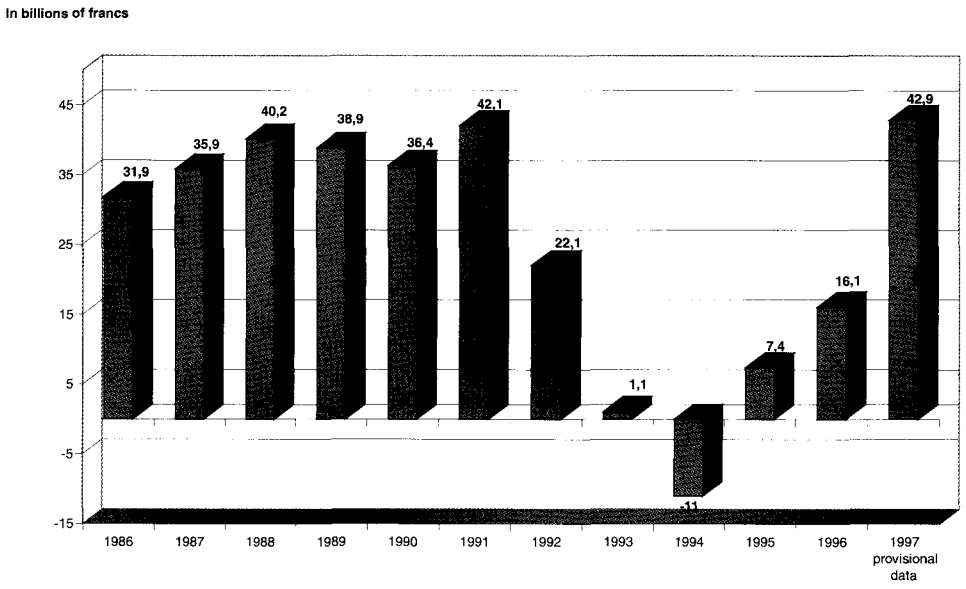
average in the early 1990s) presented the banks with a problem. Small- and medium-sized enterprises, especially in the construction and retail sectors, were particularly hard hit. The problems encountered by many of them had direct repercussions for the banks, who are their main and often only source of finance. Firms facing financial difficulties included property companies affected by the cyclical downturn, especially in the office market in the Paris region. The property slump and the difficulties encountered by SMEs gave rise to the booking of a large amount of provisions, which increased from FRF 43 billion in 1986 to over FRF 118 billion in 1992.

Graph 11
Provisions
All credit institutions



Source: Banking Commission.

Graph 12
Net income
All credit institutions

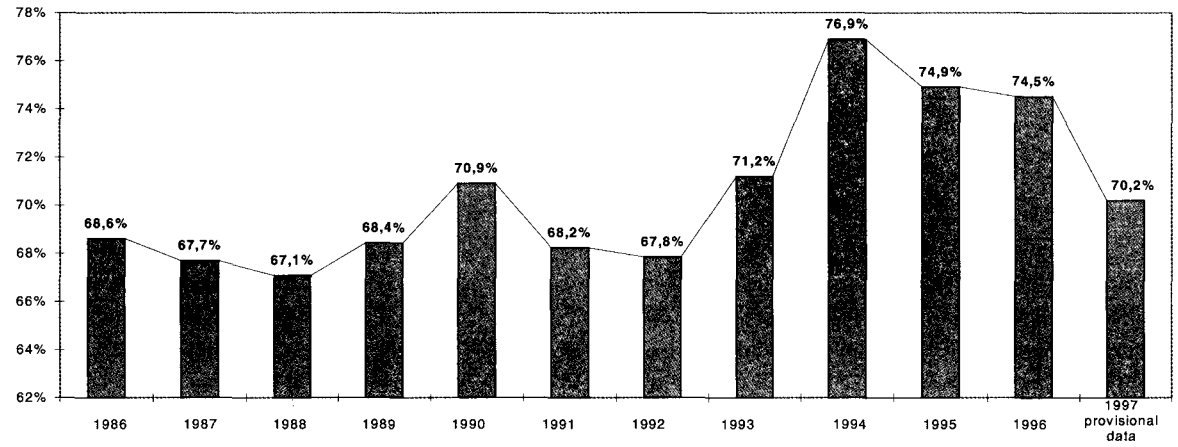


Source: Banking Commission.

As well as further weakening the economic fabric and adversely affecting banks' portfolios, the economic downturn starting in 1993 led to a virtual halt in the growth of credit demand. Combined with currency turbulence at the beginning of the 1990s, this caused a fall in net banking income that year, so that the French banking system created less value added in 1994 than in 1993. Illustrating the deep slump which had engulfed it, profitability collapsed and significant losses amounting to FRF 11 billion were reported in 1994.

Since then, the French banking system has gradually worked its way back into profit. In 1997, the net profit of French banks as a whole amounted to almost FRF 43 billion, the same level as at the end of the 1980s. The best-performing major French banks have now achieved a profitability ratio in excess of 10% and are steadily nearing the 15% target that most of them have set themselves.

Graph 13
Cost to income
All credit institutions



Source: Banking Commission.

Other factors have also contributed to the return to a more satisfactory level of profitability, such as efforts to contain operating expenses and better productivity. The total cost-income ratio,[2] which had peaked at almost 76.9% in 1994, fell back to 70.2% in 1997. Cost controls have been a priority for several years, reflected in job cuts and significantly improved productivity. Overall, employment in the banking sector is continuing to decline, falling by around 5% over the last five years.

4.2 International and trading activities as an offset to the decline in domestic intermediation business

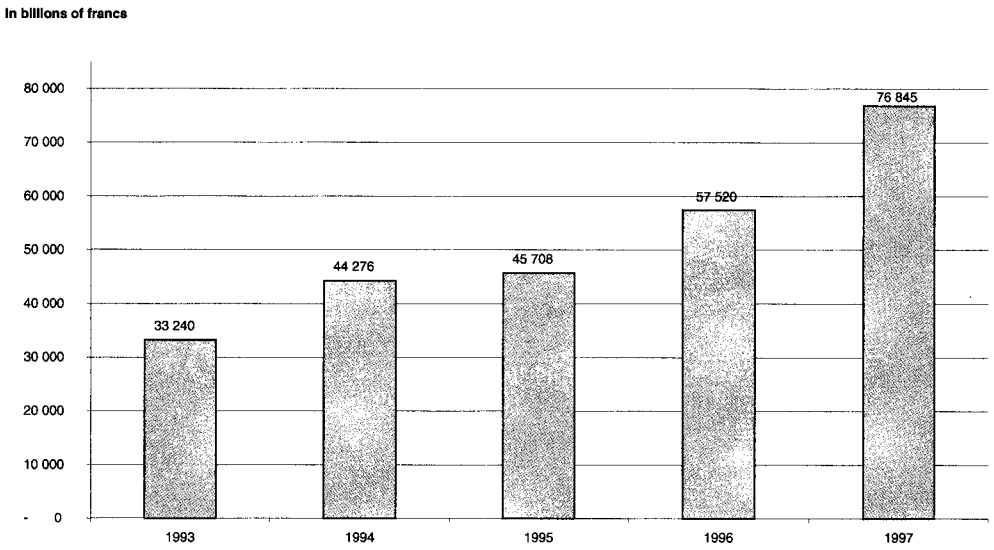
Disintermediation has encouraged French credit institutions to diversify their activities and to take an active part in the growth of trading activities. They are the main source of orders and funds for investment in market products; they distribute and also hold a large proportion of government securities; they provide financial engineering for large firms; they have developed a substantial proprietary trading activity and act as both market makers and securities underwriters. The share of securities transactions has increased sharply, while derivatives trading has grown exponentially in recent years.

The outstanding amount of securities portfolios has increased substantially in the last few years, especially the amount of trading securities marked to market. The total outstanding amount of

2 Operating costs/Operating income

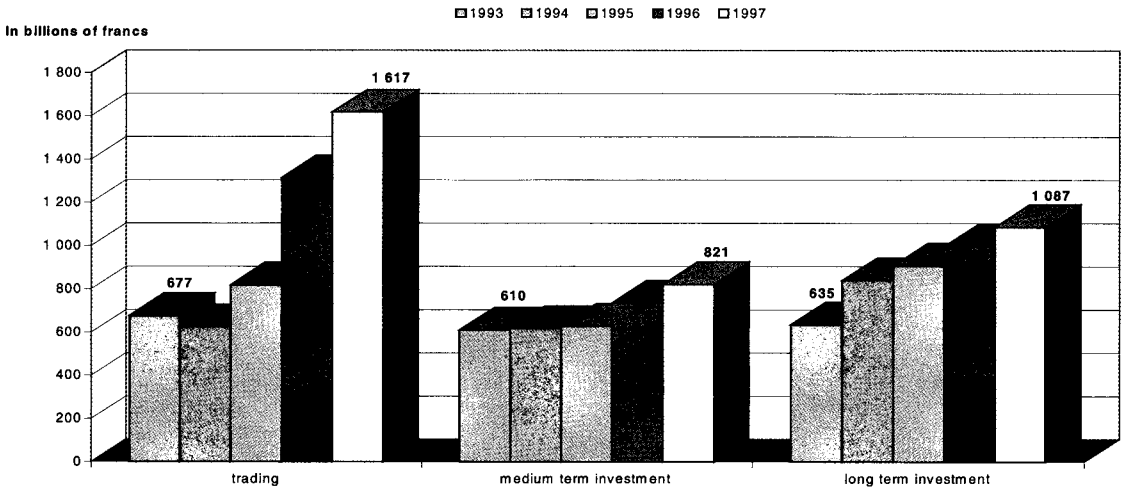
securities rose by 83.4% between 1993 and 1997, while the proportion of outstanding trading securities increased by 138.8%. Marking to market has given bank profits a boost, until the first semester of 1998, in a context of favourable market conditions and low interest rates. On the Paris Bourse, the CAC 40 index rose almost 30% in 1997 and 40% in the first six months of 1998, though it has slipped back 40% since then. Lower interest rates in all market segments have enabled the banks to generate substantial capital gains, offsetting the decline in the net income from retail banking, since the beginning of 1998. Conversely, the financial crisis in Europe since mid 1998 penalises such activities.

Graph 14
Total outstandings on financial futures instruments



Source: Banking Commission.

Graph 15
Securities portfolio



Source: Banking Commission.

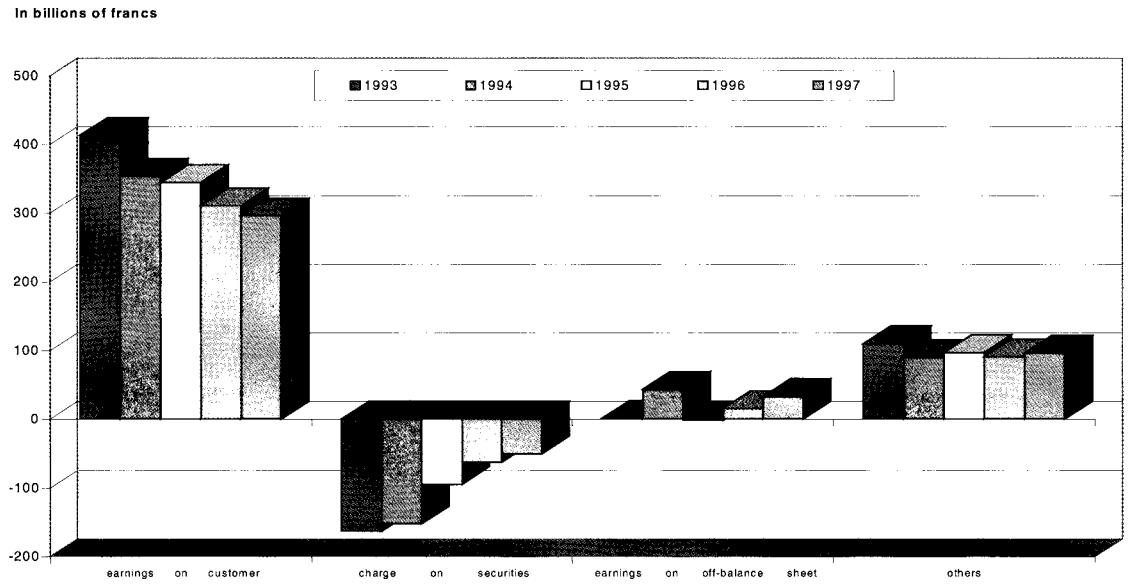
In a context of globalisation, the universal banks have naturally wanted to be present in all of the world's major financial centres and have also sought business development opportunities there. Diversification has thus gone hand in hand with internationalisation, and credit institutions have very rapidly expanded their international operations. The share of foreign branches has risen steadily from just 14.2% of total assets in December 1994 to 18.2% now. International business is also highly profitable, since foreign branches represented almost 10% of net banking income in 1997, compared with only 8.5% in 1996, corresponding to a 23% increase.

4.3 Banking profitability faced with new demands with regard to return on investment

Diversification has resulted in a wider range of sources of income, the discovery of sales methods and management techniques different from those customarily used in France, and above all in the ability to offer clients global services. All these factors have strengthened the financial position and stimulated the competitiveness and creativity of French credit institutions.

However, the greater use of markets imposes new requirements in terms of competitiveness and efficiency. In particular, the disciplines imposed by rating agencies have had a beneficial effect in terms of better profitability, better solvency, better ratings and lower borrowing costs. Above all, however, changes in banks' shareholder structures have led to a more demanding approach to return on investment. As a result of restructuring, banks have gradually moved towards a more shareholder-oriented corporate culture, bringing with it new profitability requirements.

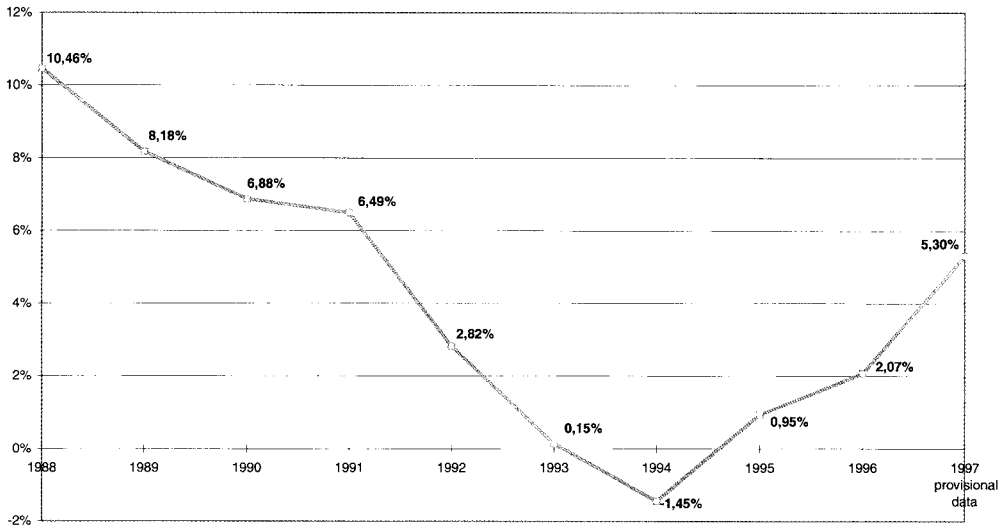
Graph 16
Composition of operating income
All credit institutions



Source: Banking Commission.

The privatisations which began in 1986 were accompanied by a modernisation of financial markets. Facing growing competition in open and deregulated markets, banks now have to ensure that they achieve satisfactory levels of profitability. Credit institutions have become diversified financial services groups no longer answerable only to the State and the supervisory authorities but also to private sector shareholders with demands in terms of return on investment.

Graph 17
Return on equity
All credit institutions



Source: Banking Commission.

Part 2: Bank restructuring and financial stability

Like many of its European counterparts, the French banking system is currently in a transitional phase (see Part 1) affecting both its structures and its business conditions. This transition brings with it uncertainties and new risks and therefore makes an adaptation in banking supervision necessary.

5. A transition phase with uncertainty and risk

5.1 Concentration: a necessary pragmatism

The pace of concentration in the European banking sector has accelerated since the mid-1990s, especially among merchant banks. With the introduction of a single European currency now a certainty, concentration has been taking place on an unprecedented scale since 1997, affecting every business line of the banking profession.

Until 1995, most restructuring in the French banking sector concerned savings and provident institutions and mutual banks. Although French banks were also involved in the broad wave of restructuring that began after 1995, concentration in the French banking sector was still regarded as rather tentative, for two main reasons. First, French banks are less profitable and have lower stock market capitalisations than their European counterparts. Not only is their capacity to acquire other institutions limited as a result, but they also become potential takeover targets themselves. Paradoxically, French banks could be even more vulnerable following higher profits in 1997 and the first half of 1998. This makes them more attractive because one of the chief fears of potential buyers is that an acquisition with poor profitability will reduce the overall return on equity demanded by shareholders. In addition, the so-called "French exception" with regard to employment conditions is becoming less marked following, inter alia, the abrogation of the 1937 decree and denunciation of the AFB collective agreement. Moreover, the crisis in european stock markets since mid-1998 has

increased the low level of banks capitalization. Second, the present degree of concentration, which puts the French banking system in the middle of the range, limits the scope for major combinations. One of the distinctive features of the French banking sector is the number of medium-sized banks.

Despite these forces of inertia, however, French banks have embarked on a genuine restructuring process, in particular with a view to the introduction of a single European currency.

Individually, credit institutions are seeking the optimum size that will enable them to improve efficiency and profitability via economies of scale or rationalised product ranges, achieve better risk diversification and gain significant market influence.

In France as in the rest of Europe, recent bank link-ups have been primarily domestic in scope. Banks have sought to strengthen their national base, within which synergies are easier to identify and implement, so that they can confront outside competition under the best conditions. From this standpoint, concentrations may be of two types: they may be designed to generate economies of scale or economies in product ranges.

Concentrations designed to generate economies of scale take place between two banks with similar lines of business: the total activity of the merging entities and the revenue generated are added together, while excess fixed costs are reduced by integrating their material and human resources. In France, the takeover of Crédit du Nord by Société Générale and of CIC by Crédit Mutuel could potentially generate economies of scale.

The aim of concentrations designed to generate economies in product ranges is to benefit from the diversity of activities carried on by the combining entities by offering a wider range of products and taking advantage of complementary client segments, banking services or geographical coverage. In France, this category includes the merger of Crédit National and BFCE (Natexis) and the takeover of the newly created entity by the Banques Populaires, the takeover of Banque Indosuez by Crédit Agricole and, to a lesser extent, the takeover of CIC by Crédit Mutuel.

European banks have carried out less domestic concentration, but cross-border M&A activity has gathered pace recently. Such transactions enable banks to diversify their risks, both geographically (if the banks have the same business lines) and, potentially, by diversifying their activities. In several recent cases, French banks have made acquisitions in order to strengthen their international presence. Société Générale, for example, has acquired Hambros, an English bank, Cowen Securities, an American investment bank, and increased its stake in Asia Credit, a Thai financial institution, from 18.5 to 51%. BNP has acquired the equities unit of Peregrine, a Hong Kong bank, for similar reasons.

Across the banking sector as a whole, combinations automatically reduce the number of players on the market. The economies of scale generated by concentrations also reduce over-capacity. Such rationalisation of the industry is especially necessary in France, where competitive pressures are notoriously excessive and may even be destructive. A reduction in the number of players will help to restore lending margins which have been cut to the bone.

As well as generating economies of scale or economies in product ranges, the aim of mergers and acquisitions may also be to impose a large entity on the market, both financially and commercially. With the introduction of the single currency at a time when no single player has more than 3% of the European market, the pursuit of market influence is a major reason for bank combinations. Size is all the more important given that clients are often attracted to large banks because they are assumed to be less risky.

5.2 Adapting risk management methods

The French banking system is going through an important period of change affecting not only its structures but also its activities. Over the last few years, French credit institutions have sought to compensate for deteriorating margins on domestic intermediation business by diversifying their sources of revenue (see Part 1). They have looked to two main sources of new growth: trading transactions and international business. The result has been a significant improvement in profitability

in 1997 and the first half of 1998. However, it has also made French banks more sensitive to international economic conditions and market volatility, as seen since mid-1998.

Recent difficulties, such as the financial crisis in emerging countries and roller-coaster stock markets, have shown how important it is for credit institutions to develop and refine their risk management methods, especially by tightening up internal controls. There is clearly a close correlation between the appearance of difficulties and ineffective or even non-existent internal controls.

Under regulations in effect since 1st October 1997, internal controls in France apply to all activities (trading operations, traditional intermediation services) regardless of where they are carried on. Comprehensive internal controls of this nature can therefore be applied only within a consolidated framework. All operations appearing on the balance sheet of the bank or a subsidiary entirely or jointly controlled by the bank must be monitored and scrutinised precisely, whatever the context in which they are carried out, whether in France or elsewhere. The recent financial crisis in South-East Asia and the need to cope with it as best as possible have highlighted the importance of a consolidated global approach to internal control.

Regular monitoring and control of the risk and profitability of each transaction, while particularly important in trading activities, must also be systematic for intermediation activities. The regulations mentioned above lay particular emphasis on the monitoring and control of lending, the profitability of which must be measured precisely beforehand and verified afterwards. It must also be possible to convert all risk, whether credit risk or market risk, into a homogeneous unit of measurement so as to determine total exposure, on the basis of which the appropriate level of provisioning and allocation of own funds can be set. Risk analysis prior to decision-taking must be backed up by a detailed assessment of the profitability of each transaction. Costs arising from the conception, distribution, marketing, management and funding of a product must be analysed using the most suitable method (whole cost, direct cost, marginal cost, etc.) and charged to the loans in question. Banks are therefore required to carry out prior risk assessment and management.

Clearly, such requirements have a significant impact on French banks' management techniques, and many of them have had to adapt or even overhaul their management and information systems. Some French banks are already fully aware of the need to take this type of approach; systematic methods for assessing risk and the associated return on investment are becoming more widely used, with the implementation of RAROC[3] type systems or scenario methods, for example.

The widespread introduction of this type of approach should enable French banks to improve their responsiveness by encouraging them, as appropriate, to adapt their strategies to give priority to the most profitable products or client segments.

As well as requiring banks to adapt, the changing environment resulting from restructuring and trends in banking activities, in particular their internationalisation, also presents a major challenge to banking supervision.

6. Required changes in banking supervision

Change in financial structures and activities is a vector of risk, implying that security has to be further tightened for both the public and banking centres. Crisis management methods have to evolve, supported in particular by strengthened deposit guarantee schemes and an adaptation of the way in which both national and international supervisory authorities are organised and operate.

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[3] RAROC: Risk Adjusted Return On Capital.

6.1 Crisis management methods and stronger deposit guarantee schemes

Through its off-site monitoring staff, the Banking Commission maintains close links with all banks subject to such procedures. In addition, inspection teams can take action in the context of more precisely targeted assignments. By these means, the Banking Commission seeks to forestall or, if the worst comes to the worst, to limit the cost of a crisis. In doing so, it can draw on a range of suitable sanctions and courses of action.

However, supervision cannot forestall every individual bank default: Banking Commission controls, however prompt and efficient, are always ex post facto and cannot justify interference in the management per se of credit institutions. There is no doubt that at a time of restructuring and change in the banking sector, there is an increased risk that a bank's situation might deteriorate very rapidly.

Forestalling a crisis of this type requires closer cooperation with two other bodies having control functions, namely the statutory auditors and the internal control managers serving the corporate supervisory bodies, i.e. the shareholders. Effective crisis management also requires a solid guarantee fund so that preventive or curative measures can be taken, reconciling the inevitable disappearance of failed banks with depositor security. The overall cost is much lower than if a failed bank were to be purely and simply liquidated. In addition, this solution offers the possibility of taking action against negligent managers, the adverse consequences of whose negligence are borne by the community. This aspect is important in forestalling moral hazard.

The French authorities have on several occasions shown their wish to reform the existing deposit guarantee scheme in order to increase the real protection afforded to clients, which is naturally one of the Banking Commission's chief concerns. Draft legislation along these lines is currently under discussion, raising new possibilities for preventive action and giving the Banking Commission a central role.

6.2 Complex and international financial structures as a challenge to supervisors

The limits of prudential control organised on a national basis are thrown into stark relief by the case of banking groups that have activities in several different countries. The BCCI case clearly demonstrated that when a bank has its headquarters in one place, takes decisions in another and operates in yet another, the perception of risk is distorted unless better communication between the supervisory authorities of the countries concerned is established. Dilution of responsibility can also foster a less vigilant attitude towards international groups. It is tempting for the host country authority to take little interest in the branches of foreign banks as long as the parent company looks solid. Likewise, the home country authority may be tempted to neglect risks located in subsidiaries, hoping that any local difficulties will affect only the host country and will not contaminate the parent.

While the internationalisation of banking structures highlights the limits of purely national supervision, their growing complexity also raises questions about the very structure of supervisory bodies. The emergence of financial conglomerates, bringing together activities in at least two regulated financial sectors (banking, investment services, insurance) under a single management and control structure, clearly presents a challenge to prudential supervisory authorities, most of which are still organised along sectoral lines even though growing numbers of "multi-disciplinary" authorities are being created.

The rise of cross-sector conglomerates offering not only financial services (possibly in just one of the three sectors mentioned above) but also industrial and commercial services poses an additional problem, since the latter are non-regulated activities for which there is no prudential supervisory authority.

Conglomerates pose specific risks. Often multinational firms with complex structures (especially share ownership structures) and carrying on a range of activities, tend to reduce financial transparency, thus making prudential supervision more complex while increasing the moral hazard facing the supervisory authorities. They also increase the systemic risk of contagion resulting from the

links between their different components: difficulties encountered by one company can contaminate healthy units as a result of intra-group exposure, the deterioration of the group's reputation and the loss of public confidence.

6.3 Need for cross-border and cross-sector cooperation

Diversification, increasingly international markets and the growing number of banks with networks in other countries all limit the effectiveness of supervision organised on a national and sectoral basis. The fact that markets are no longer compartmentalised or reserved for a single type of player has increased the need for cross-border and cross-sector cooperation between national and international banking supervisory authorities.

While the international organisations responsible for banking supervision have given particular priority to harmonising prudential rules, cooperation has also been a major concern, parallel to the internationalisation and integration of banking activities. In response to the spread of financial conglomerates, the closer relations initially established between banking supervisory authorities responsible for supervising the geographical entities of international banking groups have been extended to supervisory authorities in other financial sectors.

Quick to realise the limitations of a strictly local approach to supervision, banking supervisory authorities defined how responsibilities were to be shared and introduced a framework for cooperation between home and host country authorities. The initial work of the Basle Committee led in 1975 to the adoption of a Concordat on the supervision of banking institutions in other countries, revised in 1983 following the Banco Ambrosiano crisis and in 1992 following the collapse of BCCI. The Basle Committee and the group of offshore banking supervisors have also jointly worked out practical ways of securing a better exchange of information between home and host countries.

This move to set bilateral relations on a formal footing, necessary to overcome the obstacles to information exchange, has been particularly fruitful in Europe. Under the principle of home country supervision, the supervisory authorities of each Member State have full discretion to specify rules relating to the operation, approval, authorisation, off-site monitoring or on-site supervision and sanction of credit institutions on their territory.

The introduction of a single European market soon made it necessary, along with the harmonisation of prudential rules, to set up a framework for cooperation between banking supervisory authorities. The first banking directive of 1977 laid the foundations for institutional cooperation between supervisory authorities. The second directive placed particular emphasis on cooperation and exchanges of information between supervisory authorities, in particular by allowing for the lifting of professional secrecy between them. In practical terms, cooperation takes place through various channels, both bilateral and multilateral (contact group).

The transition to Stage Three of Economic and Monetary Union will not affect the current context of prudential supervision within the European Union. In accordance with the principle of subsidiarity, national authorities will continue to be responsible for the prudential supervision of credit institutions. The Member States have agreed that the role of the European Central Bank should primarily be consultative, described as "macro-prudential". As regards cooperation, the European Central Bank's Banking Supervision Committee will be responsible for encouraging cooperation between banking supervisory authorities on macro-prudential issues.

As well as meeting the challenge of globalisation of banking operations, banking supervisors also have to cope with the integration of banking, stock market and insurance activities within often multinational financial conglomerates. The risk of contagion implies supervising such groups as a single entity, in addition to supervising each line of business. The variety of different activities combined with the risk of contagion means that the traditional consolidation-based approach of banking supervisors needs to be supplemented by an assessment of intra-group exposure and a review of the allocation of own funds.

This raises the issue of the best structure for supervising increasingly integrated financial activities. Some economists suggest that supervisory bodies should be organised according to their objectives. Thus, Taylor (1995) and Goodhart (1996) argue that supervision has two aims: ensuring systemic stability and protecting users. They propose creating two agencies, one for each objective, covering all banks and financial institutions and all their lines of business. Others, such as Aglietta, Sessin and Sialom (1997), go even further and suggest the introduction of a "meta-level" of supervision, involving the creation of a single supervisory body covering all banking and financial lines of business and responsible for all supervision objectives. This globalisation of supervision is regarded as an essential response to the constitution of financial conglomerates.

Prudential authorities are far from unanimous on the subject. Davies[4] considers that banking supervision should be kept separate and carried out under special rules because banks are unique, especially where systemic risk is concerned. In a nutshell, there is no easy way of defining how many supervisory bodies there should be or what they should do.

Situations vary widely from one country to another. In most countries, each type of financial intermediary is supervised by one or more different authorities. The United States are at one extreme in this respect, due partly to the country's federal structure: in addition to the large number of supervisors at the federal level, there are federal state supervisors. Other countries concentrate the supervision of all financial operators and activities in the hands of a single supervisory authority. In Denmark, for example, a single body, *Finanstilsynet*, is responsible for supervising all financial activities. This type of system, prevalent in small countries especially, has tended to spread in recent years in response to the growing interpenetration of the different segments of the financial sector. In 1997, the United Kingdom decided to set up a single supervisory authority for the banking and financial sector, the Financial Services Authority (FSA), uniting the tasks of all the existing authorities.

France has opted for an intermediate solution. The Banking Commission has had the scope of its supervisory remit extended without being turned into a "mega-regulator". The Financial Activity Modernisation Act of July 1996 extended the Banking Commission's competence to investment firms, most of which were previously supervised by other bodies (brokerage firms and jobbing firms were supervised by the *Conseil des Bourses de Valeurs* (CBV) and by the *Société des Bourses Françaises* (SBF) respectively, while commodity brokers and floor traders were supervised by Matif SA). In other areas, supervisory responsibility has remained separate. UCITS and portfolio management companies are supervised by the *Commission des Opérations de Bourse* (COB). Insurance companies are supervised by the *Commission de Contrôle des Assurances* (Insurance Supervisory Commission) under the aegis of the French Finance Ministry. There is no significant convergence between banking supervision and insurance supervision: both the nature of the risks assumed and the approach to accounting and prudential regulation differ. However, these separations do not rule out exchanges of information and opinions between supervisors, which take place as often as necessary and can be extremely helpful.

At an international level, initiatives to encourage cross-sector cooperation were taken in 1994 with the creation of the international organisations of securities supervisory authorities (IOSCO)[5] and insurance supervisors (IAIS).[6] Their action has been placed on a more permanent footing with the setting-up of a "joint forum" on financial conglomerates in 1996. The Joint Forum has thirty members from three financial sectors, representing thirteen countries. France is particularly well-represented, since it has three members: the General Secretariat of the Banking Commission, the COB, and the

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4 This view is cited in Goodhart et al. (1997), p. 158.

5 The International Organization of Securities Commissions (IOSCO) was founded in 1982 by expanding the Inter American Association of Securities Supervisors which had held an annual conference since 1974. Its membership consists of 135 authorities responsible for supervising investment firms and financial markets.

6 The International Association of Insurance Supervisors (IAIS), founded in 1994, has over 80 members, reflecting the spread of internationalisation to all financial sectors.

Ministry of the Economy, Finance and Industry (representing the Insurance Directorate and Insurance Supervisory Commission).

A European joint group on financial conglomerates has also been in existence for ten years or so under the aegis of the European Commission (the Commission has observer status). Its work has been suspended pending the results of the Joint Forum's discussions. Confronted with the difficulties of implementing operational cross-sector cooperation, Member States have often used other forums[7] to take action on a case-by-case basis.

Since the adoption of the investment services directive in 1993, however, financial activities complementary to pure banking activities are now covered by European regulations. Thus, the 1993 own funds directive applies not only to credit institutions but also to investment firms, i.e. to institutions seeking not to grant loans or collect deposits but to provide intermediation services on financial markets.

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[7] Such as the contact group.

Some implications of bank restructuring for French monetary policy

Christian Pfister and Thierry Grunspan[1]

Owing to the limited degree of bank restructuring in France,[2] this article broadens the scope to changes in the environment in which banking activities are conducted. Such changes, as well as banking restructuring itself, can be expected to have implications for both the transmission mechanism (Section 1) and the definition and implementation of monetary policy (Section 2).

1. Implications for the monetary policy transmission mechanism[3]

The development of capital markets and the increased competition between banks are factors that can be expected to have strengthened the efficiency of the transmission mechanism, at least in its first stages: the response of money market rates and bank lending rates to changes in policy rates should have become both more rapid and larger. As a consequence, the interest rate channel is likely to have been reinforced both in absolute terms and relative to the credit channel. However, the overall impact on the transmission mechanism is unclear to the extent that long-term interest rates, which are not directly under the control of the central bank, play an important and increasing role in the financing of the French economy.

1.1 The response of money market rates to policy rates

Comparing two periods, 1987-91 and 1992-96, it appears that the transmission of monetary policy impulses to money market rates has become much more rapid.[4]

Before 1992, it took the one-month rate one month to adjust up to 85% to a shock to the intervention rates (repurchase tender rate and five-to-ten day repurchase facility rate) and the overnight rate; after the same lapse of time, 80% of the same shock was reflected in the three-month rate.

Since 1992, the passthrough of a change in the overnight rate to the one-month rate takes one week, with 92% of the adjustment taking place on the first day; the lag is approximately two weeks for the transmission of changes in both the overnight rate and the official rates to the three-month rate.

The more rapid response of money market rates to policy rates may be accounted for by the increased efficiency of the French money market resulting from reforms implemented in the mid-eighties (creation of a new compartment open to all economic agents in which certificates of deposit, commercial paper and Treasury bills are traded; improved security through the promotion of repurchase transactions with delivery of securities).

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1 The authors are members of the Economics Department of the Banque de France. The views expressed are theirs and not necessarily those of the Banque de France.

2 See Matherat and Cayssials (1998).

3 For a broader view of the monetary policy transmission mechanism in France, see Cordier and Ricart (1995).

4 See Pfister (1997a).

1.2 The response of bank lending rates[5]

Previous research has tended to show that bank lending rates in France adjusted only partly and sluggishly to changes in policy rates.[6] This may reflect two types of factors:

- from a technical point of view, estimations have usually focused on the banking base rate. However, this rate is adjusted infrequently and today applies only to a small and declining part of banks' credit: 6.6% at the end of 1995 as against 10.5% at the end of 1992.[7] Furthermore, the banking base rate is used as a reference mainly for short-term credit extended to small and medium-sized enterprises. Here, we have recourse to rates compiled quarterly by the Banque de France Business Conditions Division that we consider more representative of the genuine cost of credit and that allow us to differentiate between short, medium and long-term credit as well as between enterprises and individuals;
- from an economic point of view, an important part of French banks' liabilities is still remunerated at regulated interest rates (Table 1). This may hamper the response of bank lending rates to policy rates. Here, we try to account for inertia stemming from regulated interest rates by using the spread between the rate at which the Banque de France provides the bulk of banks' refinancing (the repurchase tender rate) and the weighted level of regulated interest rates as an explanatory variable for bank lending rates.

Table 1
Breakdown of banks' liabilities according to remuneration
Percentage of total, end-year figures

	1984	**1997**
Sight deposits*	20	14
Regulated interest rates	34	30
Passbook deposits	*29*	*18*
Housing saving schemes	*5*	*11*
Market interest rates	39	45
Term deposits	*18*	*15*
CDS	*1*	*9*
Bonds and medium-term notes	*20*	*21*
Own funds	8	12

* The remuneration of sight deposits can also be considered as regulated to the extent that it is forbidden to pay interest on French franc-denominated sight deposits which account for the quasi-totality of sight deposits.

Source: Banque de France.

Estimations of short-term loans extended to firms have been run over the period 1983Q1-1998Q2 as well as over the two sub-periods 1983Q1-1989Q4 and 1990Q1-1998Q2. From the results it appears that:

- the short-run response of the bank lending rate to the policy rate has increased over the period. In the 1980s, after one quarter, only 64% of a change in the repurchase tender rate was reflected in

[5] See the Appendix for more detail.

[6] See, for instance, Borio and Fritz (1995).

[7] The corresponding figures for banks' variable rate loans referenced on money market rates were 20.6 and 21.2%; they were 69.6 and 65.0% for fixed rate loans. Figures are quoted from Barillas (1995) and Gervais (1997).

the short-term loan rate under the assumption that the regulated rates adjusted in line with the repurchase rate. In the 1990s, the corresponding percentage is 82%, regardless of whether regulated rates are adjusted or not;

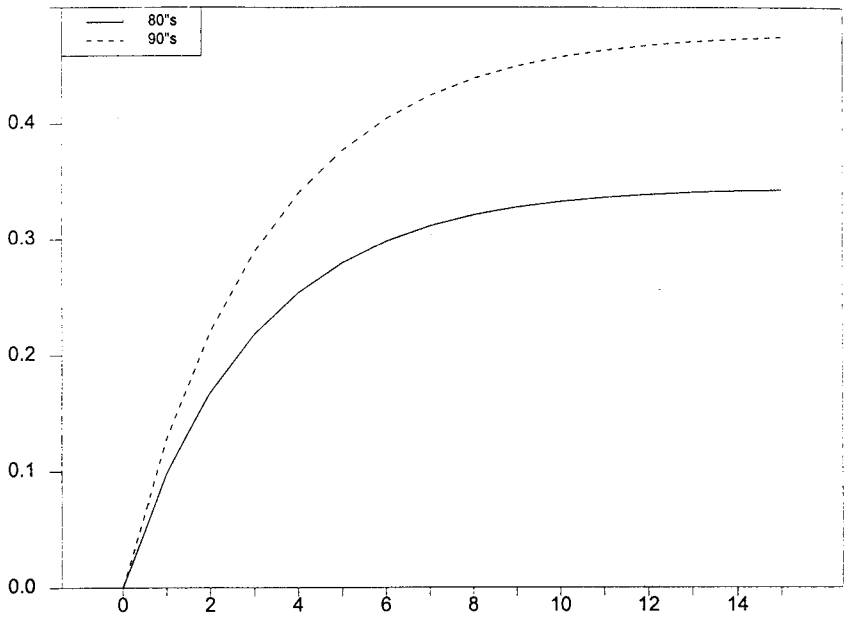
- indeed, in the 1980s, the inertia of regulated interest rates vis-à-vis the main policy rate slowed the adjustment of the lending rate. For instance, after three quarters, the lending rate adjusted by 71% if the regulated rates and the policy rate moved in line, but only by 42% if the repurchase tender rate alone was moved. In the 1990s, the spread between the policy rate and regulated rates is not statistically significant.

As a consequence, the response of short-term banks' lending rates to firms in France has become quite similar to the ones observed in other G-10 countries.[8]

Owing to data availability, estimations for short-term loans extended to individuals were confined to the second sub-period only. In this case, the spread between regulated rates and the repurchase tender rate is statistically significant over the estimation period.

Estimations for medium and long-term loans extended to firms have been run over the period 1984Q2-1998Q2 as well as for over the two sub-periods 1984Q2-1989Q4 and 1990Q1-1998Q2. Between the two sub-periods, bank lending rates have become more responsive to changes in the ten-year interest rate: the relative weight of the ten-year in the long-run response has approximately increased from one third to one-half.

Graph 1
Response of medium and long-term lending rate to firms
1% increase in 10-year rate (with unchanged policy rate)



As in the case of short-term loans, data availability limits the scope of the estimation for individuals to the 1990s. Ten-year interest rates account for more than three quarters of the long-run response of loan rates, while regulated interest rate inertia slows down the response of the loan rate to the policy rate. For instance, at a two-quarter horizon, loan rates adjust nearly completely to a simultaneous change in the policy, ten-year and regulated rates; however, they adjust only up to 58% if the latter are kept unchanged.

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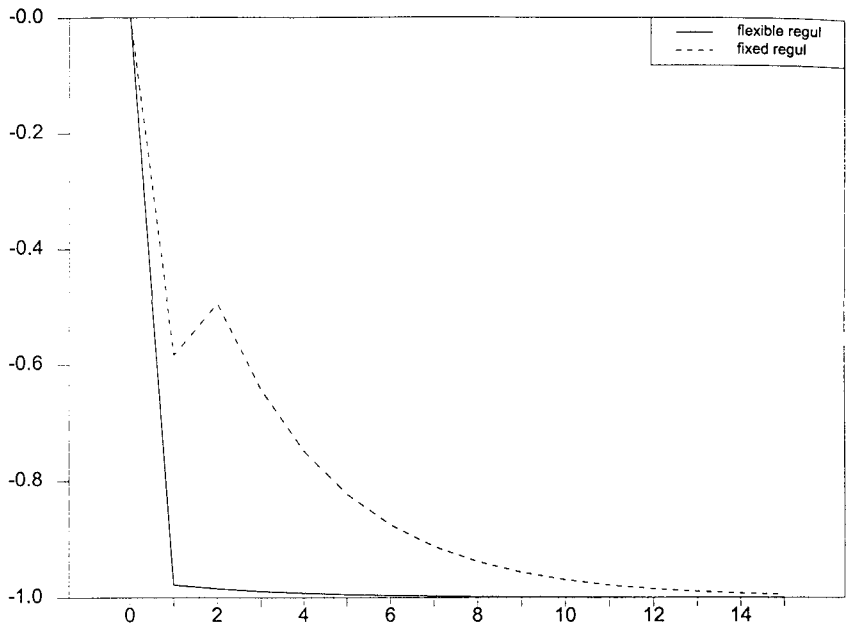
[8] See Borio and Fritz (1995).

Graph 2

Response of medium and long-term lending rate to households

Simultaneous 1% fall in the policy rate and 10-year rate



All in all, it appears that, in the 1980s, banks did not behave in a competitive manner, as their average funding cost played an important role in the pricing of credit. By contrast, in the 1990s, growing competition between banks and the creation of a market for commercial paper have rendered bank lending rates more responsive to policy and market rates, as far as loans extended to firms – especially short-term credit – are concerned. However, as individuals do not have direct access to money market financing, banks are still in a position to impose their average funding cost.

These results may be regarded as ambiguous to the extent that credit growth has been decelerating and interest rates declining during most of the 1990s. However, one should note that policy and market rates have had an increasing influence on bank lending rates in spite of two adverse factors: during the 1990s, assets remunerated at variable interest rates have outweighed liabilities of a similar nature in the aggregated balance sheet of banks and regulated interest rates have declined less than market interest rates (Table 2).

Table 2

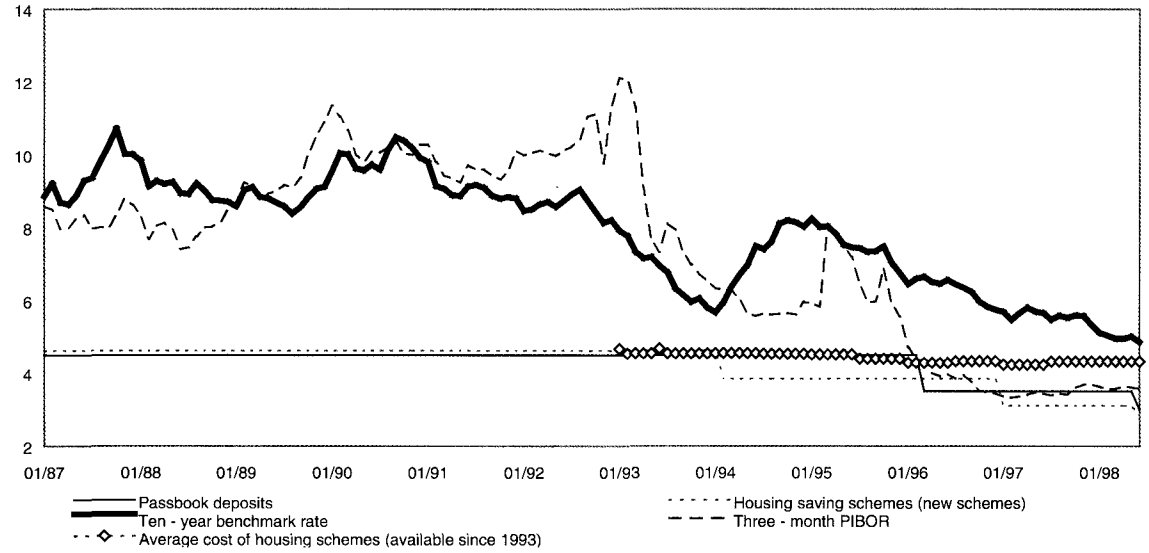
Breakdown of banks' balance sheet according to type of remuneration

French franc-denominated assets and liabilities, as a percentage of total, end-year figures

	1992	1993	1994	1995
Assets remunerated at variable interest rates	29.3	30.9	23.0	24.4
Liabilities remunerated at variable interest rates	24.2	18.5	18.6	17.3

Source: Barillas (1995) and Gervais (1997).

Graph 3
Market and regulated interest rates
In percent



Source: Banque de France.

1.3 Impact on the transmission mechanism

The larger and faster response of money market and bank lending rates to policy rates is suggestive of a strengthening of the interest rate channel. However, this channel remains partially muted as a large part of French banks' liabilities is still remunerated at regulated interest rates that are far stickier than market rates. As a consequence, regulated interest rates influence the cost of credit extended to households. Furthermore, long-term interest rates, that are not under the direct influence of the central bank, play an important role in the financing of the French economy. As mentioned above, this role has even increased in the 1990s as regards medium and long-term bank loans extended to firms. Also, the development of capital markets and the increased competition between banks in France since the mid-1980s are likely to have weakened the credit channel relative to the interest rate channel.

Table 3
Relative importance of short versus long-term interest rates for the private sector
1995, as a percentage of GDP, end-year figures

	Non-financial companies	Households
Assets		
• Short-term rates	12.0	12.2
• Long-term rates	4.0	47.0
Liabilities		
• Short-term rates	20.0	6.0
• Long-term rates	22.9	25.7
Net assets		
• Short-term rates	–8.0	6.2
• Long-term rates	–18.9	21.3

Source: Cailleteau and Grunspan (1998).

At the same time, the concentration of the French banking sector has only marginally increased over the past fifteen years and thus not acted as a constraint on the financing of small and medium-sized firms. Moreover, recourse to credit still plays the major role in the financing of most French companies, with the growth of the share of financing on domestic capital markets in the total domestic debt reflecting mainly the deterioration of the public finances over the period. In fact, although the banking credit channel is unlikely to play a significant macroeconomic role in the transmission mechanism of French monetary policy,[9] there are signs that a broad credit channel complementary to the money channel is at play.[10]

Table 4
Breakdown of total domestic debt
As a percentage of total, end-year figures

	1985	1997
Credit to the economy	71.8	57.7
Companies	*34.4*	*25.7*
Households	*28.5*	*23.9*
*Others**	*8.9*	*8.2*
Central government non-negociable debt	5.5	2.9
Financing on domestic capital markets	19.6	37.1
Central government	*14.5*	*30.0*
Companies	*4.1*	*5.8*
*Others**	*1.0*	*2.6*
Credits obtained from non-residents	2.1	1.0
Bonds issued abroad	1.1	1.3

* Non-central government, private administrations and insurance companies.
Source: Banque de France.

2. Implications for the definition and implementation of monetary policy

The pursuit of price stability, the final objective of monetary policy, has by no means been endangered by the restructuring of the French banking industry. Indeed, the capacity of the Banque de France to influence short-term interest rates through its role as provider of the final means of settlement has not diminished. On the contrary, it has increased and French monetary policy has been successful in bringing down inflation and keeping it at a low level.[11]

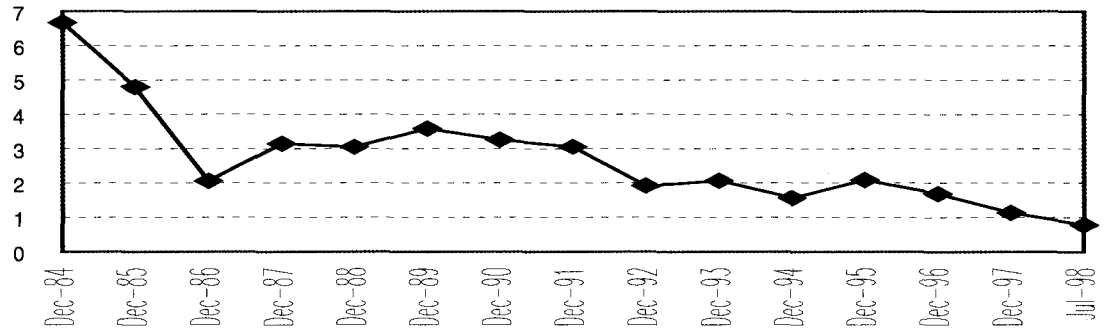
However, the broader context of deregulation, globalization, and financial innovation in which bank restructuring has taken place has deprived the central bank of some of its instruments and constrained more tightly the use of the remaining ones. It has also made the intermediate objectives of the French monetary policy at times more difficult to achieve or to define and led to more emphasis being put on price indicators.

9 See Rosenwald (1998b).

10 See Rosenwald (1998a).

11 Conversely, the issuance of electronic money is likely to have significant implications for monetary polity in the future. See European Central Bank (1998).

Graph 4
Consumer price inflation



Source: INSEE.

2.1 Implications for the monetary policy instruments

In order to reap the benefits of the development of capital markets and improve resource allocation, recourse to direct control instruments, that had been a feature of the French monetary policy since the end of 1972,[12] clearly had to be discontinued. This was done progressively as limits on domestic credit expansion were lifted in 1987 and the last controls on capital movements removed at the end of 1989. However, as noted above, some elements of direct control still remain, such as regulated interest rates that may be useful in a context of excessive competition between banks but slow the response of loan rates to individuals.

Growing capital mobility and asset substitutability in a context of participation in the Exchange Rate Mechanism (ERM) led to a tighter constraint on other instruments, in particular the setting of reserve requirements and policy rates.[13]

In face of a heightened risk of relocation of money market activities and as a part of the efforts to disconnect temporarily the domestic impact of monetary policy from its external effects in situations of tension on the foreign exchange markets, reserve requirements were substantially eased in the early 1990s. The lowering of reserve requirements, that were unremunerated, was to some extent also useful against the background of slow growth in money and credit aggregates. But, as minimum reserves reached a level close to that of settlement balances, they lost their properties of stabilising very short-term interest rates and enlarging the demand for central bank money. These properties are, however, to be restored with the progressive introduction, from 16th October 1998, of a flat 2% ratio on most items of the liability base, in anticipation of the minimum reserve system that will be applied by the European Central Bank from the beginning of 1999. This restoration will nevertheless be achieved at the cost of abandoning, at least temporarily, the monetary control function of required reserves, as these are now fully remunerated in line with the main features of the ECB minimum system.

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[12] See Castel and Masse (1983).

[13] See Pfister (1997).

As reserve requirements were brought to very low levels, open market operations had to bear the brunt of the Banque de France's money market management. Furthermore, following the widening of ERM fluctuations bands in August 1993, there was uncertainty among market participants about the monetary policy that would be followed. Consequently, the Bank wished to show increased caution in adjusting money market interest rates towards their "baseline" levels in the wake of speculative attacks and tightened its control over very short-term interest rates. Both the lowering of reserve requirements and the wish to control very short-term interest rates led the Bank to increasingly rely on daily fine-tuning operations rather that its main refinancing operations to steer money market rates. As a consequence, the steering function performed by the official rates declined and, as seen above, changes in the one-month money market today reflect only those in the overnight rate. The focus on very short-term interest rates also reflected the wish of the Bank to minimize the impact on longer-term interest rates when the exchange had to be defended, in view of the important role played by medium and long-term interest rates in the financing of the economy. Finally, speculators were all the more penalized in such situations as short positions on the French franc were usually financed at conditions referenced on the overnight rate.

2.2 Implications for the monetary policy intermediate objectives and indicators

In the same way as they have constrained the use of monetary policy instruments, growing capital mobility and asset substitutability have, at times, rendered the intermediate objectives that French monetary policy pursues more difficult to achieve or define: a domestic objective based on a growth target for a money aggregate and an external objective of keeping the exchange rate stable vis-à-vis the most credible currencies in the ERM. Thus the broad monetary aggregate M3 has had to be redefined twice: in 1986, through its extension to money market paper held by non-financial agents and to assets held by money market mutual funds;[14] and in 1991, through the direct inclusion of money fund shares in M3. These changes reflected both the spreading of the holding of money market fund shares by the public and the wish to protect M3 developments against portfolio shifts decided by fund managers rather than directly by investors, such as delocation to circumvent minimum reserves.

As shown in Table 5, the monetary target itself was based on M2 (in its former definition comprising cash, sight and term deposits) until 1985, M3 (in its new definition) in 1986, M2 and M3 in 1987, M2 from 1988 to 1990, M3 from 1991 to 1996 and on a range of monetary aggregates (M1, M2, M3 and M3 + P1[15]) in 1997 and 1998. The target was alternatively set as a reference rate (from 1977 to 1980, in 1983 and from 1994) and as a corridor (in 1981, 1982 and from 1984 to 1993). Also, the target horizon that was set at one year until 1993, and was extended to the medium term from 1994 to 1997.

Despite the changes in the definition of the monetary target, deviations became more frequent and larger. This probably reflected four factors: the loss of direct instruments that had made monetary targets easier to achieve and the increased difficulty to control broad monetary aggregates in the short-run as the share of non-renumerated assets in M3 decreased and financial innovation led to monetary assets being renumerated at rates closer to money market rates.

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[14] In 1986, deposits with savings banks were also reclassified into M1 (cash and sight deposits in French francs), M2-M1 (passbook deposits) and M3-M2 (term deposits, sight deposits in foreign currecies, money market fund holdings and money market paper) according to their nature.

[15] P1 consists of contractual savings (housing saving schemes and peoples' saving schemes) that have an initial maturity of four years or more.

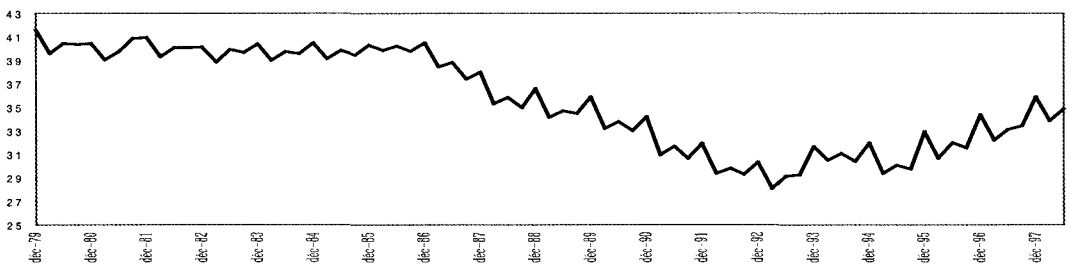
Table 5
Monetary targets

Years	Benchmark aggregates	Target (in %)	Outturn	Deviation from target (in %)
1977	M2	12.5	13.9	+1.4
1978	M2	12	12.2	+0.2
1979	M2	11	14.4	+3.4
1980	M2	11	9.8	–1.2
1981	M2	10–12	11.4	–
1982	M2	12.5–13.5	11.5	–1.0
1983	M2	9	9.9	+0.9
1984	M2R[1]	5.5–6.5	7.6	+1.1
1985	M2R	4–6	6.5	+0.5
1986	M3	3–5	4.5	–
1987	M2	3–5	4	–
	M3	4–6	9.1	+3.1
1988	M2	4–6	3.9	–0.1
1989	M2	4–6	4.4	–
1990	M2	3.5–5.5	–0.7	–4.2
1991	M3	5–7	4.2	–0.8
1992	M3	4–6	5.9	–
1993	M3	4–6.5	–1.2	–5.2
1994-96	M3	5	1.0[2]	–4.0
1997	M1	5	6.5	+1.5
	M2	5	7.8	+2.8
	M3	5	1.9	–3.1
	M3 + P1	5	4.8	–0.2
1998	M1	5		
	M2	5		
	M3	5		
	M3 + P1	5		

[1] Monetary aggregates were defined either in terms of holdings or both holdings and residence until 1985 (the differences between the two aggregates were negligible before that date, due to exchange controls); the letter "R" was dropped from 1986 as from then on aggregates were defined of both holdings and residence. [2] Average yearly rate of change.

Source: Banque de France.

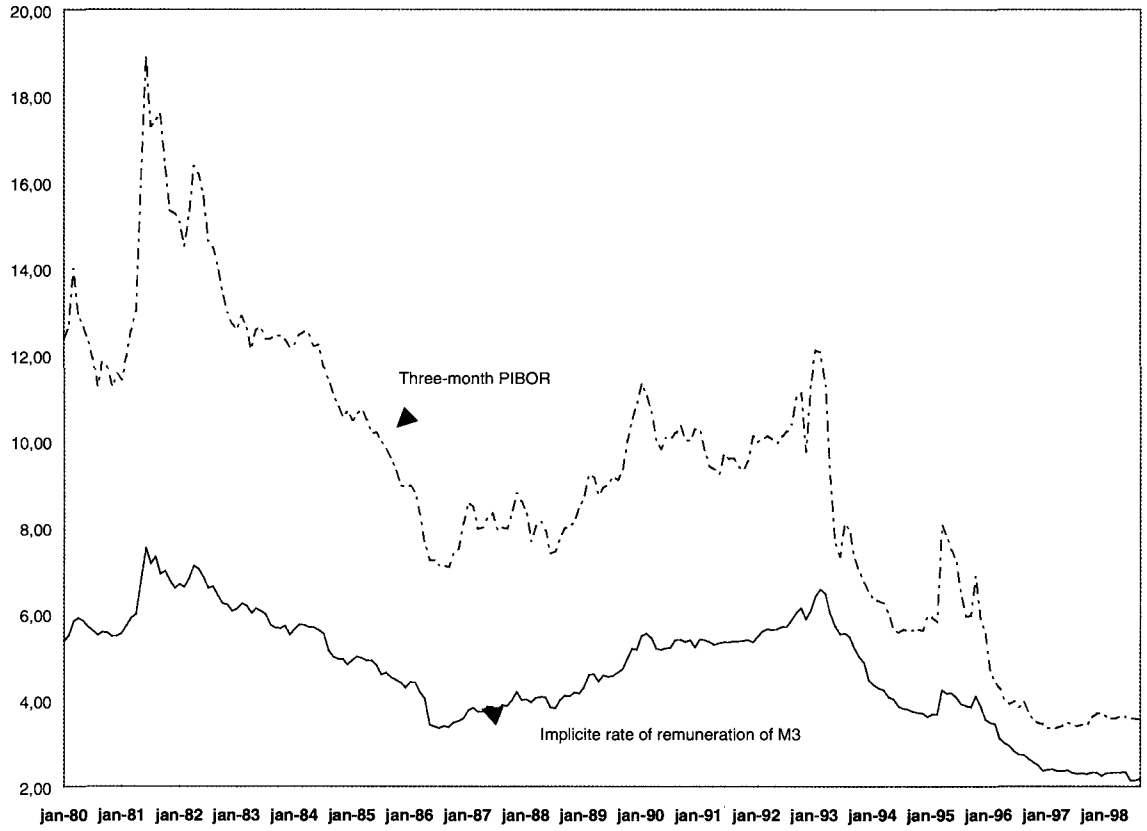
Graph 5
Share of non-remunerated assets in M3 (in %)



Source: Banque de France.

Graph 6

Implicit rate of remuneration of M3* and three-month PIBOR (in%)



* Weighted pre-tax creditor interest rates.

Source: Banque de France.

At times the exchange rate objective also became more difficult to achieve as capital flows developed, leading to a sweeping change in the structure of the French balance of payments: in 1984, current account transactions accounted for 70% of all operations registered in the balance of payments and 35% of GDP ; whereas the latter percentage remained more or less constant over the following ten years, capital flows accounted for more than 70% of all operations in 1993 and far exceeded GDP.[16] More specifically, the holdings of French central government securities by non-residents increased sharply from 3% of the outstanding public negotiable debt in 1987 to a peak of 34.5% at the end of 1992. This raised questions about the stability of that demand and the potential adverse consequences of portfolio shifts.[17]

Indeed, it was at times necessary to raise policy rates to defend the currency, in some cases during rather long periods (from September 1992 to March 1993 and March to June 1995). However, interest rate hikes in defence of the franc in 1992-93 have apparently had a smaller impact on the economy than generally thought,[18] possibly reflecting the rather modest response of longer-term interest rates and thus a much reduced impact of these interest rates on the financing conditions of the economy.

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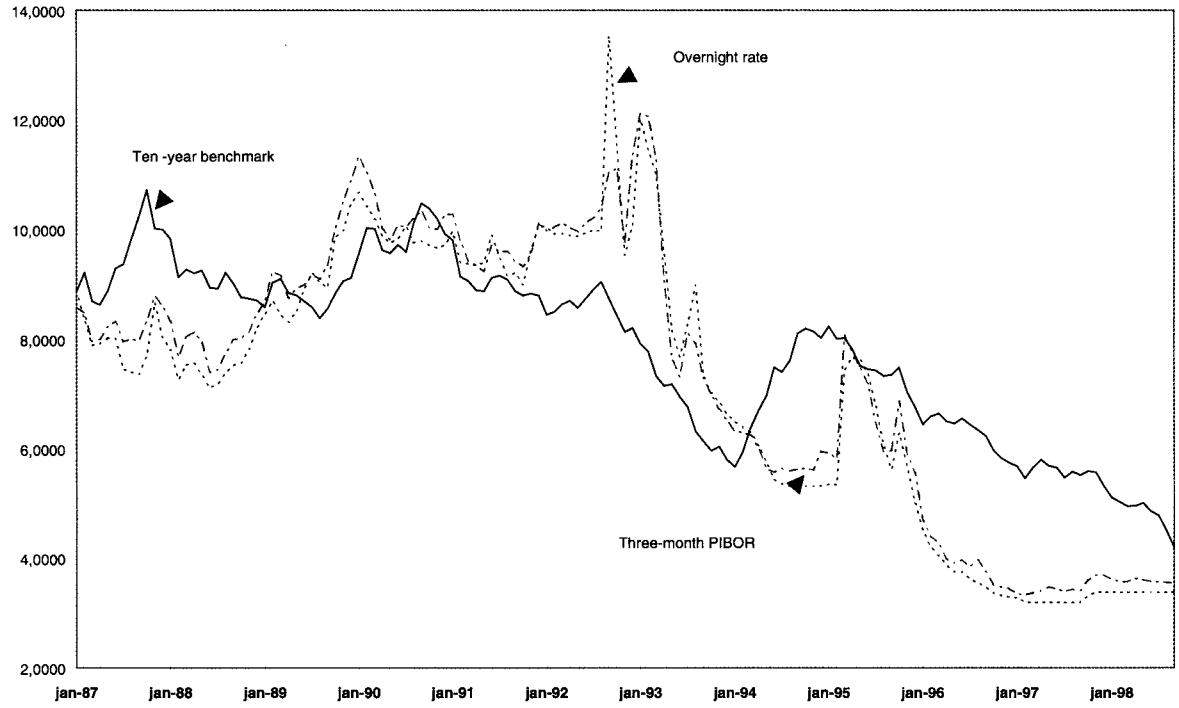
16 See Dedryver (1994).

17 See Patat (1994).

18 See Levy and Halikias (1997).

Graph 7
Short and long-term interest rates (in %)



Source: Banque de France.

Three factors were at the root of the stronger emphasis by the Banque de France on price indicators:

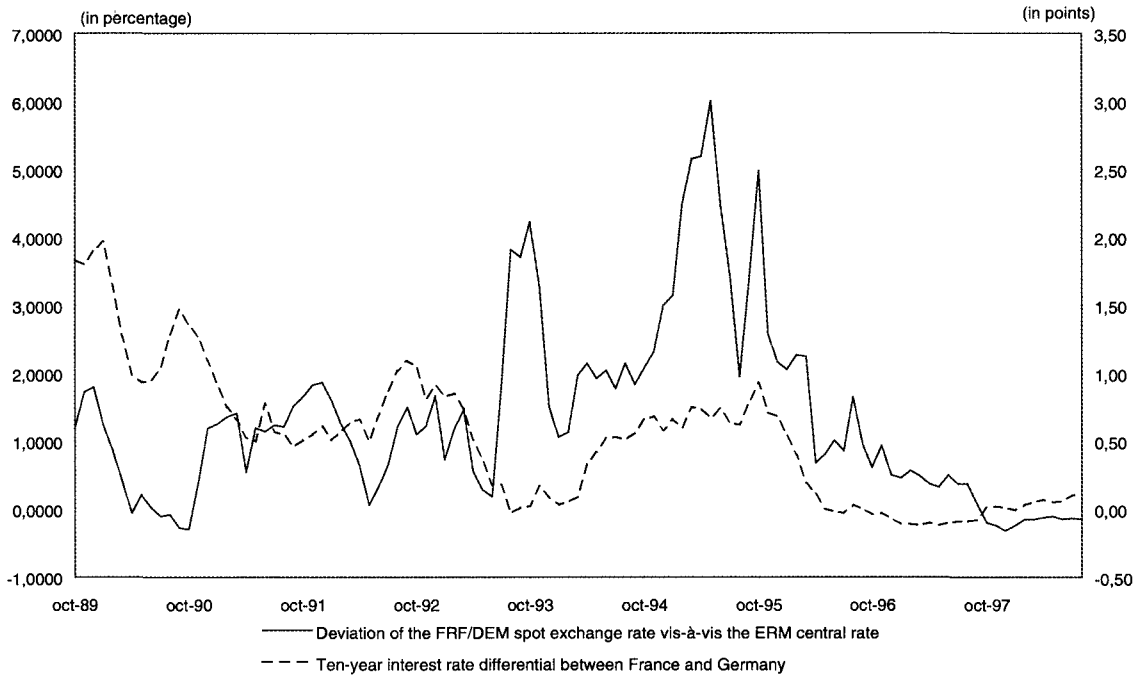
- the role played by the exchange rate, that is itself a price, in the day-to-day conduct of monetary policy; this favoured the use of indicators that are available on a permanent basis;
- the development of deep and liquid financial markets, the prices of which can be considered as representative of investors' judgements and which incorporate information rapidly;
- the growing influence of market interest rates in the financing of the economy as well as the growing presence of banks in financial markets.

Four types of price indicators stand out among those monitored by the Banque de France: the yield curve, monetary conditions indicators, asset prices and derivatives. The *yield curve* is an important indicator for three main reasons. First, as mentioned above, medium and long-term interest rates play an increasing role in the setting of banking conditions and more generally in the French economy. Second, it has been possible to show that, over the period 1985-95, the term structure contains information for certain maturities. On the one hand, spreads vis-à-vis two-year rates are informative for future changes in both short and long-term rates; on the other hand, the spreads from (two- versus one-year rates) to (five- versus one-year rates) and (four- versus two-year rates) are the most informative for future changes in the inflation rate.[19] Third, long-term interest rates differentials are used in conjunction with deviations of the spot exchange rates vis-à-vis the ERM central rates of the other most credible participating currencies as indicators of credibility of the exchange rate objective (Graph 8).

[19] See Jondeau and Ricart (1997).

Graph 8

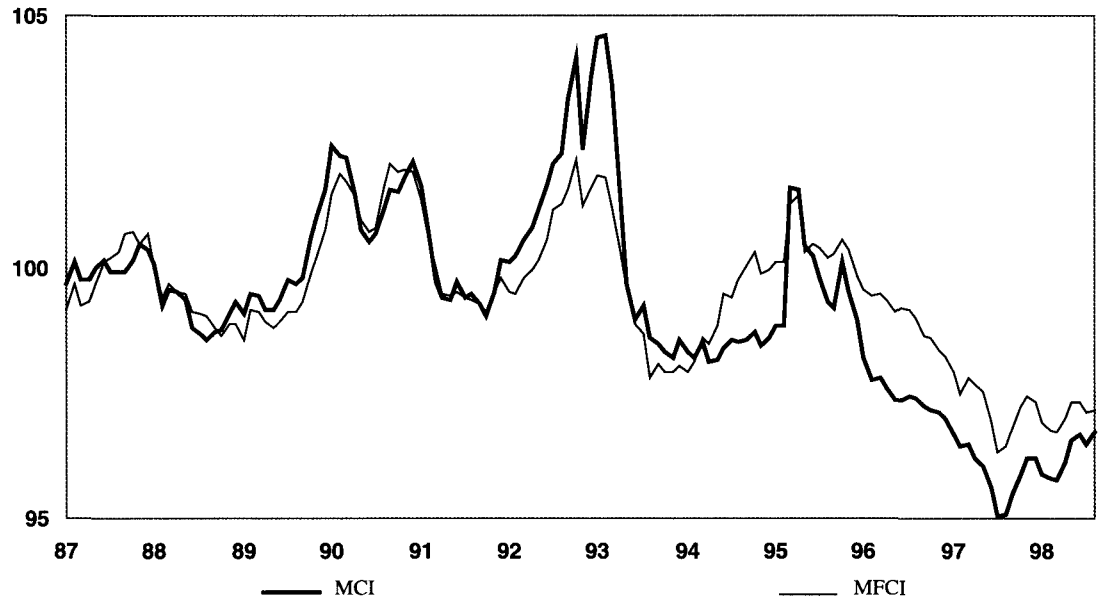
Long term interest rate differential and deviation vis-à-vis the Deutsche mark's central rate



Source: Banque de France.

Graph 9

MCI and MFCI in France



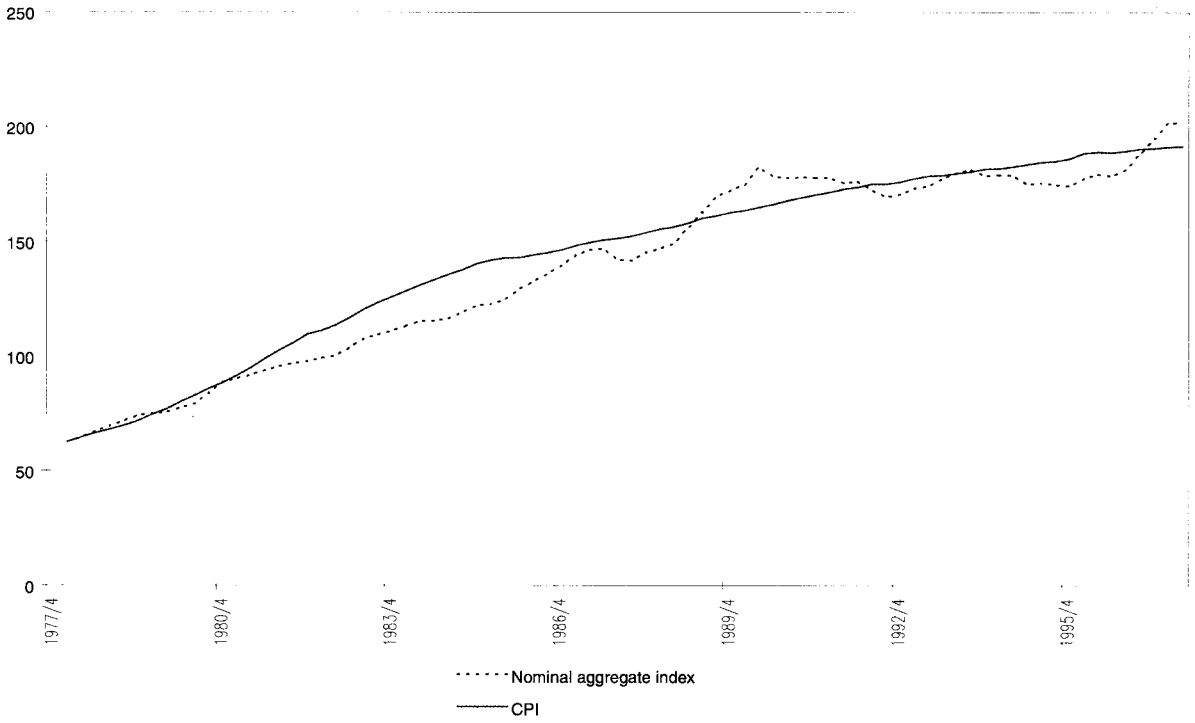
Base : 100 = 1987 average

Source : Banque de France

The Banque de France also monitors *monetary conditions indicators* despite the inherent limits on the use of such tools, especially the fact that they reflect changes in monetary conditions from a given base year, so that they can only represent a relative degree of tightness and not an absolute one. Indeed, these indicators have the merit of synthesising in a readily available and internationally comparable manner the joint effects of variations in interest rates and exchange rates on economic activity, regardless of whether they originate from monetary policy or market behaviour. Moreover, the coverage of a monetary conditions index (MCI) can easily be extended to broader financial variables, such as long-term interest rates, in order to build a monetary and financial conditions index (MFCI). This is particularly justified in the case of France.[20]

The reason why the Banque de France monitors *asset prices* is not so much related to a wealth effect, since available data do not validate the hypothesis of such an effect.[21] It has more to do with their overall contribution to maintaining a high level of financial stability conducive to an efficient conduct of monetary policy[22] and with the high degree of involvement of French banks in financial markets and real estate credit.

Graph 10
Aggregate index of asset prices



Source: Grunspan (1998).

Derivatives, in particular options, provide central banks with new opportunities for gauging market sentiment.[23] Notably, implied volatilities, call put volume ratios, smile curves and risk-neutral probability density functions on the three-month PIBOR and the Notional contract are used by the

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20 See Frochen (1996) and Verdelhan (1998).

21 See Jaillet and Sicsic (1998).

22 See Pfister (1997b).

23 See ECSC/BIS (1994).

Banque de France to assess the direction and distribution of market expectations about future short and long-term interest rates.[24] Implied volatilities, risk reversals and risk-neutral probability density functions are used to assess the direction and distribution of market expectations about future exchange rates, especially the bilateral French franc/Deutsche mark rate.[25]

Tighter constraints on the use of instruments and difficulties to achieve or to define intermediate targets have increased the need to explain to the public the reasons and the consequences for the economy of monetary policy decisions. This has been done mainly by referring to the final objective of price stability and to developments in some price indicators, notably long-term interest rates. Bank restructuring and changes in the broader context of banking activities have thus led the Banque de France to be more transparent and accountable. Another motive for enhanced transparency was found in the increasing reliance on price indicators in the day-to-day conduct of monetary policy. This increased the need to dispel any uncertainties in the markets about the monetary policy thrust, if only to avoid the "noise" such uncertainties might create in the information recovered from market prices.

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[24] See Coutant, Jondeau and Rockinger (1998).

[25] See Rzepkowski (1997).

Appendix

The appendix is organised as follows. The first section presents the data used, while the second analyses the response of short-term bank lending rates to policy rates and the third focuses on medium and long-term bank lending rates. The fourth section makes an overall assessment.

A1. The data

As mentioned in the core paper, the estimations were based on quarterly data compiled by the Banque de France Business Conditions Division instead of the base rate. Although the latter is usually used for research, it is adjusted infrequently and today applies only to a small and declining part of total bank credit. The loan rates used in this paper are more representative of the cost of credit for non-financial firms and individuals. Moreover, the data allow us to differentiate between both short and medium and long-term loans, and non-financial firms and individuals.

Data from the Banque de France Business Conditions Division (1984Q2-1998Q2 for firms and 1990Q2-1998Q2 for individuals) could be backdated to 1983 for firms, using a survey from "*Institut National de la Statistique et des Etudes Economiques*".

The market rates used are the three-month interbank interest rate and the ten-year interest rate on government securities. The tender rate has been chosen to model policy rates. Finally, a quarterly indicator representing the average cost of resources collected at regulated rates[26] by the banking sector has been computed since 1983. The indicator is built by weighting the level of each regulated rate (*passbook deposit rates, housing saving schemes rate*)[27] according to their weight in the resources of the banking sector.

All the data used are stationary in first differences. The spread between the three-month rate and the tender rate is found to be stationary in level. All regressions are estimated by OLS.

A2. The response of short-term bank lending rates to policy rates

The behaviour of bank lending rates is modelled by an error-correction model which allows flexibility in capturing the dynamic interaction between the variables. In the long run, the lending rate is supposed to reflect variations in the cost of central bank refinancing (the *tender rate*). In the short run, it can deviate from the long-term target and respond to other explanatory variables such as the level of regulated rates or short-term market rates.

We estimate the following relation:

$$\Delta debit(t) = \sum_{i=1}^{p} a_i \Delta debit(t-i) + \sum_{j=0}^{q} b_j \Delta ao(t-j) + \sum_{k=0}^{r} c_k Spread(t-k)$$

$$+ \sum_{l=0}^{s} d_l \Delta(ao - reglem)(t-l) + \alpha(debit - \beta ao)(t-1) + \varepsilon_t$$

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[26] Regulated rates are set by the Government.

[27] In some cases, the Government adds a premium (perceived by the owner of the asset) to the remuneration paid by the credit institution which collects the funds. Since we compute the average cost of resources for the banking sector, such premiums have not been taken into account. They may generally lower the actual bank funding cost. However, they could also increase such costs if they apply to products that would have been supplied at lower rates in the absence of regulation, since the share of such products in the resources of banks would have been lower.

where *debit* is the lending rate, *ao* the tender rate, *spread* the spread between the three-month rate and the tender rate and *reglem* the average cost of resources collected at regulated rates. Since the tender rate is one of the explanatory variables in the short-term dynamics regulated rates and market rates appear in the error correction form by the spread they make with the tender rate in order to avoid multicolinearity problems.

The response of short-term bank lending rates to non-financial firms and to individuals was estimated as follows. Estimations were carried out over the period 1983Q1-1998Q2 as a whole separately and over the two sub-periods 1983Q1-1989Q4 and 1990Q1-1998Q2. Results are reported in Table A1 leaving out non-significant parameters. Three elements can be inferred from the results:

- the short-run response of the bank lending rate to the policy rate has increased. In the 1980s, after one quarter, only 64% of a change in the repurchase tender rate was reflected in the short-term loan rate under the assumption that the regulated rates adjusted in line with the tender rate. In the 1990s, the corresponding percentage is 82%, regardless of whether regulated rates are adjusted or not;
- in the 1980s, the inertia of regulated interest rates vis-à-vis the tender rate slowed down the adjustment of the lending rate. For instance, after three quarters, the lending rate adjusted by 71% if regulated rates and the tender rate moved in line but by 42% if only the tender rate was moved. During this period, the banking sector used to price to customers the average cost of their resources, so that the efficiency of monetary policy was affected by the sluggishness of regulated rates;
- in the 1990s, the spread between regulated rates and the policy rate is no longer statistically significant. This suggests that, facing increasing competition inside the banking sector as well as with financial markets, credit institutions are no longer able to price to firms the real average cost of their resources but are compelled to price market rates.

Table A1
Modelling of the short-term bank lending rates to firms
Dependent variable : $\Delta debit$

Independent variable	**1980s**		**1990s**		**Whole period**	
debit (–1)	–0.17	(–1.8)	–0.22	(–1.9)	–0.14	(–1.9)
AO (–1)	0.15	(2.2)	0.17	(1.9)	0.14	(2.4)
ΔAO (–1)	0.49	(3.2)	0.65	(3.1)	0.57	(4.3)
Spread	–		0.32	(2.4)	0.22	(2.0)
Δs_ao_reglem (–3)	–0.30	(–2.9)	–		–0.15	(–1.4)
c	0.62	(1.0)	0.73	(1.3)	0.20	(0.5)
R^2	0.66		0.51		0.49	
DW	2.29		2.04		2.08	
SEE	0.27		0.44		0.39	
No. of observations	28		34		62	

Notation: *AO*: tender rate
Spread = 3-month rate less tender rate
s _ ao _ reglem = Tender rate less average resources cost collected at regulated rates
debit: short-term lending rates to firms.

Owing to data availability, estimations for loans to individuals were confined to the second sub-period 1990Q1-1998Q2. It appears that the spread between regulated rates and the tender rate is statistically significant over the estimation period (see Table A2). This suggests that, since individuals do not have direct access to financial markets, the banks are able to price the exact cost of their resources, including the cost of resources collected at regulated rates.

Table A2

Modelling of short-term bank lending rates to households

Dependent variable : Δpar_tres over the period 1990Q2-1998Q2

Independent variable	Loans ≤ 10,000 FRF		Overdrafts, permanent loans, installment credits > 10,000 FRF		Personal loans and other loans > 10,000 FRF	
par_tres (–1)	–0.50	(–3.4)	–0.42	(–2.9)	–0.32	(–2.5)
AO (–1)	0.41	(3.5)	0.26	(2.7)	0.27	(2.7)
Δ*AO* (–1)	1.35	(1.9)	1.61	(2.7)	0.54	(1.1)
Δ*s_ao_reglem* (–1)	–1.30	(–1.9)	–1.21	(–2.0)	–	
Spread	–		–		0.14	(1.6)
c	6.00	(3.3)	4.64	(2.9)	2.14	(2.2)
R^2	0.50		0.46		0.62	
SEE	0.39		0.36		0.27	
DW	2.00		1.89		2.10	
No. of observations	32		32		32	

Notation: *par_ tres*: short-term lending rates to households
AO: tender rate
reglem: average cost of resources collected at regulated rates
s _ ao _ reglem = tender rate less average cost of resources collected at regulated rates
Spread = 3-month rate less tender rate.

A3. The response of medium and long-term bank lending rates to policy rates

Following previous research, a long-run relation of the following form is sought:

(1) $debit = a + \lambda * Tx10ans + (1-\lambda) * Ao$

where *debit* is the bank lending rate, *Tx10ans* the ten-year rate and *Ao* the tender rate. However, as in the case of short-term bank lending rates, the behaviour of medium and long-term bank lending rates is modelled within an error correction model:

$$\Delta debit(t) = c + \sum_{i=0}^{p} a_i \Delta ao(t-p) + \sum_{j=0}^{q} b_j \Delta tx10ans(t-j) + \sum_{k=0}^{r} c_k Spread(t-k) + d \times debit(t-1)$$

$$+ e \times Tx10ans(t-1) + f \times Ao(t-1) + \varepsilon_t$$

with the same notation as that used in the previous section. A constraint in the long-run relation ($f = -d-e$) is imposed.

The parameter d depicts the convergence speed of lending rates towards the long-run target defined by relation (1). The relative weight of the ten-year rate in the long-run relation (λ) can be assessed from the ratio of parameter e to parameter d.

As in Section A2, estimations for lending to firms have been run over the period 1984Q2-1998Q2 as a whole and over the two sub-periods 1984Q2-1989Q4 and 1990Q1-1998Q2 separately. From the first to the second sub-period, bank lending rates have become more responsive to changes in the ten-year interest rate: the relative weight of the ten-year rate in the long-run response has approximately increased from one third to one-half (see Table A3).

Table A3
Modelling of medium and long-term lending rates
Dependent variable : $\Delta debit$

Independent variable	Medium and long-term loans to firms						Household mortgages at fixed rates		Household mortgages at variable rates	
	1980s		1990s		Whole period		1990s		1990s	
c	0.35	(1.7)	0.20	(1.6)	0.22	(1.9)	0.66	(6.4)	0.85	(4.4)
ΔAO (–1)	0.41	(2.2)	0.29	(2.2)	0.37	(3.3)	0.68	(3.2)	0.14	(1.2)
δ	–0.28	(–2.,6)	–0.27	(–3.7)	–0.26	(–4.0)	–0.30	(–7.7)	–0.43	(–5.1)
λ	0.34	(1.2)	0.48	(2.9)	0.42	(2.8)	0.76	(7.9)	0.52	(4.6)
Spread	–		0.21	(3.0)	0.18	(2.5)	–		–	
Δs_ao_reglem (–1)	–		–		–		–0.39	(–1.9)	–	
Δs_ao_reglem (–2)	–		–		–		–0.21	(–3.2)	–0.29	(–2.7)
R^2	0.70		0.67		0.66		0.85		0.62	
SEE	0.29		0.23		0.27		0.12		0.19	
DW	2.71		2.15		2.3		2.15		2.16	
No. of observations	26		34		56		31		31	

Bank lending rates are estimated as follows:

$$\Delta debit(t) = c + \delta(debit - \lambda Tx10ans - (1-\lambda)AO)_{-1} + \sum_{i=1}^{p} a_i \Delta ao(t-p) + \sum_{j=1}^{q} b_j Spread(t-j) + \sum_{k=1}^{r} c_k \Delta s\_ao\_reglem(t-k) + \varepsilon$$

Notations : *AO*: tender rate
debit: lending rate
Spread = 3-month rate less tender rate
s_ao_reglem = tender rate less average cost of resources collected at regulated rates
Tx10ans: 10-year rate.

As in the case of short-term loans, data availability limits the scope of the estimation period for individuals to the 1990s. Ten-year interest rates account for more than three-quarters of the long-run response of loan rates (see Table A3). Moreover, regulated interest rate inertia slows the response of the loan rate to the policy rate: at a two-quarter horizon, loan rates adjust nearly completely to a simultaneous change in the policy, ten-year and regulated rates, but only up to 58% if the latter are kept unchanged.

A4. Conclusion

In the 1980s, banks apparently did not behave in a competitive manner. Their average funding cost – including the cost of resources collected at regulated rates – played an important role in the pricing of the credit. In the 1990s, two effects could account for the increasing part played by policy and market rates: the growing competition inside the banking sector on the one hand and the creation of a market for commercial paper and the development of bond markets on the other hand. Unfortunately, it does not seem possible to disentangle these two effects on the basis of the aggregate data used. For that purpose, it would have been useful to distinguish between loans to large firms – which are able to issue commercial paper and bonds – and loans to small firms. However, results for individuals give some indication as banks are still in a position to impose on their customers their average cost of funding-including the cost of resources collected at regulated rates.

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The changing German banking industry: where do we come from and where are we heading to?

Hans Bauer and Dietrich Domanski[1]

1. Introduction and summary

The German banking system has undergone significant changes during the past decade. Intensifying competition, ongoing securitisation, the international integration of the financial markets and rapid advances in technology have affected banking in Germany as they have in other industrialised countries. However, the German banking sector and, more broadly, the financial system, still display a number of distinct features, such as the comparatively minor importance of institutional investors, the slow pace of disintermediation and, within the banking sector, a continuing low degree of concentration. The paper describes trends in the German banking industry in the nineties and, against this background, discusses factors determining the future role of banks. It closes with some implications for monetary policy.

Technological progress and the start of EMU will likely exert continuous and probably increasing pressure for structural changes in the German banking system, favouring further consolidation to exploit economies of scale. However, the preferences of the real sector, which should be the main forces driving the demand of non-banks for banks' services – such as the legal framework in which companies operate or the system of old-age provision – can be expected to change only gradually. Therefore, a continued trend towards increased institutionalisation of savings, a more prominent role of financial markets and further securitisation – although to a large extent "on balance" and therefore not necessarily associated with disintermediation – rather than a radical change can be expected.

Monetary policy is likely to face an increasing role of the interest rate channel. With securities markets and institutionally managed portfolios growing in importance, interest rate changes of the central bank will have an immediate impact on a larger share of financial assets, and, thus, tend to become more effective. On the other hand, the volatility of financial market prices may, at least temporarily, rise, which could dilute monetary policy measures. An increasing role of the credit channel appears rather unlikely. The implications for financial stability are hardly predictable. Although destabilisation by quick disintermediation is not to be expected, strategic re-orientation and stronger competition may be a risk. The issue of banking sector stability will require particular attention in the future.

2. Major trends in the German banking system

2.1 Overall importance of banks and balance sheet composition

In Germany, there has been a gradual decline over the past few decades in banks' overall importance as financial intermediaries. During the seventies and eighties, banks' share of total domestic financial sector assets fell from about 84.5% at end-1970 to 77% at the end of 1990. Since the early nineties, this decrease has been accelerating somewhat. At the end of 1997 the ratio was 72.5%, reflecting the more prominent role of institutionalised saving – particularly via investment funds – and direct financing through securities markets. At end-1997, investment funds held 8% of financial assets,

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[1] The views expressed in this paper are those of the authors and not necessarily those of the Bundesbank.

compared with just 4% in 1990. Also, the capitalisation of German stocks and bonds accounted for 73% of banks' assets, compared with 55.5% at the end of 1990. Despite these tendencies, banks' business volume increased faster in the nineties (annual rate of +9.3%) than in the previous decade (+6.9%).

The declining overall share in financial intermediation together with the faster growth of business volume points to a major trend in German banking: a strong increase in interbank activities and in business with other financial intermediaries as well as a greater involvement in securities markets. As a result, the increase in the banks' business volume is largely attributable to a lengthening of intermediation chains. For example, the share of interbank loans rose from 26% in 1970 to 28% in 1980. In 1990 and 1997, it accounted for as much as 34%. At the end of 1997, investment funds' holdings of assets with banks (including bank bonds) accounted for around 3% of the business volume compared with 1½% in 1990.[2]

Longer intermediation chains also help to explain why the sharp growth of securities markets has not led to a significant disintermediation. In Germany, securitisation occurs to a large extent "on-balance", by banks issuing debt securities and holding bonds, and rarely in the Anglo-Saxon manner of removing loans from banks' balance sheets.[3] The share of securitised lending since 1990 has increased slightly from 11.2 to 13.6% as at end-1997 (see Table 1). About 50% of this paper consisted of bonds issued by domestic banks, which therefore represented securitised interbank loans, and a further 15% was made up of German government bonds. Domestic corporate bonds accounted for less than 1%. Among banks' liabilities, the share of securities – mainly bank bonds – increased much more sharply, from 26.4 to 30.6%.

Table 1
Securitisation in the German banking industry[1]
As a percentage of business volume

End of year	Assets		Liabilities		*Memo item: Business volume in DM billion*
	Money market paper[2]	Capital market paper[3]	Money market paper[4]	Capital market paper[5]	
1990	0.4	10.8	0.3	26.1	*5,243.8*
1991	0.3	10.8	0.3	27.3	*5,573.5*
1992	0.2	11.4	0.4	27.7	*5,950.8*
1993	0.3	12.6	0.5	27.6	*6,592.2*
1994	0.1	13.6	0.5	28.4	*6,952.8*
1995	0.1	13.0	0.7	29.5	*7,538.9*
1996	0.2	13.1	0.6	30.0	*8,292.4*
1997	0.1	13.5	0.6	30.0	*9,109.9*

[1] Excluding securities of foreign branches. [2] Portfolios of Treasury bills, Treasury discount paper and other money market instruments. [3] Portfolios of debt certificates. [4] Issued short-term bearer bonds and savings bonds as well as registered money market instruments. [5] Issued medium and long-term bearer bonds and savings bonds as well as registered bonds.

In line with the growing importance of on-balance-sheet securitisation and business with other intermediaries, there has been a decline in the share of bank lending to the non-financial sectors and in deposits placed with banks by domestic non-financial sectors. However, this trend was much less pronounced on the asset side than on the deposit side (Table 2). At the end of 1997, bank credits still

[2] See Deutsche Bundesbank (1998b), pp. 27-49.

[3] See Deutsche Bundesbank (1995), pp. 19-32.

made up 54.3% of enterprises' total liabilities – the same share as in 1990.[4] It is not possible to ascertain any "crowding out" of banks or disintermediation in corporate finance. By contrast, the banks have been perceptibly weakened over the past 30 years in terms of financial investment. Between 1970 and 1997, the share of "traditional" bank deposits (excluding bank bonds) in the financial investment of the domestic non-financial sectors fell from 41.5 to 36.6%, mainly due to a larger rate per equities and investment fund certificates in investors' portfolio.

Table 2
Banking system's position within overall financing

Year	Bank lending[1]				Funds[2] placed with banks			
	to domestic non-financial sectors		of which: to enterprises		by domestic non-financial sectors		of which: by households	
	DM billion	% share of total liabilities[3]	DM billion	% share of total liabilities[3]	DM billion	% share of financial assets[4]	DM billion	% share of financial assets[4]
1970	520	55.2	404	51.3	502	51.5	275	52.4
1975	883	55.8	658	51.6	853	51.8	514	54.5
1980	1,461	59.1	1,026	54.9	1,238	50.2	778	52.4
1985	1,979	53.5	1,392	51.1	1,644	44.3	1,021	46.1
1990[5]	2,776	54.2	2,061	54.3	2,254	41.5	1,417	44.3
1991	3,088	54.7	2,300	55.4	2,380	40.4	1,496	42.9
1992	3,271	54.1	2,429	56.0	2,533	40.8	1,601	43.1
1993	3,528	53.0	2,635	55.8	2,781	41.1	1,747	42.7
1994	3,756	54.1	2,791	56.9	2,819	40.3	1,779	41.3
1995	4,087	52.3	2,999	55.9	2,915	37.9	1,859	40.0
1996	4,399	52.3	3,233	55.7	3,115	37.9	1,943	39.2
1997	4,670	51.6	3,450	54.3	3,204	36.6	1,991	37.3

[1] Excluding lending against securities. [2] Bank deposits excluding bank bonds. [3] In relation to all external financial resources of the respective sector, including securities at market prices. [4] In relation to the financial assets of the respective sector, including securities at market prices. [5] From 1990, including eastern Germany.

The banks' continued strong position in the intermediation process can also be gauged by the trend in the scale of off-balance-sheet transactions. At the end of the second quarter of 1998, the notional amounts of off-balance-sheet business added up to more than DM 28 trillion, compared with slightly less than 10% of that amount in 1990. The bulk of this, at around two-thirds, was in interest-rate-related business (interest-rate swaps, interest-rate forward and option contracts at 12½% and slightly less than 11%, respectively); forward exchange contracts and currency options, taken together, accounted for slightly more than 30%.

2.2 Concentration and competition

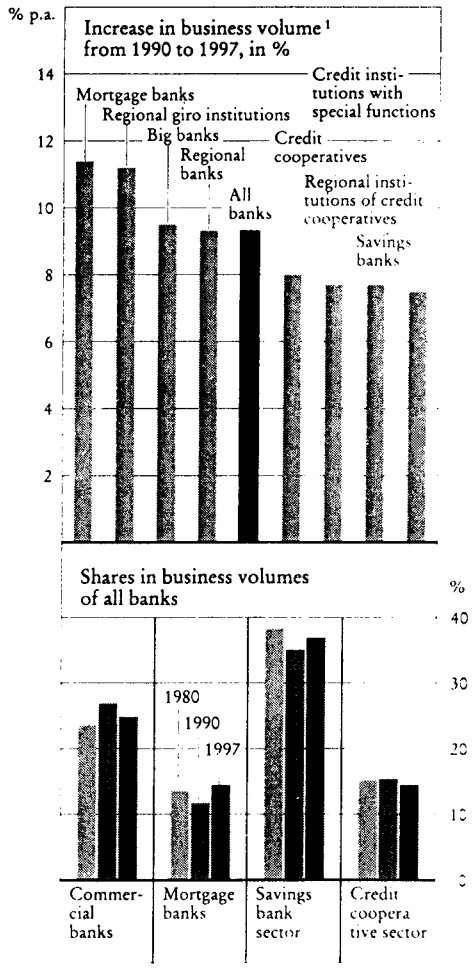
The overall degree of *concentration* in the German banking system is relatively low.[5] The market shares in the banking business of domestic credit institutions (excluding foreign branches or subsidiaries and consolidated figures of banking trusts) exhibits no predominant role for any of the

[4] See Deutsche Bundesbank (1998b), pp. 27-49.

[5] See Deutsche Bundesbank (1998a), pp. 33-64.

three main groups of banks (commercial banks[6] 25%; savings banks and Land banks, taken together, 37%; credit cooperative sector 15%: see Chart 1). This is not true without qualification with regard to individual lines of business, however. The degree of concentration is comparatively low in major retail business areas. For example, in lending business with non-banks no category of bank among domestic banks holds a market share of more than 25% (commercial banks); in deposit business, however, the savings banks occupy a strong position with a market share of 30% of domestic non-banks' deposits (see Table 3).

Chart 1
Business volume by category of banks



1 Average annual increase; statistical changes have been eliminated.

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Nevertheless, major fields in wholesale business are dominated by commercial banks, including the branches of foreign banks. In June 1998 they accounted for around 75% of all off-balance-sheet business, with the savings banks/Land banks taking second place with only 16%. The ratios are similar in safe custody business. Although the commercial banks administer no more than roughly

6 The three big banks' market share is 10%. Including the business volume of their foreign branches it was 13.8%. The market shares for the big banks' financial groups (including mortgage banks, foreign subsidiaries, mutual funds and insurance companies) were significantly larger.

33% of all customer safe custody accounts, these accounts contain around 75% of all securities lodged in deposits at any one time. Furthermore, one-third of foreign branches belong to the big banks, which account for roughly one-half of the foreign branches' total business. Finally, the big banks themselves form large groups with a large number of different financial intermediaries at home and abroad.

Table 3

Share of individual categories of banks in major balance sheet position[1]

In percentage points

Category of banks	End of year	Business volume	Assets			Liabilities					
			Advances to credit institutions	Advances to non-banks	Total lending against securities	Liabilities to credit institutions	Deposits of and borrowing from non-banks				
							Total	of which: domestic non-banks			Bearer bonds outstanding
								Sight deposits	Time deposits	Savings deposits and bank savings bonds	
Commercial banks[2]	1980	23.6	27.4	21.6	20.7	32.4	22.6	33.2	27.4	15.5	11.5
	1990	26.9	23.3	29.5	18.4	39.1	23.0	34.8	23.5	14.4	12.8
	1997	24.8	23.7	24.8	22.7	32.6	21.9	35.3	21.0	12.0	13.6
Big banks	1980	9.6	8.7	9.0	8.6	9.9	11.4	17.6	11.4	9.0	2.3
	1990	8.9	7.0	9.7	6.5	8.4	10.6	14.9	9.0	7.8	3.0
	1997	9.8	8.5	9.8	8.7	11.9	10.6	18.0	7.1	6.1	2.6
Regional banks and other commercial banks[2]	1980	10.6	11.3	10.4	9.1	13.7	9.4	12.2	13.8	5.8	9.1
	1990	15.3	11.7	17.8	10.0	24.6	10.9	17.6	12.8	6.0	9.7
	1997	12.7	10.7	13.7	11.7	15.3	10.1	14.9	12.8	5.5	10.9
Branches of foreign banks	1980	1.9	5.5	0.9	1.3	6.2	0.4	0.9	0.2	0.0	–
	1990	1.5	3.3	0.8	0.9	4.3	0.3	0.4	0.2	0.0	–
	1997	1.7	3.8	0.7	1.8	4.9	0.3	0.4	0.2	0.0	0.0
Private bankers[2]	1980	1.5	2.0	1.2	1.7	2.6	1.4	2.5	2.0	0.6	–
	1990	1.2	1.2	1.2	1.1	1.8	1.2	1.9	1.5	0.6	0.1
	1997	0.6	0.6	0.6	0.5	0.5	0.9	2.0	0.8	0.4	0.0
Regional giro institutions[3]	1980	16.3	18.8	16.2	15.6	19.3	5.9	4.4	10.7	0.6	43.3
	1990	14.5	19.5	12.6	15.6	18.6	6.3	3.4	11.1	0.5	32.8
	1997	18.3	29.0	15.0	13.4	24.8	9.9	5.8	18.7	1.5	27.6
Savings banks	1980	22.1	9.8	23.4	36.3	9.5	36.1	34.5	12.8	55.0	0.1
	1990	20.6	10.4	21.5	35.0	10.0	33.6	34.5	14.5	54.0	4.5
	1997	18.6	6.3	21.1	30.0	13.3	30.5	32.9	11.3	52.6	4.9
Regional institutions of credit cooperatives[4]	1980	4.3	12.6	1.4	5.8	12.9	0.9	1.0	1.1	0.8	1.9
	1990	4.1	8.1	1.8	5.8	11.6	0.6	1.2	1.0	0.1	1.7
	1997	3.8	6.5	1.5	7.0	8.7	0.8	0.8	2.1	0.0	2.9
Credit cooperatives[2]	1980	10.9	7.8	11.5	13.2	5.7	17.4	19.2	11.7	22.4	0.0
	1990	11.3	7.7	11.9	15.7	4.6	19.5	19.4	14.5	26.4	1.5
	1997	10.7	5.6	12.1	14.2	5.2	19.4	20.2	12.8	29.4	2.6
Mortgage banks	1980	13.6	8.7	18.2	1.0	8.6	7.7	0.4	24.4	0.0	37.8
	1990	11.7	9.4	15.9	2.2	4.6	9.4	0.2	24.6	0.0	30.7
	1997	14.5	11.4	19.3	4.8	6.9	8.3	0.4	22.4	0.1	38.1
Credit institutions with special functions[5]	1980	8.1	14.6	6.3	7.0	9.1	8.7	6.8	11.2	4.9	5.3
	1990	10.9	21.6	6.7	7.3	11.6	7.7	6.5	10.8	4.5	16.0
	1997	9.4	17.7	6.3	8.1	8.5	9.1	4.6	11.6	4.5	10.3
Memo item:											
Credit institutions majority-owned by foreign banks	*1980*	..	..	..	..	..	..	..	..	..	..
	1990	*2.5*	*3.4*	*1.9*	*3.2*	*5.5*	*1.3*	*1.8*	*1.0*	*1.0*	*0.1*
	1997	*2.7*	*3.5*	*2.2*	*3.6*	*4.3*	*2.2*	*3.5*	*1.9*	*1.3*	*1.1*

[1] Data relate to stock figures; statistical changes have not been eliminated. [2] The bank category "Instalment sales financing institutions" was abolished in December 1986; the banks previously allocated to that group were reclassified as "Regional banks and other commercial banks", "Private bankers" or "Credit cooperatives" depending on their legal form. [3] Including Deutsche Girozentrale. [4] Including Deutsche Genossenschaftsbank. [5] Including Deutsche Postbank AG.

Table 4
Structure of the German banking industry

Year	Number of credit institutions[1]	Domestic branches[2]
1990	4,557	43,490
1991	4,288	44,813
1992	4,030	45,589
1993	3,866	45,380
1994	3,701	44,919
1995[3]	3,616	44,486
1996	3,508	44,011
1997	3,408	43,430

[1] Excluding building and loan associations, investment companies, central securities depositories and guarantee banks. [2] From 1992 extended definition of branches. [3] Including Deutsche Postbank AG but excluding its branches (1995: approx. 19,700; 1997: approx. 16,000).

The *number* of credit institutions in Germany fell by roughly one-quarter from end-1990 to end-1997 (see Table 4).[7] The greater part of this was accounted for by mergers of relatively small credit cooperatives, mainly driven by the attempt to exploit economies of scale. However, with 2,418 institutions at the end of 1997, credit cooperatives still make up approximately 70% of all banks. The consolidation process in the credit cooperative sector also helped to shift the size structure of German credit institutions substantially upwards. Credit institutions with a business volume of up to DM 50 million – as a percentage of all credit institutions – declined from 20% in 1990 to just over 5% in 1997 (see Chart 2). The predominant size category, at around 25% of all banks, is now that of banks with a business volume of between DM 100 million and DM 250 million. However, the credit cooperatives' average business volume (DM 400 million) is still significantly lower than that of comparable savings institutions (DM 2,830 million; 600 institutions in 1997), indicating further prospects for consolidation and cost cutting. Recently, there have been more vertical mergers or even mergers between different banking groups, with geographical or product-specific economies of scope coming to the fore.[8]

A meaningful distinction can be made between retail and wholesale business with regard to the intensity of competition. In retail business, the fragmentation of the banking industry has encouraged fierce competition. The typical competitive situation at the local level is that of a broad oligopoly. Besides local credit institutions, which belong to one of the associations (savings banks or credit cooperatives), the big banks are generally present with their branches, as are regionally operating commercial banks and the postal bank. The Land banks (which belong to the savings bank sector) are also involved in bulk business nationally in some cases. During the past few years, the competitive situation in the retail sector has intensified as a result of the establishment of direct banks (mostly as subsidiaries of the big banks), securities brokers, and pure money market funds.[9]

The intensity of competition in wholesale tends to be determined by competition at the international level. A low degree of competition should therefore not be inferred from the above-mentioned concentration ratios. What is more meaningful in this context are the quantities of cross-border capital

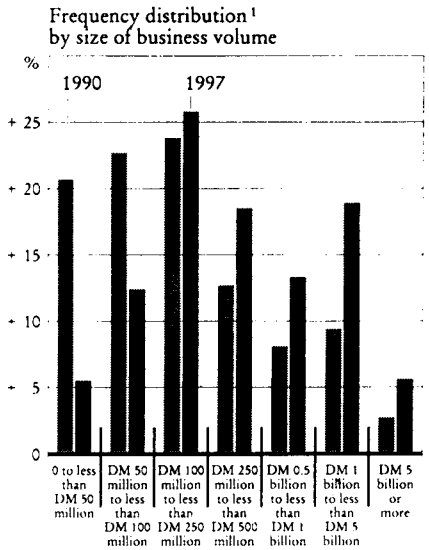
[7] As reporting to the monthly balance sheet statistics.

[8] Worthy of mention in this connection are the accomplished or planned mergers between Bayerische Hypotheken- und Wechselbank and Bayerischer Vereinsbank (since 1st September 1998), Südwestdeutsche Landesbank, Landeskreditbank und Landesgirokasse in Baden-Württemberg (from 1st January 1999) as well as mergers between the mortgage lending subsidiaries of financial groups. To these are added alliances between various (still legally independent) Land banks.

[9] This view is supported by empirical analysis which does not reject the hypothesis of a structural break in banks' time deposit rates after the introduction of money market funds in August 1994; see Domanski (1997), p. 288.

movements, such as German enterprises' liabilities to non-residents, which have increased by an annual average of around 10.5% in the nineties.

Chart 2
Size structure of domestic credit institutions*



* Excluding building and loan associations. — 1 Number of credit institutions per size category as % of the number of all credit institutions.

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2.3 Profitability

The long-term trend in banks' profitability is largely consistent with the trends in other major industrial countries. Interest margins have tended to narrow, while non-interest-rate-related earnings have become more important.[10] Among the expenditure items, it is mainly administrative expenses – measured as a ratio of the average business volume – that have declined. On a long-term trend, the return on capital has been falling since 1983.

The surpluses in interest rate-related business continue to represent the most important source of earnings.[11] For about ten years, the banks' interest margin has been below 1.9%, the average of the last thirty years. In 1997 it reached an all-time low at 1.5% (see Chart 3). The declining interest margin is due, firstly, to the fact that the above-mentioned lengthening of the intermediation chains has brought about an expansion of low-margin business, especially interbank business. If the business volume is adjusted for interbank business with other German institutions, the interest margin level is somewhat higher (1.98% in 1997 rather than 1.50%), but has still displayed a falling trend since 1994 (see Table 5). Another reason for the declining interest margin is the persistently low interest rate

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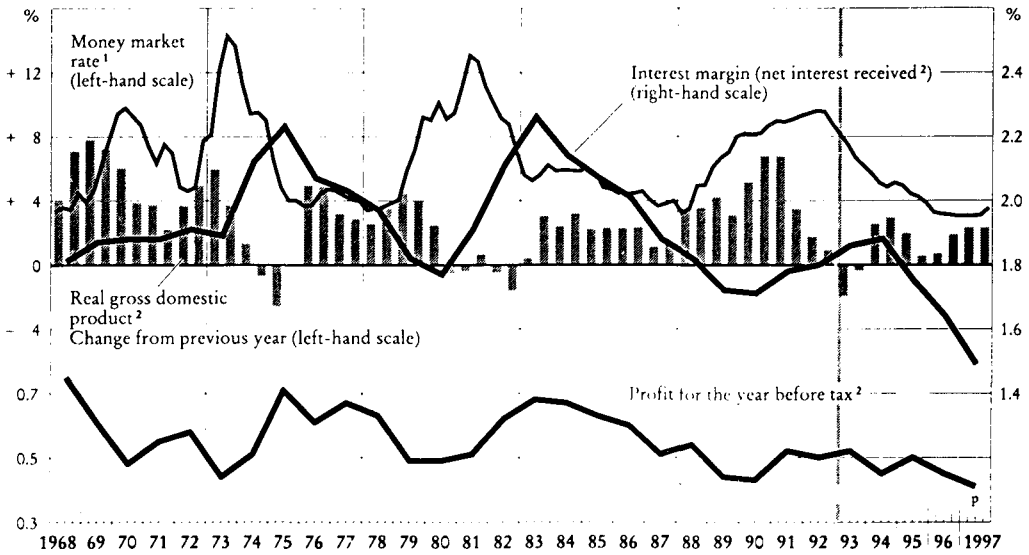
10 See Deutsche Bundesbank (1998c), pp. 27-57.

11 A more precise analysis of the four major areas of earnings (net interest income, net commissions received, net profits or losses on financial operations (= own-account trading), surplus of other operating income and expenditure) is possible only from 1993, however, since the own-account trading result and other business were, until then, included in "extraordinary income" and not identifiable. The 1993 income structure (net interest income 77.2%; net commissions received 17.3%, own-account trading 4.4% and other bank earnings 1.1%) is very similar to the 1997 structure (net interest income 77.6%, net commissions received 18.3%, own-account trading 2.8%, other bank earnings 1.2%).

level, which has strongly encouraged the demand for long-term low-margin loans. In mid-1998 the share of loans to domestic non-banks (including securitised lending) with a maturity of at least four years was just under 82%, compared with 74% in 1990. Finally, the interest margin was burdened by the intensification of competition among banks.

Chart 3
Interest margin and profit for the year in the context of interest rates and business activity



1 Money market rate for three-month funds in Frankfurt, quarterly averages. — 2 As a percentage of the average volume of business, annual values. — 3 After adjustment for seasonal and working-day variations, half-yearly. Until 1992 west Germany, from 1993 the whole of Germany. — o From the financial year 1993 including east German credit institutions and in accordance with the new accounting regulations.

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Historical experience argues against a short-term recovery of the margin (see Chart 3). Net interest received tends to go up in periods of declining interest rates, as the share of longer-term fixed-rate liabilities is normally smaller than the corresponding fixed-rate share of assets, and the terms of variable-rate liabilities are often adjusted more flexibly. Additionally, borrowers tend to attend lower interest rate levels before contracting new loans for longer periods with a locked-in interest rate. Up to then, they rely more on short-term loans which offer larger interest margins to the banks. In periods of rising interest rates the interest margin tends to narrow, because the funding of banks gets more expensive. A rather stable low interest rate level tends to press the margin, too, because low-interest bearing assets are usually the only option for the reinvestment of resources deriving from maturing higher-yielding loans and securities. The analysis has, however, to be complemented by a reference to the development of profits before tax. The movement of the interest margin has a relatively weak impact on profits before tax, primarily because the interest rate cycle is accompanied by opposite movements in provisioning against credit risks.

In contrast to the interest margin, the share of commissions received in gross income has risen perceptibly (1970: 11.6%, 1997: 19.1%). Earnings from non-interest-related business have increased primarily as a result of investors' growing interest in portfolio investment (stock brokerage, placing, and safe custody business). In this area, the banks are able to benefit from their position as universal banks and their "one-stop" financing strategies. Earnings from services relating to payments, on the other hand, have tended to stagnate for a number of years. Surpluses arising from own-account trading display a high volatility in line with capital and foreign exchange markets (since 1993 their share of the business volume has been fluctuating between 0.11 and 0.01%). Moreover, their contribution to banks' gross earnings is comparatively limited overall, at an average of 2.5% since 1993.

Table 5

Interest margin without mutual interbank lending of German banks[1]

Year	Business volume	Interbank business volume among German banks	Business volume, adjusted[2]	Net interest received	Interest margin		Difference[4] in percentage points
					traditional in %	adjusted in %[3]	
	(1)	(2)	(1)–(2)=(3)	(4)	(4):(1)=(5)	(4):(3)=(6)	(5)–(6)=(7)
1990	4,675,228	1,220,142	3,455,086	80,474	1.72	2.33	–0.61
1991	5,129,528	1,385,069	3,744,459	91,597	1.79	2.45	–0.66
1992	5,571,856	1,432,719	4,139,137	100,952	1.81	2.44	–0.63
1993	6,354,137	1,538,571	4,815,566	118,863	1.87	2.47	–0.60
1994	7,085,311	1,675,758	5,409,553	133,664	1.89	2.47	–0.58
1995	7,592,916	1,770,291	5,822,625	133,552	1.76	2.29	–0.53
1996	8,545,924	2,049,913	6,496,011	140,833	1.65	2.17	–0.52
1997[p]	9,625,073	2,329,690	7,295,383	144,585	1.50	1.98	–0.48

[1] Calculated by interbank assets; interbank liabilities as securities not exactly reported statistically. Business volumes and net interest in millions of Deutsche mark. [2] Business volume without interbank lending to other domestic credit institutions (including foreign branches). [3] Interest margin stemming from business with domestic and foreign non-banks as well as with foreign banks (including foreign subsidiaries of German banks). [4] Negative difference shows "interbank related part".

Since 1990, there has been a below-average rise in administrative expenses as a proportion of the business volume. This was mainly due to moderate salary increases. Staff costs still account for around 57% of all administrative expenditure at present (compared with roughly 62% in 1990); the declining trend is the result of sharper increases in operating expenditure, due to spending on modernising the east German banking industry in the early nineties. Investment in information technology is now a very significant item. The temporary deterioration in the cost/income ratio from just under 58% in 1983 to 63% in 1997 should therefore be seen against the fact that a future lowering of costs can be expected from that investment. Operating expenditure is also being pushed up by the changeover to the euro, overcoming the year 2000 problem and by the implementation of prudential changes.

3. The future financial landscape in Germany: what will be the role of banks?

Generally speaking, changes in the role of banks depend on three forces: firstly, changing preferences of the consumers of financial services affecting the demand for banking products. This reflects the view that changes in the financial sector should – at least in the longer run – be driven by the needs of the real sector. However, even if demand conditions remain unchanged, financial services provided by banks may be substituted by those of other financial intermediaries, securities markets or even non-banks. Secondly, such forces might be exacerbated by changes in the regulatory environment and, thirdly, by technological progress.[12] While the former may remove or raise administrative barriers, the latter could induce significant changes in the supply of financial services by facilitating the design of new financial contracts or by affecting the cost of production.

[12] See Rajan (1996), p. 121.

3.1 Changes in the supply conditions: (i) technological progress

Advances in information and computer technology have been a major – if not the most fundamental – force for change in the financial sector and the conditions under which financial services can be provided.[13] The immaterial character of financial services has made them prone to radical changes resulting from dramatically reduced computer costs. One outstanding feature of this process is the "unbundling" of the properties embedded in financial products. The result of this splitting are often homogenous and therefore tradeable components of financial instruments such as market price risk. Bearing in mind this "commoditisation" of financial services and the properties of financial contracts, a comparison of the different functions performed by banks, other financial intermediaries and securities markets helps to identify areas where technological progress is particularly likely to increase the substitutability of bank products.

The role of banks as *suppliers of money and payment* services is of outstanding importance for the central bank. While there has been a marked trend towards the use of electronic payment systems[14] and German banks have made substantial efforts to provide the necessary infrastructure, this appears to be an area where banks are rather immune to competition from other financial intermediaries, securities markets and non-banks. The reason for this is that it is necessary to have recourse to accounts with banks, in order to definitively settle payments. Liquidity can thus be provided "objectively" (system-wide) only by the banking system, which has access to refinancing at the central bank.[15] Systems are conceivable in which there is no commitment to convert giro money into reserve money at a rate of one to one at all times. Nevertheless, realising such a system of free banking does not appear to be a very realistic proposition at present. The "linking" of giro money to legal tender provided by the central bank is crucial for money demand and safeguards the controllability of money supply. This is the motivation for the intended obligation of redeemability in central bank money to be placed on issuers of electronic money in the EU. Although the overall role of banks as providers of payment services is likely to remain largely unchanged, innovation and technological progress in this area might affect the structure of the banking sector and competition. The costs of technology are strengthening the incentive to form alliances and cooperations as well as joint solutions.

Distinct from the provision of money and payment service is the intertemporal allocation of resources by banks. Related to this, banks may supply passive or active transformation functions. Banks act *passively* in a world of symmetric information on the risks and returns of financial assets and transaction costs by "rebundling" them. The result is a maturity or size transformation or a diversification of risk. This can generally be achieved by pooling assets and exploiting imperfectly correlated risks in large portfolios. Therefore, passive transformation functions are generally not unique to banks, but are also provided by mutual funds,[16] insurance companies or non-banks.

Technological progress has already largely eroded the advantages which banks had in providing passive transformation services. The application of financial engineering and portfolio management techniques has become widely available with the dramatic decline in computer cost. Additionally, by employing these techniques, the desired risk return profile of a portfolio can be easily constructed

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[13] See White (1998), p. 4.

[14] In cashless payments, not only electronic transfers but also (and chiefly) card-based payments (especially the use of debit cards) have attained a position of considerable importance (Table 6). At the end of 1996, the number of debit card transactions was around 215 million, with a total turnover of DM 32.7 billion. The figures for 1997 are estimated at 246 million transactions valued at DM 39 billion. Measured in terms of retail turnover, the share of card-based payments increased from 6.2 to 13% between 1994 and 1997. Electronic money, which hitherto has almost exclusively existed as card money in Germany, is at present (November 1998) at around DM 110 million (money card loading equivalents). Between the end of 1997 and mid-1998, the number of places accepting the cards rose from around 35,000 to approximately 60,000.

[15] See George (1997), pp. 263-70.

[16] See, for example, Chant (1992), p. 43.

because a broader variety of financial "commodities" is traded. Finally, information about the products is more widely available. This increased substitutability primarily affects standardised bank products that are not directly linked to the provision of payment services, particularly longer-term deposits. As a consequence, a further erosion of interest rate margins and/or a declining share of bank deposits in financial assets of the non-financial sector is to be expected. Thus, the trends in banks' balance sheet composition and profitability outlined above will probably continue.

Table 6
Selected developments in payment system

Year	Credit card transactions			Debit card transactions[1]			Automated teller machines, in thousands	*Memo item: sight deposits[2] as a % of GDP at current prices*
	Number, in millions	DM billion	as a % of sight deposits[2]	Number, in millions	DM billion	as a % of sight deposits[2]		
1987	38.0	8.0	3.4	0.4	0.1	0.04	–	*12.0*
1988	46.0	11.0	4.2	0.6	0.1	0.04	–	*12.4*
1989	81.8	15.8	5.8	0.8	0.1	0.04	–	*12.2*
1990	118.2	22.4	6.9	3.5	0.2	0.06	11.3	*13.4*
1991	150.2	28.2	7.3	20.2	1.8	0.5	13.8	*13.5*
1992	186.0	33.8	8.3	28.0	1.9	0.5	19.0	*13.3*
1993	224.4	42.1	9.5	69.1	6.2	1.4	25.0	*14.0*
1994	246.5	46.4	9.5	104.0	10.8	2.2	29.4	*14.7*
1995	266.7	45.1	8.9	149.4	20.5	4.1	35.7	*14.6*
1996	289.9	49.2	8.7	214.2	32.7	5.8	37.6	*16.1*
1997	303.4	52.7	8.4	225.8	29.0		41.4	*17.3*
					(40)	(6.4)		

[1] 1987-90 as well as 1997 only "electronic cash". In 1991 and 1992 "electronic cash" and other debit card procedures. 1993-96 "electronic cash" and "POZ procedures" (POZ: point of sale without payment guarantee). [2] Annual averages.

By contrast, banks take an *active* role in the intermediation process if they take risk and reduce information asymmetries. Neither function can be achieved by merely pooling assets, but requires liable capital (for risk taking) and access to information and an incentive to process it. Technological progress – again as a result of computerisation and telecommunications – encourages the dissemination and processing of information. This leads to a reduction in information asymmetries and an improvement in conditions for monitoring, say, by rating agencies or individual investors in financial markets. It is doubtful, however, whether technological progress will have a significant effect on relationship lending.

Although state verification should become less costly, implicit long-term commitment in the bank-customer relationship,[17] which is characteristic for housebank lending, may be largely unaffected by technological progress. The availability of private information to banks providing relationship lending might be more related to disclosure requirements on account of the legal form of the company or even the "philosophy" of company owners, rather than to data transmission and processing facilities. An erosion of relationship lending would be likely only if there was a significant increase in the cost of providing private information in the form of expensive borrowing vis-à-vis direct access to the capital market.

[17] See, for example, Hellwig (1991) or Boot and Thakor (1994).

3.2 Changes in the supply conditions: (ii) regulatory environment

As far as changes in the regulatory environment are concerned, Europan integration without doubt has had the strongest impact on banks. EU banking law harmonisation at minimum levels together with providing banks with an "European passport" put an inherent pressure to level down national regulations so as not to expose domestic banks to competitive disadvantages. To that extent, the harmonisation of banking legislation in the EU area can be seen as a major driving force reinforcing the general trend towards more competition.

A clear conceptual distinction should be made between harmonisation of banking regulation and the implications which the start of stage three of European Monetary Union (EMU) will have for the role of the banks. With regard to the payment services performed by banks, the creation of a single money market and, in that context, the establishment of the Europe-wide real time gross settlement system (TARGET) deserve particular mention. The possibility of making payments within the euro area in real time might lead to a concentration of liquidity-holding not only with banks operating throughout Europe but also with non-banks. The cost advantages to be gained by "economising" the holding of liquidity are likely to promote further concentration and/or cooperation in interlinking systems.

With respect to the active transformation functions performed by banks in lending, the disappearance of the exchange rate risk within monetary union might favour a greater focus on an appropriate evaluation of credit risk, which thus becomes more important in relative terms.[18] However, this argument implies that a significant mispricing of credit risks as well as unexploited business opportunities currently exist. Additionally, exchange rate risk, at least between the core countries, has played only a very limited role or has even been virtually disappearing for a number of years. It is doubtful whether this underlying assumption of large-scale market inefficiency appropriately reflects the reality in the EU. As a result, the growth of the market for securitised corporate credit in Europe and, correspondingly, the speed of disintermediation, might be less affected by EMU than is sometimes assumed.

Of greater importance might be indirect effects owing to increasing competition from European institutional investors, who can be expected to lose some of their home bias as currency matching rules disappear.[19] This should contribute to more proactive cross-border portfolio investment. (Cross-border investment in German equity market may foreshadow these shifts in portfolio structure.) As the range of portfolio investments broadens, bank products, including passive transformation services, will face increasing competition. Thus, increasing cross-border activities by institutional investors will likewise reinforce the trend towards securitisation or, at least, market-oriented interest rates on banks' liabilities.

3.3 Changes in demand conditions: preferences of the real sector

The ultimate function of the financial sector is the efficient allocation of financial resources. As a consequence, savers' and investors' preferences and needs should – at least in the longer run – be the main driving force behind changes in financial intermediation. In this respect, two features of the German economy are of outstanding importance in terms of the changing role of banks: firstly, the legal framework in which German companies operate and their size structure, and, secondly, the financing of provision for old age.

With respect to the demand for bank credit, the size structure of enterprises in Germany encourages borrowing from banks. For both small and medium-sized enterprises – which represent the bulk of enterprises (see Table 7) – direct recourse to the capital market has not been very attractive hitherto

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[18] See, for example, De Bandt (1998), p. 7.

[19] However, attempts to explain the home bias – and thus also the empirical relevance of currency matching rules – have not yielded satisfactory results; see Upper (1998), pp. 5-7 for a review of the literature.

on account of the costs associated with the issuing of securities and continuous monitoring.[20] An added factor is that relationship lending by housebanks ensures a relatively steady availability of credit across economic cycles.[21] In this context, it is to be mentioned that small and medium sized companies lack the endowment of pension reserves as a source of internal financing. Into this picture fits that large enterprises have increasingly been disengaging themselves from bank lending, whereas for small and medium-sized enterprises, bank loans even account for an increasing share of their liabilities (see Chart 4).[22]

Table 7
Enterprises by legal form and size of sales
At end-1996

Volume of sales (turnover) in DM million by size of sales volume	**Public limited company**	**Private limited company**	**Partnerships**	**Sole proprietors**	**Others**	**Total**
<DM 5 million	1,310	409,496	215,016	749,735	26,542	1,402,099
5 million - <10 million	1,180	194,942	116,322	84,987	14,556	411,987
10 million - <50 million	9,963	458,148	422,774	101,332	54,439	1,046,656
50 million - <100 million	12,865	180,631	216,966	16,342	33,161	459,965
100 million - <500 million	81,835	407,560	459,174	15,669	79,931	1,044,169
500 million - <1 billion	74,470	153,767	170,535	0	23,730	422,502
1 billion and more	1,211,264	411,651	349,163	7,748	84,998	2,064,824
Total	1,392,887	2,216,195	1,949,950	975,813	317,357	6,852,202
Number of enterprises by size of sales volume						
<DM 5 million	1,106	357,211	286,266	1,952,622	42,003	2,639,208
5 million - <10 million	163	28,034	16,490	12,488	2,066	59,241
10 million - <50 million	394	23,092	19,828	5,747	2,518	51,579
50 million - <100 million	177	2,606	3,128	237	472	6,620
100 million - <500 million	329	2,005	2,325	85	387	5,131
500 million - <1 billion	105	220	252	0	36	613
1 billion and more	171	176	143	2	41	533
Total	2,445	413,344	328,432	1,971,181	47,523	2,762,925

The financing preferences due to the legal framework are likely to carry even greater weight than the size structure. With regard to the various legal forms, access to the capital market is primarily open to incorporated enterprises on account of the far-reaching disclosure requirements. An added factor is that the wish to avoid outside influence is of much less importance to the "anonymous" public companies than to partnerships or sole proprietorships. The decline in bank loans has been even more pronounced in the case of incorporated enterprises, which underlines the connection between financing behaviour and legal form. Financing through banks has also benefited from the creditor-friendly regulations of German property and bankruptcy legislation. Apart from the possibility of using large parts of a firm's assets as collateral, another attraction is the viability of loan collateral in the event of bankruptcy. Finally, accounting rules are aimed at providing creditor protection. These

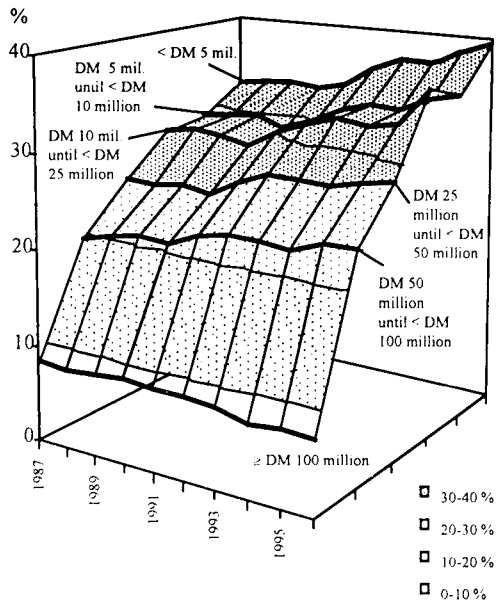
[20] See Kashyap and Stein (1997), p. 11.

[21] Elsas and Krahnen (1998) report that "housebanks are able to establish a distinct behavioural pattern consistent with the idea of long-term commitment. In particular, we found that housebanks do provide liquidity insurance in situations of unexpected deterioration of borrower ratings" (p. 3).

[22] See Deutsche Bundesbank (1992), p. 26.

factors are likely to change as a result of increasing internationalisation and competition in goods markets and the associated efforts to restructure companies.

Chart 4
Share of bank credits by size of companies*



*Companies of manufacturing, trade and service sector, all bank credits in relation to balance sheet volume. Size categories by annual turnover. *Source: Companies' balance sheet statistics.*

As far as the demand for bank deposits is concerned, the financing of old age provision plays a major role. There are two ways in which financing, largely based on the contribution system, leads to a strengthening of the banks: firstly, a key motive for individual, long-term capital investment is no longer to the fore. Instead, saving for specific purchases and precautionary saving play the most important role in households' investment decisions in Germany. Accordingly, preference is given – in addition to (tax-supported) life insurance schemes – to forms of investment that are comparatively liquid and subject to only minor price or credit risks, or none at all, such as bank deposits happen to be (see Table 7). Secondly, in the German financial system there are no pension funds, which typically invest very heavily in securities and contribute to a channelling of savings through the securities markets.

In the light of the ongoing "ageing population" debate and the questions surrounding the capacity of the statutory public pension insurance scheme to finance the present level of provision, it is probable that private old age pensions will rapidly gain in importance. This in turn is likely to lead to a growing need for professional asset and portfolio management, i.e. for passive transformation services which may also be performed by investment funds, in particular. It deserves to be mentioned in this connection that the authorisation of "genuine" pension funds envisaged in the fourth Financial Market Promotion Act is likely to strengthen this trend.

Taken together, bank's role in the German financial system appears to be anchored in the real sector primarily with respect to the active transformation functions associated with lending rather than the passive transformation functions mainly associated with collecting funds. Generally, it is important to recognise that prevailing financing structures are a result of institutional arrangements outside the financial sector, such as the legal or the tax system, but also influenced by cultural-specific

behavioural patterns. These factors are basically exogenous to the financial system and likely to change only gradually.

3.4 Strategic responses by German banks

As regards the main business areas, a (continued) deterioration of banks' role as providers of specific functions (or contracts) can be expected, particularly with respect to time and savings deposits and possibly other largely standardised products embedding passive transformation functions. As far as lending is concerned, a sharp decline of bank lending appears rather unlikely, given that some of banks' active transformation functions are still unique. However, the trend towards disintermediation is likely to strengthen gradually with changing structures in the real sector, such as the increasing size of companies and the shift towards listed companies.

Strategic responses of banks as *institutions* comprise two dimensions: the range of products offered and the geographical area covered. With respect to the first, the range varies from financial conglomerates or cooperations providing all financial services within one bank as one extreme to specialised banks covering niches as the other. With respect to the second particularly, local, European and global strategies are conceivable.

As to the geographical coverage of bank's activities, profit maximisation in an environment of largely competitive deposit rates (or, more generally, refinancing conditions) may be achieved, on the one hand, by translating customer relation and local information into economic rents, or, on the other, by attempts to exploit economies of scale by offering standardised products. The former strategy is obvious for banks that already focus on local business, as credit cooperatives and savings banks, while the latter could be particularly advantageous for big banks with a large branch network or direct banking activities. The successful implementation of local strategies mainly relying on relationship banking may not cause significant concentration tendencies. However, to be able to provide the full range of financial products to local customers, a close cooperation between local banks with compound institutions may be required.

European or global strategies have, up to now, been focused on specific areas in wholesale business[23] and thus rely more on transaction-based banking and competition with financial markets. The policy followed by German banks so far, has primarily been to increase the presence in foreign markets by opening foreign branches (see Chart 5). In mid-1998, branches and subsidiaries together accounted for more than 30% of the business volume of domestic credit institutions (compared to 12% in 1990). While this has been mainly related to "traditional" commercial banking activities, big banks got access to global investment banking business by the acquisition of foreign investment banks. Takeover activities of the largest German banks could continue after the start of EMU or be reinforced by it. Besides, European niche strategies of specialised banks, e.g. mortgage banks, are conceivable for the future.

A segment of the German banking system particularly prone to structural changes might continue to be medium-sized universal banks, that are perceived to be neither able to fully exploit economies of scale in retail business nor to have the "critical mass" to engage in European or global wholesale activities. For these banks, particularly mergers could become an attractive option, but takeovers from foreign banks are not unlikely either.

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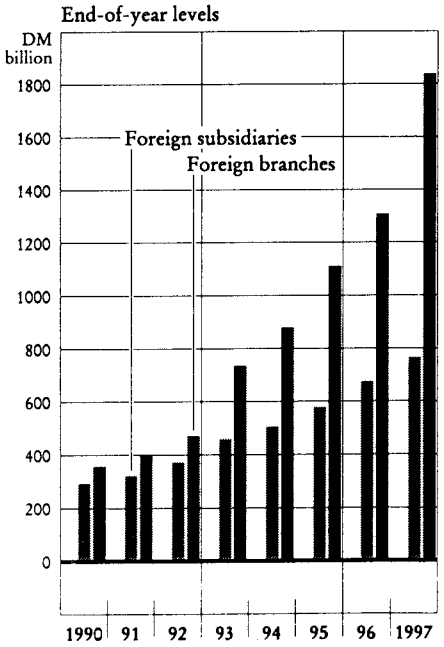
[23] For a similar classification, see Rajan (1996), p. 123.

Chart 5
Business volume of foreign subsidiaries and foreign branches



4. Where are German banks heading: some implications for monetary policy

Although technological progress and EMU will exert continuous and probably even increasing pressure for structural changes in the German banking system, large disruptions or structural breaks appear rather unlikely. The reason is that the main forces driving the demand of the non-financial sectors, such as the legal framework for companies or the system of old age provision, can be expected to change only gradually. As in the past, the underlying trends should be an increased institutionalisation of savings and a more prominent role of financial markets and securitisation, though to a large extent on balance and therefore not necessarily leading to disintermediation.

With respect to the *impact of monetary* policy on the economy, a growing significance of the interest rate channel can be expected. Growing competition tends to quicken the pace with which monetary policy changes work through the banking sector. Increasing securitisation means that monetary policy measures impact on a growing stock of assets, which is subject to ongoing market valuation and changes in relative prices, and will spread more quickly over the whole range of domestic and foreign financial and investment instruments. Additionally, the financial system tends to be more strongly exposed to shifts in market sentiment. This may be pronounced by a more prominent role of institutional investors, who – at least at times – appear to contribute to higher financial market volatility.[24] As a consequence, monetary policy-makers could be required to focus – to an even greater extent than before – on avoiding uncertainties and shifts in expectations of financial markets' participants.

[24] See Domanski and Neuhaus (1996), p. 120 and Deutsche Bundesbank (1996), p. 59.

The role of a credit channel of monetary policy, the existence of which has not been supported empirically for Germany,[25] should only under specific circumstances play some role in the future. It is conceivable that increasing competitive pressure on deposits may force banks to adjust not only interest rates on credit, but also credit availability as a result of large changes in short term interest rates. However, if the willingness of housebanks to lend to small and medium sized enterprises depends on the availability of private information and the good access to real collateral provided for by the German bankruptcy law,[26] it is again changes in the real sector that should be more important than changes in the financial sector.

This leads to the question whether the changes in the financial system will negatively affect the *stability* of German banks and the overall financial system. Even in the absence of strong disintermediation trends, mainly three factors may contribute to higher fragility: First, an increasing share of banks' assets and liabilities prone to changes in market prices (as a consequence of increased competition on the liability side and growing securitisation); second, a higher volatility of earnings related to securities business; and third, the re-positioning in new markets and business areas may be associated with additional fluctuations in earnings. Universal banking activities can be expected to provide for some smoothing of banks' profits. From this perspective, strategies focused on specialisation may bear more risk for instability than those concentrating on universal banking. In any case, issues related to banking sector stability will require particular attention.

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[25] See Stöss (1996), pp. 47-8.

[26] See Stöss, (1996), p. 48.

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Restructuring of the Dutch banking sector: implications for banks and the economy

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1. Introduction and summary

In the past 10 years, the Dutch banking landscape has changed dramatically. Large-scale mergers, such as the creation of ABN Amro and NMB-Postbank (currently ING Bank), and closer cooperation between savings banks have resulted in a relatively concentrated market for banking services. Cross-border expansion has intensified as well, illustrated in recent years by rather sizeable acquisitions by Dutch banks in Belgium, Brazil and the United States.

In the next section of the paper, we provide an overview of the main changes the Dutch banking sector has witnessed since the late 1980s and some of the causes associated with the regrouping of the banking industry in the Netherlands. It is often stated that regrouping is a strategic reaction to increased competition. In the banking industry, regrouping may have halted the shrinking of margins in traditional lines of banking intermediation. In the third section of the paper, we present a detailed analysis of interest rate margins and their development. By exploring the development of margins on different activities, we hope to shed some light on the competitive conditions in different market segments. Although the main focus is on the Dutch banking system, we also include a comparison between major banks in the Netherlands, Germany, France and the United Kingdom. The fourth section is devoted to the relationship between banks and small and medium-sized firms in the Netherlands. In the fifth section we analyse the response of the banking sector to an increase in the money market rate.

The main results of our research are summarised below.

- In contrast to many other European countries, overall interest rate margins in the Netherlands have been remarkably stable in the 1990s at about 1.5% (domestic assets). However, the overall trend disguises diverging developments in different market segments as well as strong indications that downward pressures are building up.
- In particular, Dutch banks have profited from a buoyant housing market and very large margins on mortgages, largely on account of maturity transformation gains. The growth of the corporate loans business has also been strong, albeit at much narrower and shrinking interest rate margins, which does not support the proposition of increased market power following banking concentration.
- Due to rising competition from both new entrants and investment funds, banks have gradually increased the compensation for short-term retail savings relative to money market rates. Long-term funding costs have also increased relative to money market rates on account of a normalisation of the term structure of interest rates since 1993. As a result, the average banks' cost of funds hovered slightly above money market rates in recent years.
- In an international context, Dutch banks have performed relatively well in the 1990s. Whereas the interest rate margins obtained by major German, French and British banks have come down considerably over the last decade (about 50 basis points according to our calculations), the

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[1] W. Jos Jansen, Department of Monetary and Economic Policy and Raymond T. L. Moonen, Directorate of Supervision, De Nederlandsche Bank. The views expressed in this paper are those of the authors and not necessarily those of De Nederlandsche Bank. We would like to thank Gabriele Galati, Jan Kakes, Job Swank, Peter van Bergeijk, Carel van den Berg and the participants at the BIS Central Bank Economists' Meeting for helpful comments on preliminary drafts.

difference between the average bank lending rate and the cost of funds at major Dutch banks has fluctuated between 1.9 and 2.1% (consolidated assets).

- Small firms are four times as likely to be hit by credit constraints as large firms. The underlying causes of credit rationing are (1) asymmetric information, leading to a relatively strong preference on the part of banks for collateral and a track record, and (2) the relatively strong aversion on the part of firms to giving up control and to greater transparency of business operations.
- Firms mainly respond to (external) financing difficulties by muddling through or adjusting investment plans. In addition, small firms hold a larger stock of liquid assets and retain more of their profits than large firms, which can be seen as hedging strategies against the risk of credit rationing.
- Despite the high degree of concentration in the banking sector, there still appears to be significant competition among banks, as one out of three firms has changed to another bank in the past few years.
- Following a monetary policy tightening, Dutch banks attempt to shield their loan portfolio, with holdings of foreign assets acting as a buffer stock. This contrasts with the American experience where holdings of securities fulfil this role.
- Despite the guilder-Deutsche mark peg, the Netherlands has enjoyed a limited scope for discretionary monetary policy in the past 15 years. The impending move from a quasi-monetary union to a full monetary union therefore entails non-trivial costs.

2. General overview of recent developments in the Dutch banking industry

2.1 Introduction

As in many other banking systems, a trend towards concentration has characterised the Dutch banking sector during the last two decades. The largest shifts took place in the late 1980s and early 1990s, when Nederlandse Middenstandsbank (NMB) merged with Postbank (1989), subsequently adding the biggest Dutch insurer Nationale Nederlanden to form the ING Group (1991), and when Algemene Bank Nederland (ABN) and Amsterdam-Rotterdam bank (Amro bank) joined forces in ABN Amro (1990). The emergence of "all-finance" was not limited to the new ING Group. Other combinations of banks and insurers have emerged since the liberalisation of the so-called "financial structure policy", which effectively separated banking and insurance services before 1990. Savings banks, cooperative banks and merchant banks have joined forces as well, bringing the total number of credit institutions incorporated in the Netherlands down to about 150 in 1997 from 170 in 1988. Currently, the total number of banking firms is composed of almost 100 universal banks, 18 securities houses, 26 savings banks, 4 mortgage banks and 1 central institution. Close to 480 cooperative banks operate under the umbrella of a central institution (Rabobank).

In this section, we provide an overview of recent developments in Dutch banking. In particular, we review market structure and concentration in Section 2.2, diversification and internationalisation in Section 2.3 and efficiency and the financial results of the Dutch banking sector in Section 2.4.

2.2 Market structure

The merger activity described above has of course influenced the concentration levels and the distribution of market shares of banks in the Netherlands. However, two developments mitigated concentration in terms of market shares. First, customers with a preference for more than one banking relationship moved to third banks, which somewhat reduced the combined market shares of the merged banks. Second, new entrants in the mortgages and savings markets had some success in

concurring small market shares. Both developments are corroborated by data on individual market shares in credit and deposit markets.[2] In Table 1, the development of market shares of the three largest and the five largest banks over the last 10 years is shown. It is important to note that the two mega-mergers in 1989-90 involved all top five institutions except the largest one. As a result, the composition of the top three banks was changed and two – much smaller – banks were added to the top five. All in all, the market shares of the five biggest banks have decreased slightly over the last 10 years (most notably with respect to mortgages: reduction from 94% in 1987 to 88% in 1997), while an overall increase in concentration, although somewhat mitigated in the most recent period, did clearly show up in the top three figures.

Table 1
Degree of concentration in Dutch banking*
Combined market shares as a percentage of the total banking sector

	Private sector credit			Savings and deposits		
	1987	**1992**	**1997**	**1987**	**1992**	**1997**
BIG 3	65.8	81.5	77.7	61.3	80.4	78.7
BIG 5	89.0	88.5	86.8	90.2	86.9	87.3

* Data do not include Bank Nederlandse Gemeenten, Waterschapsbank and Nationale Investeringsbank due to their more recent classification and reporting as private sector banks.
Source: De Nederlandsche Bank (see, also, footnote 2 below).

The relatively high levels of concentration in the Dutch banking industry should be qualified by the relative positions of banks and non-banks in the intermediation process. In the Netherlands, domestic bank claims represent just over half of all claims vis-à-vis the domestic private sector. Insurance companies, pension funds and other institutional investors are rather important financial intermediaries as well.[3] In this respect, the Netherlands is comparable to the United Kingdom, whereas in France, Germany and Italy, the banking sector as a whole dominates financial intermediation with shares of 80% and more.[4]

Foreign banks have not really been able to penetrate Dutch retail markets to any significant extent, despite long-standing open access regulations on establishment and free capital movements. Only Credit Lyonnais captured a small retail market share in the 1980s, which was subsequently taken over by Generale Bank of Belgium. In wholesale markets, however, an increasing number of EU-institutions, rising from 120 in 1995 to 170 in 1997, offer cross-border services from their home base. Outward internationalisation had already been practised to some extent in the 1980s, mainly by ABN, but really took off in the 1990s. ABN Amro ventured into the United States by gradually building up a significant second retail home market. Acquisitions in Eastern Europe, Asia, Australia and Latin America have also taken place. In 1997, ING achieved the development of a second home market, a long held strategic goal, in one big stroke by acquiring Bank Brussel Lambert of Belgium. The move was more or less repeated by the binational Fortis Group as it acquired Generale Bank in 1998.[5] Both ABN Amro and ING earlier expanded into investment banking by taking over brokers and merchant banks in the United States (Furman Seltz), the United Kingdom (e.g. Hoare Govett, Barings) and other European markets.

2 Data on individual market positions are reported to De Nederlandsche Bank in confidence and cannot be reproduced here.

3 De Bondt (1998) and Borio (1996) show that the claims not intermediated by banks are mostly intermediated by other financial institutions, including investment funds, whereas claims held by households comprise only 3% of total private sector credit (compared to 19% in the United Kingdom).

4 Groeneveld (1998).

5 Fortis itself is a product of consolidation among savings banks, the integration of retail banking, merchant banking and insurance, as well as internationalisation.

2.3 Reasons for concentration and internationalisation

In the academic literature, a number of reasons for bank mergers and acquisitions have been discussed.[6] Economies of scale are generally found to exist for small banks, but the evidence is often inconclusive for larger banks.[7] Improving cost efficiency, however, may not be the only or even primary target of large-scale mergers and acquisitions.[8] As regards the restructuring of the Dutch banking sector in the 1990s, diversification and internationalisation goals (output efficiencies) have probably been as important as cost efficiency considerations. The benefits of increased diversification have been demonstrated by the savings banks, which have developed into universal banks. By means of "one-stop-shop" selling strategies, they have expanded their market shares in many financial market segments. The profitability of these banks has increased from a relatively mediocre level in the early 1990s to the average industry standard.[9] The NMB-Postbank merger (currently ING Bank) was also complementary in nature, with Postbank bringing in a very large retail customer base and NMB concentrating heavily on small and medium-sized corporates. As a result, a very large share of payment flows was internalised, increasing cost efficiency, the concentration of exposure to individual sectors of the economy was reduced and the surplus of retail funds at Postbank (the former state savings bank) was put to more profitable use in the corporate sector. Cost cutting was clearly one of the main targets for ABN and Amro bank (see Section 2.4). The new combination set out to redress overlaps both in terms of activities and geographical spread. In addition, combining and strengthening the home operations was a means to achieve a sound basis for international expansion.[10]

Ambitions with respect to internationalisation have been directed at two market segments: one being investment banking and large corporate clients, the other being foreign retail markets. Both segments require an adequate capital base for expansion, whilst serving customers abroad may also require an international banking network. ING and ABN Amro have to a large extent succeeded in positioning themselves as major players in international markets, mainly through acquisitions, which had most probably not been possible without regrouping first. The share of income derived from providing banking services abroad has increased sharply in the 1990s and currently stands at approximately 50% for these main banks and close to one third for the Dutch banking sector as a whole. The opportunities offered by internationalisation are related to both price and volume. As regards interest revenues, it appears that foreign interest margins are generally higher than domestic margins (see Figure 1). In terms of volume, foreign markets and especially emerging markets, may offer a much larger potential for expansion than the relatively mature domestic market. However, the advent of the single currency, the euro, may add a new dimension to competitive forces in European markets as well as increase the scope for diversification, which is already leading to bank regrouping within EMU-countries.[11]

2.4 Profits, solvency and efficiency

Since Dutch banks' profits are generated to a relatively large extent by lending, they are generally more stable than bank profits in the United Kingdom or Switzerland. In 1996, net commission income

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6 See Molyneux et al. (1996) for an extensive overview.

7 Swank (1996) finds that overall economies of scale only exist at small Dutch banks with the amount of branches held constant, in line with e.g. Berger and Humphrey (1991) for US banks. However, there is no evidence of a U-shaped average cost curve, suggesting that even the largest banks in the Netherlands can expand without having to worry about cost disadvantages.

8 Recent technological innovations suggest that the setting up of direct banking subsidiaries and internet branches with much lower cost to income ratios as well as increased electronic processing of retail business are probably the main ways of attaining higher cost efficiency.

9 This is in line with Akhavein et al. (1997), who find that profit efficiency, in contrast to cost efficiency, does generally improve following bank mergers in the United States due to changes in the composition of production.

10 Schuitemaker (1993).

11 For a discussion on increasing banking competition in continental Europe, see White (1998).

and other non-interest categories represented just 20 and 15% of total income respectively (Figure 2). This is not to say that profitability was not supported by the favourable stock market climate until recently, but on the whole, a strong growth in lending was mainly responsible for good financial results. Figure 3 shows a steadily rising return on equity in Dutch banking. Major banks in the United Kingdom and the United States still outperform Dutch banks, but some catching up has indeed taken place (Table 2). Potential problem areas are the investment banking activities, which, inter alia, compete with Anglo-Saxon investment banks for highly qualified staff.

Figure 1
Interest return on assets
Dutch banking sector, in percent

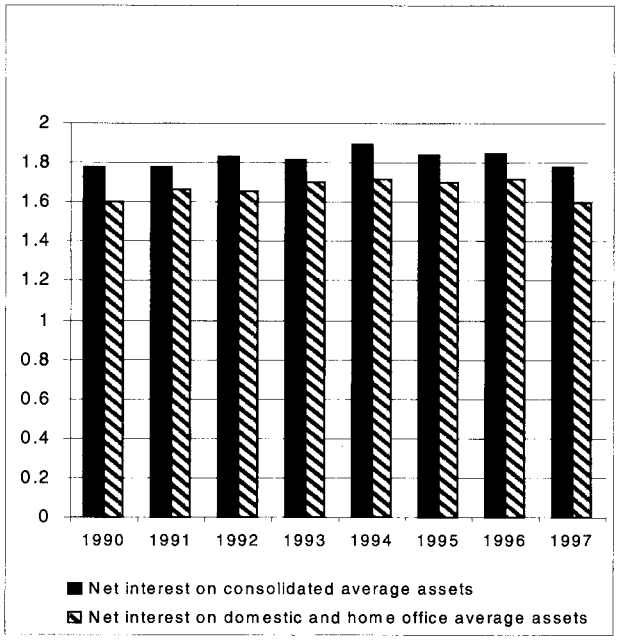

Figure 2
Income components
As a percentage of total income

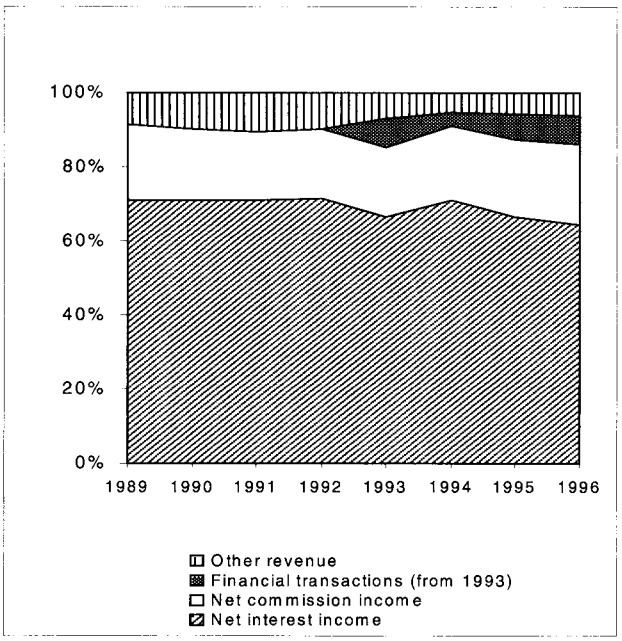

Figure 3
Return on equity
Dutch banking sector, in percent;
equity = average capital and reserves

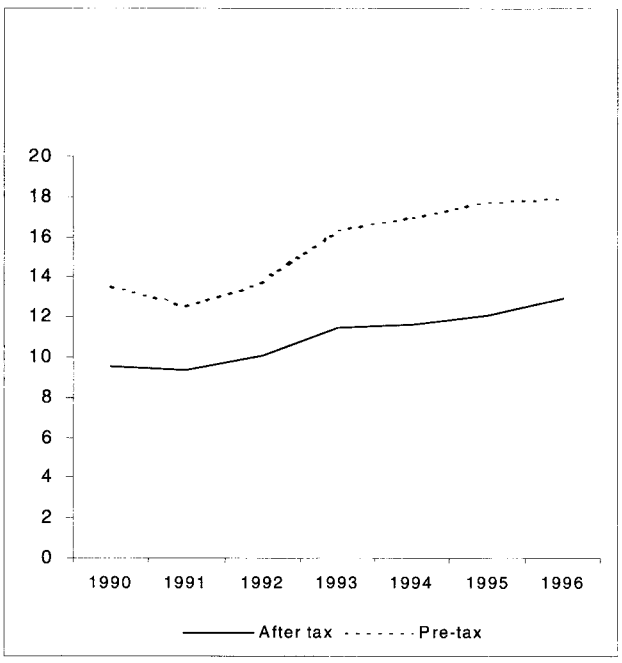

Figure 4
Efficiency ratios
Non-interest expenses on gross income

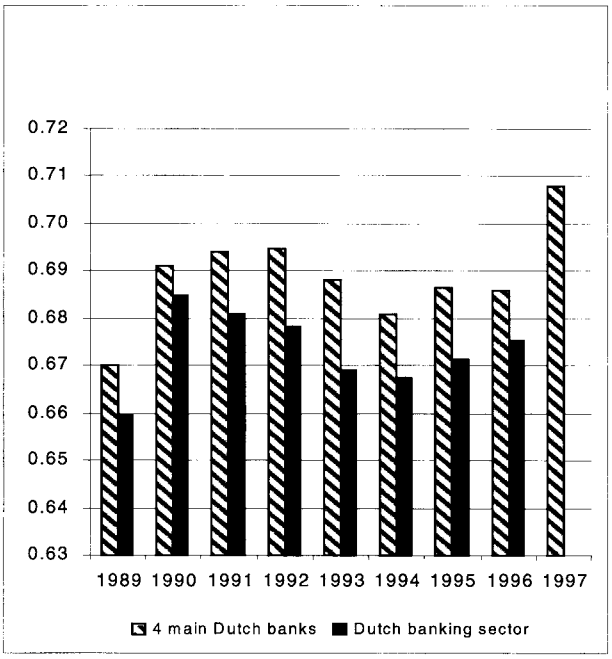

Table 2
Return on equity of major banks in selected countries*
In percentages

	1993	1995	1997
Netherlands	10.0	10.8	12.0
Germany	8.8	8.5	7.6
United Kingdom	14.8	20.2	18.0
France	2.4	4.0	10.0
Switzerland	11.6	5.8	9.5
United States	15.4	15.3	15.6
Japan	2.2	–2.1	–13.2

* ROE is defined as after tax profit on average capital and reserves. Major banks are the 5 biggest domestic institutions ordered according to tier-1 capital as far as listed in the Banker's top 50.

Source: Fitch IBCA, BankScope database.

The solvency of the Dutch banking sector has remained relatively stable, with average BIS ratios hovering between 10 and 11% in the 1990s. Broadly comparable levels are currently recorded by the main competitors in other countries, with the exception of Japan. Bad loan provisions have come down in recent years, following a rise before and during the 1992-93 economic slowdown.[12] The consolidation and restructuring of the Dutch banking sector have had the effect of dramatically reducing the number of banks with a poor performance, measured as ROE below the real risk-free interest rate. In the late 1980s, the Dutch banking sector did not score well on this performance measure (with approx. 60% of banks underperforming), only to move to the top of the league in the mid-1990s (7%).[13] However, average bank efficiency, as measured by the cost-income ratios, did not improve on balance (Figure 4). After initial cost increases, the mergers did have a positive efficiency effect, mainly through staff reductions, only to loose those gains in recent years on account of rising costs related to the investment banking activities (bonuses) and information technology (year 2000 and euro provisions).

3. The development of interest rate margins

3.1 Introduction

In this section, we will review the development of interest income in detail. It is recognised that the share of commission and other income related to capital markets business has increased somewhat in the 1990s, but interest income has remained by far the largest component of total bank income (65% in 1996 compared to 70% in 1989). Another reason for focussing on interest income is the popular claim, which is supported by research,[14] that interest rate margins are gradually eroding due to increased competition in savings and loans markets. If also found to be true for Dutch markets, rising bank profitability in the 1990s would be somewhat of a mystery given that the efficiency gains have not taken root. We cannot simply point the finger at the high level of concentration in the Dutch banking sector. For instance, Swank (1995), developing dynamic specifications for the demand for mortgage loans, the supply of savings and the associated interest rates over the period 1957-90, concludes that competition in the mortgage market significantly intensified in the course of the 1980s. Bikker and

[12] However, it is anticipated that 1998 data will show a significant increase in provisions on account of value adjustments to claims and other exposures on counterparts in Asia and other emerging markets.

[13] Davis and Salo (1997).

[14] E.g. Bonte and Holvoet (1996) and Deutsche Bundesbank (1998).

Groeneveld (1998), estimating competitiveness measures by evaluating the elasticity of interest rate revenues with respect to changes in banks' input prices, find that competition in Dutch banking has been quite fierce in the 1990s and on par with most other European countries, despite a relatively high concentration index. Nevertheless, we find that Dutch banks, as a group, have been able to expand in a profit centre – mortgage business – very successfully. Volumes have increased markedly due to a favourable economic climate and gradually falling long-term interest rates. And margins on mortgages have held up, despite growing pressures on funding costs and competition from non-bank intermediaries, thanks to a significant maturity mismatch.

3.2 Methodology and data

3.2.1 Methodology

In many studies, interest margins are determined by straightforward accounting, i.e. the net interest margin is calculated as net interest income over total assets (Figure 5). In this way, changes may reflect innovations in the numerator or in the denominator of the ratio.[15] As a consequence, the development of the net interest margin provides a picture of average net price changes only, without reference to the changes in the composition of assets and liabilities and the price movements of the various components. We set out to provide a more detailed picture of interest rate margins. In addition to calculating average bank interest rates on assets and liabilities (the bank lending rate and the cost of funds), we also decompose the overall margins into interest rate margins for various intermediation activities. A reduction in the overall margin may, for instance, be caused by a decrease in the share of interest-free deposits, an increase in the share of a relatively unprofitable activity, relatively lower lending rates or relatively higher savings rates. A general ratio would not be able to tell the difference.

Assuming that detailed bank balance sheets are available, the analysis would be relatively straightforward if all prices were easily observable. However, this is not the case. First, bank lending rates for certain activities may not be readily available. In our case, average lending rates for corporate credits had to be calculated, whereas average mortgage rates, government bond yields and interbank offer rates were known ex ante. Second, it is not clear from banks' balance sheet information when financial contracts have been entered into and how often interest rates on long-term contracts are being changed. Thus, the average portfolio interest rates must be construed on the basis of estimated or assumed interest rate (re)adjustment frequencies for various portfolios (or, in other words, the interest-specific maturities of the specific portfolios). This is relevant for both asset portfolios (e.g. mortgages and bond investments) and liabilities (e.g. long-term savings and debentures issued).

The overall interest rate margins and the margins on certain portfolios have been calculated vis-à-vis a common reference variable, the weighted average cost of funds. This rate was arrived at by adding the compensations paid to the banks' creditors: deposit-holders (current account, savings, time deposits), holders of bank debentures, domestic and foreign banks. Since two foreign interest rates were used, seven components contributed to the reference cost of funds, which can be expressed as follows:

$$(1) \qquad i_t^f = \sum_j^7 \mu_{j,t} i^*_{j,t} \qquad \text{with} \quad \sum_j^7 \mu_{j,t} = 1$$

where $\mu_{j,t}$ refers to the share of liability component j at time t and $i^*_{j,t}$ is the relevant compensation paid to banks' creditors holding instrument j at time t. Since portfolios of bond liabilities and long-term savings build up over time and interest rate adjustments are relatively infrequent, average portfolio interest rates must be calculated. Based on Swank (1995), the following function was used to estimate average interest rates for these portfolios:

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[15] In addition, if the interest rate margin is defined as a ratio rather than the difference between lending and funding rates, the absolute level of interest rates is not taken into account. This does not matter much as long as interest rates are relatively low. But the higher the interest rates, the larger is the difference between the ratio of net interest income over total assets on the one hand and the difference between lending and funding rates on the other hand (see also footnote 17 and the slight difference between overall margins in Table 5 and Figure 5).

(2) $$i^*_{j,t} = \delta i_{j,t} + (1-\delta) i^*_{j,t-1}$$

where $\delta = 1/(1+\lambda)$, λ being the average interest-specific maturity of the portfolio.[16]

Having established the reference variable, i.e. the cost of funds, net interest income can be attributed to the various income generating activities in order to arrive at the respective margins. Four asset categories have been distinguished: corporate credits, government (guaranteed) loans, domestic interbank exposures and mortgages. This can be formalised in a straightforward identity, stating that net interest income is equal to gross interest revenues (in four intermediation activities) minus interest expenses:

(3) $$I_t = (i^f_t + \alpha_t) A^{cc}_t + (i^f_t + \beta_{1t}) A^m_t + (i^f_t + \beta_{2t}) A^g_t + (i^f_t + \beta_{3t}) A^b_t - i^f_t P_t$$

where I_t is the net interest income for the selected aggregate of banks at time t; i^f_t is the weighted average cost of funds at time t; α_t, β_{1t}, β_{2t} and β_{3t} are the interest rate margins belonging to the various intermediation activities at time t: respectively, corporate credits (A^{cc}), mortgages (A^m), public sector loans (A^g) and domestic interbank exposures (A^b), and P_t is total liabilities less capital and reserves at time t. Since interest income is measured over a period of one year (t), all balance sheet components are determined as averages of two end-of-year data (t and t-1).

The β-values refer to margins that can be calculated relatively easily by subtracting the cost of funds from the relevant portfolio interest rates. This is the case for domestic interbank deposits, because the relevant interest rate, AIBOR, is readily available. It is also true for public sector loans and mortgages, because the margins on these activities can be calculated using observable interest rates, i.e. government bond yields and mortgage rates, and equation (2). Thus, the only really unknown variable is the margin on corporate credits. Rewriting equation (3) generates the following equation for the α-values over time:

(4) $$\alpha_t = \frac{1}{A^{cc}_t}(I_t - i^f_t [A^{cc}_t - P_t] - i^*_{m,t} A^m_t - i^*_{g,t} A^g_t - i^*_{b,t} A^b_t)$$

where $i^*_{m,t}$, $i^*_{g,t}$ and $i^*_{b,t}$ are the bank lending rates for mortgages, public sector loans and domestic interbank exposures respectively; in other words $i^*_{m,t} = i^f_t + \beta_1$ etcetera.

3.2.2 Data

Regarding balance sheet data, two sets of data have been used. First, in order to provide a full picture of the Dutch banking sector, we have used data gathered as part of the reporting framework by De Nederlandsche Bank. These data make it possible to disregard income derived from the activities of foreign subsidiaries of Dutch banks (see also Section 2.2). Interest income related to cross-border loans, however, is included as part of corporate credit. The data have been aggregated or averaged over the entire Dutch banking sector. Hence, the interest rate margins presented in the next section are industry averages. Second, comparisons between major banks in selected European countries have been carried out on the basis of data from the BankScope database by Fitch IBCA. BankScope provides foremost consolidated data that do neither permit a separation of domestic income streams from those from abroad nor can balance sheet data be easily split in such manner.[17]

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[16] The following interest-specific maturities have been used: 5 years for bank debentures and government bonds, 3 years for mortgages (typically 5 or 10 years, but reduced in order to take into account product innovations, prepayment and switch over options) and 2 years for savings.

[17] Furthermore, since asset components were not individually analysed, only in an aggregate value for the interest rate margin of major banks could be calculated. If γ is that composite, then $\gamma_t = 1/A_t(I_t - i^f_t[A_t - P_t])$.

3.3 Results

3.3.1 Volumes

Before turning to the calculated interest rate margins, we present the quantitative forces that, together with the prices or portfolio interest rates, have shaped the net interest revenues and thereby the overall financial results of the Dutch banking sector. In Tables 3 and 4, recent developments in the balance sheet structure are provided. As regards liabilities, a number of developments can be highlighted. First, long-term funding and domestic interbank deposit taking have been substituted to some extent by loans from foreign institutions. Second, the share of short-term savings and time deposits appears to react to the level of market interest rates in line with theory. However, it cannot be concluded from these figures, as is often claimed, that bank customers rationalise on low-interest deposits, as the share of current account balances has expanded continuously. Third, assuming that foreign funding is mainly of a short-term nature, the total share of short-term funding components has increased by 7 percentage points between 1989 and 1997.

Figure 5
Net interest margin
Dutch banking sector, in percent

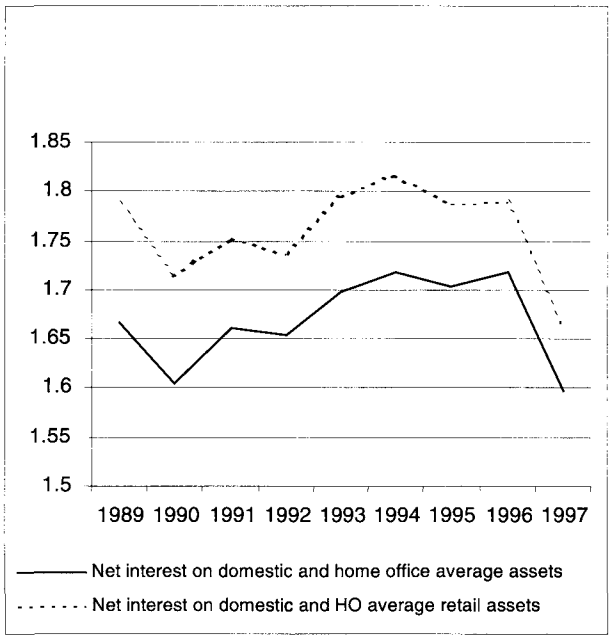

Figure 6
Bank lending rate and cost of funds
Dutch banking sector, in percent

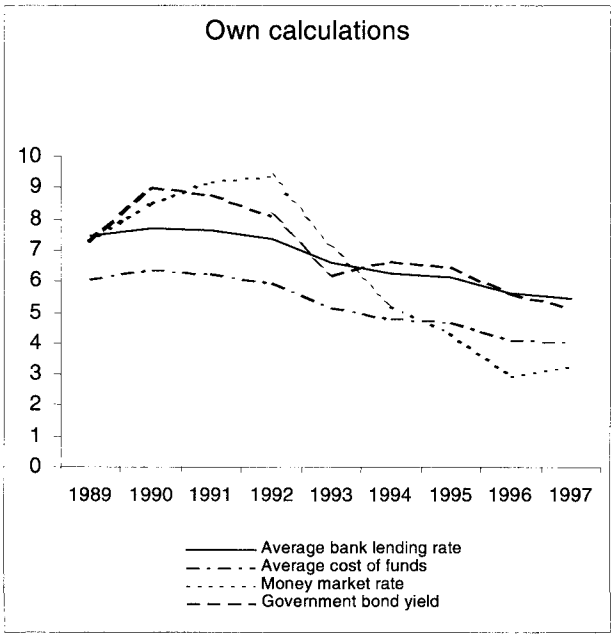

Table 3
Funding structure of Dutch banks
As a percentage of total average liabilities less capital and reserves*

	Domestic funding components				Foreign funding share
	Interbank loans	Short-term savings and time deposits	Sight deposits and current accounts	Long-term savings and debentures	
1989	7	25	10	23	28
1993	5	28	11	19	31
1997	4	22	13	18	38

* The components do not add up to 100% as the category "other liabilities" is not included.

Source: De Nederlandsche Bank (1998).

Table 4
Asset structure of Dutch banks
As a percentage of total average assets

	Interbank	Public sector	Corporate sector	Mortgages
1989	7	18	61	14
1993	5	15	64	15
1997	4	13	62	21

Source: De Nederlandsche Bank (1998).

As part of the asset side of the balance sheet, the share of public sector loans (including government guaranteed loans) has decreased significantly over the 1990s. The banks' expansion has been concentrated in the mortgage market. In the Netherlands, both public sector and mortgage business are mainly based on long-term interest rates. Thus, on the assumption of a stable maturity pattern of the corporate loan business,[18] the increase in the share of short-term funding was not matched by a similar shift on the asset side of the balance sheet.[19]

In recent years the growth of mortgage business has been consistently stronger (12-19%) than the growth of total assets (approx. 10%). Demand for housing was supported by relatively low long-term interest rates and, on account of government subsidy reforms, rising rents. Rising house prices, tax provisions and relaxed lending standards have been held responsible for increasing mortgage credit volumes as well.[20] It is of interest to note that institutional investors, although on the whole growing faster than banks, have recorded a more modest 6% increase in mortgage loans, thus reducing their market share to about 30% in 1997.

The balance sheet changes point in the direction of increased profits and a rising return on equity, in line with the account of recent developments in Section 2.4. Not only is short-term funding generally cheaper than long-term funding, which provides profitable maturity transformation opportunities, mortgage business is more profitable than public sector loan business as well.

3.3.2 Prices

In Figure 6, the development of the average bank lending rate and the cost of funds are drawn out. In addition to the changes in the balance sheet composition described above, several price trends have played a role in shaping the margins between lending and funding rates. First, due to the maturity composition of the asset and liability components (in fact, differences in the average interest rate adjustment frequencies), average bank lending rates adjusted more slowly to lower market rates in the course of the 1990s than the average cost of funds. Second, following a rather flat yield curve and some inversion, a normalisation of the term structure has taken place since 1993. Thus, over the period under review the interest rates on balance sheet components with long-term interest-specific maturities did not fall as much as the rates on short-term components. As a result of both factors, average bank lending rates on the portfolios of government bonds and (fixed-rate) mortgages remained relatively stable and the margins on these components, as measured vis-à-vis the falling average cost of funds, increased significantly (β_1 and β_2-values, Table 5).

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18 Mallekoote and Moonen (1994) find that the share of short-term corporate credit in total corporate credit is rather stable at 25-30% (1982-92). But the share of loans with money market related pricing is probably larger and perhaps more volatile when long-term loans with floating rate conditions are also considered. In addition, a survey by Swank (1994) brought to light that the pricing of long-term bank loans is partly based on short-term interest rates as well as long-term rates.

19 Another caveat is in order: we abstract here and in the remainder of the paper from any net hedging of the open maturity position by the banking sector in interest rate derivatives markets (asset-liability management).

20 De Nederlandsche Bank (1998), Chapter 7. The mortgage interest tax relief policy has probably stimulated credit demand secured by mortgages for other purposes than housing as well.

Table 5
Overall margins and margins for selected activities
In basis points vis-à-vis average cost of funds

	Net overall interest rate margin	Margins for selected activities			
		Interbank	Public sector	Corporates	Mortgages
1989	141	121	147	125	213
1990	133	215	143	103	219
1991	138	293	168	90	259
1992	138	341	201	70	300
1993	146	192	255	68	350
1994	148	41	273	71	359
1995	147	-36	264	72	346
1996	150	-116	291	66	359
1997	137	-82	265	60	327

Source: Own calculations.

Third, and perhaps most important in the long run, savings rates more or less doubled in relative terms between 1992 and 1997 (Figure 7). New entrants in the savings market have gained significant market shares (see Section 2.3) and the increasing clout of some non-bank intermediaries, such as investment funds, have probably made a competitive difference as well. Thus, in contrast to the mortgage market, where banks became more dominant, developments in the savings market did not go their way. This can be illustrated by the ratios between the average cost of funds on the one hand and the money market rate and the bank lending rate on the other hand, which we have called market power ratios (Figure 8).

Figure 7
Savings deposit ratios
Dutch banking sector

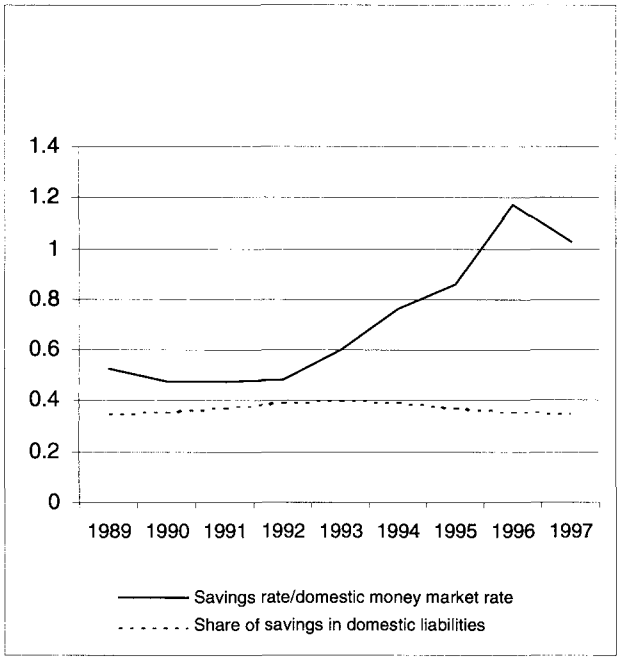
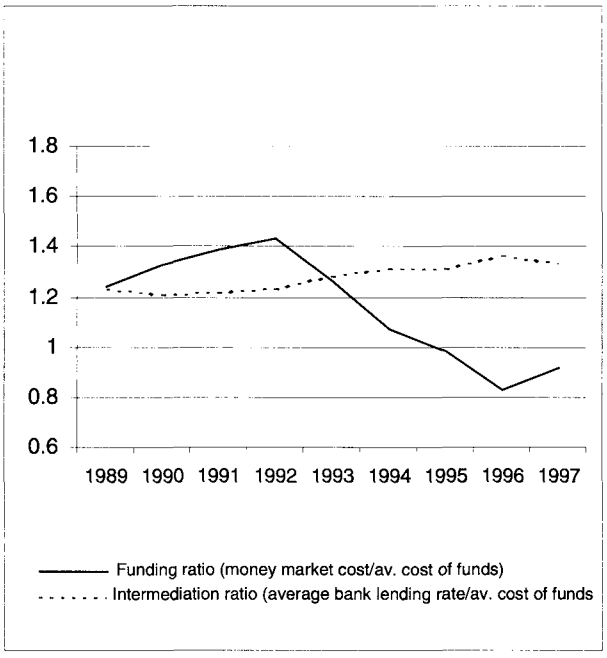


Figure 8
Market power ratios
Dutch banking sector



Fourth, average interest rates on corporate credits have been falling somewhat faster than the average cost of funds, which resulted in shrinking margins (see α-values). It is recalled that the computed margin on corporate credits is a residual, bringing together short-term and long-term loans, as well as domestic and cross-border loans initiated by banks' head offices. It is therefore difficult to draw definite conclusions. Explanatory variables may be interest rate developments, (international) loan market competition, portfolio risk and economic conditions.[21] As regards interest rate developments, somewhat lower α-values from 1992 onwards were indeed to be expected on account of a narrower spread between the market rates and the cost of funds. The relative rise in the compensation to bank creditors could not be passed on to (large) corporate debtors. It appears that, at least in the corporate loan market, increased market power on account of concentration in the Dutch banking sector would not square with these results. Other factors, such as reduced portfolio risk as a result of diversification following the mergers in 1989-90 (Section 2.2), increasing credit quality since 1993 and improved economic conditions in general (Figure 9) may also have played a role, but further research would be required to test these hypotheses.

Figure 9
Corporate credit margin and some economic indicators

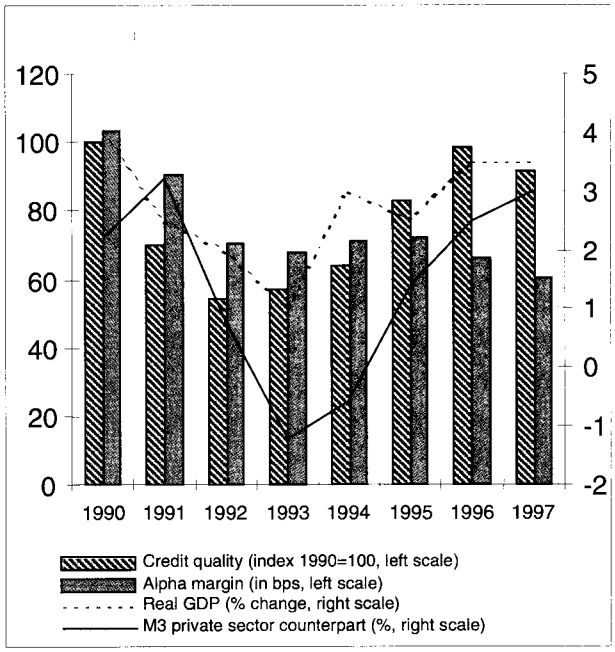
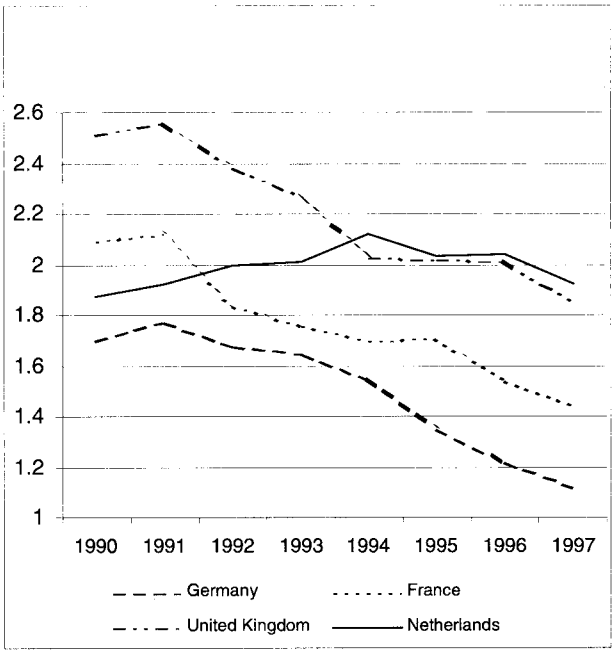


Figure 10
Interest rates margins
Four major banks, in percent



Simulation exercises suggest that the results for the α- and β-values are fairly robust. Large changes to the assumptions underlying the calculations, i.e. the λ-values and the relative distribution of foreign interest rates in the foreign funding component, have no significant effect on the net overall interest margin (at maximum 2 basis points) and relatively small effects on the margins for selected activities (5-10 basis points generally, at maximum 25 basis points).

3.3.3 Value

The development of the overall interest rate margin is the result of changes to the balance sheet composition (the shares of the various portfolios) and price movements (the portfolio interest rates). On balance, the overall interest rate margin was remarkably stable over the 1990s. However, the overall trend disguises diverging developments in different market segments as well as strong

[21] Demirgüç-Kunt and Huizinga (1998).

indications that downward pressures are building up. In structural terms, changes in balance sheet composition have pointed to a widening of margins (e.g. the strong growth of the contribution of the mortgage portfolio). But the rising cost of savings is probably a structural phenomenon as well. The negative impact of the latter development on banking margins becomes clearer if it is realised that, rather than stability, a significant cyclical improvement was to be expected following the peak of market rates and a flat yield curve in the early 1990s, on account of maturity transformation gains. Thus, if competition in the savings and corporate loans markets remains intense and the share of low cost deposits cannot be expanded further – which is unlikely in any case – it can be expected that the interest margin will, at least temporarily, come under pressure once market rates go up and the interest-specific maturity mismatch turns against the banks.

3.4 International comparison

The booming housing market, although a recurrent phenomenon in many countries, and the dominance of fixed-rate mortgages can be regarded as country-specific to the Netherlands in the period under review. We would therefore not expect to find a similar development of profitability and aggregate interest rate margins in other countries. In line with the methodology set out in Section 3.2, overall interest rate margins have been calculated for major banks in the Netherlands, Germany, France and the United Kingdom. In contrast to the analysis for the Dutch banking sector, which mainly focussed on domestic operations, consolidated balance sheet and income data have been used. Figure 10 shows that interest rate margins in Germany, France and the United Kingdom, as represented by four major banks, have shrunk in the 1990s (by approx. 50 basis points), compared to a fairly stable development at major Dutch banks (1.9 to 2.1%).[22] A relatively heavy reliance on long term funding has certainly not supported the financial results of the major German banks in recent years. In contrast to the Netherlands, the selected German banks apparently could not compensate these rising costs with buoyant mortgage or other long-term business. But even in places where long-term funding has been a relatively minor part of total funding (France and the United Kingdom), banks were confronted with a rising average cost of funds (in relative terms). The selected banks in France, for instance, witnessed average costs of funds exceeding money market rates for the first time in 1997. In the United Kingdom, bank lending rates have come down considerably – as a result, the relatively wide margins, compared to international levels, appear to be a thing of the past.

4. The banking sector and small and medium-sized firms

In the literature there has been a growing attention to the relationship between banks and small and medium-sized firms (SMEs), and the impact of these firms on the business cycle (see, for example, Gertler and Gilchrist (1994)). Information on the economic and financial behaviour of Dutch SMEs, in particular their relationship with banks, is relatively scarce and scattered around. In this section we summarise the information that can be gleaned from various recent Dutch language surveys. Before going into the financial behaviour of Dutch businesses, we first present some basic facts on the importance of SMEs for the Dutch economy.[23] Within the private sector, 99% of the firms is either a small or a medium-sized firm. In 1997, SMEs accounted for 29% of total value added, 30% of total wage income, 16% of exports, and 37% of total employment (EIM 1998). In the past few years, job creation within small and medium-sized firms represented more than 40% of the economy-wide employment growth.

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[22] For the data source, see section 3.1. The selected 16 main banks are: ABN Amro, ING bank, Rabobank, Fortis bank, Natwest, Barclays bank, Lloyds bank, Abbey National, Deutsche Bank, Dresdner Bank, Commerzbank, Bayerische Vereinsbank, Credit Agricole, BNP, Société Géneral, Credit Lyonnais.

[23] Small and medium-sized firms refer to firms with less than 100 employees in the private sector. The non-private sector comprises government organisations and sectors that are heavily affected by government regulations, like agriculture, fishery, mining, utilities, education, social services, health care, etc.

Non-financial firms in the Netherlands primarily use retained earnings (profits not paid out as dividends) to pay for investments. This holds for small firms and large firms alike. Figure 11 shows gross saving and gross investment by nonfinancial firms in the 1990s. Since 1993 total gross saving has even exceeded gross investment for the aggregate of all nonfinancial firms. Of course, not every firm can finance its investment plans out of retained earnings. Broadly speaking, there are four ways to raise external funds: (1) the bond market, (2) the stock market, (3) loans from banks and other financial institutions, and (4) venture capital companies and informal investors. Due to problems associated with asymmetric information, access to public capital markets is limited to those firms that are able to establish their creditworthiness, e.g by a debt rating accorded by an independent rating agency, and by publishing annual reports that meet certain accounting standards. In practice this implies that only large firms can tap capital markets for investment funding.

Figure 11
Gross investment and saving by Dutch non-financial firms, 1990-96

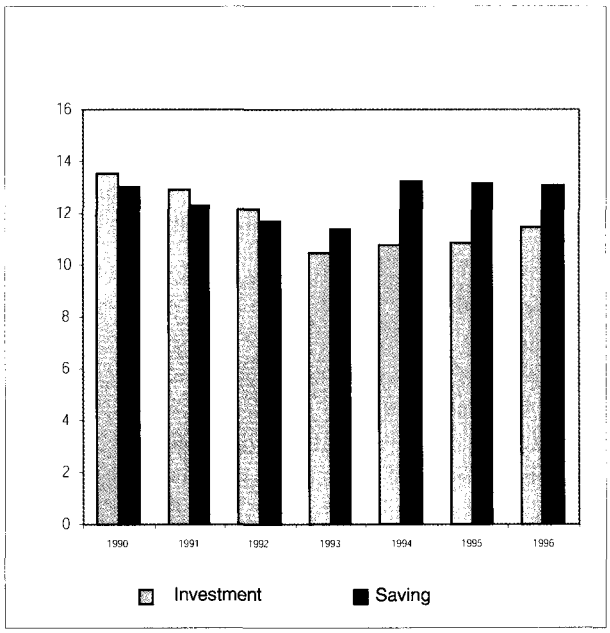
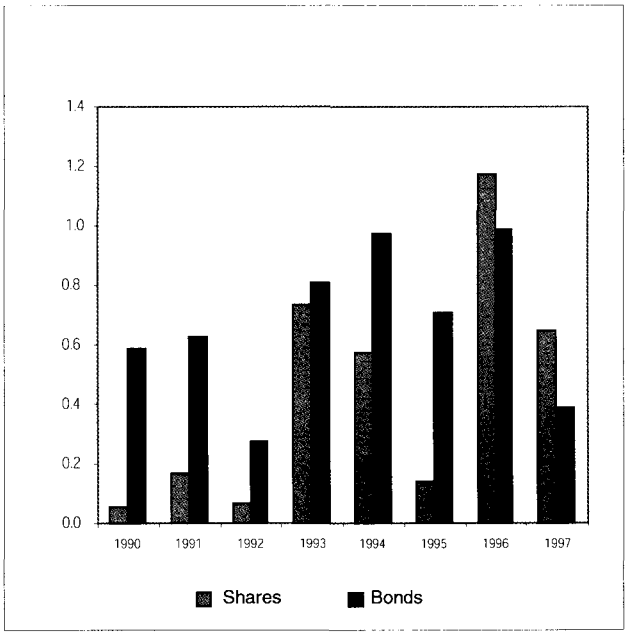


Figure 12
Issues of new securities by Dutch non-financial firms, 1990-97



Like elsewhere in continental Europe, the corporate bond market in the Netherlands is underdeveloped compared to its US counterpart. Dutch private sector bonds are mainly issued by financial institutions. Bond issues by non-financial firms on average amounted to 0.67% of GDP annually in the period 1990-97 (see Figure 12). Only large and well-known companies issue bonds, and when they do, comparatively large amounts are involved. The risk and liquidity premium versus government debt was only 0.9% on average in 1991-95. Ligterink and Schmeits (1998) argue that there seems to be a natural self-selection of issuing companies: few companies issue marketable debt, but the ones that do are very creditworthy and thus pay low rates of interest.

Large companies can also go to the stock market for new funds. Issues of new shares by nonfinancial firms are relatively small, although in recent years their size has increased. In the 1990s new issues were on average 0.44% of GDP per year (see Figure 12), although there is a marked increase after 1993. Like in the bond market, financial institutions are more active as fundraisers than nonfinancial firms. For example, in 1997 new issues by financial institutions amounted to Hfl 14.6 billion (2.1% of GDP), three times the amount raised by non-financial firms.

Since small and medium-sized firms cannot signal creditworthiness easily, they cannot use the bond

and stock markets as a source of funds.[24] Consequently they are heavily dependent on banks for external financing.[25] Banks offer a solution to the two problems caused by asymmetric information, adverse selection and moral hazard. By developing long-term relations with their customers, banks get access to firm-specific information, which allows them to determine their clients' creditworthiness, and to monitor their activities. Because of the inside information, they can make better lending decisions than lenders in the public capital markets. Although banks specialise in gathering and evaluating business information, they know that informational asymmetries will continue to exist. Since banks cannot perfectly discriminate between good and bad borrowers, increasing the lending rate, especially when it is high already, will exacerbate the adverse selection problem. Bad risks will have no problem to promise to pay the higher interest rate, while some of the good risks will withdraw their loan application. Banks will not raise the lending rate too much in order to avoid the deterioration of the loan portfolio. Instead, they will refuse credit to some loan applicants and only extend part of the amount applied for to others, even though these applicants are willing to pay a higher interest rate. Besides credit rationing, another common strategy to limit the effects of adverse selection and moral hazard is to ask for collateral or a minimum amount of capital put up by the entrepreneur himself. Banks also value a track record, as it reduces the information shortage.

Informational asymmetries between lenders and borrowers are most severe for the smaller firms, especially starting firms and firms that try to market a technological invention, like small high-tech firms. Small firms have ill-diversified activities and customer base, and a small capital base, and thus have a unfavourable risk profile. Starting firms do not have a track record and lack collateral. The assessment of the prospects of firms that invest in new products and services requires know-how that banks often do not possess, which naturally makes them reluctant to get involved. Moreover, these firms often invest in licenses and other immaterial assets, which cannot serve as collateral.

Jonkheer et al. (1997) conducted an international survey on the financial bottlenecks facing SMEs, and the way they are dealt with.[26] Their analysis, which is based on qualitative rather than quantitative information, yielded the following results. Dutch banks are relatively risk-averse compared to their foreign counterparts. In part this finding is attributable to the fact that Dutch firms on average are riskier since they invest more in immaterial assets (like software licenses and R&D expenditures), which are not accepted as collateral, and have a more international orientation. Consequently, Dutch banks put great emphasis on collateral and a track record.[27] For small companies, mortgaging the private home is often necessary. However, the lending rates banks charge are relatively low. Compared to their foreign counterparts, Dutch firms mainly respond to (external) financing difficulties by muddling through or adjusting investment plans (downsizing, delay, or even cancellation), rather than searching for other solutions in the financial sphere (e.g. leasing, use of credit card, change of repayment conditions, informal investors).[28]

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[24] A listing at the Amsterdam Stock Exchange requires a minimum equity capital of Hfl 10 million. Since March 1997 Amsterdam has a separate exchange for small, fast-growing companies (minimum equity capital Hfl 2 million), NMAX. However, only four companies were listed in October 1997 (Ministry of Economic Affairs 1997, Chapter 8).

[25] Venture capital companies and informal investors are an alternative source of external finance, especially for starting high-tech firms and fast-growing firms, but the amounts involved are rather small. Total invested venture capital funds amounted to 0.6% of GDP in 1995. Invested funds by informal investors were also 0.6% of GDP, although this potential source of funds is not yet fully utilised (Ministry of Economic Affairs 1997, Chapter 8). Trade credit is another source of working capital. Unfortunately, there are no data available on the relative importance or the role of this source of funds.

[26] Countries included in the survey are Denmark, Germany, Italy, the Netherlands, the United Kingdom and the United States.

[27] This behaviour can also be observed in the market for housing finance. Banks are eager to extend mortgage loans and ask for relatively low risk premiums. Consequently, the volume of mortgage credit has been growing at a fast pace in the 1990s, and it is well-known that part of the borrowings will be used to finance consumption of durables. This part is in effect collateralised consumer credit. By contrast, banks ask much higher interest rates for regular, unsecured consumer loans.

[28] There is also evidence to the contrary. For instance, Haffner and Waasdorp (1998) and Ministry of Economic Affairs (1997) cite research that found that 1 out of 3 high-tech starters that initially were unable to secure funding ultimately succeeded to pull off a viable market introduction of their products and services.

Table 6
Short-term bank loans to Dutch SMEs, 1990

Number of employees	Use of credit			Credit rationing	
	Had short-term bank loans at the end of 1990 (%)	Never had any short-term bank loans (%)	Credit outstanding (% of sales)	Encountered difficulties borrowing from banks	Therefore still reluctant to call on a bank
1	29	42	12.5	31	57
2-19	44	25	9.7	20	47
20-99	45	24	8.1	16	20
100 and more	56	31	7.3	8	19
Total	40	30	10.5	22	48

Source: De Haan (1997), Chapter 7.

How dependent are Dutch firms on banks? Table 6 (left panel) contains information on the importance of short-term bank credit, derived from a survey of SMEs in the early 1990s by De Haan (1997). Short-term bank credit consists of two types. The most important one is credit on current account, which accounts for about two thirds of credit outstanding. This involves an arrangement whereby the customer can overdraw his bank account to a certain limit. In principle this facility can be used indefinitely, although the limits will periodically be reviewed. The second type are fixed advances, which account for about 30%, and which are granted for a certain period. At the end of 1990, 40% of the firms had short-term bank loans, while 30% had never had any loans. The larger firms in the sample are more likely to have bank loans and less likely to have never borrowed short-term funds. Only 29% of the one-employee firms had short-term bank loans in 1990, and 42% had never had any. The borrowed amount is on average 10.5% of total sales or turnover. Again there are differences between small and large firms. For one-employee firms, bank credit equals 12.5% of sales on average, while for the largest firms it represents only 7.3%. Hence, small firms have fewer short-term loans, but these loans are relatively important to their business operations.[29]

In the same survey, firms were also explicitly asked about possible difficulties with obtaining bank credit. The results are in the right panel of Table 6. 22% of the firms reported that they did not get all the credit they asked for, although they would be willing to pay a higher interest rate. Again, large differences between small and large firms exist, as is predicted by asymmetric information theories. Small firms are four times as likely to be confronted with credit rationing than large firms (8% versus 31%). In their panel data study on investment behaviour of Dutch firms in the period 1983-92, Van Ees et al. (1996) estimated that one-third of the companies was debt-constrained.

Of course, firms will attempt to hedge the risk of credit rationing or a deterioration of lending terms. Theories stressing the lending channel of monetary policy predict that small firms will hold a relatively large stock of liquid assets as an insurance against reductions in the availability or cost of short-term credit (see, for example, Gertler and Gilchrist (1994) and Kashyap and Stein (1997)). Moreover, small firms will retain more of their profits than large firms because of the barriers to external finance. Table 7 presents recent data that confirm these predictions. The smallest firms have liquid asset holdings equal to about 19% of total assets, while the largest firms have less than 6%. De Haan (1997) also found that firms often do not completely pay back their short-term bank loans even if they have the financial surpluses to do so. A similar pattern can be discerned with retained earnings.[30]

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[29] The Dutch Council for SMEs (1995) found that about 50% of SMEs are 100% financed by internal funds. However, the true number is probably lower as some firms apparently did not view short-term credit as debt.

[30] The category of smallest firms (total assets less than one million) retains less of their earnings than the next three categories. This is probably a statistical artifact, reflecting the fact that this class contains a relatively large number of marginal firms with very low or negative profits.

Table 7
Liquid assets and retained earnings of Dutch SMEs, 1996

Balance sheet total (guilders)	Liquid assets (% of total assets)	Retained earnings (% of total earnings)
Less than 1 million	18.9	64.5
1-5 million	16.0	82.3
5-10 million	13.9	76.9
10-25 million	12.8	67.8
Greater than 25 million	5.7	46.5
Total	8.1	52.7

Source: Central Bureau of Statistics (1998), Table 4.

A recent survey by the Dutch Council for SMEs (1995) found that 60% of the small firms and 50% of the medium-sized firms think that financing problems inhibit the expansion of their company. 70% of the firms expect that future growth will primarily be financed by internal funds. Firms that planned a large investment project in the next few years were asked whether they expected financing problems. Of the firms that had invested large sums before, only 30% expected financing troubles, which illustrates the value of a track record. Most (three quarters) of the large investments are entirely or partially financed by bank loans, with banks asking for collateral in 70% of the cases.

Dutch firms usually have a special relationship with a particular bank that provides the majority of financial services (the so-called "huisbank"). Has the increasing concentration in the banking sector affected the financing of small and medium-sized enterprises? The survey by the Council for SMEs found that Rabobank is the bank of choice of over 50% of the small firms, while 50% of the large firms is with ABN Amro. Along with ING Bank, the three largest Dutch banks between them have a market share of over 80%, which might raise the question whether these three have too much market power. Firms can still vote with their feet, however. One out of three firms has in the past few years changed to another bank, 41% of the medium-sized firms and 26% of the small firms.[31] In line with expectations, small firms, for which informational asymmetries are more serious, are more reluctant to sever the relation with their bank. These turnover rates suggest that competition between the Big Three is not dead. Moreover, the evidence presented above that Dutch banks earn low margins and have low costs (compared to banks in other industrial countries), also suggests that the extremely high degree of concentration in the Dutch banking sector does not appear to impair efficiency.

Dutch SMEs are confronted with considerable credit constraints, and as a consequence do not invest as much as they would like. This is not necessarily a bad thing. One of the functions of financial intermediaries is to distinguish good projects from bad projects. There is no welfare loss if an ill-conceived investment project is cancelled for want of money. However, banks and other financial intermediaries can perform this selection process better, the smaller the problems of asymmetric information are. Furthermore, one should keep in mind that a part of Dutch businesses effectively do not use external finance by choice. External finance naturally involves the partial surrender of control and greater transparency of business operations and results. Compared to their foreign counterparts, Dutch firms are less prepared to accept these consequences of external financing (Jonkheer et al. (1997)).[32] The resulting heavy reliance on internal finance puts of course restrictions on their growth opportunities.

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[31] Among the large firms, 22% moved to another bank. This low percentage could reflect the fact that large firms usually do business with several banks. Alternatively, banks may make greater efforts to keep large customers happy.

[32] For example, the Council for SMEs (1995) found that even among those firms that were very satisfied with the services provided by their bank, 40% preferred to operate without a bank. 78% of the firms were strongly opposed to the idea of their bank becoming a shareholder in the firm.

The root cause of credit rationing is asymmetric information, and related to this, a strong preference for collateral by banks. Several measures have been suggested to reduce the asymmetry of information between lenders and borrowers, among them technology rating (which was introduced in 1995), and an independent rating agency for SMEs. Bruins et al. (1996) and Jonkheer et al. suggest programmes to increase the business skills of entrepreneurs, as the Council for SMEs (1995) found that only 20% of small firms and 40% of medium-sized firms had a business plan. A well-argued business plan may provide a favourable signal about creditworthiness to banks, informal investors and venture capital companies. In view of the shortage of collateral, Jonkheer et al. argue for making more SMEs eligible for the successful government loan guarantee scheme aimed at SMEs (BBMKB). The Council for SMEs and Bruins et al. have stressed the need for independent financial consultants specialised in SME finance in view of the large gap in knowledge in this area between SMEs and financial institutions.

5. Bank behaviour and the monetary transmission mechanism

In this section we briefly examine how Dutch banks react to changes in the money market interest rate.[33] The literature on the credit channel emphasises the role of banks in the transmission of monetary policy.[34] In this view banks will respond to a monetary policy tightening with a reduction in their loan supply. Because adjusting the loan portfolio is costly, banks will also try to hedge against the risk of monetary tightening by holding securities as a buffer stock against a reserve outflow. The sample period is 1983:III-1997:IV (58 quarters), the period in which Dutch monetary policy was first and foremost aimed at maintaining a fixed guilder/mark exchange rate, using the interest rate as the main instrument.[35] This exchange rate objective of course limited the scope for independent movements of the Dutch money market interest rate. Still, the band of ±2.25% around the parity allowed some interest rate flexibility vis-à-vis Germany.

Following the empirical literature on the monetary transmission mechanism we use a Vector Autoregression (VAR) model to investigate the impact of monetary policy changes. We estimate the following VAR model, which is a reduced form,

$$Z_t = A_1 Z_{t-1} + \ldots + A_p Z_{t-p} + u_t$$

where Z_t is a vector of variables observed at time t, and p is the maximum lag of the system. The VAR disturbance vector u_t is assumed to be serially uncorrelated and to have covariance matrix V. This reduced form can be thought of as being derived from the following structural model:

$$Z_t = B_0 Z_t + B_1 Z_{t-1} + \ldots + B_p Z_{t-p} + e_t$$

where e_t is the vector of the underlying structural shocks that we want to identify. e_t has as covariance matrix the identity matrix. The reduced form disturbances u_t are thus related to the underlying structural disturbances e_t by:

$$u_t = [I - B_0]^{-1} e_t = A_0 e_t,$$

implying $V = A_0 A_0'$. The impulse-response functions to the structural shocks e_t can be calculated via:

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[33] Originally, we planned to link changes in the monetary transmission mechanism to structural changes in the banking system. However, when we tried to document the changes in the monetary transmission mechanism, we found little evidence of any change.

[34] See Bernanke and Blinder (1992), Bernanke and Gertler (1995) and Kashyap and Stein (1997) for overviews of this literature.

[35] The last change in the guilder/mark parity occurred in March 1983 when the guilder was devalued by 2% against the mark.

$$Z_t = [I - A(L)]^{-1} A_0 e_t$$

We estimate our VAR by ordinary least squares to obtain estimates of the matrices V and $A(i)$, $i = 1, \ldots, p$. A_0 is calculated from V using the conventional Cholesky decomposition. Hence, A_0 is a lower triangular matrix, and u_t is assumed to be determined in a recursive fashion by e_t.

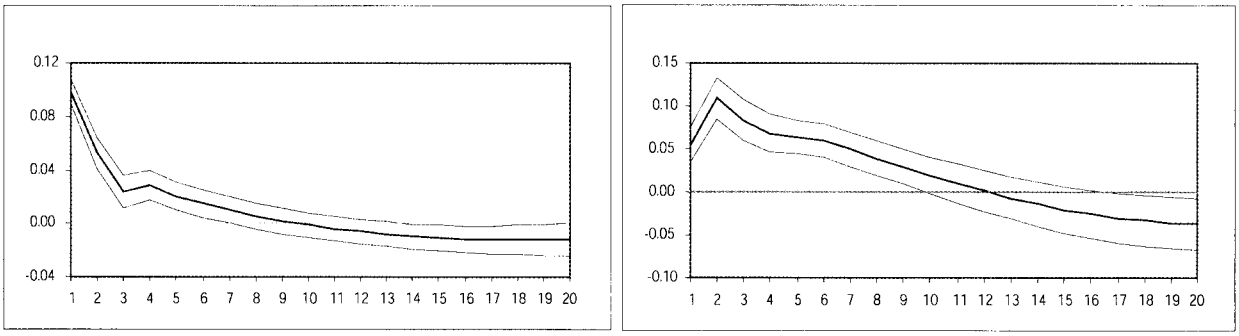
The maximum lag p is set at 3.[36] Given the limited length of the available time series, it is not possible to include all variables of interest in a single unconstrained VAR system. On the other hand, if we include too few variables in the VAR we run the risk of significant omitted variables bias. Given this trade-off we follow an intermediate strategy, which was also employed by Christiano, Eichenbaum and Evans (1996). We estimate a range of VARs for which the vector Z contains five variables. Z always includes the following four core variables: the log of the consumer price index (P), the log of the real GDP (Y), the log of the guilder/Deutsche mark exchange rate (E), and the interbank rate (R). To these four we add the specific variable we want to focus on, say X. X is different for every estimated VAR model.

The ordering of the variables in the VAR determines the pattern of recursivity, and thus may be of crucial importance for the orthogonalisation of the disturbances. Our main identifying assumption here is that output and the price level do not contemporaneously react to interest rates changes, hence they appear at the top of the ordering. As the money market interest rate is the policy variable, it is usually last in the ordering. Given the overriding importance of the exchange rate objective, the guilder/Deutsche mark rate precedes the interest rate. In case the additional variable is a balance sheet item or a real variable, it is the third variable in the vector Z. If it is an interest rate set by banks, it is the last variable in the ordering. Hence we allow for a contemporaneous response by the banks' interest rates to a change in the money market rate. As an exogenous variable we employ the German money market interest rate (current and three lagged values).[37] We thus assume that the German money market rate is set independently from the Dutch interest rate or the state of the Dutch economy, and that the Dutch central bank can react to any changes contemporaneously.

Figures 13-15 present the impulse response functions (IRF) of various variables after a one standard error shock to the Dutch money market rate. All IRFs show percentage points deviations from the baseline path for up to 20 quarters after the shock. The broken lines indicate one-standard error bands.

Figure 13 illustrates the working of the peg. A weakening of the guilder versus the mark is countered by a higher interest rate, and the exchange rate quickly reverts to its old value. Moreover, the interest rate falls back to the baseline at a slower pace, pointing to a vigorous and pre-emptive defence of the peg.

Figure 13
Response to a weakening of the guilder



[36] We fix p at 3 for degrees-of-freedom considerations. However, fixing p at 4, which is often done in empirical papers using quarterly data, does not change the results materially.

[37] Treating the German money market rate as an endogenous variable, i.e. including it in Z, does not change the basic results. Interchanging Y and P in the ordering is also irrelevant to the results.

Figure 14

Response to an increase in the money market rate

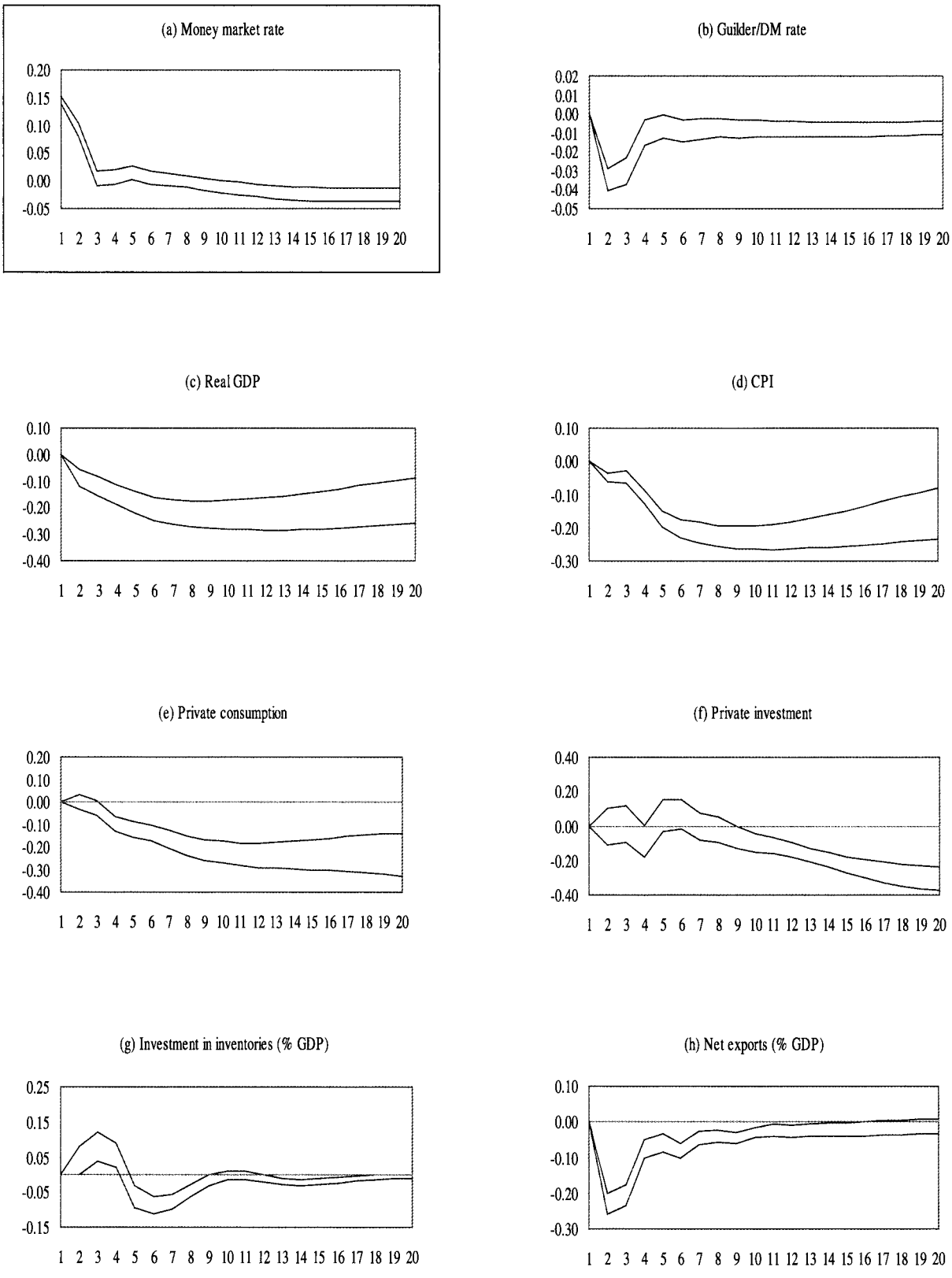
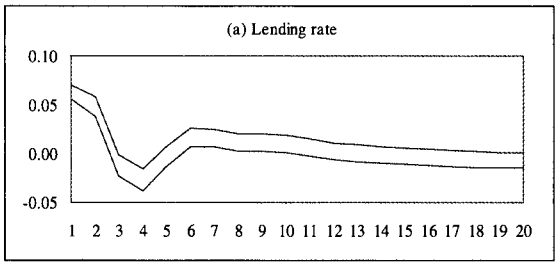
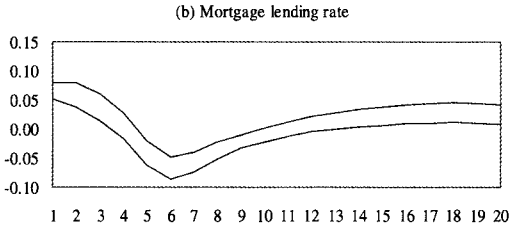
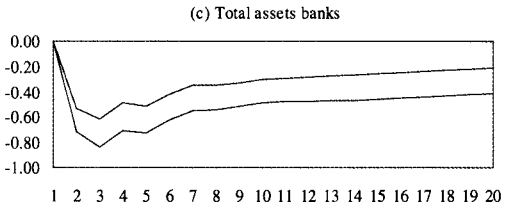


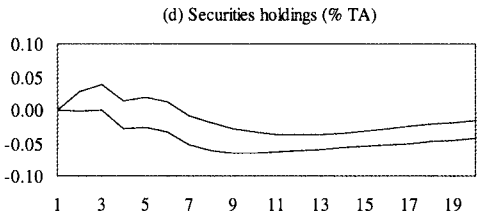
Figure 15

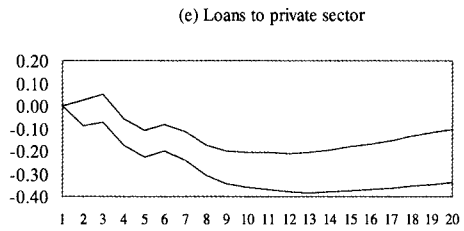
Dutch banking sector's response to an increase in the money market rate

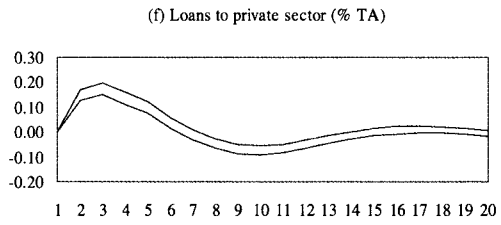


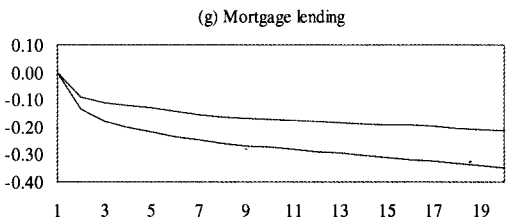


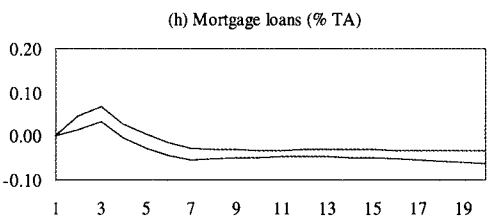


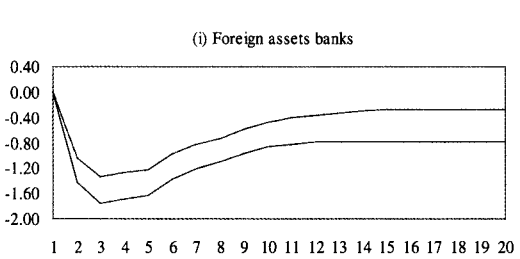












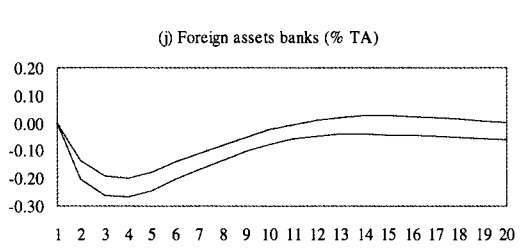


Figure 14 shows the effects of an increase in the Dutch money market rate.[38] The estimated coefficient of the current German interest rate in the interest rate equation of the various VARs is around 0.92, while its standard error is about 0.10. This coefficient is thus clearly insignificantly different from one. The interest rate shock can therefore be interpreted as a deviation from the German interest rate that is consistent with the guilder/mark peg. The typical shock is only 15 basis points and short-lived (Figure 14a), illustrating the limited room for independent interest rate movements in the Netherlands. However, this does not imply that monetary policy is powerless. A rise in the money market rate is followed by a temporary appreciation of the guilder (Figure 14b). Output gradually declines for 8 quarters to 0.17% below the baseline, before turning around (Figure 14c). Prices are sticky, as the price level remains unaffected for 2 quarters, before it gradually falls to 0.19% below the baseline (Figure 14d). After bottoming out the price level slowly starts to rise towards the baseline. The so-called "price puzzle" is thus remarkably absent.[39] In the short run, the economy's response is determined by the interplay of net exports and investment in stocks. Net export sharply contract for two quarters, reflecting lower exports and temporarily higher imports (Figure 14h). Inventories rise for two quarters due to falling foreign and domestic demand and decline as the level of output is adjusted (Figure 14g). In the medium term, lower output and spending mainly translates into lower consumption (Figure 14e). For investment we get a counterintuitive result, but the estimates are rather inaccurate as the confidence interval around this IRF is unusually wide (Figure 14f).

Figure 15 focuses on the banking sector's response to a contractionary monetary policy. Banks increase their lending rates in the same quarter by approximate half of the money market rate increase (Figures 15a and b). The central bank succeeds in shrinking the balance sheet of the banking system (Figure 15c). Total banking assets quickly fall by 0.5% after one quarter, and start to increase after the third quarter. Despite alternative sources of funding, Dutch banks appear to be unable to fully shield their operations from monetary policy actions. The decline of total banking assets is accompanied by an adjustment of the composition of the portfolio. The share of loans to the domestic private sector increases by 0.2% in two quarters, while the opposite can be observed for foreign assets. Initially, the share of the holdings of securities displays a modest rise. Banks protect their loan portfolio, as initially total loans even increase a bit despite the higher lending rate. This may reflect the temporary increase in short-term financing needs by firms due to higher inventory investment (see Figure 14g).[40] Banks treat households and firms differently, however. Mortgage loans start to decline quickly, although in percentage terms less than total assets.[41] The share of mortgages rises 0.07% in two quarter before coming down quickly, and it even falls below the baseline in the medium term. Banks also raise the interest rate on mortgages somewhat more aggressively than the short-term lending rate. Firms get preferential treatment as their loans appear to be less sensitive to interest rates changes in the short run. This finding, in combination with the evidence that small firms are much likelier to experience difficulties with credit availability, suggests that large firms especially are able to maintain and use their credit lines. Ultimately these loans decline too as the demand for credit falls with economic activity.

A remarkable aspect of the banks' behaviour is that foreign assets serve as the hedge against monetary tightening. The literature, which is mainly focused on the situation in the United States, assigns this role to holdings of securities. See, for example, Bernanke and Blinder (1992) for the United States, and Tsatsaronis (1993) for Germany. Our result also contrasts with Garretsen and Swank (1998) who

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[38] Figures 14a-14d are from the four-variable VAR with Z containing P, Y, E, and R (in that order). Figures 14e-14h and 15c-15h are IRFs of the variable X from five-variable VARs with Z containing P, Y, X, E, and R, while Figures 15a and 15b are derived from VARs where X is ordered last: P, Y, E, R and X.

[39] The "price puzzle" refers to the finding that the price level rises following a monetary policy tightening. See Sims (1992) and Christiano, Eichenbaum and Evans (1996) for a discussion.

[40] A similar finding is reported for the US economy by Christiano, Eichenbaum and Evans (1996), and for the German economy by Tsatsaronis (1993).

[41] A small part of the mortgages is recorded as corporate debt. However, an unknown part of the mortgages recorded as household debt is in fact debt of small unincorporated businesses.

for Dutch banks also found that securities act as a buffer.[42] Our results suggest that winding down positions in the international interbank market is the cheapest way to adjust the balance sheet quickly, and to shield the loan portfolio in this way from adverse short-run interest rate movements. It would be interesting to investigate whether the same adjustment pattern can be detected for other countries that have large and internationally oriented banks, like Switzerland and the United Kingdom.

The banks' response pattern is consistent with the prediction in the literature on the credit channel and the financial accelerator that following a contractionary monetary policy shock, banks will initially seek to protect their loans by drawing down a buffer stock of assets, and will primarily cut loans to those agents that are more bank-dependent (e.g. mortgages).

Finally, our analysis has some implications for the cost of monetary union. It has sometimes been argued that for the past fifteen years the Netherlands has in effect been in a monetary union with Germany, and that the approaching EMU does not represent any significant sacrifice in terms of monetary policy independence. However, our results suggest that the move from a quasi monetary union to a full monetary union still entails non-trivial costs. By taking part in EMU the Netherlands will give up the admittedly limited scope for discretionary monetary policy it still enjoyed in the past fifteen years, and which is summarised in Figure 14.

[42] There are a number of non-trivial differences between our analysis and theirs, however. Garretsen and Swank employ monthly data running from 1979 to 1993 in a seven-variable VAR involving Dutch and German variables, while our sample consists of quarterly data from 1983 to 1997 in which there was only one exchange rate regime. They measure output by industrial production which in the Netherlands accounts for 20 to 25% of the GDP, whereas we use GDP figures. Finally, they use changes in the German money market interest rate as the monetary policy shock. This issue warrants further research.

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The recent evolution of the UK banking industry and some implications for financial stability

Alex Bowen, Glenn Hoggarth and Darren Pain

1. Introduction

The UK financial system experienced significant structural change during the 1970s and 1980s. Before then the system was segmented. Different institutions existed to provide the differentiated services of commercial banking, investment banking, housing finance, life assurance, fund management and securities trading. Within the banking sector, there was a clear demarcation between *clearing banks* which provided commercial banking facilities and money transmission services largely to domestic customers, *investment banks* which provided a range of largely market intermediated financial services to both domestic and overseas corporate clients such as equity issuance and portfolio investment advice, and *building societies* which were the main source for housing finance. These demarcations were maintained by various forms of official regulation such as exchange controls and lending constraints (including credit ceilings), which served to restrict competition and thus impart stability to the oligopolistic structure of the market.

Changes to the institutional architecture took place progressively over the 1970s and 1980s. This was largely an evolutionary process, but a number of factors contributed to an intensification of competition and tended to erode the functional distinctions between firms. Five in particular are worth noting. First, the entry of foreign banks, associated with the continued growth in the eurodollar market and London's prominent role in this market, prompted the major clearing banks to expand their businesses into non-traditional markets such as corporate and unsecured lending. Initially, this was typically achieved through acquisitions in order to circumvent existing credit control regulations. But deregulation in the form of Competition and Credit Control (1971) and the abandonment of supplementary special deposits (the "corset") in the early 1980s eventually removed a number of barriers to the activities of the clearing banks.[1] The UK merchant banks were most affected by this increased competition from the traditional retail clearing banks and foreign banks, largely due to their small scale, which restricted their ability to compete for international capital projects/syndicated loans. Second, the removal of exchange controls in 1979 increased the global nature of competition. Previously banks' domestic sterling activities were effectively ring-fenced from competition from overseas banks, including those foreign institutions already established in London. Again UK merchant banks perhaps bore the brunt of this increased internationalisation in their markets, as in particular the large US banks such as Citibank and Chase Manhattan, freed from their restrictions at home, expanded into wholesale and corporate banking in the United Kingdom. Third, in the early 1980s retail banks entered the domestic mortgage market, a market that had previously been dominated by the building societies. This increased competition led to the abandonment of the lending cartel in mortgages that had restricted prices and encouraged quantity rationing in the provision of housing finance. It also encouraged banks and building societies to compete in other markets in which

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[1] Specific changes in regulation have clearly influenced how the financial system evolved. The Appendix highlights the major regulatory changes that have affected banking over the past three decades (see Robb (1997)). In particular, the Building Societies Act (1986) increased the range of activities in which building societies were permitted to engage. But more generally, the changes in the financial system reflect an intensification of competition, not driven by deregulation alone. Indeed, some authors have argued that the process of deregulation through the 1970s and 1980s was largely a response to competitive pressures and financial innovation rather than a policy change designed to create greater competition (Llewellyn (1990), Fforde (1992)).

they had previously enjoyed significant market power, in particular retail deposits and money transmission services. Fourth, during the 1980s in particular, the financial system became more "market-oriented". Banks faced growing competition from other providers of savings media and credit financing for households as well as competition from capital markets for the provision of external finance to firms (Llewellyn (1990)). Finally, deregulation in the UK securities market in 1986 (the so-called "Big Bang") to remove restrictive practices in securities trading tended to bring the traditional banking system and the securities industry closer together and the functions performed by each institution have increasingly been merged. Indeed, this reform encouraged a number of the large UK and overseas retail banks to build-up a presence in the securities markets in London through acquiring existing securities houses/investment banks.

The upshot of these changes for the UK financial system was that by the end of the 1980s the traditional structure of specialist institutions had given way to a more conglomerate structure, at least in the retail banking market. Retail banking conglomerates attempted to learn the trade and techniques of investment banking and began to offer a wider range of services than traditional asset-liability transformation. And building societies, freed from regulatory barriers, began to compete with banks in unsecured lending and raise funds in wholesale markets. Moreover, some large retailers (e.g. Marks and Spencer) and large industrial companies (e.g. British Petroleum) set up their own banking arms to compete with banks in supplying some traditional banking services.

The UK investment/merchant banks, at least the ones that remained independent, continued to offer specialist services. Indeed, during the 1980s, the diversity of business structures increased with different firms adopting different strategies to compete in the increasingly global financial markets. Until the mid-1980s, UK merchant banks were fairly homogeneous with all providing trade finance, a limited volume of lending, fund management and corporate finance business. Since then, institutions have begun to concentrate more on particular niche services to compete against the dominant US investment banks. The latter typically sought to provide a global service in all aspects of investment banking – broking, lead management/underwriting of bond and equity issues, securities trading, corporate advisory business, fund management and traditional corporate lending.

Is this characterisation of banking in the United Kingdom still true for the 1990s? Have there been any further structural changes in the provision of banking services? Sections 2 and 3 of this paper attempt to address these questions by drawing out some stylised facts about the UK banking industry over the past twenty or so years. More specifically, Section 2 examines the recent trends in bank and non-bank financial intermediation with a view to establishing whether banks are in anyway still "special". In Section 3, the underlying issue is whether the competitive environment within which banks operate has intensified further in the latest decade. The section considers five aspects: the size of banks and market concentration; the profitability and efficiency of UK banks; the scope of services provided and, in particular, the evidence of increased diversification; the presence of new entrants to markets and the exit of firms from the industry; and changes in the means of delivery of banking services. Given the historical development of the UK banking system along functional lines, the section draws a particular distinction between investment and commercial/retail banking.

One of the key findings is that despite increased competition facing UK retail and investment banks in the 1990s, profits have remained high. Section 4 considers what factors might account for this somewhat puzzling result. Section 5 reviews the implications for financial stability. The latter is defined quite broadly to encompass not only systemic risk but also the financial fragility of particular UK financial institutions (and markets). In the light of continuing structural change and, in particular, given the blurring of the distinction between banks and non-banks, the section considers whether the UK banking system has become more susceptible to shocks and whether such shocks have a greater impact and are transmitted more widely across the financial system. Section 6 offers some conclusions.

2. Trends in bank and non-bank financial intermediation

The growth in the assets of the UK financial system and its institutional subsectors is illustrated in Chart 1. The period of most rapid asset growth for the system as a whole was the first half of the 1980s, when the assets of all the main institutions increased by at least 50% more than nominal GDP, which itself rose by around 60%. By comparison, growth in the second half of the 1980s was much more subdued; the total assets of financial institutions increased by around 15% more than nominal GDP between 1985 and 1990.

Chart 1
Total assets of financial institutions
As a percentage of GDP

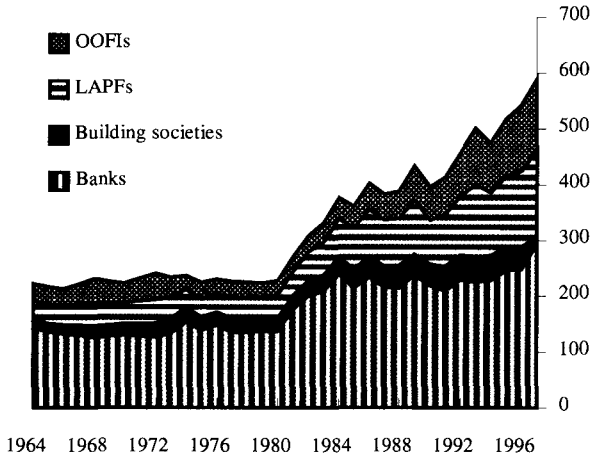
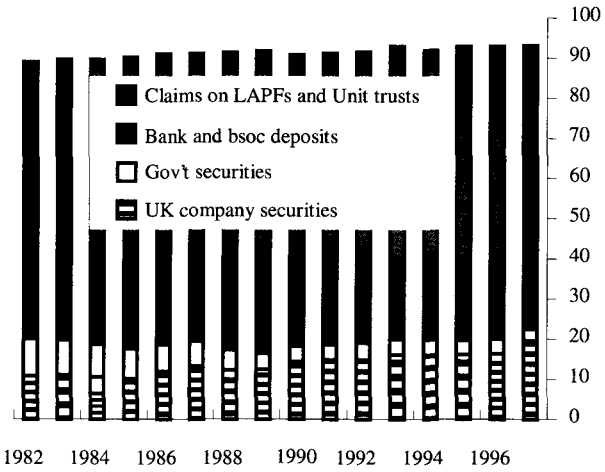


Chart 2
Selected assets of the personal sector
As a percentage of total assets



For the bank and building society (mutual) sectors, growth has continued in the 1990s, although at a slower pace. Between 1990 and 1997, their assets rose by around 4% more than nominal GDP. In contrast, the assets of non-bank financial institutions (NBFIs) (which includes life assurance and pension funds (LAPFs) and other non-bank financial institutions (OOFIs) have grown more rapidly over the past five or six years. In order to understand the reasons for this growth, it is useful to review the developments in the balance sheets of the UK non-bank private sectors. These reflect the behaviour of the domestic customers of, and in some cases the competitors to, the traditional banking sector. The trends can therefore illustrate how financial intermediation is carried out and evolves over time.

2.1 Personal sector

As shown in Chart 2, personal sector deposits with banks and building societies have gradually fallen as a share of households' stock of gross savings. Most of the decline is accounted for by building society deposits, which represented only 3% of total assets in 1997, down from around 15% in 1982. Some of this decline reflects conversions of building societies into banks. Other "traditional" savings media have also become less important. For example, the share of the Government's National Savings scheme has more than halved. In contrast, there has been a significant increase in the proportion of assets held via institutional investors. Indeed, indirect savings via institutions now represent more than half of the personal sector's financial assets. LAPFs account for by far the biggest element, although saving through unit and investment trusts has also become more important during the 1990s.

The shift in the composition of the personal sector's assets represents a shift away from capital-certain, low-risk savings vehicles towards higher-risk, higher-return assets. It reflects not merely an increase in awareness by households of the need to make adequate provisions for retirement but also increased financial sophistication in searching out higher returns for their savings. Privatisation of public sector activities in the 1980s may also have encouraged households to hold equities. Table 1 shows that this movement from direct to indirect savings vehicles has occurred in a number of other countries, most notably in the United States. And even where the deposit share has held up, claims on institutional investments have become more significant.

Table 1
Household sector balance sheet: proportions of total gross financial assets

		1970	1975	1980	1985	1990	1995
United Kingdom	Deposits	0.34	0.40	0.43	0.30	0.31	0.26
	Bonds	0.07	0.08	0.07	0.02	0.01	0.01
	Equities	0.24	0.15	0.12	0.11	0.12	0.12
	Institutional claims	0.23	0.26	0.30	0.47	0.48	0.54
United States	Deposits	0.28	0.36	0.33	0.30	0.25	0.18
	Bonds	0.13	0.13	0.10	0.10	0.12	0.12
	Equities	0.36	0.24	0.21	0.16	0.15	0.19
	Institutional claims	0.22	0.26	0.28	0.35	0.41	0.44
Canada	Deposits	0.31	0.37	0.38	0.34	0.36	0.33
	Bonds	0.14	0.12	0.08	0.10	0.05	0.04
	Equities	0.27	0.22	0.24	0.23	0.21	0.25
	Institutional claims	0.22	0.20	0.21	0.25	0.28	0.31
Germany	Deposits	0.59	0.62	0.59	0.52	0.48	0.45
	Bonds	0.08	0.09	0.12	0.15	0.16	0.14
	Equities	0.10	0.07	0.04	0.06	0.07	0.06
	Institutional claims	0.15	0.15	0.17	0.19	0.21	0.28
Japan	Deposits	0.55	0.59	0.69	0.65	0.60	0.62
	Bonds	0.06	0.06	0.09	0.11	0.09	0.06
	Equities	0.12	0.10	0.07	0.08	0.09	0.07
	Institutional claims	0.14	0.13	0.13	0.15	0.21	0.25
France	Deposits	0.48	0.60	0.59	0.50	0.38	0.32
	Bonds	0.06	0.07	0.09	0.07	0.04	0.04
	Equities	0.26	0.15	0.14	0.27	0.27	0.32
	Institutional claims	0.06	0.06	0.07	0.08	0.26	0.29
Italy	Deposits	0.45	0.63	0.58	0.42	0.35	0.29
	Bonds	0.19	0.14	0.08	0.17	0.19	0.20
	Equities	0.11	0.02	0.10	0.10	0.21	0.24
	Institutional claims	0.08	0.07	0.06	0.11	0.08	0.09

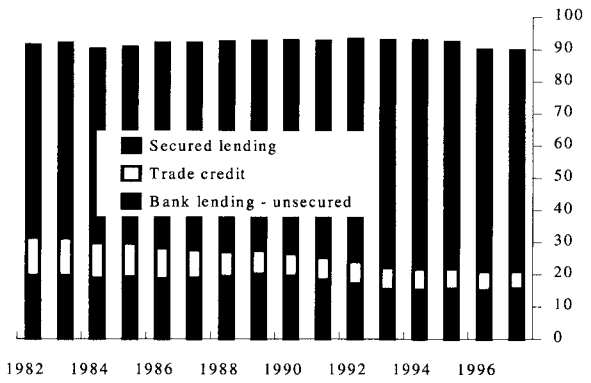
Source: E. P. Davis (1996).

It should be noted, however, that apart from the provision of current and cheque account facilities by some building societies, UK bank deposits remain the main provider of transaction and settlement services. Improvements in technology, such as the development of credit and debit cards, and centralised payment-settlement systems such as Clearing House Automated Payments System and Banking Automated Clearing System, have led to a decline in cheque usage; in 1997, cheques were used in around 20% of transactions by the personal sector compared with around 45% of transactions

in 1976. But, in contrast to the United States, where money market mutual funds offer cheque-account facilities, banks and building societies have remained the key providers of such services. Moreover, given the move away from the payment of wages in cash, banks have witnessed an increase in demand for such services. The proportion of adults with a bank current account rose steadily from 44% in 1976 to over 80% in 1996.

On the liabilities side, secured lending remains the largest liability of the personal sector. More specifically, mortgages secured on property are typically the most significant debt taken out by households. They accounted for around 70% of total personal sector liabilities in 1997 – a ratio that has only increased marginally since the early 1980s (Chart 3). Banks and building societies are the main providers of household mortgages. Together they account for over 90% of the stock of outstanding mortgages held by domestic residents. But, as in the deposit market, there has been a change in their relative positions. Banks have gained market share at the expense of other lenders since the early 1980s, when they first entered the domestic mortgage market. This process has accelerated over the very recent past with the conversion of many building societies into banks. In 1997, banks accounted for around 70% of total personal sector mortgages, compared with only 5% in 1984. In contrast, the share of building societies fell from over 80% in 1984 to only 23% in 1997, following the conversion of several building societies into banks.

Chart 3
Selected liabilities of the personal sector
As a percentage of total liabilities



Personal sector mortgage debt in the UK has typically been priced at a variable rate; i.e. the interest paid by the borrower varies in line with market rates over the life of the mortgage. But in recent years there has been an increase in the proportion of new mortgages written at fixed rates. In the first quarter of 1998, over 60% of new mortgages were written at fixed rates, up from 25% in 1995. However, the fixed-rate period is typically quite short – usually five years or less – and much shorter than in the United States. As a result, even though new business conducted at fixed rates has increased, its significance in the overall outstanding mortgage stock has remained modest. By value, around 20% of the stock of outstanding mortgages were at fixed rates in 1997, broadly unchanged from the proportion in 1994.

Given the scale of mortgage borrowing, unsecured debt is a relatively small part of personal sector liabilities, accounting for around 16% of total liabilities in 1997, broadly comparable with its share in the mid-1980s. But this comparison masks a rapid increase in the growth of unsecured borrowing since the mid-1990s. Banks are the lead providers of such consumer credit, currently accounting for around 73% of the total market. Competition has nonetheless increased. Until the late 1980s, the banks' market share had been increasing and was close to 80% in 1987. Building societies entered

this market following the change in regulation in 1986. But, at their peak, they only accounted for around 2% of the market. More recently, the major competition to banks has come from specialist lenders, whose market share has grown from around 10% in 1992 to over 20% in 1997. It should be noted, however, that a significant proportion of these specialist lenders are subsidiaries of banks.

2.2 Corporate sector

The trends in lending to the corporate sector are less straightforward than those for the household sector. Debt and equity of industrial and commercial companies (ICCs) increased during the 1980s, although there was a decline in the relative importance of trade-credit finance. But in the 1990s, the structure of debt finance has shown signs of shifting. In particular, ICCs as a whole have moved slightly away from reliance on bank loans and increasingly tap capital markets directly through the issue of bonds and commercial paper (Chart 4). Debenture and preference share net capital issues (which are largely corporate bonds) have increased in significance in the 1990s – they represented around 5% of ICCs' liabilities in 1997 compared with around 2% in 1980. This should not be over-emphasised; bond finance still represents a relatively small share of total liabilities, and, in flow terms, internally generated funds are likely to be more important in financing ICCs' expenditure (Chart 5). Compared to some other countries, most notably the United States and Canada, where bonds represented around 20% of corporate sector liabilities in 1994 (Davis (1996)), bond finance in the United Kingdom remains modest. Traditionally, higher and more variable inflation in the United Kingdom has resulted in higher long-term expected yields which in turn has made bond finance relatively expensive because of the inflation-uncertainty premium. But the fact that bond issuance as a share of total ICCs' liabilities increased in the 1990s, albeit from a low level, is a significant change. Moreover, an increase in desired gearing, reflected in the recent proliferation of equity buy-backs by a number of firms, may not show up clearly in the aggregate. In contrast, bank borrowing has remained very modest until the past couple of years; there was actually a prolonged period of debt repayment during the first four years of the decade. To some extent this reflects the buoyancy of profits during the 1990s, which ICCs have used to finance expenditure or repair balance sheets following the increased "fragility" experienced during the early 1990s recession. The continued rapid growth in the value of the equity and bond markets in the 1990s has also helped to reduce the cost of capital raised through these means relative to bank loans.

Chart 4
Selected liabilities of ICCs
As a percentage of total liabilities

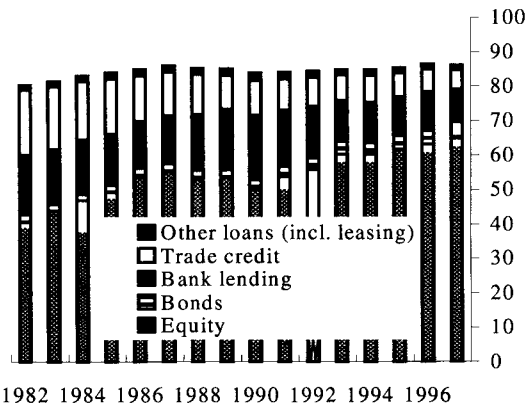
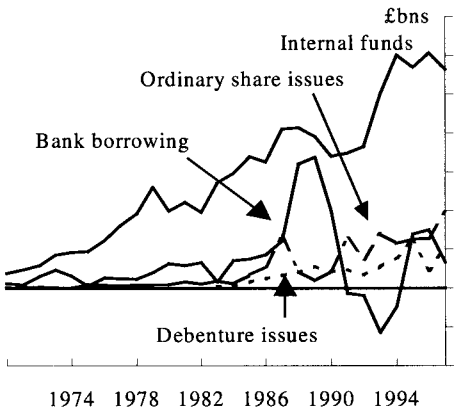


Chart 5
Selected sources of ICCs' capital funds



Bank finance nevertheless remains important for small firms, which have less access to capital markets. As Table 2 shows, bank lending accounted for 51% of external finance of small firms with turnover less than £1 million, lower than the 61% recorded for 1987-90. But asset-backed finance, which is largely provided by bank subsidiaries, has increased significantly, so that, including this category, banks probably accounted for around 80% of external finance in 1994-95, broadly unchanged from 1987-90.

Table 2
Small firms' sources of external finance
In percentages*

	1987-90	1994-95
Bank lending	61	51
HP/Leasing	15	31
Partners/Shareholders	8	5
Venture capital	3	2
Factoring	6	2
Other sources	7	8
Total	100	100

* These percentages are based on a simple average of responses and have not been weighted according to the volume of external finance provided by firms participating in the survey.

Source: Centre for Business Research, University of Cambridge.

On the asset side of ICCs' balance sheets, the most notable trend is the increasing internationalisation of assets. A growing share of ICCs' assets are claims on or ownership of overseas firms, related to both direct and portfolio investment abroad.

2.3 The non-bank financial sector

The increased savings of households via non-bank institutions have not been entirely lost to the banking system. As part of their investment strategies, such institutions often choose to place funds on wholesale deposit with banks, not least because of their need for liquidity. Such deposits constitute capital-certain, low-risk assets which are appropriate within a balanced portfolio. Indeed, as a share of LAPFs' total assets, holdings of bank and building society deposits have increased since the mid-1980s.

Table 3
Selected assets of OFIs
As a percentage of total assets

	LAPFs[1]		OOFIs[2]	
	1986	1997	1986	1997
Bank and building society deposits (£ and FC)	3.2	4.6	14.3	20.0
UK company securities	51.8	53.3	6.2	3.0
Overseas securities	16.2	16.6	19.7	20.7
British Government securities	19.3	11.1	22.9	26.1

[1] Life assurance and pension funds. [2] Other financial institutions excluding LAPFs.

Source: ONS, Bank of England.

Bank and building society deposits have also become a more significant element for other financial institutions (OOFIs) during the 1990s. These institutions, which include securities houses and finance houses, play an active part in the wholesale money markets and the increase in their bank and building deposits seems likely to reflect the liability management of banks and building societies as they bid for such wholesale deposits to fund their lending. In the face of competition for retail savings, banks and building societies have increasingly relied on wholesale deposits as a source of finance. In 1983, wholesale deposits accounted for around 20% of bank and building society sterling deposits from the non-bank private sector (M4). In 1997, this share was closer to 35%.

The introduction of the open gilt repo market in January 1996 intensified this trend toward wholesale deposits and, in particular, the willingness of OOFIs to provide marginal funds to the banking system. Banks often bid for marginal funds in wholesale markets to finance their lending. When a bank undertakes a gilt repo it sells a gilt to another party, usually another bank or an OOFI,[2] with an agreement to buy back equivalent gilts at a specified price on a particular date. The bank's repo liability is recorded as an increase in bank deposits. So the repo is in effect a form of secured deposit backed by gilts. If a bank does a reverse repo, the position of the parties is reversed – the bank lends to the OOFI using gilts as security.

More generally, the development of repo markets, not just gilt repo, and derivatives (OTC and exchange traded) have facilitated a rapid expansion in OOFIs' balance sheets in the 1990s by encouraging significantly greater interaction between OOFIs and the banking sector. Together with LAPFs, OOFIs have accounted for virtually all of the increase in the annual growth in sterling bank and building society deposits and lending over the past three years. And in recent months, banks' exposures to OOFIs, in particular hedge funds, have been a concern for financial stability in the United Kingdom and some developed economies.

In summary, non-bank financial institutions have grown much more rapidly than banks and building societies in the 1990s. This reflects a combination of increased flows of household savings into these institutions and a growing desire by large companies to access capital markets directly. Essentially the financial system has become even more market oriented, with alternatives to bank intermediation increasingly being used. But, the decline in the role of banks should not be overstated. Banks still play a major role in the payments and settlement system in the United Kingdom. They are also "special" in that they still provide liquidity to the rest of the financial system through the provision of short-term lines of credit and facilities. And banks and building societies remain the main providers of transactions payments services and the main homes for households' liquid savings. Significantly, they are the lead providers of credit finance to smaller firms and households and while asset-backed finance has grown in importance, this is largely provided through bank subsidiaries.

More generally, financial market intermediation is still some way from replacing banks altogether. The traditional maturity transformation role of banks remains largely intact in the United Kingdom. Imperfect information continues to exist between borrowers and lenders which banks remain well placed to exploit both in terms of providing depositors with liquidity insurance against random shocks to their income and in spreading the cost of monitoring the risky projects of borrowers over a large number of depositors. Even where market mediated alternatives are available, as we will see below, banks have reacted by widening the range of services they offer. Essentially banks have responded to disintermediation pressures by providing market instruments themselves and thereby reintermediate funds.

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[2] So far only banks and OOFIs have actively entered the gilt repo market.

3. Structure and profitability of the UK banking sector

In this section we seek to draw out some "stylised facts" which may help to illuminate the competitive environment in which banks operate. Five aspects are considered: the size of banks and market concentration; services provided by banks; the presence of new entrants to markets and exits of firms from the industry; the profitability and efficiency of UK banks; and changes in the means of delivery of banking services.

3.1 The size of banks and market concentration

The assets of the UK banking sector have expanded significantly, in relation to overall economic activity, since 1980, although as noted earlier, the period of most rapid growth was the first half of the 1980s. Over the past year or so, bank assets have increased at a faster rate again, but that largely reflects the process of demutualisation and conversion to banks within the building society sector (Chart 6).

Chart 6
Value of assets of UK banking and building society sectors

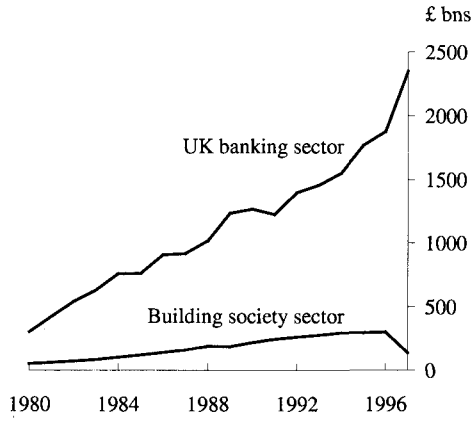
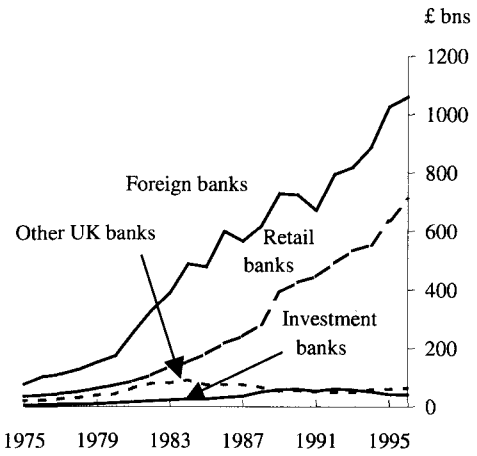


Chart 7
Value of assets by type of bank



Within the UK banking sector, retail and foreign banks dominate the industry (Chart 7). As of the end of 1996, more than half of the total assets were on the books of foreign banks, which have had a significant presence since the mid-1970s, reflecting the role of London as an international banking sector. UK retail banks have accounted for an increasing proportion of the total since the middle of the 1980s. In 1985, their assets represented roughly a quarter of the total; in 1996 this share was nearer 40%. In contrast, the assets of UK investment banks have become less significant, reflecting acquisition and the absorption of assets into domestic retail and foreign parents.

Despite the presence of a large number of foreign banks, most of their assets in the United Kingdom are foreign-currency-market loans and advances, the funding for which is typically drawn from wholesale markets, also in foreign currency. Foreign banks do not have a significant presence in the domestic household savings and mortgage markets or in the smaller to medium-sized corporate market. This reflects not only their lack of high-street presence, but also some cultural inertia on the part of traditional bank customers, who typically prefer banks with an established "brand". A clear example of this is Citibank, which grew in prominence in London as the Eurobond market developed in the 1960s and 1970s but which, so far, has only a small presence in the domestic retail market. Reflecting this preference for UK brand names, National Australia Bank acquired some small regional UK banks in the early 1990s, and the Bank of Ireland acquired the Bristol and West Building Society in 1997. Nevertheless, the acquired banks have retained in both cases their original brand.

Table 4
Share of assets by bank type

	1975	1980	1985	1990	1996
UK banks					
Retail	25.8	24.1	23.8	33.6	37.9
Investment	4.2	4.2	3.5	4.7	2.2
Other	14.6	14.2	9.8	4.4	3.4
Total UK banks	44.6	42.5	37.2	42.8	43.5
Foreign banks					
United States	26.6	19.8	13.1	8.7	8.2
Japan	8.6	13.5	23.4	20.1	9.7
Other	20.2	24.3	26.4	28.4	38.6
Total foreign banks	55.4	57.5	62.8	57.2	56.5
Grand total	100.0	100.0	100.0	100.0	100.0

Source: Bank of England.

In contrast to foreign banks operating in the United Kingdom, retail banks are primarily oriented towards serving domestic household and corporate customers; almost two-thirds of their assets are sterling market loans and advances. Their deposit liabilities provide the main component of the liquidity of the private sector and their lending to households and businesses plays an important role in financing economic activity. Within the UK-owned banking sector, the largest institutions are also retail banks. The so-called "Big Four" retail banks (Barclays, NatWest, Lloyds-TSB and Midland) accounted for around one half of the total assets of UK banks and building societies in 1996 (Chart 8). This level of concentration has been broadly stable since the mid-1980s.[3]

Table 5
Share of assets by bank type and currency

	1975	1980	1985	1990	1996
UK retail					
£ market loans and advances	56.9	59.7	56.5	68.7	62.0
of which: UK private sector	*36.6*	*40.4*	*40.2*	*55.0*	*47.0*
FC market loans and advances	12.2	17.8	24.7	13.9	14.5
UK investment					
£ market loans and advances	40.2	42.0	42.6	58.9	38.8
of which: UK private sector	*13.2*	*12.7*	*12.1*	*24.2*	*17.2*
FC market loans and advances	46.4	43.8	41.1	28.5	25.2
Foreign					
£ market loans	9.3	11.8	11.4	21.5	17.0
of which: UK private sector	*4.0*	*4.6*	*4.5*	*10.9*	*7.6*
FC market loans and advances	88.5	85.8	80.8	71.1	66.1

Source: Bank of England.

[3] Cross-country comparisons reveal that concentration differs significantly. Within continental Europe, for example, the five largest institutions account for around 17% of total credit institutions' assets in Germany, compared with 41% in France and over 80% in Sweden.

Table 6
Share of liabilities by bank type and currency

	1975	1980	1985	1990	1996
UK Retail					
£ deposits	71.2	66.2	60.5	70.2	65.8
of which: UK private sector	*63.6*	*56.1*	*44.8*	*51.2*	*46.2*
FC deposits	12.2	17.9	22.9	14.4	20.9
UK Investment					
£ deposits	39.0	41.3	42.4	58.9	56.2
of which: UK private sector	*24.9*	*23.2*	*26.4*	*29.6*	*28.5*
FC deposits	48.2	48.2	45.0	28.2	31.9
Foreign					
£ deposits	9.3	11.5	11.5	21.5	20.3
of which: UK private sector	*2.9*	*2.4*	*11.5*	*5.2*	*20.3*
FC deposits	88.7	87.2	85.9	76.2	75.9

Source: Bank of England.

Given that banking is typically a multi-product industry, concentration is best measured from the perspective of the markets in which banks operate, rather than from the total size of institutions' balance sheets. On the retail side it is therefore instructive to distinguish between the main markets: those for deposits, mortgages and unsecured credit. For investment banks, which have a more global focus, we consider: mergers and acquisitions business, debt underwriting, syndicated loans and equity/equity-linked issuance.

Chart 8
Share of Big Four* banks' assets in total assets of sector

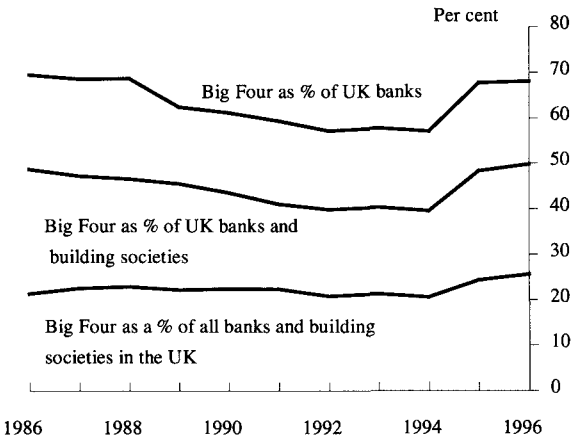
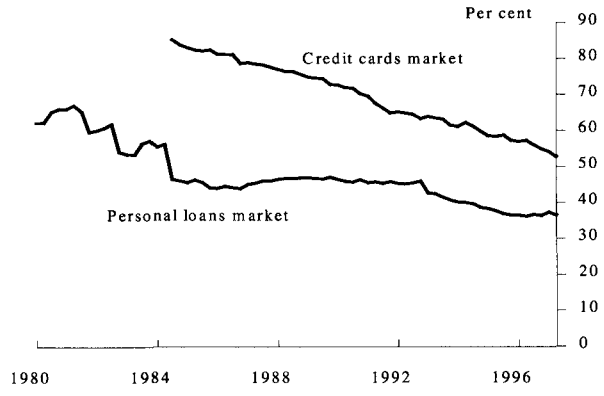


Chart 9
Big Four's share of total banks' unsecured credit



* Barclays, NatWest, Lloyds-TSB and Midland.

In addition to the recent conversion of building societies into banks, there have been some notable mergers between institutions active in the domestic mortgage market during the 1990s. Three of the

top four mortgage providers are now banks, while previously building societies were the institutions with the biggest share. The largest mortgage lender (Halifax) was formed by the merger of two institutions in the top ten. The second and third largest mortgage lenders (Abbey National and Lloyds-TSB-Cheltenham & Gloucester) were created by the merger between institutions of which at least one in each case was a relatively small player in the market. As a result, the largest four mortgage lenders still only account for around 50% of the market and, as set out in Table 7, the mortgage market does not appear to be particularly concentrated, although concentration has increased over the past three years.

Table 7
Alternative measures of concentration in the mortgage market (1997)

Measure	1992	1993	1994	1995	1996	1997
Herfindahl*	0.0549	0.0566	0.0585	0.0811	0.0858	0.0823
Market share of 3 largest	34%	34%	34%	42%	44%	43%
Market share of 4 largest	39%	40%	40%	49%	51%	50%
Number of firms accounting for 80% of the market	21	19	17	13	12	12

* Constructed as $H = \Sigma si^2$ where si = share of the ith firm in the industry (n.b.: the sample of institutions used in the calculation accounted for around 96% of the total market).

Source: Raw data from Fitch IBCA.

While the Big Four have a significant share of the consumer credit market, it has declined in recent years as competition in the industry has intensified (Chart 9). The Big Four accounted for over 90% of the banks' credit card market in 1984, but this has declined steadily to a share nearer 50%, as US firms have become more significant. In the personal loan market, which accounts for around 70% of total non-mortgage consumer credit, the Big Four's share has fallen since the 1980s. This appears to have taken place in two phases. In the early 1980s, the market share of the Big Four declined as the relaxation of regulations on bank and building society lending practices led to greater competition in the consumer-credit market. There then followed a prolonged period through the 1980s when the Big Four's share remained stable. In the 1990s, their market share has come under further downward pressure, reflecting the growth of specialist lenders.[4]

Table 8
Measures of concentration in the retail deposit market

	1992	1993	1994	1995	1996	1997
Herfindahl*	0.0746	0.0686	0.0645	0.0667	0.0604	0.0698
Market share of 4 largest	46%	44%	42%	46%	43%	45%

* N.b.: the sample of institutions used in the calculation accounted for 84% of the total market.

Source: Raw data from Fitch IBCA.

Although the funding policy of banks and building societies shifted in the 1980s towards wholesale deposits, retail funds still represent the bulk of their deposit liabilities. Within the sector, retail deposits are not particularly concentrated with certain institutions, although the big "high street" banks are the biggest players. In contrast to the mortgage market, the share of the four largest retail

[4] However, these include bank subsidiaries such as finance houses.

deposit takers has remained very stable through 1990s, confirming that consolidation has not led to significant concentration.

Table 9
Concentration in global investment banking markets

	1990		1994		1998	
	Rank	**Market share***	**Rank**	**Market share***	**Rank**	**Market share***
Mergers and acquisitions business						
Merrill Lynch	7	8.5	5	12.3	1	29.2
Goldman-Sachs	2	12.1	1	19.2	2	26.2
Morgan Stanley	3	11.2	3	14.5	3	21.0
J P Morgan	11	4.4	9	7.2	4	15.0
Share of top 4 firms		47.7		57.5		91.4
Highest UK investment bank	1	13.2	7	12.8	12	7.9
Global debt underwriting business						
Merrill Lynch	7	3.6	1	7.5	1	7.6
SBC Warburg	3	6.0	3	5.1	2	6.9
Morgan Stanley	16	2.1	6	3.8	3	6.7
Deutsche M. G.	6	4.3	11	2.8	4	6.1
Share of top 4 firms		28.4		23.8		27.3
Highest UK investment bank	22	1.2	16	1.8	13	2.6
Global syndicated lending business						
Chase Manhattan	1	17.5	1	28.7	1	32.3
J P Morgan	3	9.7	3	16.2	2	20.3
Citicorp	2	12.4	2	17.1	3	19.0
Nations Bank	24	1.3	5	5.8	4	18.6
Share of top 4 firms		48.6		71.3		90.2
Highest UK investment bank	5	7.2	10	3.9	9	7.5
Global equity and equity-linked issuance business						
SBC Warburg	3	8.2	1	8.7	1	18.1
Commerzbank	37	0.2	37	0.4	2	13.2
Deutsche M. G.	14	2.3	13	2.8	3	8.8
Merrill Lynch	11	2.8	5	6	4	6.9
Share of top 4 firms		39.6		29		47
Highest UK investment bank	10	2.9	11	3	5	6.2

* Measure based on internal research by Morgan Stanley/Dean Witter.

Sources: IFR/Securities Data Company and Morgan Stanley/Dean Witter Research.

The large US investment banks have a significant presence in most of the corporate investment banking services markets. In 1998, at least one American bank featured among the top four firms by market share in global M&A, debt underwriting, syndicated lending and equity business (Table 9), with the markets for M&A and syndicated lending having become particularly dominated by the US banks.

UK specialist investment banks[5] (i.e. those that are not part of a bigger conglomerate) are much smaller players by comparison. Their relatively small balance sheets have tended to constrain their ability to compete in global markets, as greater capital resources are increasingly required to fund technology and staff expertise in all business areas (Molyneux (1995)). According to recent UBS research on investment banking, "product commoditisation, high fixed costs and price sensitive clients all suggest a high volume approach, bringing improved liquidity and distribution across multiple products and locations" (UBS (1997)). This has been particularly true since the "Big Bang" in London securities trading in 1986, when access restrictions were relaxed. In some cases, this has led to mergers with larger European commercial banks. In others, firms have opted to focus on a particular aspect of investment banking where they can market particular expertise and foster client relationships, for example, the corporate advisory specialists NM Rothschilds and Schroders. The cost of funding following the failure of Barings may also have been a factor in determining the amount and type of business in which UK merchant banks have recently engaged.

3.2 Profitability and efficiency of UK banks

Data limitations mean that the statistics for retail banking are restricted to the Big Four UK clearing banks or, in some cases, the Major British Banking Group, which covers the largest ten retail banks. For investment banking, figures relate to a selection of the remaining specialist UK investment banks: Robert Fleming, Schroders, Rothschilds and Lazards. These banks account for around 67% of total UK investment banks' assets.

Chart 10
Net interest margins

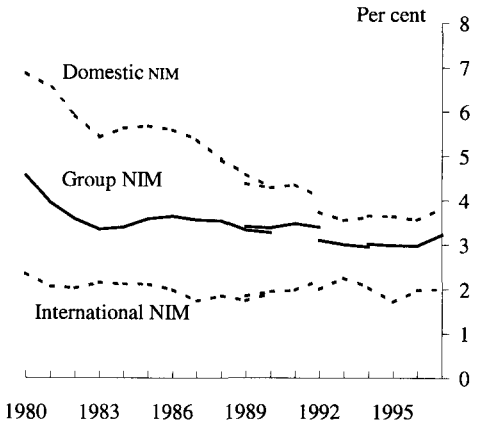
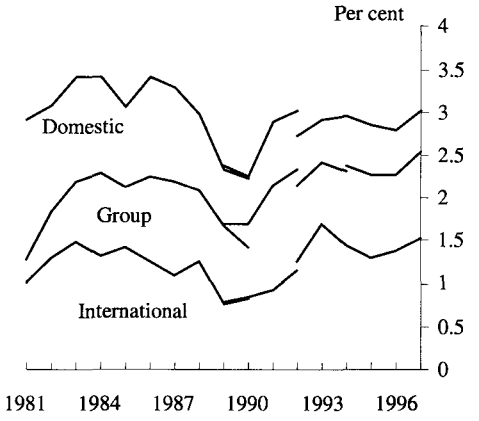


Chart 11
Big Four spreads



Retail banks' margins were relatively wide in the 1970s and strongly influenced by the level of interest rates.[6] For example, between 1972 and 1974, the Big Four's net interest margin nearly doubled, because banks benefited from the endowment effect. During the 1980s, net interest margins fell, particularly on domestic business (Chart 10). The sharpest fall occurred during 1980-83, largely

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5 The most notable remaining UK investment banks are Schroders, Rothschilds, Robert Fleming and Lazards.

6 The *net interest margin* is defined as net interest income as a percentage of average interest-earning assets, while the *net interest spread* is measured as the yield on assets (interest received divided by average interest-earning assets) less cost of funds (interest paid divided by average interest-bearing liabilities). The *endowment effect* is the net interest margin less the net interest spread; i.e. the amount banks earn from funding interest-earning assets with non-interest bearing liabilities.

due to the reduced endowment effect as interest rates fell; in fact, spreads actually increased (Charts 11-12). The further downward pressure on margins in the second half of the decade was driven by declining spreads, probably because of increased competition in the markets for loans and deposits. Competition in the deposit market entailed the payment of interest on an increasing proportion of deposits, thus also reducing the benefit of the endowment effect when interest rates were high (Chart 13).

Chart 12
Big Four endowment effect

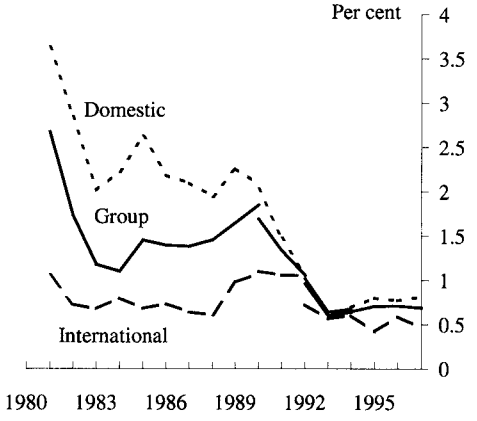
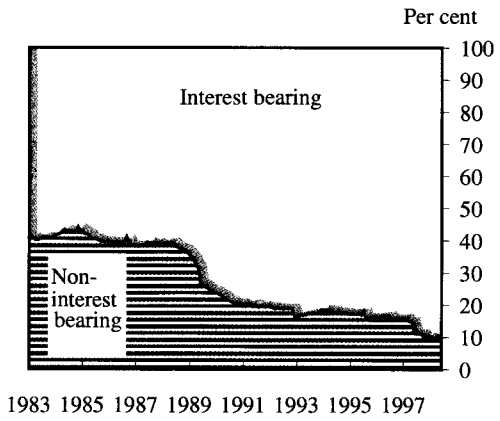


Chart 13
Proportion of interest and non-interest-bearing deposits in banks' retail M4



In the 1990s, net interest margins remained broadly stable, although once again the trends in spreads and the endowment effect diverged. As in the early 1980s, the endowment effect has been ratcheted down further, with the major fall occurring in the recession years 1990-92, when interest rates fell sharply. Since then, the endowment effect has remained around 0.5 percentage points, reflecting a period of relatively low inflation and low interest rates. Nonetheless, spreads rose significantly in the early 1990s and have returned to their levels of the early 1980s. Research at the Bank of England (Milne and Robertson (1997), Milne and Gallagher (1997)) suggests that the rise in spreads is likely to have reflected developments on the deposit rather than on the lending side of banking business. While there has been some contraction in the spread between mortgage lending rates and wholesale funding rates in recent years, the spread between mortgage lending rates and average retail deposit rates remains higher than in the 1980s.

In the 1970s, interest income provided over 80% of banks' total income, but by 1990 this had fallen to just over 60%. The counterpart was the steady expansion of non-interest income, reflecting banks' desires to diversify into new areas of business, in response to increased competition in their traditional markets. This pattern continued during the early 1990s, but since 1993 the position has stabilised (Chart 14). UK investment banks have also come to rely much more on non-interest income and this trend has continued through the 1990s. In 1992, UK investment banks derived around 25% of their income from interest sources; in 1997 this proportion was closer to 15%. This trend is echoed in the accounts of the dominant US investment banks, which have also recorded a gradual decline in the share of interest income (Chart 15).

Chart 14
Big Four income

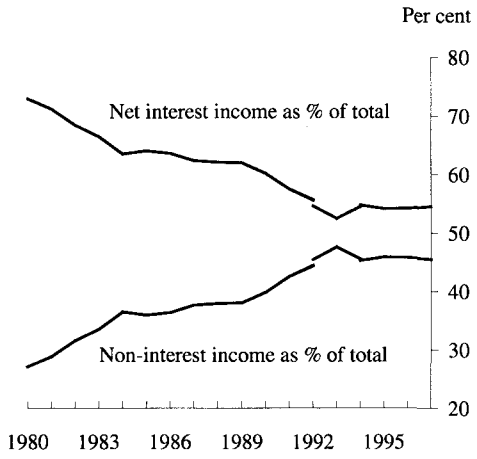
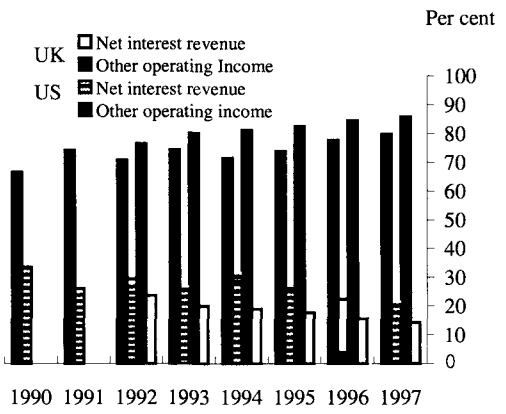


Chart 15
UK and US investment banks compared



Although there are significant differences across countries, Davis and Tuori (1998) generally found that "there is evidence of changes in income structure for most EU countries, leading banks to have a greater relative dependence on non-interest income". This, they conclude, reflects the evolution of banking into a market-oriented phase[7] where capital markets become more active and create greater opportunities for banks to generate more income from brokerage, consultancy and off-balance sheet activities. But, as they point out, the rise in the relative share of non-interest income has not always been accompanied by higher returns on equity suggesting that overall profitability may not have improved.

Table 10
Ratio of interest to non-interest income in selected countries

	1984-87	1988-91	1992-95
Germany	4.1	3.3	3.6
France		3.6	1.5
Italy	2.9	3.4	3.7
United Kingdom	1.8	1.6	1.3
Finland	1.2	1.0	1.0
Sweden	2.1	2.7	1.5
EU	2.9	2.7	2.3
Euro area	3.6	3.3	2.8
United States	2.6	2.1	1.8

Source: Davis and Tuori (1998).

[7] Rybcynski (1997) distinguishes two sub-periods in the market-oriented phase. In the first, banks continue to perform the three basic functions: running the payments system, providing liquidity and collecting and allocating new savings. They are also the dominant suppliers of external funds to non-financial companies. The absolute and relative size of the money and credit markets begins to rise, but they are still used predominantly for interbank business. The second market-orientated sub-period is characterised by the growing importance of non-bank savings collecting institutions (e.g. insurance companies, unit trusts, etc.). Moreover, the proportion of external funds raised in capital markets begins to increase.

The increase in retail banks' non-interest income has come from a variety of sources. For example, banks have sought to cross-sell related financial products, such as insurance, and diversify into other financial activities such as investment banking and asset management. The accounts of the Big Four show that income from fees and commissions, dealing profits, and other non-interest income have all increased through the 1980s and 1990s so that their share in non-interest income has remained fairly stable (Chart 16).

Chart 16
Big Four non-interest income

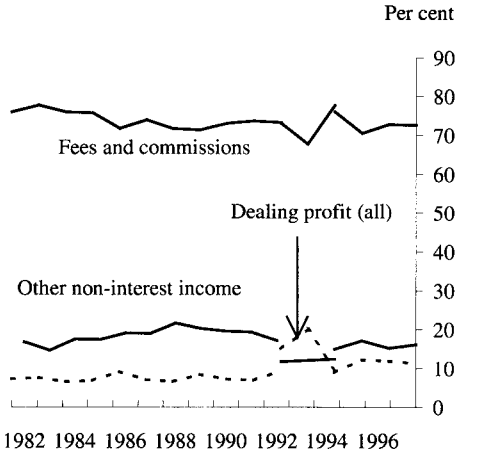
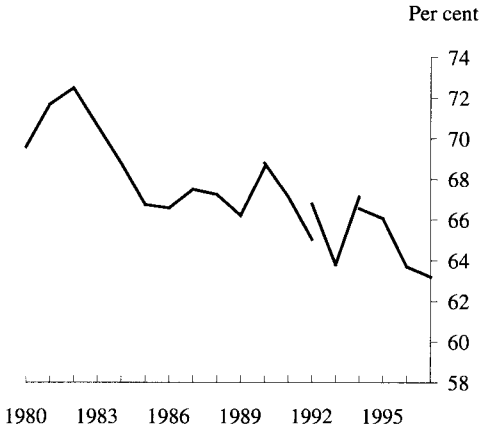


Chart 17
Big Four cost/income ratio



As highlighted above, the competition for funds forced banks to pay interest on an increasing proportion of their retail deposit liabilities. A desire to expand their assets also led banks (and building societies, following deregulation in the mid-1980s) to make increased use of relatively more expensive wholesale deposit funding. Both factors served partially to offset the benefit banks enjoyed from the endowment effect. Non-interest costs also rose in the late 1970s, partly as a consequence of inflation, but also because low levels of competition (particularly when the "corset" was imposed) and the benefit of the endowment effect offered little incentive to cut costs. Despite lower inflation and more competition since the early 1980s, the Big Four's cost/income ratio has fallen only gradually (Chart 17). Staff costs as a share of income and of total operating costs have fallen during the 1990s,[8] reflecting both a decline in the number of bank staff and a switch to part-time workers (Charts 18 to 20). In 1997, staff costs represented 56% of the Big Four's total costs, compared with 67% in 1980. But this moderation in staff costs has been offset by a rising share of income spent on non-staff costs, probably related to increased expenditure on IT and costs associated with new means of delivering banking services, given the decline in the branch network. More recently, significant costs have been incurred in making changes to systems in readiness for EMU and Year 2000 compliance.

The cost-to-income ratios in UK investment banks (and indeed in the big US investment banks) are higher than in retail banking and have increased over the past five years (Chart 21). Although these institutions do not have a branch network to support, staff costs (relative to income) are typically higher for investment banks reflecting both higher salaries and the labour intensive nature of their activities.

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[8] The fall in staff costs is understated because they include restructuring costs relating to staff reductions. At their peak in 1995, such costs accounted for around 5% of the Big Four's staff costs.

Chart 18
Big Four: selected costs/income ratios

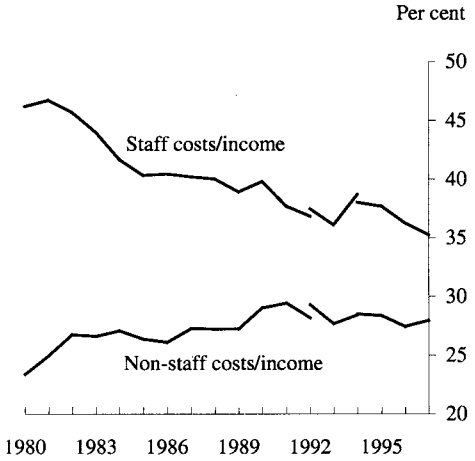
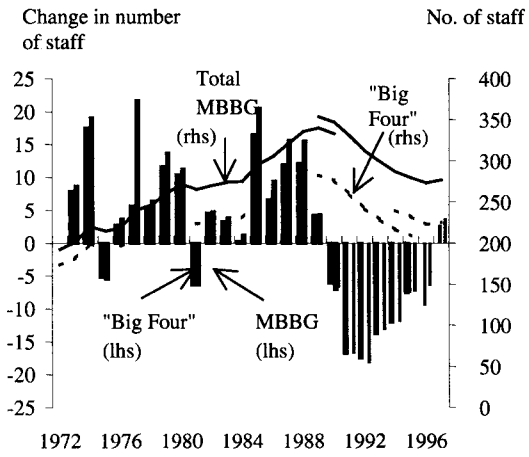


Chart 19
Bank staff



Banks' profits are heavily influenced by the economic cycle and the interest-rate response of the authorities. Abstracting from these factors is difficult, but retail banks' profitability did appear to increase substantially through the 1970s and 1980s. This upward movement was abruptly halted in the early 1990s, when domestic bad debts associated with the economic recession accumulated rapidly. Accompanying the cyclical upswing, bank profitability recovered later in the 1990s to levels achieved briefly in the late 1980s (Chart 22). Comparing returns on equity (ROEs) across industries is clearly hazardous. But, as Table 11 shows, recent retail bank profitability at over 30% compares favourably with selected results in utilities, construction, transport and communication and retailing industries, while Chart 23 shows that bank equity prices have increased more rapidly during the 1980s and 1990s than in a number of other industries.

Chart 20
Number of MMBG* staff

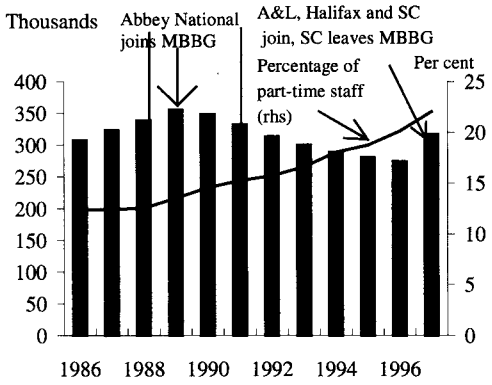
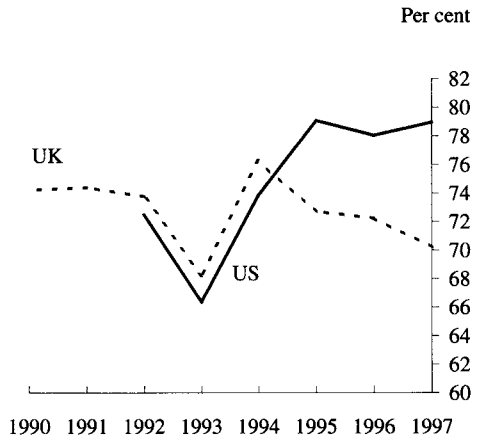


Chart 21
US and UK investment banks' cost/income ratio



* Major British Banking Group.

Chart 22
Big Four profitability

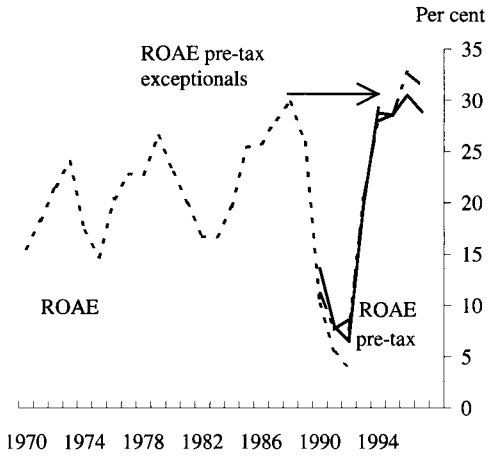


Chart 23
FT stock market indices

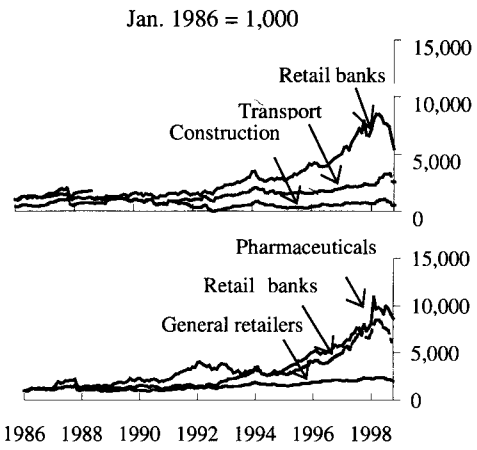


Table 11
Average return on equity

Company	1988	1991	1994	1997
British Airways	36	14	16	22
British Telecom	28	29	21	28
SmithKline Beecham	n.a.	83	51	58
Anglian Water	n.a.	13	9	13
Marks and Spencer	23	25	25	24
Bryant (Construction) Group	42	5	16	15

UK investment banks have not enjoyed a similarly large cyclical recovery in profitability and profitability did not contract as sharply during the early 1990s recession. In fact, as Chart 24 shows, UK investment bank profitability has been much more stable, compared with that of the Big Four. Over the whole 1990-97 period, the average ROE for UK investment banks (at 15.3%) exceeded that for the Big Four (13.0%). Profitability, as measured by profits relative to assets has, if anything, been

Chart 24
Return on average equity for UK banks

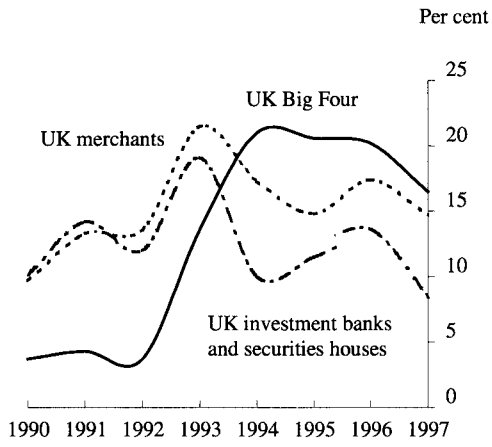
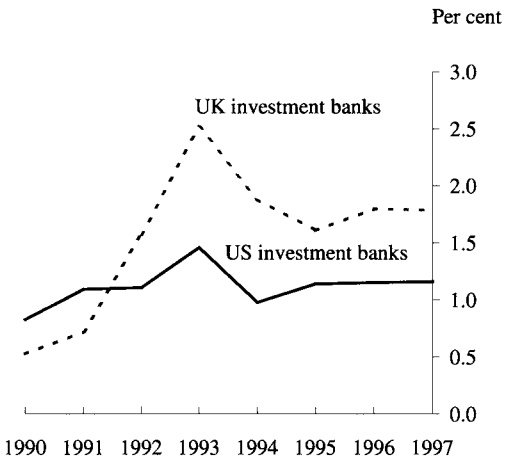


Chart 25
Profitability of US and UK investment banks
As a percentage of assets



rising in UK specialist investment banks in the 1990s to levels above those of the large US investment banks (Chart 25). This could reflect the type of niche markets UK investment banks operate in or the relationship-type banking model they tend to prefer, both of which might insulate them to some extent from the effects of the economic cycle.

However, returns from broader investment banking businesses have fallen over recent years. Grouping UK investment banks and securities houses together, average ROEs fell from around 18% in 1993 to less than 10% in 1997. Much of their business is now more transaction-driven, so the corresponding markets are more open to competition from the large US investment banks. The dominant market position of the latter may have placed them in a better position to exploit the increased debt/equity underwriting business and the recent boom in mergers and acquisitions. But others have noted that although the global market for investment banking is becoming increasingly concentrated, profitability of the largest US investment banks has undergone a long-term structural decline through the 1980s and 1990s (Molyneux (1995)).

3.3 The scope of services provided by UK banks

Table 12 provides an indication of the scope of services offered by a selection of UK retail banks and how they have evolved over time. A number of points immediately stand out: (a) the range of services has increased over time, with the development of personal banking generally preceding entry into non-traditional markets such as insurance and asset management; (b) all the banks typically provide the same types of services. This homogeneity, at least by type, although not necessarily by quality, of service, is not simply a function of banks chosen in the table. The ten banks within the Major British Banking Group (MBBG) all tend to offer similar services, reflecting the conglomerate model of retail banking that has developed in the United Kingdom; (c) the extent of the services offered is not necessarily related to bank size, although it might be more significant for the smaller non-MBBG banks; and (d) the established retail banks – Barclays, Lloyds-TSB and Midland – developed their product range significantly in the 1970s and 1980s, in particular with the move into insurance and asset management. The increase in scope of the new banks (Halifax and Woolwich, which were until recently building societies) occurred in the 1990s.

In general, the wider range of services offered by banks represents a response to increased competition in the industry, as banks have sought to diversify into non-traditional markets to maintain profits. As a result, the distinctions between specialist financial sectors have been eroded. Moreover, through this process of conglomeration, institutions hope to exploit economies of scale and scope more effectively and to reduce volatility of earnings which can affect their credit ratings and hence cost of funding. The example of the newly converted banks suggests that this process, which gathered momentum in the 1980s, has continued in the 1990s.

The nature of diversification has differed among banks. In most cases, they have developed new business either organically or by acquiring an existing player in the market. But in some cases, banks have formed business links with specialist providers, either as a formal joint venture or in an agency relationship to market the service. Such relationships typically exploit the retail banks' distribution networks and the partners' product expertise, although most joint ventures are majority-owned by banks. For example, the Woolwich bank has formed joint ventures to offer both life and non-life insurance products.

It is interesting, however, that diversification by banks has not extended much beyond the financial sector. It could be that the existing physical capital and labour resources in banking have little comparative advantage to exploit outside the financial arena. The capacity of the branch network and personnel, for example, would need to be extended and modified to compete effectively in more general retailing. However, banks could have used their financial capital to take a stake in companies in non-financial business and the fact that they have not generally done so may reflect the relatively high returns achieved in banking. In fact, the entrance of non-banks into banking provides further support to this view.

Table 12
Services offered by banks

	Current rank*	Personal banking		Real estate	Insurance		Asset management
		Credit card	Mortgages		Life	Non-life	
Barclays	1						
1960s		✓			✓		✓
1970s		✓	✓		✓		✓
1980s		✓	✓		✓	✓	✓
1990s		✓	✓		✓	✓	✓
Lloyds-TSB	4						
1960s							
1970s		✓					
1980s		✓	✓	✓	✓	✓	✓
1990s		✓	✓		✓	✓	✓
Midland	6						
1960s							
1970s		✓	✓				✓
1980s		✓	✓		✓		✓
1990s		✓	✓		✓	✓	✓
Halifax	5						
1960s			✓				
1970s			✓				
1980s		✓	✓	✓			
1990s		✓	✓	✓	✓	✓	✓
Woolwich	9						
1960s			✓				
1970s			✓				
1980s		✓	✓	✓			
1990s		✓	✓	✓	✓	✓	✓

* Rank = relative position of bank by size of total assets. ✓= service provided by bank.

3.4 Exit from and entry to the UK banking industry

As noted earlier, foreign banks account for more than half of the UK banking sector's total assets. In terms of numbers, their share is higher still, reflecting not only an increase in the number of banks authorised to take deposits in the United Kingdom but also a decline in the number of UK banks over the past decade.

The country composition of foreign banks in the United Kingdom has changed. In particular, a continuing trend over the 1980s and 1990s has been the significant increase in banks from the EU countries, whose share of overseas banks' assets increased from less than 20% in 1985 to nearly half of the total in 1996. In contrast, the share of Japanese banks halved, reversing a sharply rising trend during the 1980s, and largely reflecting the domestic difficulties of the Japanese banking system. The position of US banks has been broadly stable over the 1990s, following a fall from 20% in 1985, mainly due to US bank failures in the late 1980s. This change in country pattern from the late 1980s to the early 1990s is generally confirmed by figures on the *number* of foreign banks by country of origin. A detailed breakdown of the 550 foreign banks based in London,[9] including representative offices as well as authorised institutions, highlights the growth and decline in the numbers of Japanese

[9] Compiled by consultants Noel Alexander in 1996.

and US banks respectively, and a more than doubling in the number of European banks over the past 20 years from less than 100 in 1975 to 249 in 1996.

Table 13
Numbers of banks in the United Kingdom

Authorised banks	1985	1990	1995	1997
UK incorporated	355	289	224	212
Incorporated outside the UK (1)	250	259	301	342
- Europe	–	–	146	193
- Outside Europe	–	–	155	149
Total authorised banks	605	548	525	554
Representative offices (2)	161	184	208	215
Foreign banks in UK [(1)+(2)]	411	443	509	557
Channel islands and Isle of Man*	66	55	41	41

Note: Representative offices in foreign banks are not authorised to lend or take deposits and are not part of the UK banking sector.

* These financial institutions will be excluded from end-September 1997, when they are reclassified as non-residents for statistical purposes.

Source: Bank of England.

Over the past decade there has been a significant decline in the number of UK incorporated banks, due largely to mergers between banks; with the exception of BCCI, most closures have been of small institutions and mainly voluntary, although sometimes attributable to failure (Barings being the most publicised). On the retail side, mergers have largely been between the smaller institutions, the two major exceptions being HSBC's purchase of Midland in 1992 and Lloyds' takeover of both TSB and the Cheltenham & Gloucester building society in 1995. A more notable development has been the recent process of demutualisation in the building society sector.

Table 14
Assets of foreign banks in the UK banking sector

	United States	Japan	Europe	Other	Total
£ billion					
1980	60	41	28	46	175
1985	100	178	95	106	479
1990	110	255	233	126	724
1996	155	181	495	229	1,060
% share					
1980	34.4	23.4	16.0	26.2	100.0
1985	20.8	37.2	19.8	22.1	100.0
1990	15.2	35.1	32.2	17.5	100.0
1996	14.6	17.1	46.7	21.6	100.0

Source: Bank of England.

Deregulation in 1986 facilitated the conversion of building societies to quoted-company status in one of two ways: conversion of the existing business into a bank, or the take-over of a building society by a bank. Despite the legislative change, there was little immediate interest in exercising this option. In

fact, only one institution (the second largest building society) converted to bank status between 1986 and 1994. But more recently the process of demutualisation has gathered momentum. Table 15 shows that, between 1995 and 1997, eight building societies out of around 80 institutions in the sector (accounting for around 75% of the total mortgage assets of the sector) either merged with a bank or converted to a bank in their own right. Why this process took so long to get underway is not entirely clear, given that the changes in legislation occurred more than a decade ago. The main motivation claimed for conversion was the greater freedom to diversify which bank status gives the institutions. But the 1986 legislation itself had already given building societies scope to expand into new areas, including stock-broking, insurance and money transmission services, although access to capital markets is still limited; building societies can only fund a maximum 40% of their home loans from wholesale markets. Nonetheless, restrictions on diversification per se cannot explain the recent shift away from mutuality. Indeed, the remaining mutual societies claim that their mutual status can help maintain their competitiveness in retail markets, since they do not have to pay out dividends to shareholders. A more likely explanation is the potential greater commercial freedom they gain as banks to expand their businesses. Since 1992, annual growth in the real value of total mortgages has averaged only 5%, compared with average growth of around 16% between 1985 and 1990. Such modest growth in their core market seems likely to have encouraged societies to consider the benefits of becoming banks. And the performance of the Abbey National, which converted to a bank in 1989, may well have given an added impetus: its asset growth outstripped that of the major banks and building societies between 1992 and 1996.

Table 15
Demutualisations in the building society sector

	Conversion to bank status		Merger with bank	
	Institution	**Rank in building society sector**	**Institution**	**Rank in building society sector**
1989	Abbey National	2		
1995			Cheltenham & Gloucester	6
			Leeds Permanent*	5
1996			National Provincial	6
1997	Alliance & Leicester	4	Bristol and West	7
	Halifax	1		
	Woolwich	3		
	Northern Rock	5		

* Merger with Halifax which subsequently became a bank.

Consolidation has been greater in investment banking. Since 1985, just before the "Big Bang" in the UK securities market, a number of prominent UK investment banks and securities houses have been taken over by European commercial banks. The major acquisitions are outlined in Table 16. In contrast to the wave of acquisitions in the mid-1980s, most of the acquisitions of UK merchant banks in the 1990s have involved overseas purchasers, probably in preparation for the expected increased competition following EMU, as the bigger market may be better suited to larger institutions and the continental European acquirers sought capital market expertise. More generally, the dominance of the big US banks has shown the importance of balance-sheet size in remaining competitive in global investment-bank markets. Nevertheless, over the past two years some UK retail banks have signalled their intention to scale back their investment bank operations. In particular, Barclays has recently disposed of its equities, equity-capital markets businesses and mergers and acquisitions advisory businesses (part of its BZW subsidiary) and NatWest has sold off its secondary equity market operation (part of its NatWest Markets (NWM) subsidiary). The rationale for the disposals seems to have been the realisation that to compete effectively in these markets would have required significant

further investment, particularly given the recent consolidation within the industry (for example Travelers Group's take-over of Salomon-Smith-Barney, and subsequently the merger between Citicorp and Travelers). The relative low returns (BZW and NWM both recorded heavy losses in 1997) they had earned from investment banking compared to commercial/retail banking discouraged them from undertaking that investment.

Table 16
Major acquisitions of UK securities firms by European commercial banks

Acquiring institution	Nationality of acquirer	Target institution	Date
ABN AMRO	Dutch	Hoare Govett	1992
Barclays	British	de Zoete Bevan	1985
		Wedd Durlacher Mordaunt	1985
Credit Lyonnais	French	Laing and Cruikshank	1985
Deutsche Bank	German	Morgan Grenfell	1989
Dresdner Bank	German	Kleinwort Benson	1995
HSBC	British	James Capel	1992
Midland	British	Samuel Montagu	1974
ING	Dutch	Barings	1995
NatWest	British	Fielding Newson Smith	1985
		Bisgood Bishop	1985
		Wood Mackenzie	1987
SBC	Swiss	S.G. Warburg	1995
UBS	Swiss	Phillips and Drew	1986
Credit Suisse	Swiss	Buckmaster & Moore	1985

The entry of both non-bank and non-financial companies into retail banking has been an important feature in the past few years. In particular, the late 1990s has seen insurance companies and supermarket retailers entering traditional retail banking markets. Two modes of entry have been

Table 17
Insurance companies offering banking services

Start date	Prudential Banking	Standard Life Bank	Legal & General Bank	Scottish Widows Bank	Sun Bank (Sun Life of Canada)
	October 1996	January 1998	July 1997	May 1995	1994[1]
Current a/c	No	No	No	No	No
Savings a/c	Yes	Yes	Yes	Yes	Yes
Telephone	Yes	Yes	Yes	Yes	Yes
Postal	Yes	No	Yes	Yes	Yes
Branch	No	No	No	No	No
Personal loans	Yes	In future	No	Policy loans only	No
Credit cards	No	No	No	No (group issues)	Yes
Mortgages	Yes	No	Yes	Yes	Yes
Business services	No	Savings a/c	No	Savings a/c	Savings a/c with cheque book, loans[2]
Deposits (as at)	£958mn (Dec. 1997)	£1,000mn (Sep. 1998)	£200mn (Dec. 1997)	£400mn (Sep. 1998)	£460mn (Dec. 1997)

[1] Opened as Confederation Bank. [2] Sun Bank also undertakes asset leasing activities (for personal and business customers).

common in both cases. Companies have either obtained a banking licence in their own right (i.e. they have set up their own bank, possibly as a joint venture with an existing bank) or they have sought strategic alliances with banks to cross-sell their services. In the case of supermarkets, the latter may imply the development of "in-store" banking facilities, which is the popular model for similar retail developments in the United States.

Table 18
Supermarkets offering banking services

Start date	Tesco Personal Finance[1] February 1997	Sainsbury's Bank[2] February 1997	Marks & Spencers Late 1980s
Current a/c	No	No	No
Savings a/c	Yes	Yes	Long-term savings products only
Telephone	Yes	Yes	No
Personal loans	Yes	Yes	Yes
Credit cards	Yes	Yes	Yes
Mortgages	No	Yes	No
Personal insurance	Home and travel	Home	No
Business services	No	No	No
Deposits (as at)	£600mn (March 1998)	£1,500mn (February 1998)	n.a.

[1] Tesco has a 49% stake in Tesco Personal Finance, a joint venture with RBS. [2] Sainsbury has a 55% stake in Sainsbury's Bank, a joint venture with Bank of Scotland.

However, both insurance and supermarket banks provide only a limited range of retail banking services, much more limited than the scope of services offered by the established high-street retail banks. And, while they have generally been popular among consumers,[10] they are still very small-scale operations. The combined deposit liabilities of insurance and supermarket banks currently amount to less than £10 billion or around 1.5% of the stock of M4.

3.5 Changes in the means of delivery

The most obvious change in the way banking services are provided has been the reduction in the extent of the branch network. The number of branches operated by the major British retail banks has been on a downward trend since the mid-1970s, with the rate of decline increasing in the 1990s (Chart 26). Such developments have been strongly influenced by technological innovations. Back offices and payment mechanisms have been automated for business customers (e.g. via the Clearing House Automated Payments System (CHAPS)) and for personal customers Automated Teller Machines (ATMs) have become much more important, at least for cash withdrawals. Indeed, continued growth in the ATM network and, in particular, the increasing proportion of ATMs located away from branches may go some way towards explaining the renewed fall in the number of branches in the 1990s (Chart 27).

As well as the extension to the ATM network, a number of new delivery channels for retail bank services have recently been introduced. Three in particular have become popular: telephone banking, PC banking (direct-dial access rather than via the internet) and internet banking. Telephone-banking facilities have developed the most, the proportion of personal accounts accessible by telephone with

[10] Tesco supermarket bank received around 100,000 account applications in its first week of operation.

the MBBG banks increasing from 3.2% in 1994 to 9.7% in 1997. This probably reflects the maturity of the technology involved. But internet banking has also started to take off over the past year or so. At present only a few banks offer these services, but several others plan to introduce them over the next year. And some banks are beginning to offer cash delivery and management services to small firms in areas where branch closures have occurred.

Chart 26
The branch network

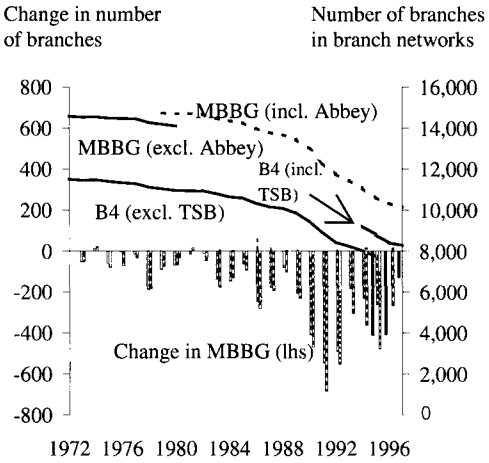
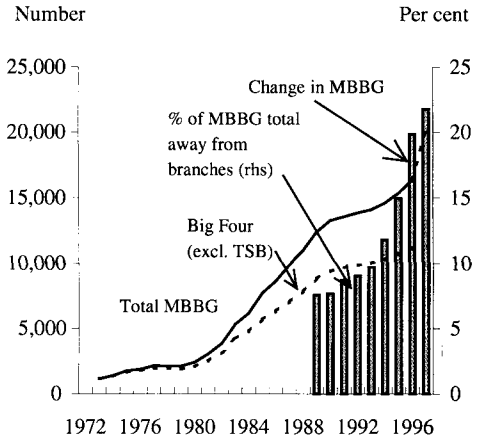


Chart 27
Number of cash dispensers and ATMs



Asset backed securitisation (i.e. the process by which (relatively) homogeneous pools of assets are repackaged (typically off-balance sheet) and resold as securities to third-party investors) first started in the United Kingdom in the mid-1980s. The first domestic mortgage-backed security was a £50mn issue by National Loans in 1987, while the first by a bank was a £135 million issue in 1989 by a subsidiary of TSB; a building society first undertook a mortgage-backed securitisation in 1996. Compared with developments in the United States, the UK asset-backed securitisation market has grown quite modestly (Table 19). At the end of 1996, total asset-backed securities outstanding in the United States were $2,449 billion, compared with a figure of less than £50 billion for the United Kingdom for outstanding securities, while, in 1997, asset-backed securities issues in the United Kingdom were only around $11 billion, compared with nearly $60 billion in the United States.

Table 19
Issues of asset backed securities
In millions of US dollars

Year	Issuer nationality	
	United Kingdom	**United States**
1989	95	625
1993	1,389	5,523
1997	10,974	56,864

Source: Capital DATA Bondware.

Moreover, unlike in the United States, UK banks and building societies have so far not been very active in the securitisation market. Between 1992 and 1997, £5.5 billion worth of sterling mortgage and credit card loans were securitised (Chart 28). This compares with total securitisations by UK issuers of around £16 billion, and represents only around 3% of bank and building society sterling

private sector lending over this period. Part of the reason for the modest involvement to date may be the lack of the government guarantees for mortgage-backed securities which have been influential in the development of the US market. Also, the conglomerate structure of UK banks means that they often own or have equity in many of the leasing and finance companies which might purchase securitised loans. LAPFs typically hold equities rather than bonds in their portfolios and the access to retail deposits nationwide may have provided less incentive for UK banks to securitise their assets.

Chart 28
Securitisations by banks and building societies

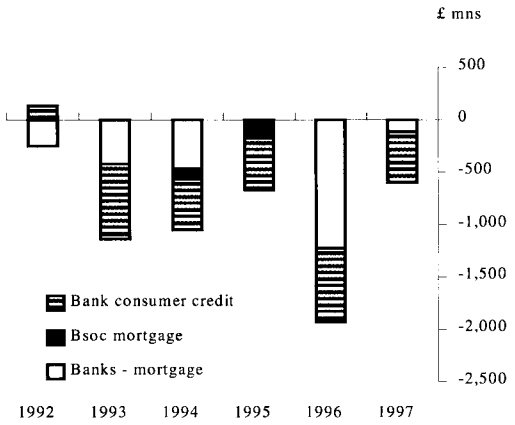
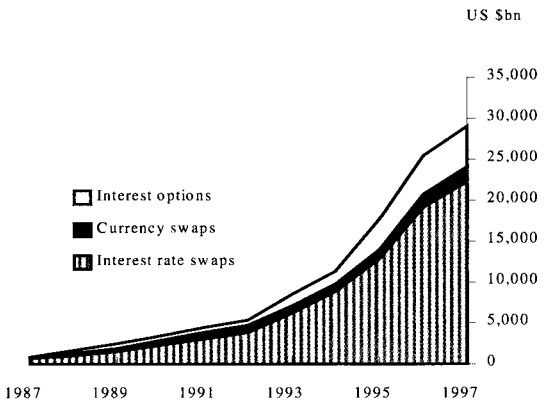


Chart 29
Global derivative contracts outstanding



However, there are some signs that securitisation may be becoming more popular. In the past, the perception was that securitisation was a tool for banks in distress who needed to free up capital. Increasingly, securitisation is now perceived as a balance-sheet management tool. For example, in 1996 and 1997 NatWest successfully securitised over one third of its commercial loans, worth around $5 billion, the aim being to increase return on equity. The NatWest transaction marked the first time a UK bank had transformed investment grade corporate loans into bonds.

While securitisation remains modest, other off-balance sheet banking business has increased significantly over the past ten years. In particular, the trading of financial derivatives[11] (i.e. instruments that are linked to the price performance of an underlying asset and which involve the trading of financial risk) has exploded in the 1990s. According to ISDA data, total global interest rate and currency swaps and options outstanding were $29,035 billion at the end of 1997, compared with $865.6 billion at the end of 1987 (Chart 29). US firms typically dominate these markets. Figures from surveys undertaken by the Bank of England suggest that around one half of the turnover in OTC derivatives traded in London in 1995 and 1998 was accounted for by US firms. But UK banks are also very active, accounting for a further quarter of trades booked in London. Moreover, according to a 1995 BIS survey, three quarters of the $12.1 trillion of (notional value) outstanding contracts held by financial firms in London were held by the ten largest dealers, amongst which are the Big Four UK clearing banks. And rapid growth in such business has continued over the past three years, with average daily turnover in the United Kingdom for OTC currency and interest rate derivatives being 131% higher in April 1998 than in 1995 (an annualised growth rate of 32%).

[11] Financial derivatives include options, futures/forwards, swaps, FRAs, caps, floors, collars, warrants and certain credit derivatives.

In summary, the main stylised facts to emerge about structure and profitability in the banking industry in the United Kingdom over the past decade are:

- Foreign and domestic retail banks dominate the UK banking sector, but they generally serve different customers. Most assets of foreign-bank are denominated in foreign currency and are funded from wholesale deposits in foreign currency. Retail banks are predominantly serving domestic household and corporate customers, and most of their assets are in sterling.
- Retail banks have continued to grow relative to investment and other UK banks. Part of this reflects acquisitions and expansion into non-retail bank markets, and the conversion of large building societies into banks while merger activity amongst the traditional retail banks has been modest. In contrast, consolidation has been significant in UK investment banking, driven largely by a need for greater balance-sheet size. A number of further acquisitions of UK investment banks have taken place in the 1990s, notably by European commercial banks.
- Concentration differs across the markets in which UK banks operate. UK banks and building societies as a whole have a powerful position in the provision of domestic mortgages and the taking of sterling deposits. But the market share of the biggest institutions remains relatively modest compared with most continental European banking systems. Unsecured credit is also largely provided by banks and building societies. The largest banks did have a dominant share of this market, but it has declined for both credit cards and personal loans in recent years. The remaining UK investment banks have little market power in the major markets and tend to operate in niche markets.
- New non-bank entrants into retail banking during the 1990s, such as supermarkets and insurance companies, have so far been relatively small in scale. In some cases they have explicitly joined forces with existing banks. More importantly, they provide only a limited range of banking services.
- Retail banks' profitability has rebounded following the sharp cyclical dip in the early 1990s and is high by comparison with other industries. Although it is unclear whether the upward trend during the 1970s and 1980s has been resumed, the level of profitability nonetheless remains high by historical standards. Net interest margins have stabilised in 1990s, but this masks a divergence in their components. The endowment effect has fallen further, mainly reflecting the move to a low-inflation environment. Lending spreads, the difference between lending and wholesale market rates, have fallen too during the 1990s reflecting an intensification of competition in retail lending markets. In contrast, retail deposit spreads have widened in the 1990s, seemingly suggesting less intense competition for retail funds, perhaps reflecting continued market power in retail deposit markets.
- By far the biggest recent structural change in retail banking has been the demutualisation of the major building societies over the past two years. They have followed the example of the established banks in diversifying into non-traditional markets such as insurance and asset management.
- Remote banking, in particular telephone and internet banking, has only started to increase in importance in the past few years and remains a small part of banks' range of services.
- Derivatives trading has taken off in the 1990s, with UK banks playing a significant role. In contrast, securitisation of bank loan books has remained limited, especially compared with the United States. But there are signs that banks may be considering securitisation more seriously, the NatWest ROSE transaction being the most prominent example.

4. Competition, innovation and bank profits

The above stylised facts suggest that competition facing UK banks has generally intensified in the 1990s. By comparison with the 1970s and 1980s, the rate of change is perhaps less marked but the developments are nonetheless significant. In retail banking, new entry by both financial and non-financial firms, has occurred in some traditional banking markets. As a result, concentration of business among the largest institutions has fallen in some markets. In investment banking, large corporates, the traditional key customers, are making increased use of market-intermediated funds in preference to traditional bank finance. And the large US investment banks, and more recently the large European universal ones, have become even more dominant in the main investment banking markets such as debt/equity issuance and syndicated lending. Market shares of the main specialist UK merchant banks have fallen in the 1990s. Yet, despite the apparent greater competition in recent years, both domestic retail and investment banks have continued to enjoy high profits. Undoubtedly, this strong performance is partly due to the upswing in the UK business cycle. But profitability is currently higher than at the same stage of previous economic cycles. Why?

According to standard microeconomic analysis, the traditional structure-conduct-performance paradigm, an increase in profitability should be associated with higher market concentration and lower competition, rather than higher. Essentially, market power and tendencies for collusive behaviour are sustained by a lack of new firms entering the industry. But there are alternative theories, which imply somewhat different empirical relationships between profits, competition and concentration. First, the contestability theory stresses that a concentrated industry can behave competitively if the hurdles to be overcome by new entrants to the market are low. The basic premise is that the threat of potential entry forces firms with large market shares to price their products competitively. In a perfectly contestable market, entry is absolutely free, exit is completely costless and the demands for industry outputs are highly price-elastic. Therefore, according to this hypothesis, it is the ease of market entry rather than the degree of concentration which is relevant for competitiveness. The continued strong profit performance of UK banks may therefore imply that, despite some new entrants, the barriers to entry remain prohibitive for many firms. Another theory, the efficiency hypothesis, states that a firm may enjoy high profits by reducing its prices and expanding its size in response to increased competition. In this case, the most efficient banks might try to gain market share even though competition has resulted in lower prices and costs (Bikker and Groenweld (1998)). Thus strong profitability amongst the UK banks may have been associated with increased efficiency gains and lower costs.

A number of authors have tried to investigate the relevance of each of these paradigms to banking in the United Kingdom and overseas. For example, Molyneux et al. (1994) apply econometric techniques to examine market structure in the banking sectors of Germany, France, Spain and the United Kingdom over the period 1986-89.[12] Unfortunately, such formal testing has proved problematic for a number of reasons. First, market structure is likely to change gradually over time and this precludes an assessment of changes in the competitive environment.[13] Second, it is difficult to disentangle the impact of competition from the strategic response by banks with market power. For example, competition could encourage an increase in the banks' activities, leading to greater profits if banks were able to exploit their comparative advantage in new fields. In practice, a number of factors may

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[12] Molyneux et al. apply the Panzar-Rosse (PR) method to the four separate years (1986-89) to construct the so-called H-statistic for the different European country's banking systems. The statistics is calculated from cross-sectional reduced form revenue equations and measures the sum of the elasticities of total revenue of the bank with respect to the bank's input prices. PR show that the banking industry is characterised by monopoly when $H<0$, monopolistic competition for $0<H<1$ and perfect competition for $H=1$.

[13] For example, Molyneux et al. (1994) report that the market structure faced by banks in the United Kingdom appeared to shift from monopoly to almost perfect competition and back to monopoly within the four years under investigation!

well have helped support UK bank profitability, although *collectively* they do not fit easily within any single one of these paradigms of industrial structure.

4.1 Continuing market power

The removal of foreign exchange controls and technological improvements have generally made financial systems more integrated. They have also reduced entry barriers to national banking systems, encouraging direct competition between institutions from different countries. Within Europe, the process of monetary union is acting as a further catalyst to this process, with the introduction of a single currency likely to make differences in prices and costs of banking services across countries more transparent. But while there is a clear tendency towards increased globalisation, there nonetheless remain obstacles to full international competition among banks, particularly in retail markets. In some cases, it is clear that the conditions of free entry and exit are still not satisfied. In the United Kingdom, for example, regulation still restricts the activities of building societies; they are constrained in the scope of their lending and in their access to wholesale funding. In Europe, it was not until the beginning of 1993 that all formal restrictions regarding the provision of financial services across the European Union were removed. And even then, tax and regulatory regimes are still not completely harmonised among the European nations, although EU Directives are in place to create a more level playing-field in banking. More generally, cultural barriers remain both in the way banking services are supplied and in the demand for those services (e.g. the benefit of an established brand) which inhibit the entry of foreign banks and possibly domestic non-banks. There are many foreign banks in London, but few provide retail-banking facilities to domestic residents.

In view of these factors, banks continue to exercise considerable market power, particularly in the retail deposit market. This may go some way to explain why retail deposit spreads have been widening even though concentration in this market has remained broadly stable. But the reduction in lending spreads coupled with a slight rise in concentration in the mortgage market suggests that this market may have become more contestable or that firms have become more efficient in providing these services.

The impact of globalisation has been more significant in investment banking. As capital markets have developed around the world and interlinkages between them have increased (in large part due to the liberalisation and deregulation of financial markets) so the demand and supply of investment banking services have become increasingly global in nature. But the capital resources and risk management capabilities needed to provide a truly comprehensive and global range of services has influenced the institutional channels for performing investment banking. Whereas the largest investment banks, the US "bulge bracket" firms and a handful of European and Japanese operators, aim to provide a comprehensive range of services, UK merchant banks have tended to specialise geographically and along specific product-bundles (Rybczynski (1995)). In these markets, UK merchant banks have closer relationships with their clients and can deliver specialist, tailor-made services which enable them to compete in other ways rather than price and which the larger firms may find more difficult. The demand for such services appears to be enduring; it is still common for firms issuing shares to employ both a merchant as underwriter and a separate corporate broker to price and place the issue (Molyneux (1995)).

4.2 Technological driven efficiencies

Advances in technology have clearly played a major role in effecting change in banking. Technological improvements have typically lowered transactions costs for both banks and their customers alike. Banks have been able to achieve significant efficiency gains. The most obvious manifestation of this in retail banking is the reduction in the scale of the branch network. Greater use of new technology (e.g. ATMs, telephone banking) has enabled banks to significantly reduce staff numbers and costs and thereby support profits. This is consistent with the predictions of the efficiency hypothesis.

Of course, in lowering the cost of banking services for all firms, technology may in itself have lowered entry barriers. Essentially technological advances (and deregulation) may well create or reveal "excess capacity" in banking. For example, the provision of telephone-banking services has reduced the need for traditional branch delivery and processing. Moreover, lower-cost and more widely disseminated information may well have undermined some of the competitive advantages banks have had in their traditional markets. For example, the increased role and scope of rating agencies and more extensive disclosure laws, coupled with more widespread and rapid access to information through IT, has eroded some of the information advantages that banks sought to exploit in taking deposits and making loans. In this way the UK banks' traditional markets may well have become more contestable and current levels of profitability may therefore prove to be transitory.

Banking in the United Kingdom has clearly also experienced product innovation in recent decades. Such innovations can typically occur in two ways: new financial instruments become available to customers or new institutions offer services which were previously not available. In both cases the crucial aspect is the "spectrum-filling" characteristic of the innovation (Llewellyn (1990)), in the sense that products which were not previously available come onto the market and fill gaps.

Product innovations have been particularly significant for investment banking. For example, the derivatives market has facilitated major improvements in banks' risk management procedures. In principle, such products are not particularly sophisticated, and indeed have been traded for many years although it was not until the seminal contribution of Black and Scholes that pricing these products appropriately became possible. But technological advance has made the wide use of such products possible. Greater computing power has meant that a vast array of calculations in ever more sophisticated derivative instruments is now possible.

In retail banking markets too, new types of product have emerged both on the deposit and lending side. In some cases, innovation has taken the form of imitating products already available in other countries. For example, mortgages in the United Kingdom traditionally have been variable-rate, while in the United States they have been fixed-rate. In the 1980s, variable-rate mortgages were introduced in the United States, and, at the same time, fixed-rate mortgages were introduced in the United Kingdom. In the 1990s, the range of mortgage products offering such facilities as discounts and cash-backs has increased immensely.

Again such product innovations represent both a threat and an opportunity to banks. Whereas banks traditionally provided the whole range of services, with financial innovation these services can often be broken down into their component parts and provided by separate institutions. This unbundling process has lowered entry barriers to the industry, since the whole range of services no longer need to be provided; firms can concentrate on products and services where they may be able to exploit some comparative advantage. The clearest example of this in the very recent past is the limited range of banking services currently provided by the new supermarket and insurance banks. Llewellyn (1991) also notes that financial innovation has the effect of eroding some of the differences between different forms of intermediation. For example, floating-rate notes and note-issuance facilities (NIFs) link banks and capital markets. Moreover, some financial innovations have explicitly integrated financial markets as they straddle different markets simultaneously; e.g. revolving underwriting facilities (RUFs).

4.3 Strategic response

Increased competition has been associated with increased pressure from shareholders to reduce costs and improve returns. The large UK retail banks have responded by seeking to exploit market power more effectively to generate higher profits. In investment banking, the general response of UK merchant banks has been to specialise. They have sought to market aggressively their information production and business advisory capabilities. This goes some way towards explaining the increased share of non-interest income in their accounts.

In contrast, most of the large UK retail banks have diversified their businesses. They have attempted to exploit cross-selling across different markets to offer some protection against the effects of disintermediation. Diversification may also have reduced the volatility of profits over the economic cycle. Non-interest income, particularly from off-balance sheet activities is less sensitive to changes in interest rates than interest income. More generally, non-interest income in the United Kingdom seems to be less volatile than interest income; the coefficient of variation for the year-on-year net interest income of the largest UK retail banks during 1982-97 was around twice that for non-interest income.

5. Implications for financial stability

Narrow definitions of financial stability focus on whether a country's payments systems are functioning or whether public confidence in banks is maintained. Stability is taken to prevail in the absence of a systemic financial crisis. The Promisel report (BIS, ECSC (1992)) defined a systemic crisis as "a disturbance that severely impairs the working of the financial system and, at the extreme, causes a complete breakdown in it". Ultimately, the report argued, systemic risk "will impair at least one of the key functions of the financial system: credit allocation, payments, and the pricing of financial assets". The definition suggests a metric by which to measure the severity of a systemic crisis: the welfare loss entailed by the delays and misallocation of consumption activities as a result of the crisis. A country's output is likely to be reduced, and there is an additional cost imposed by the misallocation of resources. If one adopts this framework, asset price volatility and unexpected redistributions of wealth, by themselves, are not evidence of systemic crisis or financial instability.

In practice, central banks are concerned about any developments that might make systemic crises more likely. They need to be alert to any significant increase in such risks above their usual levels, even if they are still small in absolute terms. Action by the authorities may then be taken either to reduce the risks to more normal levels or to reduce the costs of a crisis were it actually to take place. But what determines the "usual level" of risk? There may be a trade-off between the efficiency with which the financial system functions and the effectiveness of the regulatory framework in reducing risk. Hence when the risks of financial instability change, central banks need to understand why some factors are entirely adverse while others may permanently raise productivity a little but also increase the risk of occasional substantial welfare losses, particularly in the short run (as agents learn). The Bank of England is expected to promote both financial stability and the effectiveness of the financial system, as its current statement of core purposes makes clear. That is why it is important to try to distinguish between the two classes of shocks to financial stability.

How has the evolution of banking in the United Kingdom, as reviewed above, affected the risks of financial instability? Traditional banking activities are still at the heart of the UK financial system, but, as the sections above illustrate, non-bank financial intermediaries are taking on a larger role, and banks have branched out into a wider range of businesses. If the banking system becomes unsound, in the sense of suffering widespread insolvency, that is likely to trigger a systemic crisis of the whole financial system. The soundness of banks is the focus of much work on financial instability (see, for example Lindgren, Garcia, and Saal (1996)). But crises can also be triggered by events leading to widespread market illiquidity or insolvencies of major non-bank financial institutions, so banks should not be considered in isolation.

G-10 central banks are broadly agreed that the shocks which may cause a systemic crisis have by and large not changed. They are still many and varied, ranging from unexpectedly severe macroeconomic downturns and reassessments of likely returns on investments in different locations to microeconomic mismanagement of major financial institutions, including banks. This section therefore concentrates on assessing the general robustness of the UK banking sector rather than its likely reaction to specific shocks. But one common factor in many financial crises has been prior financial liberalisation (see Kaminsky and Reinhart (1996) and Lindgren, Garcia, and Saal (op cit.)). Financial liberalisation changes the environment in which financial firms operate; some may make critical mistakes as they

adapt business strategies to the new situation. Liberalisation itself can be triggered by governments wishing to allow firms under their jurisdiction to take advantage of the opportunities afforded by new financial products and to compete more effectively with innovative outsiders. The ultimate cause of the crises, which have sometimes arisen in the wake of deregulation, is in many cases the unleashing of competition, which at the same time stimulates progress in the financial sector and in the medium term promotes efficiency. Although the problem is not deregulation as such, but the inefficiency allowed to survive in the firms while regulated, it is still interesting to examine the response of the UK banking system to deregulation.

UK banks are still heavily involved in maturity transformation. Bank and building society deposits and loans have both increased faster than has nominal GDP. The credit channel is still important for the external finance of UK companies, especially small ones. The effort to make loan assets more liquid through securitisation has been largely limited to the issuance of some mortgage-backed securities and a few experiments with business lending. Credit-card lending has not been affected to the extent it has in the United States. Securitisation brings with it its own risks. The markets for securitised assets are not always liquid, particularly in their infancy. If the credit quality of the underlying loans deteriorates, originating banks may decide to support the issue to preserve their reputation.[14] And the quality of banks' remaining loan books is likely to have worsened within the relevant quality tier. Nevertheless, with the appropriate pricing of credit risk, securitisation can increase the liquidity of assets within the banking system and protect it against runs to which its maturity-transformation role would otherwise make it vulnerable. As with many innovations, securitisation has the potential to both reduce and increase risks to the financial system, particularly if its limitations are misunderstood. In the United Kingdom at the moment, this innovation is at the potentially dangerous experimental stage, in which liquidity and reputational problems are most acute.

Many UK banks have diversified into capital market activities, holding a greater proportion of non-loan assets. This is particularly true of the banks which have converted from mutual status and have not only increased non-mortgage loans but have also diversified into non-loan activities. However, in the past couple of years, there has been a reaction amongst the major clearing banks against diversification into investment banking. Lloyds-TSB has been particularly successful in focusing on retail banking and making significant profits out of traditional commercial banking business. NatWest and Barclays have made well-publicised partial retreats from investment banking as a result of shareholder concern with the risk and costs associated with that line of business. So managing traditional banking risk remains crucial. There are several signs that this risk has diminished in the 1990s.

First, the pattern of bank lending has changed towards business sectors which (at least in the past) have been less risky (e.g. pharmaceuticals) and away from the more risky (e.g. property development, construction)[15] (Chart 30). The major clearing banks have also increased their share of the mortgage market over the medium term at the expense of the mutuals and mortgages tend to be very low-risk assets. The demutualisation of major building societies has worked in the opposite direction, as many have diversified their loan portfolios away from a pure mortgage book, and have turned to wholesale money markets to a greater extent to raise funds; they have also tended to reduce their capital ratios, which used to be particularly high when they were building societies.[16] The greatest risks in lending

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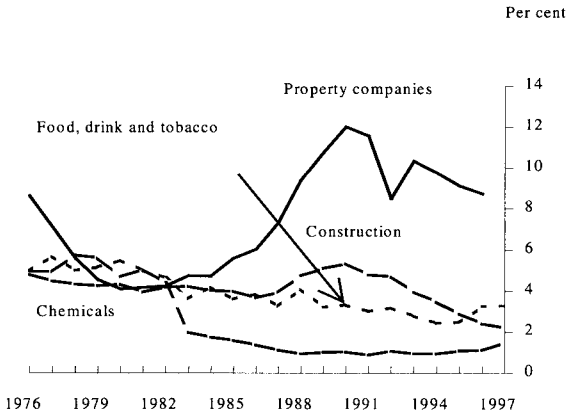
[14] This seems to have happened in the United States. Even though loans are off-balance sheet, banks still suffer some exposure in practice. This in turn raises questions about the appropriate capital treatment, given that the difference between regulatory and economic capital provides an incentive to move low-risk loans off the balance sheet while retaining higher-risk loans.

[15] Of course, if risk was properly priced by banks, the composition of their assets would have no systematic effect on their profits.

[16] See Boxall and Gallagher (1997), who argue that building up capital ratios was a self-destructive and unnecessarily risk-averse strategy for building societies once conversion to a bank by majority vote became possible.

portfolios at the current conjuncture probably lie with the increased fractions of lending to leasing companies, to the extent that they are particularly exposed to the weakness of demand for UK exports and to consumers in the form of unsecured credit, a sector of the market with several new entrants, where traditional lending margins have been under stress. Lending overseas is now less concentrated in apparently riskier regions than it used to be (e.g. Latin America in the early 1980s) and UK banks' direct exposures to the countries which have sought help from the IMF have been relatively small.

Chart 30
Bank lending in the United Kingdom
As a percentage of total lending to companies



Second, the banks are now diversified across regions, so region-specific shocks affect their deposit bases less. The development of money-market mutual funds has not been anywhere near as great as in the United States, and, as highlighted earlier, banks themselves have introduced innovations like telephone and PC banking, and helped to pioneer supermarket banking.[17] Third, methods of credit risk assessment and pricing have become much more sophisticated at most banks, although there is scope for further development of statistical techniques.[18] The degree of sophistication varies considerably amongst UK banks, as recent Bank of England interviews about the management of country risk have confirmed; the integration of risk assessment of overseas markets with credit control procedures is unlikely to be systematic. Only a handful of banks in the United Kingdom are allowed to use value-at-risk models for Basle capital-ratio purposes. Fourth, the cost-income ratios associated with traditional banking are being reduced, although this is not true of investment banks. Fifth, related to the previous point, the profitability of traditional banking has been more than adequate to improve the capital provisions of the major banks. Recent profit statements have indicated that several banks were seeking new uses of capital, including payments to shareholders. The recent profitability of UK banks has been in marked contrast to the experience of some other countries (e.g. Switzerland). In the longer term, too, the relative profitability of UK banking has been higher than in many other countries, and it is less easy to make the case that commercial banking is in decline than it is in the United States, at least prior to the latest upturn (see Edwards (1993)). A note of caution needs to be expressed with respect to the impact of new technology and new entrants on traditional banking

[17] There is a long-term threat to the major "high street" brand names from this innovation, because, at the moment at least, the supermarkets' customers are more satisfied than those of the best-known banks.

[18] The recent events surrounding banks' exposures to Long Term Capital Management highlight the threat which increased sophistication poses for banks.

activities. New technology increases the operational risks faced by banks, particularly those associated with IT system failures. It also opens up possibilities for new types of fraud. New entrants to the credit-card market and the market for deposits may in time erode the profitability of the major banks on which payments and settlements systems now depend. There is little sign of that at the moment, though, and improvements in payments and settlements systems, together with participation by a wider range of banks, should reduce the risk in the medium term.

Table 20
Four largest British banks: credit exposures through loans and OTC derivatives
At end-1997, in billions of pounds sterling

	Loans		OTC derivatives with positive market value	
	To customers	Interbank	Gross	Net
Barclays	99.8	36.9	26.4	17.7
Lloyds	87.9	20.6	7.6	3.6
Midland	47.7	13.4	7.6	–
National Westminster	84.5	32.0	20.2	8.2

Financial fragility is not only a function of how the banking system reacts to external stocks. It also depends on linkages within the system, so that firm-specific shocks may raise systemic issues because of the risk of contagion. The "high street" banks which make up some 90% of all assets in UK-owned banks continue to have large exposures to each other through their participation in the interbank market (Chart A, Appendix) and through foreign exchange settlement risk. They are also exposed to foreign banks through these routes. As the value of trades flowing through payment and settlement systems has increased, efforts have been made to reduce their riskiness; for example, intraday payment problems in the high-value payment system were reduced by the introduction of a real-time-gross-settlement system in 1996. Michael (1998) reviewed the question of systemic risk arising from financial interlinkages in the UK economy and, while acknowledging initiatives like RTGS, concluded that, "from the perspective of systemic risk, it is notable that exposures from foreign-exchange settlement continue to loom large. Moreover, exposures arising from derivatives, especially swaps, are growing, and exposures between banks in the interbank market continue to be important." Nonetheless, as shown in Table 20, derivative exposures remain small in relation to credit risk stemming from interbank placements and traditional loans.

The off-balance-sheet exposures of the UK banking system are linked to investment-banking activities. Once again, many of the innovations in this area have the potential to improve risk management by banks if they are properly understood, and were originally designed with that purpose in mind. However, they entail the risk of exposing banks to new risks which have not been properly assessed. Unfortunately, the recent turbulence in the international financial system has put banks to a severe test in this respect, through their own proprietary trading or their exposures to so-called hedge funds. So far, UK-owned banks have been relatively lightly affected by the recent developments in world markets, but certain earlier cases, like the NatWest derivatives loss of £90 million revealed in February 1997, show that there is no room for complacency. More "stress-testing" of off-balance sheet exposures, especially to sovereign entities and other agents not subject to prudential regulation, should be undertaken. Despite the evidence that investment banking activities provided the "high street" banks with income streams that were negatively correlated with their traditional income streams (Charts 31 and 32), several have decided that they do not generate sufficient returns, especially given the need to devote more capital to such activities to compete with the successful US banking and securities firms. Also, they may have been discouraged by the operational risks posed by the management problems of running large, diversified multi-nationals, not least the difficulty of assessing the market and credit risks associated with very complex portfolios.

Chart 31
Barclays profits

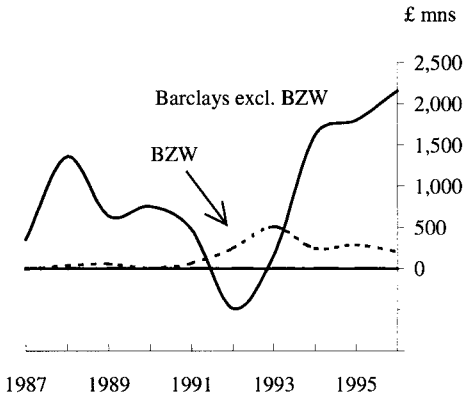
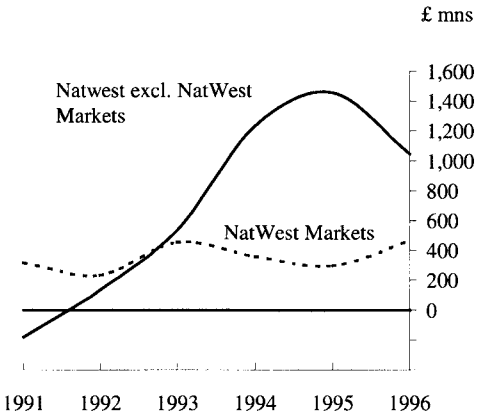


Chart 32
NatWest profits



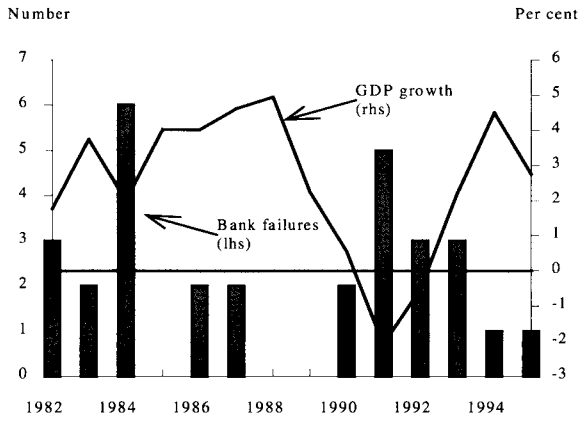
There remains an inevitable tension between promoting financial stability, on the one hand, and financial liberalisation on the other. In a deregulated environment, competition among institutions is likely to encourage greater structural efficiency in terms of the range of services offered and the responsiveness to customer preferences. Competition should also encourage greater allocative efficiency, in the sense of accurately pricing risks and allocating funds to where the risk-adjusted rates of return are highest, and increase resource efficiency as regards the real resources absorbed in the supply of financial services. But it may also increase the risks to which banks are exposed, forcing them to put greater emphasis on assessing and managing those risks properly. A strategy of diversification will not insulate banks from significant losses, as the recent experience of Barclays and NatWest in investment banking highlights. Indeed, the process of diversification itself may present difficulties for ensuring financial stability. Financial conglomerates may reduce volatility of earnings through diversification and therefore lower the risk of systemic instability being triggered by a sudden fall in cash flows. At the same time, the greater complexity of such institutions and lack of fully consolidated supervision may lead to greater risks from inadequate regulation. This is currently more of an issue in the United States, with the creation of conglomerates such as Citigroup, although it could also become a problem in the United Kingdom. The main risks facing UK banks probably relate to the disturbances to traded markets, including swaps, of a scale and duration which might seriously undermine their ability to hedge key risks, and/or a major curtailment in the liquidity of the interbank market even for good-quality names. And the (improbable) scenario of the disorderly collapse of a major international bank, which could directly affect UK banks through the direct financial linkages outlined above, must also be considered in stress-testing.

Overall, then, the UK banking system appears to be relatively robust to shocks. The main UK banks are strongly capitalised and are highly profitable. The early 1990s showed that even a major economic downturn in the United Kingdom did not undermine the viability of the core banks. And the risks entailed by maturity transformation, if anything, are probably slightly lower, partly because of the growth (albeit slow) of securitisation. There is room for improvement in the pricing of risk, and the environment in which UK banks operate is becoming more competitive. The traditional banking channel for financial intermediation is still expanding – deposits have continued to rise relative to GDP – but it is increasingly supplemented by the other channels. But does this assessment fit with the experience of financial liberalisation in the United Kingdom, which was particularly rapid during the 1980s?

The United Kingdom has not suffered a systemic crisis in the period under review, but there have been bank closures. Jackson (1996) reviewed the recent history of bank failures in the United Kingdom, and identified two periods in which their frequency increased (Chart 33). The first was in the early 1980s. This was associated with the failure of some banks to meet the new supervisory standards set by the Banking Act of 1979, which formalised the Bank of England's responsibilities for

banking supervision. Surprisingly, the manufacturing-led recession of the early 1980s does not appear to have been a major factor.[19] The second period was 1991-94. This took place in the aftermath of the bursting of the asset price bubbles of the late 1980s; the recession can be characterised as an episode of debt-led deflation (see King (1994)). Several small banks raising capital on the wholesale markets and lending for property purchase and development were hit hard by high interest rates and the collapse of property prices. Banks in general made big losses, but on the whole these were covered by their capital. The Bank of England did, however, judge it necessary to launch a "lifeboat" operation in 1991, to prevent the small-bank crisis spreading to more significant banks through the wholesale money markets. It kept 40 small banks under particularly close review and worked with them to help them reorder their affairs, or wind themselves down in an orderly fashion. Amongst those small banks, there were signs of contagion, with problems arising for otherwise sound entities because of the drying up of liquidity. The Bank of England's operation was only made public a few years later. It did not entail any adjustment of monetary policy, which was dominated at the time by the conflicting requirements of the UK business cycle and membership of the ERM. The episode did not amount to a systemic crisis, but the Bank at the time judged that there was a risk that it could do so. The quantitative impact of these events, given the Bank's intervention, can be assessed by looking at the size of payments made under the UK Deposit Protection Scheme, dating from 1982. As of 23rd April 1998, it had paid out £145 million gross, but only £38.7 million net. Even allowing for costs incurred by the Bank of England, the costs of support arrangements have been much less than in the United States, Japan, France and Scandinavia.

Chart 33
Bank failures and real GDP growth



The UK recession of the early 1990s was associated with higher precautionary saving by households and attempts by the personal and corporate sectors to reduce their income and capital gearing from the very high levels they had reached in late 1980s. Corporate insolvencies in particular led the banks to make very high provisions, although mortgage lenders also saw higher default rates, and possessions of homes increased. Building societies changed their behaviour, putting up with some non-performing loans on which they would previously have foreclosed, and holding a larger stock of housing on their balance sheets. More generally, the episode put banks under pressure to cut costs and improve their credit assessment and pricing. The banking systems of several countries ran into problems in the early

[19] The provisions made by at least one of the Big Four were considerably lower than in the more recent recession in the early 1990s.

1990s and emerged leaner and fitter later in the decade. But in the United Kingdom, far less central bank or government intervention was necessary. Davis and Salo (1997), in their study of excess capacity in European banking, note the importance of shocks to banking in the early 1990s in promoting innovation and ridding the industry of the excess capacity which can act as a barrier to entry and hence an obstacle to competition. Hoggarth, Milne and Wood (1998) draw attention to the contrast between Germany and the United Kingdom in this respect.

The advantage of having had a "shake-out" from the point of view of financial stability is that banking risks are likely to be priced more accurately. The disadvantage is that, if there is now a greater degree of competition, profits provide a thinner cushion against adverse shocks. And it might promote "excessive" risk-taking to maintain profitability. Empirically, that does not appear to be the case in the United Kingdom, perhaps because of the continuing market power and productivity gains posted by banks.

6. Conclusions

With regard to financial stability, the UK banking system appears to be relatively robust. Although a number of smaller banks made losses in the recession of the early 1990s, there have been no systemic threats in recent years. During this decade the traditional banking role of taking in deposits and extending loans has continued to expand more quickly than GDP, but banks appear to have shifted their loan portfolios away from the historically risky sectors and capital ratios are currently high. Securitisation of loans, if priced correctly, could reduce credit risk further. But, unlike in the United States, these products are not yet very well established in the United Kingdom. In fact, at such an early stage of development, liquidity and reputational risks are likely to be most acute.

There can be tension in the short run between promoting competition in the banks' economic environment, which has continued to increase in recent years, and maintaining financial stability, the second core purpose of the Bank of England. Non-traditional banking activity has been expanding fast. Although credit risk assessment and pricing are now more sophisticated, so too are the products which need to be assessed. Recent well-publicised losses by some banks on derivatives and lending to so-called hedge funds suggest there is room for improvement in the pricing of risk and stress-testing.

During the 1990s, an increasing share of the UK corporate sector's external finance has been raised through the issue of equities, and, to a lesser extent bonds, rather than through bank borrowing. This may imply that middle and larger-sized companies have become less sensitive to by banks' limiting of credit over and above any general change of interest rates. But banks remain special for small companies and the personal sector for which they are usually the sole, or at least main, providers of external funds.

Appendix 1

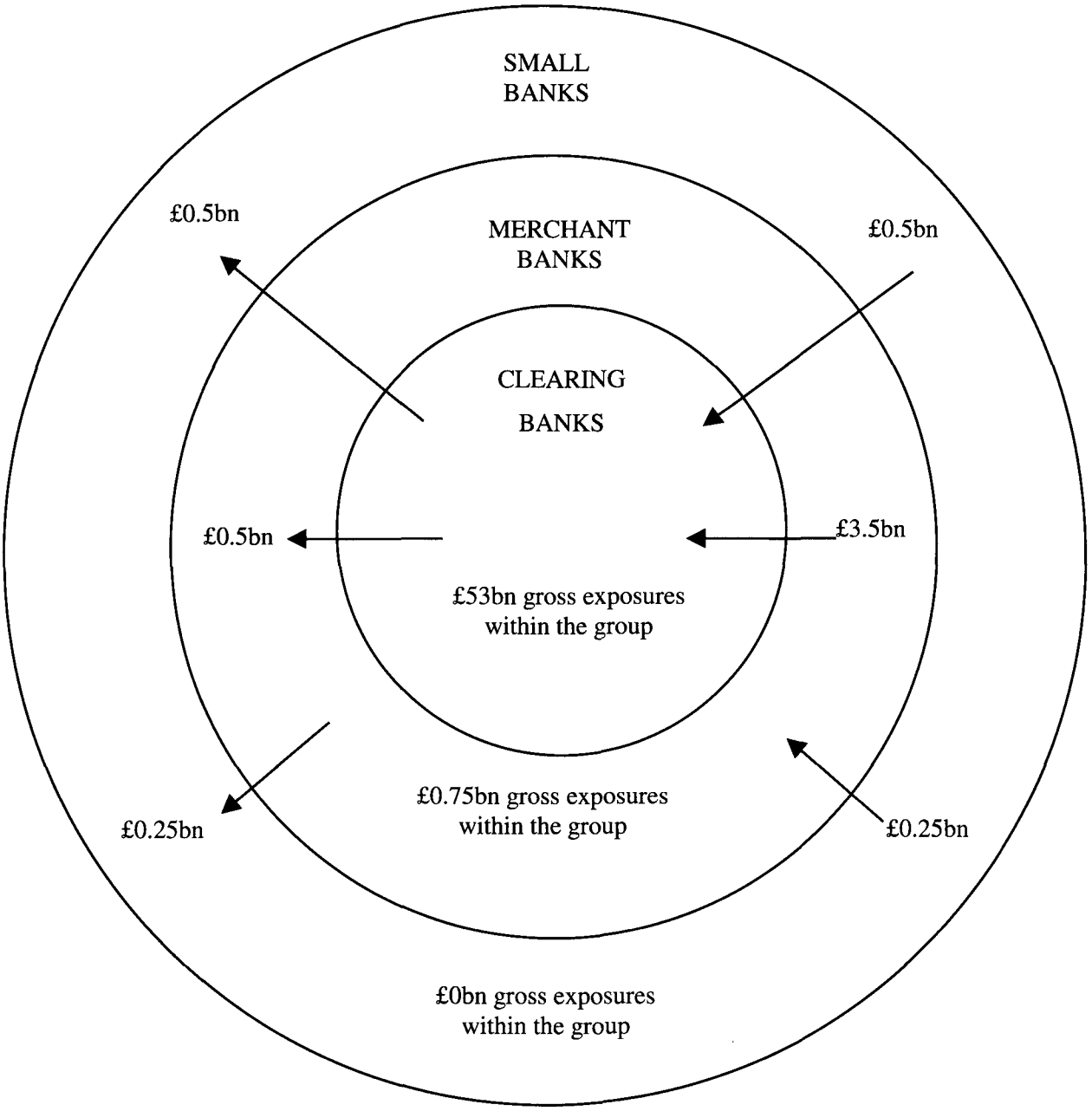
Date	Event	Effect on banks/building societies
1971	**Competition and credit controls:** 1. Direct credit controls applying to banks abolished. 2. Clearing banks interest rate cartel dismantled at official request. N.b.: lending guidance continued to be practised during the 1970s and 1980s (withdrawn in January 1987).	Strong balance sheet growth as banks increased lending.
1973	**"Corset" introduced (supplementary special deposits scheme):** 1. Restricted the interest-bearing eligible liabilities of Banks. N.b.: suspended in February 1975, reintroduced in November 1976, suspended in August 1977, reintroduced in June 1978 and abolished in June 1980.	Indirect restriction on credit expansion.
1975	**Basle Concordat:** 1. Basle Committee produced the Basle Concordat which provided guidelines on the allocation of supervisory responsibility between host and parent authorities with regard to liquidity, solvency and foreign exchange exposure.	One key objective was that no foreign banking establishment should be able to escape supervision.
1977	**First Banking Co-ordination Directive:** 1. Member states of the European Community were bound to require credit institutions with their head office in the member's territory to obtain authorisation before commencing their activities. 2. Member states could also require branches of credit institutions authorised in another member state to be authorised to carry out business in their territory.	
1979	**Banking Act:** 1. The 1976 White paper outlining supervisory weaknesses and the 1977 Basle Directive led to the 1979 Banking Act. 2. The Bank of England was given statutory licensing and supervisory powers over all deposit-taking institutions in the United Kingdom for the first time.	Pre-1979, any partnership, company or individual could take money on deposit. Following the 1979 Banking Act, a number of minimum conditions had to be fulfilled for authorisation to be granted to take deposits. The Deposit Protection Fund was introduced and protected 75% of retail deposits up to £10,000.
1979	**Abolition of exchange controls:**	Allowed banks to avoid any domestic credit controls by channelling funds abroad.
Early 1980s	**Building societies raise funds on the wholesale markets:** 1. Tax changes, particularly those in the 1983 Finance Act saw building societies start to raise funds on the wholesale markets having previously obtained almost all their funds from the retail savings market.	
1984	**Building societies' interest rate system:** 1. The building societies' interest rate cartel was discontinued.	

Date	Event	Effect on banks/building societies
1984	**Leigh-Pemberton Report Committee:** 1. Committee established following failure of JM Bank and reported in 1985.	Committee suggested a number of improvements to existing banking supervision e.g. limitations of exposures.
1984	**Tax alignment between banks and building societies:** 1. Changes in corporation tax announced by the Chancellor subsequently meant that the tax regime for banks and building societies was brought into alignment.	Prior to this building societies had had a tax advantage over banks and so these developments were costly to building societies.
1986	**Big Bang:** 1. London Stock Exchange abolishes fixed minimum commissions and single capacity trading.	
1986	**Building Societies Act (came into effect in January 1987):** 1. Increased potential for commercial lending, by allowing building societies to provide other services relating to house purchase and finance (although limits imposed on lending by commercial asset classes- see right). 2. Provision made for building societies to be able to convert from mutual to corporate status. 3. Limits imposed on wholesale funding. Building societies are not able to obtain more than 20% of their total funding from money market sources (although this could be raised to 40% by statutory instrument). 4. Building Societies Commission created to supervise societies, taking over the functions of and building on the work of the Registry of Friendly Societies which previously had been the regulator for societies.	Lending limits: Class 1 lending 90% of assets Class 2 and 3 combined 10% Class 3 lending, 5% of assets. Class 1: Advances secured on first mortgage to owner-occupiers of residential property Class 2: non-class 1, wholly secured loans Class 3: unsecured loans, interests in estate agencies, broking and other subsidiary activities.
1987	**1987 Banking Act:** 1. Following the Leigh-Pemberton Committee report and a Treasury White Paper on supervision, the 1987 Banking Act was passed.	The Banking Act strengthened the Bank's supervisory powers. New legislation created a single category of authorisation, requiring institutions to be able to satisfy 'fit and proper' tests. The deposit protection fund was increased to protect 75% of retail deposits up to a maximum of £20,000.
January 1988	**Building Societies wholesale funding limit:** 1. The wholesale funding limit was raised to its maximum ceiling of 40%. 2. The unsecured lending limit per capita also increased, from £5,000 to £10,000.	Some societies had difficulties competing in the mortgage market with the 20% limit. This problem was overcome by increasing the limit to 40%.
1989	**Second Banking Co-ordination Directive:** 1. Council of European Communities adopted 2-BCD.	Main effect of 2-BCD was to give a passport to a bank authorised in one member state to open a branch/do banking business in another member state without further authorisation.
1990-93	**Building society lending limits:** 1. Over the period 1990-93, limits on Class 2 and Class 3 lending combined increased from 10 to 17.5 to 20 to 25%. 2. Over the period 1990-93, limits on Class 3 lending increased from 5 to 7.5 to 10 to 15%.	Building societies able to take on more unsecured lending.

Date	Event	Effect on banks/building societies
1992	**Second Consolidated Supervision Directive (implemented in 1993):** 1. Replaces the Consolidated Supervision Directive of 1983.	Extends the range of institutions subject to requirement of consolidated supervision and extends the range of activities covered by consolidated supervision.
1993	**Large exposures:** 1. Implementation in the United Kingdom of the Directive on the monitoring and control of large exposures of credit institutions.	
April 1995	**Capital Adequacy Directive introduced (CAD):** 1. Amended in December 1995.	Sets minimum capital requirements for market risks in the trading books of banks and investment firms.
July 1995	**Deposit protection scheme:** 1. The Credit Institutions (Protection of Depositors) Regulations amended the UK Deposit Protection Scheme to meet the requirements of the EU Deposit Guarantee Schemes Directive.	The main change to the level and scope of protection provided was an increase in the maximum level of protection for an individual depositor from 75% of £20,000 to 90% of £20,000 (or ECU 22,222 if higher). This brought the Scheme into line with the Building Societies Investor Protection Scheme.
1996	**Introduction of gilt repo market:**	
1996	**Real Time Gross Settlement (RTGS) went live:**	
1996	**Investment Services Directive introduced:**	Purpose was to provide a single European 'passport' to investment firms and to make changes in access to regulated markets.
1996	**Sterling Liquidity:** 1. New system for measuring sterling liquidity was introduced for the large UK Banks.	Prior to this, most banks in the UK were supervised on the 'mismatch' approach, whereby assets and liabilities are allocated on the maturity ladder and limits are set on the size of the mismatch in various time bands. This approach was less suitable for very large banks whose balance sheets were characterised by highly diversified retail deposit base. For large banks it is more suitable for them to hold an adequate stock of liquid assets.
1996	**CAD-2:** 1. Amendment to the Capital Adequacy Directive - due to be implemented end-1998 in the United Kingdom.	Provision made for banks to use a measurement system for market risks similar to that in CAD, but also to use their own internal Value at Risk models as the determinant of supervisory capital for market risks (including commodities).
1997	**Chancellor announces Bank of England independence:** 1. Supervisory responsibilities transferred to Financial Services Authority.	
1997	**Building Societies Act:**	
1998	**Bank of England Act:**	

Chart A

Flows within the interbank market, mid-1997



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The monetary, regulatory and competitive implications of the restructuring of the Japanese banking industry

Haruyuki Toyama[1]

1. Major changes in the banking sector in the last decade

1.1 Overview of factors contributing to the changing nature of the banking industry

In recent years, the Japanese banking industry has faced drastic and very challenging changes, including the global trend of rapid progress in financial innovations on account of technological developments, and the accumulation of non-performing loans resulting from the burst of the bubble economy.

In addition, deregulation measures recently accelerated by the "Japanese Big Bang" has provided the industry with an impetus for changes.

1.1.1 Progress in financial innovations

Financial innovations induced by the development of technology have also taken place in Japan and have enabled financial institutions to unbundle risks of conventional financial instruments (such as loans and bonds) and produce new financial instruments, such as derivatives and asset-backed-securities. Financial innovations have also induced financial institutions to provide diversified and complex financial products in terms of cash flow, risk and return profile, and have thus enabled them to cope more flexibly with the needs of their customers.

In addition, innovations have made it easier for banks to evaluate the returns earned from bearing certain risks and thus facilitated their risk management.

1.1.2 Changes in the economic environment

The Japanese economy has experienced structural changes for the last two decades. Economic growth slowed compared to 1960s and 1970s and the less capital-intensive industries, such as services, gained larger shares in the domestic economy. These changes reduced the need for fixed investments and firms began to hold more idle funds (Graph 1). As for households, personal financial assets have accumulated up to 1,200 trillion yen. This situation drove both firms and households to pursue a variety of investment opportunities in terms of risk and return profile.

1.1.3 The burst of the bubble economy and non-performing loan problems

In the bubble economy, however, financial institutions continued to put emphasis on expanding the scale of their business rather than on improving their interest rate margins. In other words, the bubble economy blew away the momentum for changes among financial institutions and gave their management the illusion that quantitative growth of traditional loan business would continue to be the best goal to pursue. It was only after the burst of the bubble economy that this illusion was eventually wiped out.

Banks have been significantly hit by the fall in asset prices, as it appeared on their accounts as accumulated non-performing loans (Graphs 2 and 3). They had to devote their energy to cope with non-performing loans while foreign competitors developed new financial services.

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1.1.4 Recent changes in banks' management

Interest rate margins turned out to be insufficient to cover losses resulting from non-performing loans, and banks' final profits declined sharply (Graph 4). Profit margins in the traditional banking business as measured by spreads between interest rates on deposits and loans at the time of contracts had been rather steady and low compared to those of US and European banks (Graph 5).

In response, banks began to introduce more sophisticated methods to set interest rates that reflected the credit risks of borrowers as accurately as possible. Banks also recognised the need to establish business lines with increasing profits, such as investment management business, in the course of restructuring their business, and have been seeking affiliation with other financial institutions to strengthen their skills (Graph 6).

1.2 The Government's policy responses

The "Japanese Big Bang" was one of the Government's principal responses to the weaknesses in the financial sector. This measure derives from the recognition that banking and securities regulations had become outdated, as the progress of technological developments in data processing and communication had enlarged the scope for market mechanisms to ensure efficiency and contain abuses. As technology progresses further, regulations have come to be seen as burdensome and as protecting existing interests.

One of the weak aspects of the Japanese financial system was said to lie in the lack of transparency due to weak disclosure. The introduction of Prompt Corrective Action and the measures taken as part of the "Japanese Big Bang", including the introduction of mark-to-market accounting and disclosure based primarily on a consolidated basis, should help market participants to more easily scrutinise financial institutions' conditions. It was necessary for Japanese banks to clarify their restructuring policies and the schedules to write off non-performing loans in order to restore the market's confidence.

A scheme to utilise public money to strengthen the capital of banks and to assist consolidation of banks is another policy response to deal with weaknesses in the financial sector (see Section 2). Public money is to be injected into large banks to strengthen their capital and to exert pressures on banks to formulate concrete plans for recovering their financial soundness. In due course, banks should endeavour to identify their comparative advantages and allocate their resources accordingly. Moreover, quite a few banks, after a thorough review of their own resources, have sought consolidation with other financial institutions rather than restructuring on a solo basis.

2. Implications for financial stability

2.1 Recent successive failures of Japanese financial institutions and their resolutions

2.1.1 Introduction

Against the general background discussed in the previous section, this section will focus on the policy responses of the Bank of Japan to the situation after successive failures of several financial institutions in autumn 1997.

Sanyo Securities Company, Hokkaido Takushoku Bank, Yamaichi Securities Company and Tokuyo City Bank all confronted difficulties in continuing their business as they began to lose market confidence, evidenced in the sharp decline in their stock prices as well as in withdrawals of deposits and investments. In effect, the cautious attitude of interbank market players made it impossible for these institutions to raise sufficient funds to fulfil their obligations to settle payments and to meet reserve requirements.

In response, the Bank of Japan has taken several measures, including the extension of special loans (based on Article 25 of the former Bank of Japan Law) to the failing financial institutions and the utilisation of various market operation means to provide the markets with sufficient liquidity.

2.1.2 The extension of special loans to failed financial institutions

In order to ensure smooth payments of failed financial institutions, the Bank of Japan extended special loans without collateral to Hokkaido Takushoku Bank, Tokuyo City Bank and Yamaichi Securities Company. The loans were aimed at providing the necessary liquidity until the liquidation (in the case of Yamaichi) or the transfer of businesses (in other cases) could be completed.

The extension of the Bank of Japan's loan to Yamaichi raised difficult issues related to the safety net. In this case, the Bank of Japan's loan was extended to an institution which was not a bank. In light of the principles that the Bank applies in extending lender-of-last-resort loans, it was a common view that the central bank's safety net was primarily prepared for depository institutions.[2] A failure of non-depository institutions is usually not likely to cause systemic repercussion since they are not in chained creditor-debtor relationships with other entities, as so determined in the case of default of the Sanyo Securities Company.

In the case of Yamaichi, however, central bank's support was judged indispensable in order to prevent worldwide systemic repercussions. Banking subsidiaries of Yamaichi overseas could have triggered difficulties in settling payments through chains of transactions. In addition, Yamaichi had entered into derivatives and other financial contracts with a number of financial institutions in Japan and abroad. If such transactions had been wound up, erosion of the credibility in the Japanese financial system could have affected the Japanese economy and caused disruptions in domestic and overseas financial markets.

The extension of the Bank's special loan to Yamaichi raised another difficult problem, as it covered for funds for domestic and overseas affiliates within the Yamaichi Group, and not only for the securities company itself. The key issue is the extent of the Bank's coverage when its loan is extended to an institution which operates within a group.

The expansion of the safety net could lead to moral hazards within the financial system. On the other hand, the changing organisational structures of financial institutions and the diversification of financial activities make it necessary to reexamine the scope and cover of the safety net.

2.1.3 The management of the Bank of Japan's monetary policy operations

The failures of large banks and securities companies made market participants extremely sensitive to credit risks. The failure of Sanyo Securities Company was the first default in non-collateral overnight call transactions, which made the evaluation of counter-party risks in the interbank markets more stringent (Graph 7). Such market circumstances not only made it difficult for transactions to come to terms, but also placed an upward pressure on market interest rates (Graph 8). The gap between the minimum/maximum overnight non-collateral rates widened reflecting the expansion of credit risk premiums.

To cope with the situation, the Bank of Japan utilised various market operations to inject ample liquidity into the markets in order to smooth market transactions and stabilise market interest rates.

The Bank of Japan's open market operations are usually meant to counter an overall shortage or excess of reserves in the market. The fund shortages of individual financial institutions are supposed to

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[2] The Bank extends lender-of-last-resort loans to provide funds for the purpose of ensuring the stability of the financial system only in cases where all of the following conditions are met. First, there is a strong possibility that failure of one financial institution to settle transactions with another may trigger a chain reaction of defaults and, as a result, confidence in other sound financial institutions will be undermined or runs on deposits will occur. Second, credit extension by the Bank is indispensable, as there are no other sources of funds. Third, measures are taken to prevent moral hazard, and, fourth, the financial soundness of the Bank will not be threatened.

be covered through the market mechanism under which participants take adequate counter-party risks in exchange for due returns.

Faced with successive failures of financial institutions, the Bank of Japan has injected liquidity well beyond the level necessary for financial institutions to meet the reserve requirement in order to offset the upward pressure on interest rates (Graph 9). Reflecting the Bank's operations, the short-term rates were kept stable at their targeted level. In addition, the operations were intended to help financial institutions smoothly execute payment activities in cases where market participants became excessively cautious in providing credit to each other. Although enough funds were provided on a macro basis, financial institutions with low grading would have found it difficult to acquire the funds required to settle payments. The Bank's policy of injecting sufficient liquidity into the market had the effect of easing fears that defaults might occur.

Since rates on longer-term money market instruments remained high, the Bank also provided funds on relatively long terms through the purchase of bills and commercial papers. In particular, funds were provided on terms with the repayment due after the end of March to ease otherwise tight monetary market conditions. Operations to provide funds were usually 1-3 months long, while operations to absorb funds by issuing bills were shorter with maturity less than one month. Through such operations, the Bank has executed maturity transformation, which contributed to stabilising longer-term rates.

It should also be pointed out that the Bank's issuance of bills to banks have alleviated the impact of the so-called "Japan Premium" where, due to a decline in their creditworthiness in international markets, Japanese banks encounter extra funding costs, compared to leading US and European banks (Graph 10). Since the auction system meant that the Bank's bills were mainly sold to foreign banks, the operations helped Japanese banks obtain foreign currency funds, as they stimulated swap transactions between yen and foreign currencies. All in all, these operations led to a market expansion of the Bank's balance sheet (Graph 11).

Another part of the Bank of Japan operations was focused on the credit market, because the disposition of the large amount of non-performing loans forced banks to curtail their assets in order to meet the Basle capital standard. In addition, faced with severe competition, banks began to strengthen their risk management and attach more importance to improving profitability of their loans (Graphs 12 and 13).

In response to the resulting tight conditions in the credit market, the Bank of Japan increased its purchases of corporate commercial paper in order to smooth financing activities of corporations as well as ease monetary conditions (Graph 14). On 13th November 1998, the Bank announced the introduction of new measures for money market operations in response to the recent situation in firms' financing activities, including expansion of CP repo operations, the establishment of a temporary lending facility and the creation of a new market operation scheme utilising corporate debt obligations as eligible collateral.

It may be argued that the Bank's holding of corporate debt obligations instead of government bonds could deteriorate the financial soundness of the Bank and impair confidence in the currency. However, the Bank only holds or takes as collateral corporate debt obligations judged eligible and, in the case of holding, acquires them in repurchase agreements under which counter-party institutions are obliged to buy back the debts.

2.2 Temporary measures to stabilise the financial system until 2001

2.2.1 Financial revitalisation

In order to restore confidence in the Japanese financial system, the government of Japan decided to introduce temporary emergency measures to precipitate resolutions of failing banks while protecting deposits in full until March 2001 (deposits that exceed 10 million yen may not be protected thereafter).

New authorities to deal with failing banks were given to the newly-established Financial Revitalization Commission (FRC). First, the FRC may appoint financial administrators, who shall

transfer businesses of the failing banks to other banks or, if there appeared no banks that would voluntarily assume their businesses, to public bridge banks established by the Deposit Insurance Corporation (DIC). Second, the FRC may commence special public management (temporary nationalisation) of banks which have failed or are in danger of failing. In this case, the DIC has to acquire the shares of those banks.

2.2.2 Public funds

The Deposit Insurance Act was amended in February 1998 to provide public funds totalling 17 trillion yen, allowing the DIC to purchase assets of troubled banks and offer assistance to other banks overtaking their businesses. In October, the Government was also empowered to guarantee up to 18 trillion yen when the DIC borrows funds for the conduct of financial revitalisation activities such as the establishment of public bridge banks, special public management and the purchase of banks' assets.

Measures to strengthen the capital bases of banks to ensure early restoration of soundness were also laid down in October last year. The new Resolution and Collection Organization (RCO), founded by the merger of the Resolution and Collection Bank (RCB) and the Housing Loan Administration Corporation (HLAC), will be able to acquire the common stocks of significantly or critically undercapitalised banks, as well as preferred stocks of banks even with capital ratios of 8% or above. The DIC is given up to 25 trillion yen of government guarantees to borrow funds in order to provide funds to the RCO to acquire shares of banks.

2.2.3 Resolution of the LTCB and of the NCB

The Prime Minister, acting on behalf of the FRC until its establishment in December, placed the Long Term Credit Bank of Japan (LTCB) under special public management (temporary nationalisation) with the bank being deemed insolvent on 23rd October 1998. Market participants were concerned whether entering special public management might fall under the definition of "an event of default" listed in agreements of derivative transactions and thus cause all transactions to be wound up. While the LTCB is subject to special procedures for a bank placed under temporary nationalisation, the nationalised LTCB will continue its normal operations with necessary funds provided by the DIC. Therefore, all obligations including deposits, bank debentures, those from interbank and derivatives transactions owed by the LTCB will be settled orderly according to their due dates and in full value.

On 13th December 1998, the Prime Minister announced that the Nippon Credit Bank (NCB) was insolvent and that the NCB would be placed under special public management.

2.3 Stability of the financial system and the implementation of the "Japanese Big Bang"

2.3.1 The implementation of the "Japanese Big Bang"

The measures discussed above are aimed at restoring the stability of the financial system. In the long term, however, the financial system should be strengthened by competition among banks and by the innovation of private banks. The full-scale financial system reform, the so-called "Japanese Big Bang", is based on the understanding that restructuring of the banking industry through deregulation is essential.

It is sometimes argued that the "Japanese Big Bang" was implemented too early because it compels Japanese banks to both face tougher competition and charge off non-performing loans from their balance sheets. However, merely curtailing the size of banks' balance sheets without improving the profitability of banks would not be sufficient to provide banks with the basis to survive. It would rather stop the smooth flow of funds and seriously affect the whole Japanese economy. In addition, foreign financial institutions came into play in the restructuring of the Japanese banking industry since expectation grew that new business opportunities would expand in the Japanese market because of the deregulation measures. The move by foreign financial institutions to seek alliance with Japanese banks to reduce costs and risks for local marketing should help Japanese banks restructure their businesses.

Therefore, the implementation of the "Japanese Big Bang" should be appreciated both as a measure to facilitate the disposition of non-performing loans and as an attempt to restructure the Japanese banking industry as a whole.

2.3.2 The contents of the "Japanese Big Bang" (Table 1)

The "Japanese Big Bang" was initiated by the then Prime Minister Hashimoto in November 1996. He proposed the plan amid the growing perception that the international competitiveness of Japanese markets had declined in recent years, due to high transaction costs. It was also pointed out that the weakness of Japanese financial institutions in creating innovative products mainly derived from the old-fashioned stringent regulations.

The basic principles of the Japanese financial system reform plan are "free, fair, and global". It advances liberalisation in terms of entry, scope of activities and organisational structures and it establishes rules for fair and transparent transactions, with all measures to be completed by 2001. The aims of the reform are to expand the choice of options for investors and borrowers, to improve the intermediaries' services while promoting competition among them, and to develop a market which is easy to use.

The forerunner of the reform was the comprehensive amendment to the Foreign Exchange Law in April 1998. The amendment completed liberalisation of foreign exchange transactions so that domestic customers can make deals directly with financial institutions overseas without permissions of the government and any party can engage in the foreign exchange business. Failure to carry out a full-scale reform of the institutional framework without delay would have caused "hollowing out" of Japanese financial markets.

Most of the other specific items of the reform were laid down in the Financial System Reform Law which passed the Diet last June and was implemented on 1st December 1998. Major changes laid out in the Law, inter alia, include the liberalisation of organisational structures of banking groups, including utilisation of holding companies; the liberalisation of off-exchange transactions for listed securities; the lifting of the ban on securities derivatives; the abolition of license requirements for securities companies and diversification of their business operations; the introduction of mark-to-market accounting for financial instruments and disclosure of financial institutions on a consolidated basis; and the strengthening of the safety net to deal with failure of securities firms and insurance companies.

These deregulation measures have had several consequences for the banking industry. The liberalisation of entry into financial businesses has increased competition with firms of other financial sectors and even commercial firms. On the other hand, the expansion of the business scopes of banks, including securities operations, has enabled them to establish new profitable business lines. In addition, the liberalisation of organisational structures has made it possible for banks to enter into alliance with firms in other financial sectors to make their business operations more efficient by achieving economy of scope. These factors are expected to promote the restructuring of the banking industry.

2.3.3 The current wave of consolidation

The "Japanese Big Bang" has stimulated consolidation in the banking sector (Table 2). The implementation of the "Japanese Big Bang" has made banks realise the need to strengthen their financial and managerial bases, and quite a few Japanese banks have chosen to affiliate with other financial institutions. In addition, the liberalisation of organisational structures and the diversification of business fields have created an environment where banks easily find allying firms in other financial sectors.

In particular, banks have entered (or are seeking to enter) into alliance *with foreign financial institutions* to strengthen new business fields and to earn better evaluation in the market.

Investment management and derivatives, which Japanese banks are seeking to strengthen, require new investments and specialised skills which would take time before they could start earning profits. Consequently, banks regard alliances with institutions that already have such specialities to be an easier way to start these new businesses.

In addition, for Japanese banks which intend to maintain and develop global operations, alliance with foreign institutions graded highly by the markets is a key to earn high evaluation in global markets. Therefore, Japanese banks have made efforts to find partners, while scaling back their own activities through branches abroad in a move towards reducing business operation costs.

In turn, foreign financial institutions' view partnership with Japanese banks as a way to reduce costs and risks for local marketing in the Japanese market. The amendment of the Foreign Exchange Law and other deregulation measures of the "Big Bang" have enlarged such opportunities for foreign financial institutions.

Liberalisation of organisational structures is one of the main features of the "Big Bang" (Graph 15). Such measures include the lifting of the ban to establish bank holding companies and the expansion of the scope of activities permissible for banks' affiliates. Due to such deregulation measures, banking groups (including bank holding company groups and bank-sub groups) will be able to engage in all financially related businesses, such as those of securities companies, insurance companies, companies specialising in ancillary or peripheral business of banks. Reflecting the measures, many banks have sought consolidation with other types of financial institutions, especially securities and insurance companies (insurance companies that banks or bank holding companies can own are limited to failing institutions until 2001). Through such consolidations, banks are seeking to provide customers with a whole line-up of financial products enabling one-stop shopping. The types of consolidation include establishment of joint ventures, entering into capital relationships, and the acquiring of businesses under a single holding company.

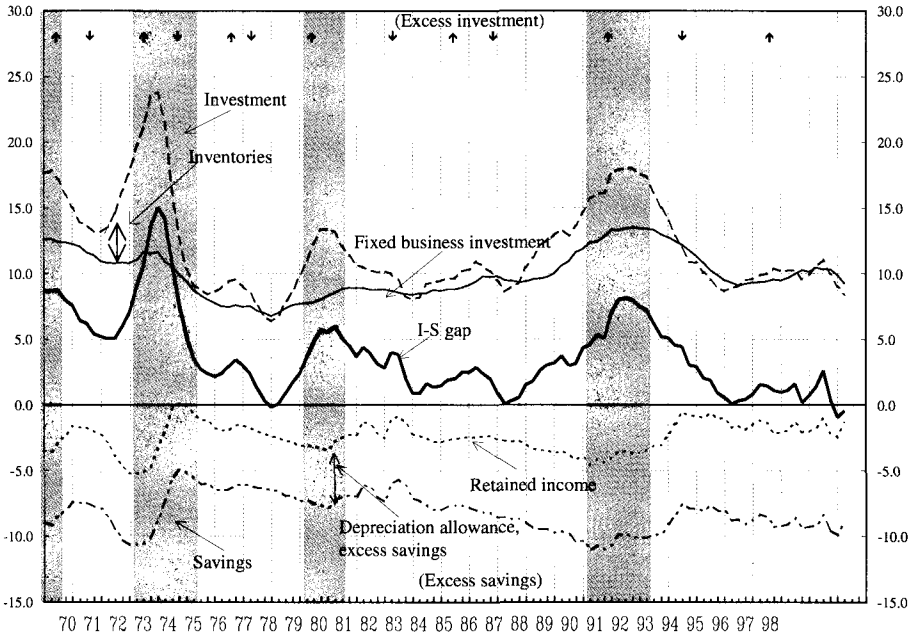
In addition, banks are seeking to make their management more efficient by specialising their business operations to areas with comparative advantages and by outsourcing or entering into alliance in other areas. The liberalisation of bank operational structures will enable banks to smoothly withdraw from particular businesses and enter into new businesses.

As banking businesses tend to be operated by a group rather than by a single entity, it becomes more important for regulatory authorities to supervise and monitor banks on a consolidated basis. Therefore, regulations to secure sound risk management of banking groups have been laid down in the Financial System Reform Law. Such regulatory measures include the application of capital adequacy rules and restrictions on large exposures (capital subscriptions and credit extensions) on a consolidated basis, and the requirement of "arm's length" transactions within the group. Financial authorities, including the Bank of Japan, need to consider concrete methods to monitor banking groups in order to check the banks' soundness.

Graph 1

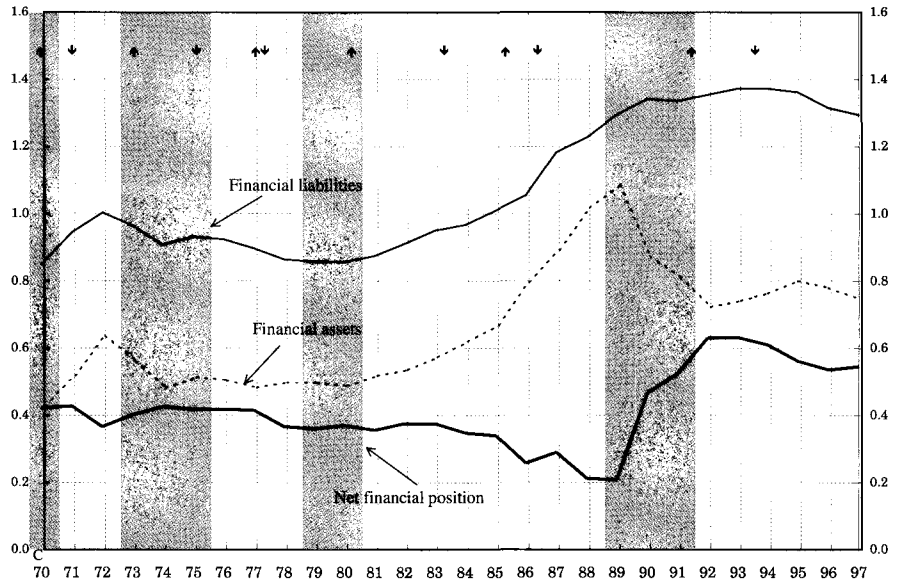
Savings-investment balance and financial position of the corporate sector

(1) Savings-investment balance of the corporate sector
As a percentage of nominal GDP, three-quarter moving averages



Notes: Based on *Corporate Business Statistics Quarterly*. Investment = newly invested fixed assets + changes in inventories; fixed business investment = newly invested fixed assets; retained income = changes in fixed provisions + special reserves and other surpluses.

(2) Financial position of the corporate business sector
Times nominal GDP

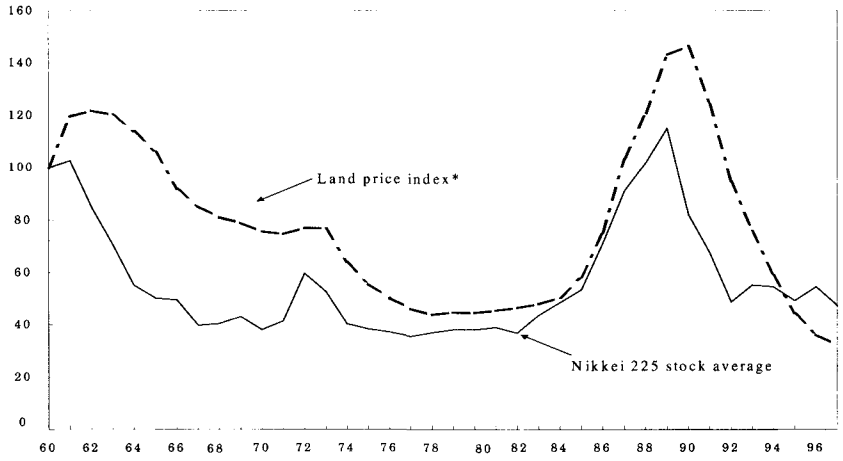


Notes: Net financial position = financial liabilities – financial assets; financial assets exclude "trade credits", "foreign claims" (foreign trade credits, foreign direct investments and other foreign claims) and "others"; financial liabilities exclude "stocks", "trade credits", "foreign debts" (foreign trade credits, foreign direct investments and other foreign debt (excludes foreign bonds)) and "others".

Source: Flow of Funds Accounts.

Graph 2
Stock and land prices

Relative to nominal GDP, 1960 = 100



* Index of land for commercial use in urban areas.

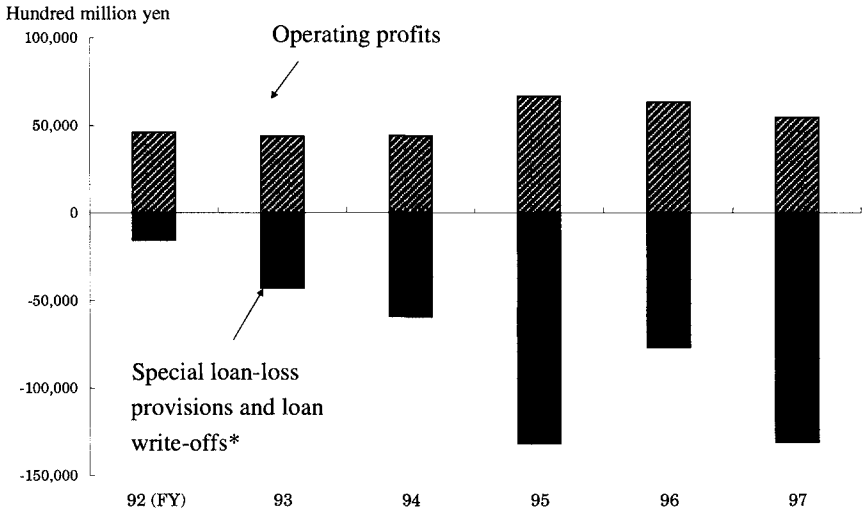
Graph 3
Non-performing loans and operating profits

(1) Non-performing loans, in billions of yen

	1992 FY	1993	1994	1995	1996	1997
Non-performing loans	12,774	13,575	12,546	28,504	21,789	19,530
Special loan-loss provisions and loan write-offs	1,619	4,105	5,455	13,445	7,819	13,268
Accumulated loan-loss provisions and loan write-offs	1,619	5,724	11,179	24,624	32,443	45,711

Notes: Non-performing loans comprise loans to legally bankrupt companies, overdue loans, loans with reduced or suspended interest (loans to legally bankrupt companies and overdue loans up to 1994) based on the disclosure standard of Zenginkyo (the Federation of Bankers Association of Japan). Special loan-loss provisions and loan write-offs = loan write-offs + non-performing loans to the Cooperative Credit Purchasing Company (CCPC) + other forgiveness of claims.

(2) Operating profits and loans write-offs



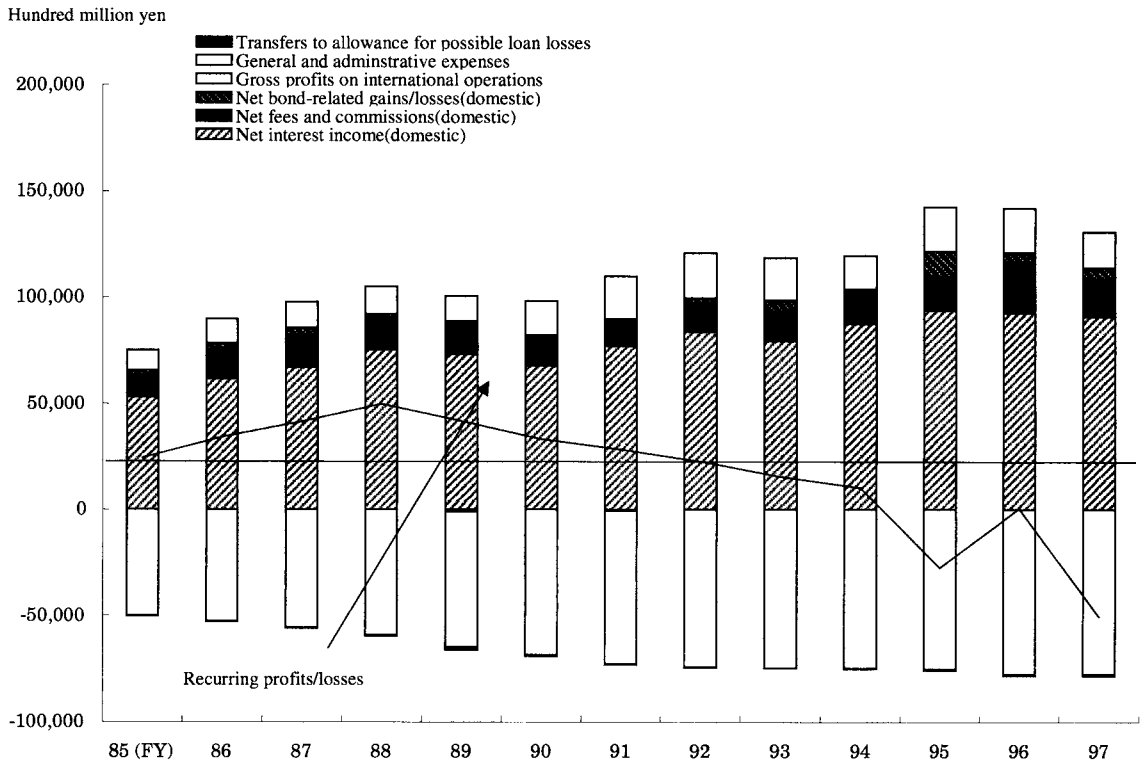
* Loan write-offs + transfers to special loan-loss provisions accounts + losses from the sales of non-performing loans to the CCPC + other forgiveness of claims.

Source: Bank of Japan, *Profits and Balance-sheet Developments of Japanese Banks in Fiscal 1997.*

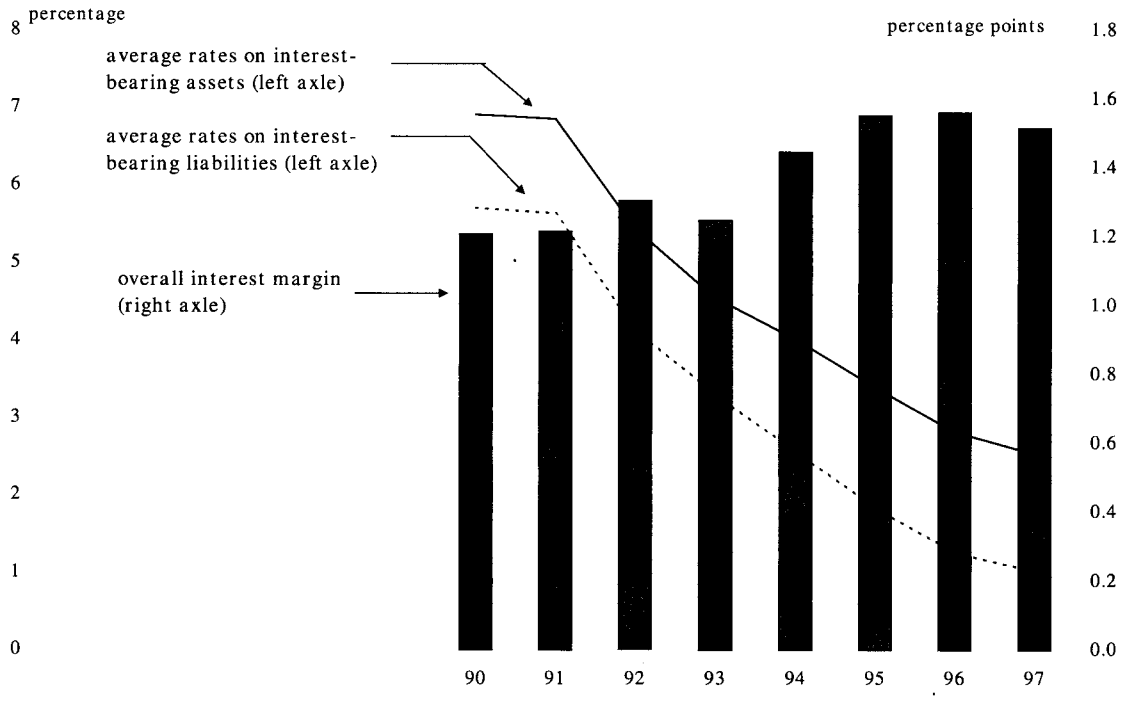
Graph 4

Operating profits and overall interest margin

(1) Operating profits

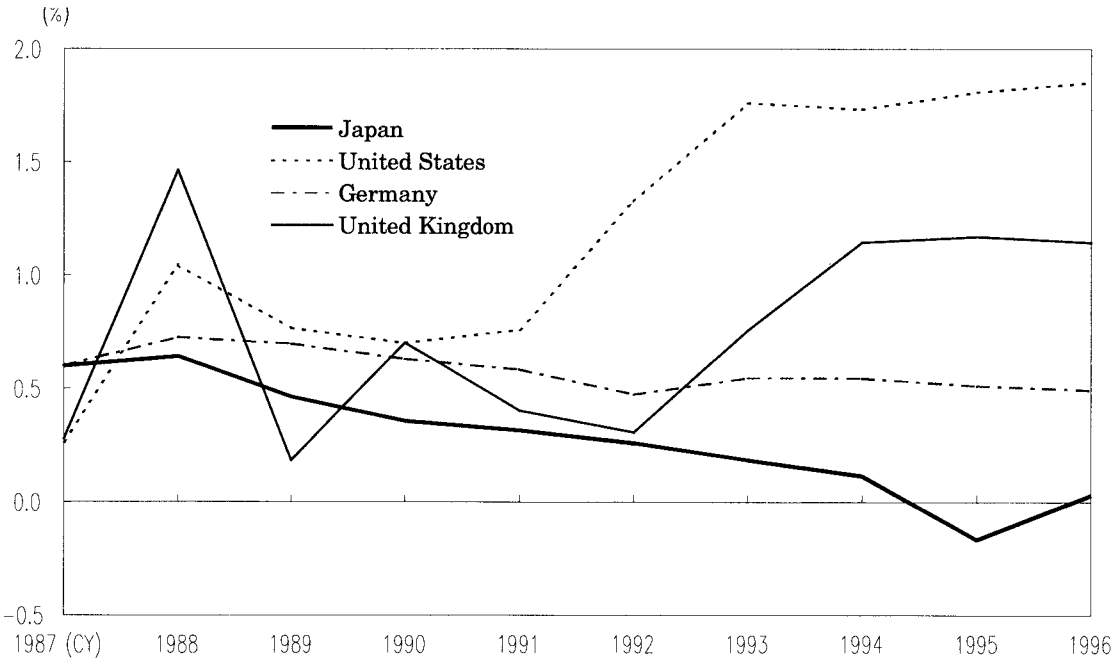


(2) Overall interest margin*



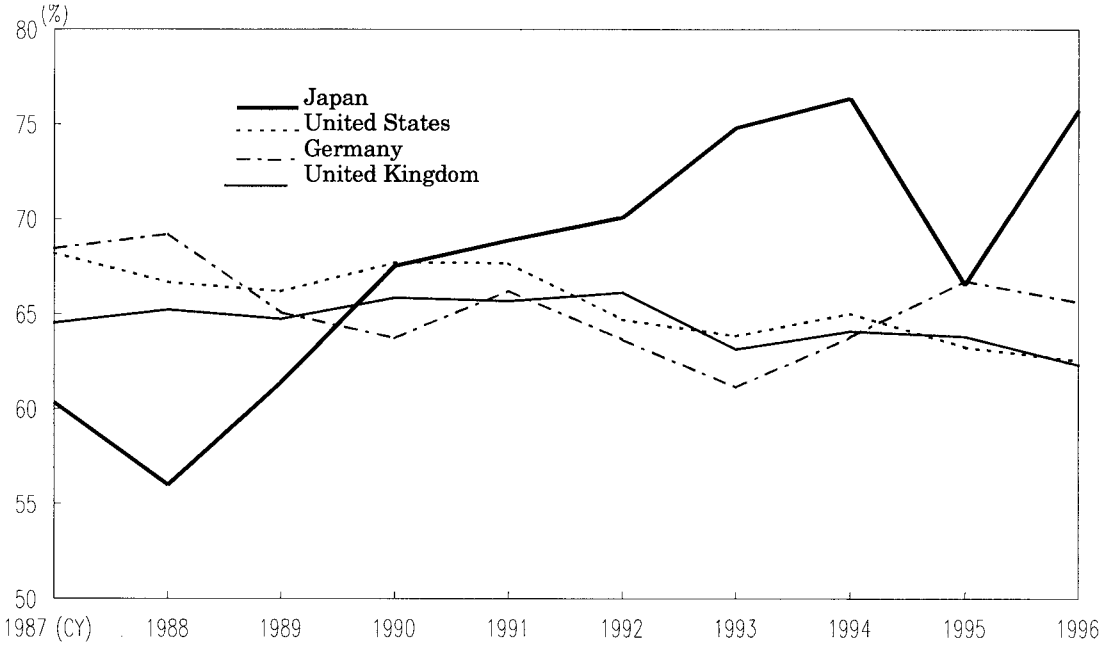
* Due to changes in the accounting method, comparable data for the period before 1990 are not available.

Graph 5
Profits of banks
(1) *ROA* of banks



Note: *ROA* = profit before tax/average asset total.

(2) Net losses/income balance



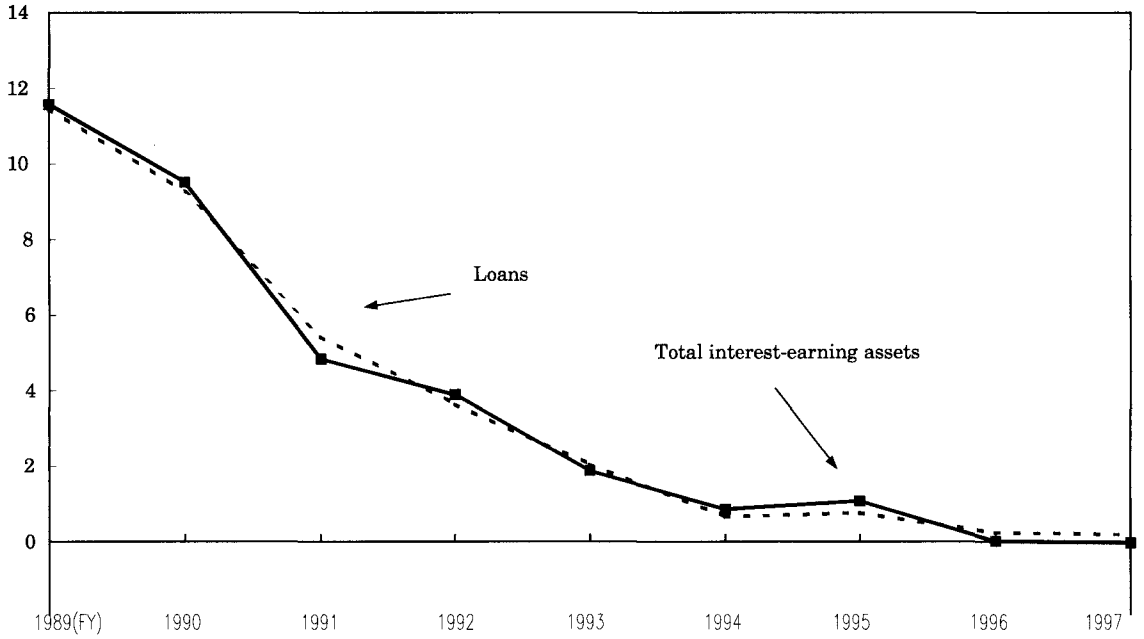
Note: Net losses/income = operating expenses / gross income.
Source: OECD, *Bank Profitability: Financial Statements of Banks* (1998).

Graph 6

Changes in balances of loans, total assets and expenses

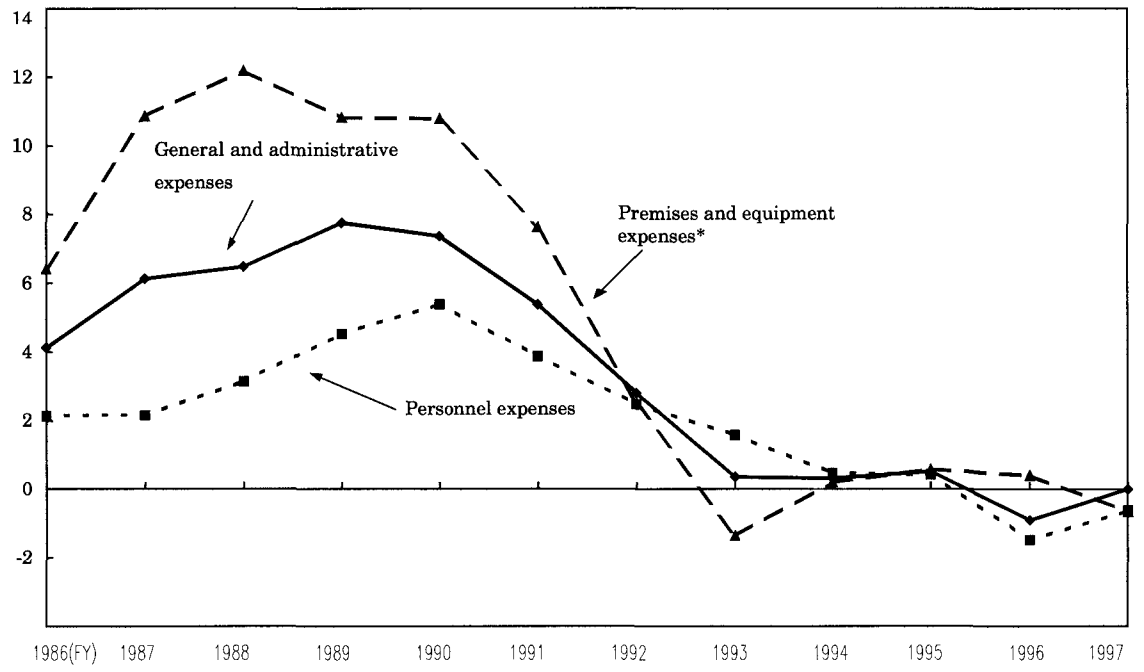
(1) Balances of loans and total assets

Percentage changes from the previous year



(2) General and administrative expenses

Percentage changes from the previous year



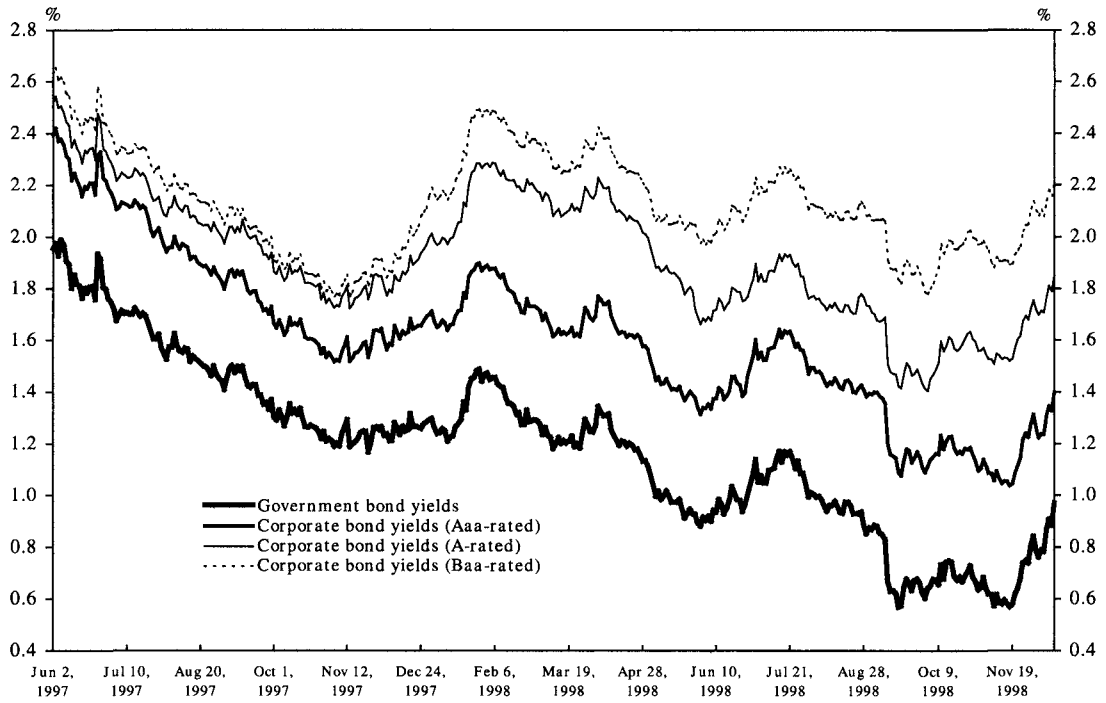
* Excludes deposit insurance and debenture issuance expenses.

Source: Bank of Japan, *Profits and Balance-sheet Developments of Japanese Banks in Fiscal 1997.*

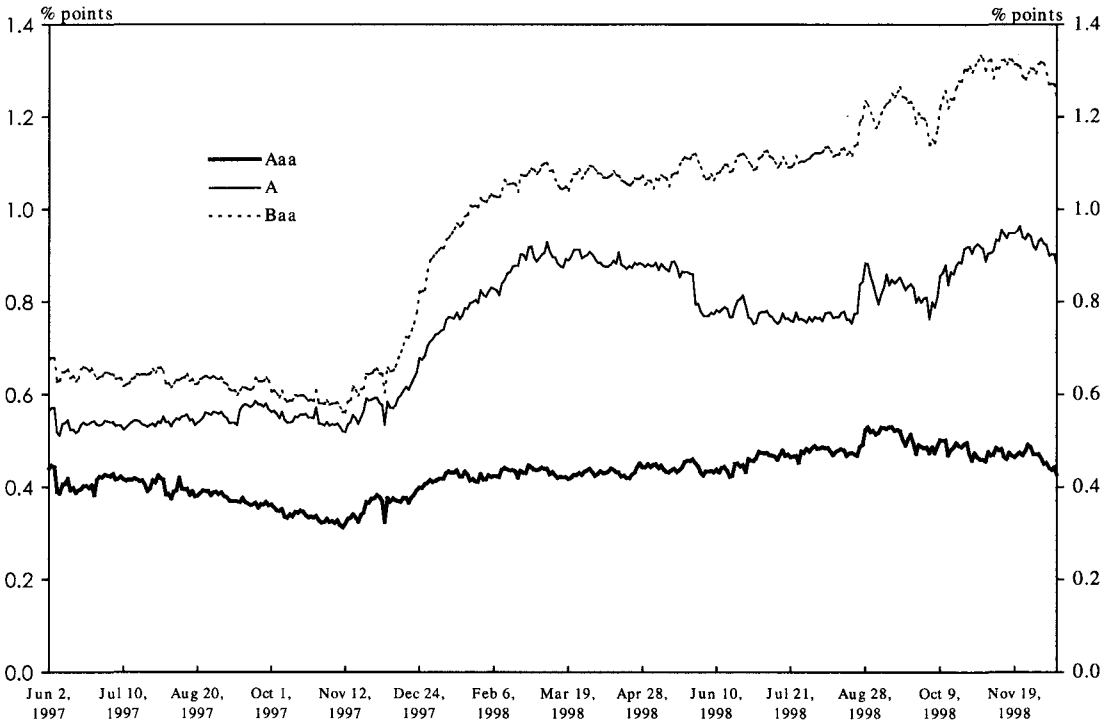
Graph 7

Corporate bond yields

(1) Yields of Government and corporate bonds by rating[1, 2]



(2) Yield spreads of public and corporate bonds



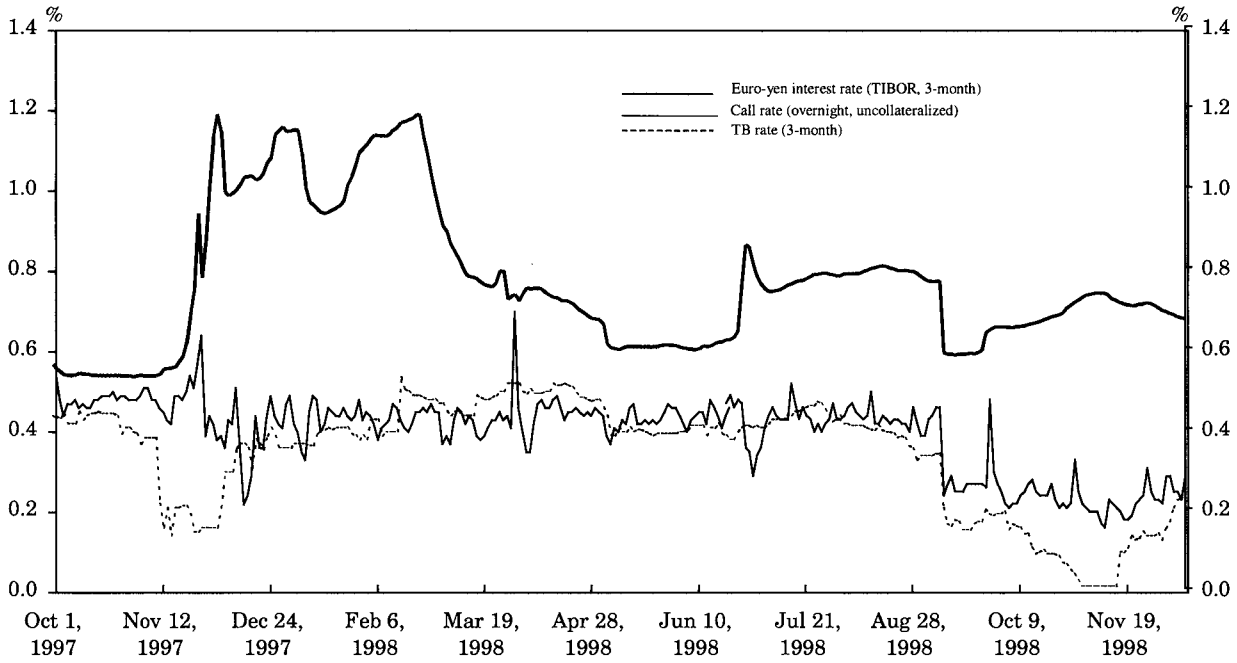
[1] Yields on bonds with 5-year maturity. [2] The indicated ratings are of Moody's Japan K. K.

Source: Securities Dealers Association of Japan, "Over-the-Counter Standard Bond Quotations".

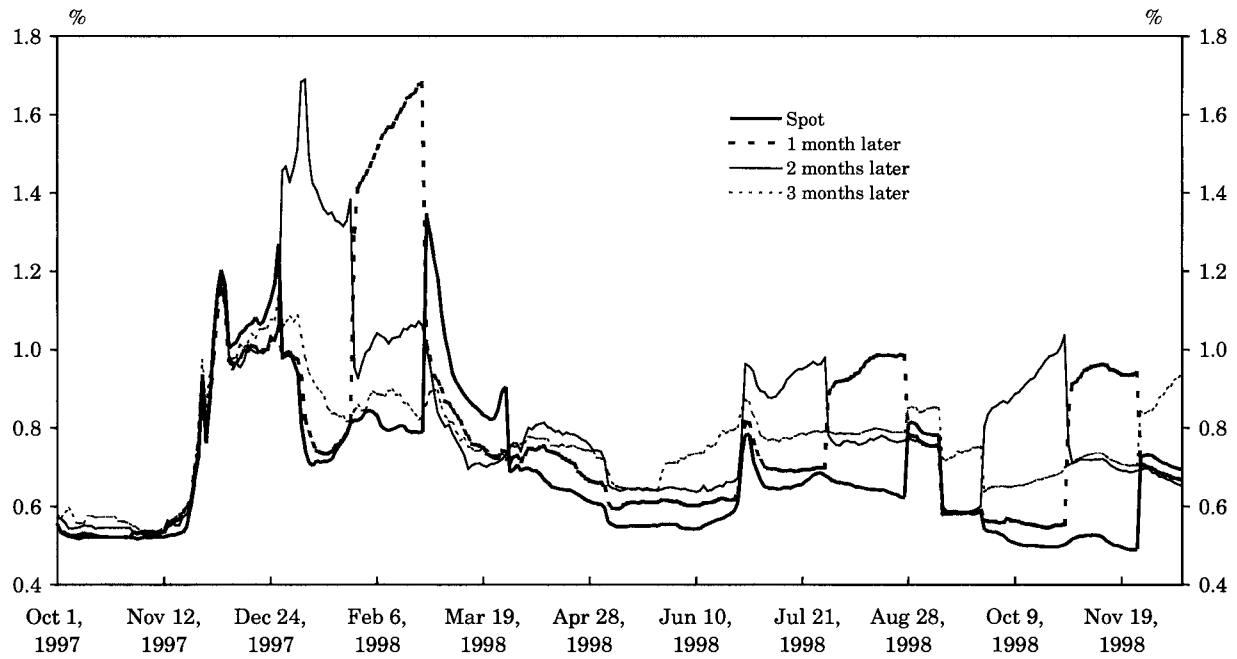
Graph 8

Short-term money market rates

(1) Interest rates on term instruments



(2) Implied forward rates*



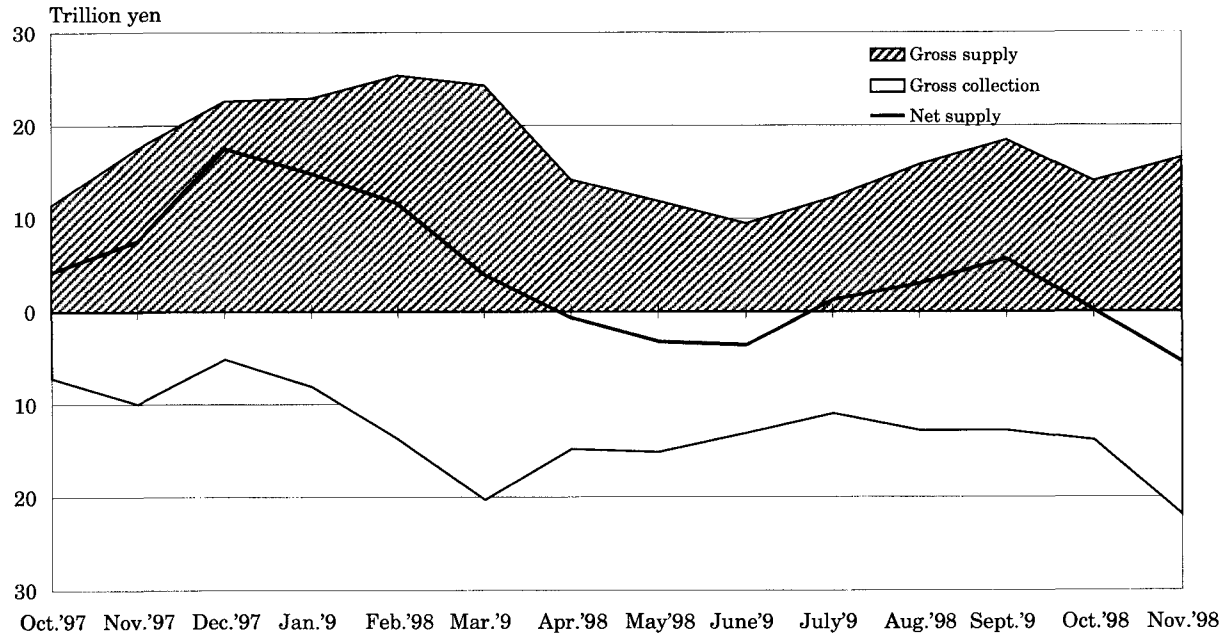
* 1-month forward rates calculated from euroyen interest rates.

Sources: Bank of Japan, "Economic Statistics Monthly" and The Nikkei Financial Daily.

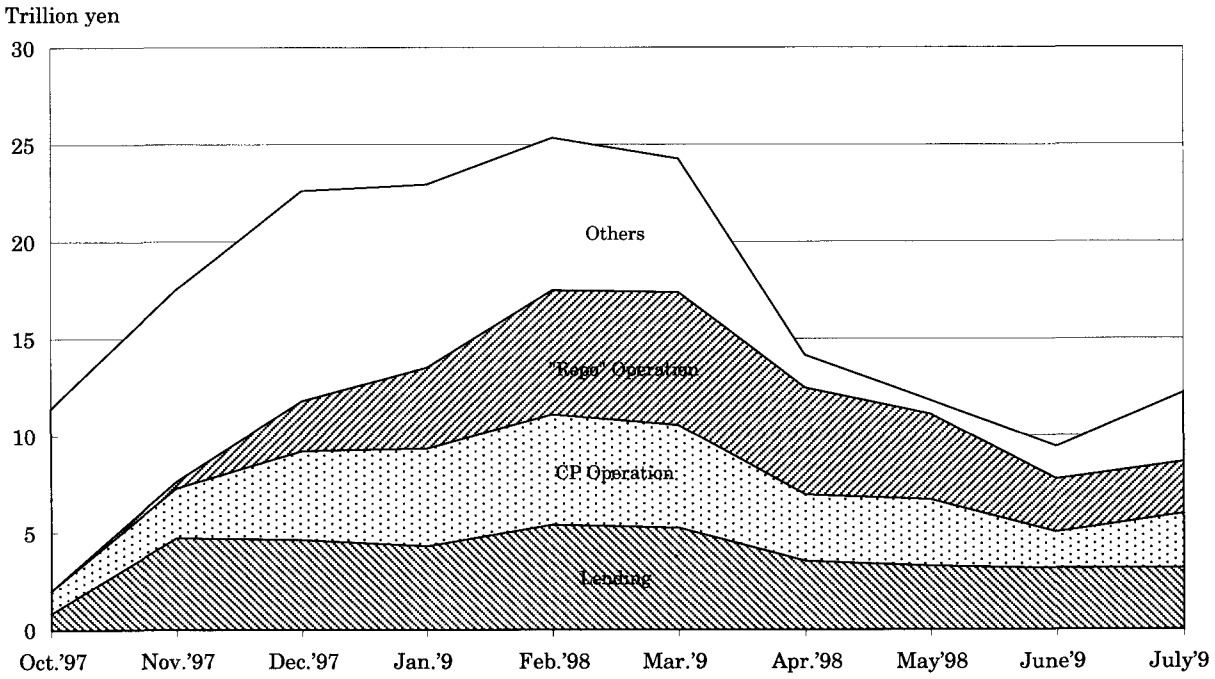
Graph 9

Supply of funds by the Bank of Japan

(1) Gross and net supply of funds



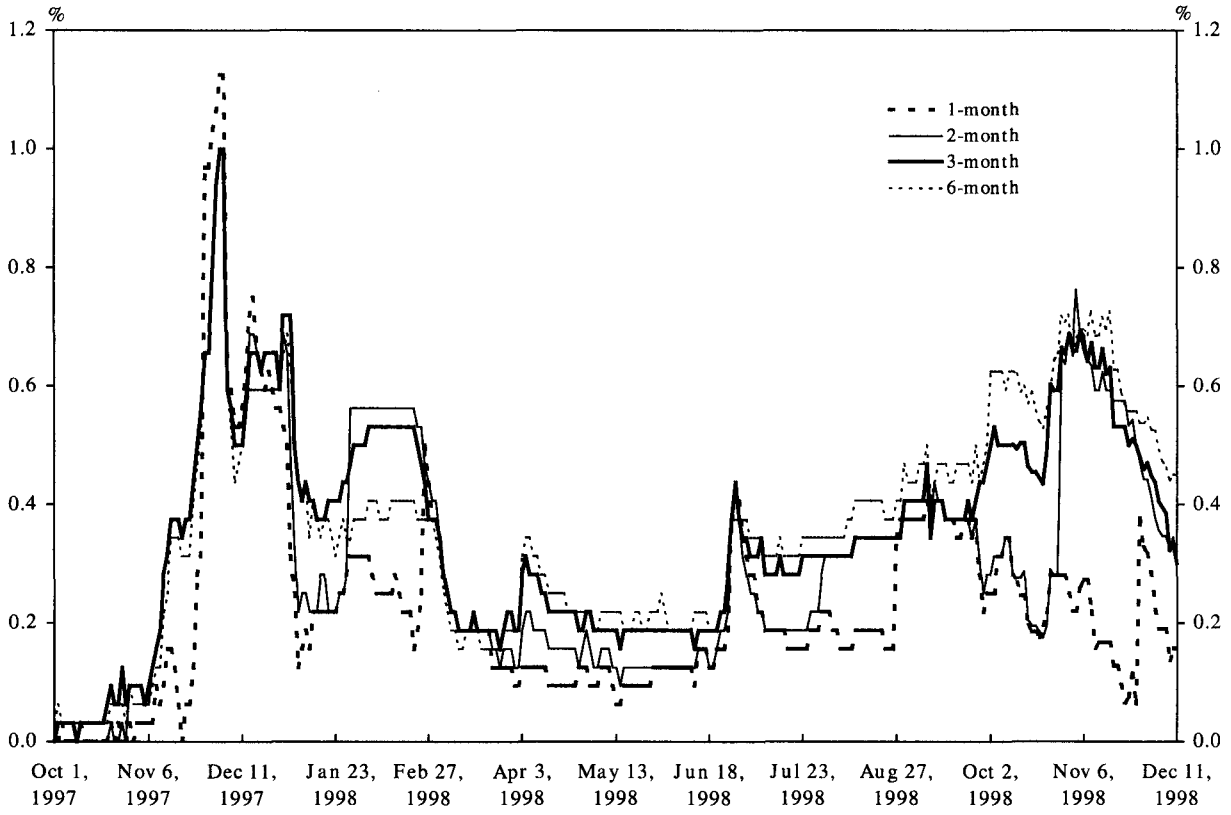
(2) Composition of gross supply of funds



Source: Bank of Japan, "Economic Statistics Monthly".

Graph 10

Japan premium in the eurodollar market

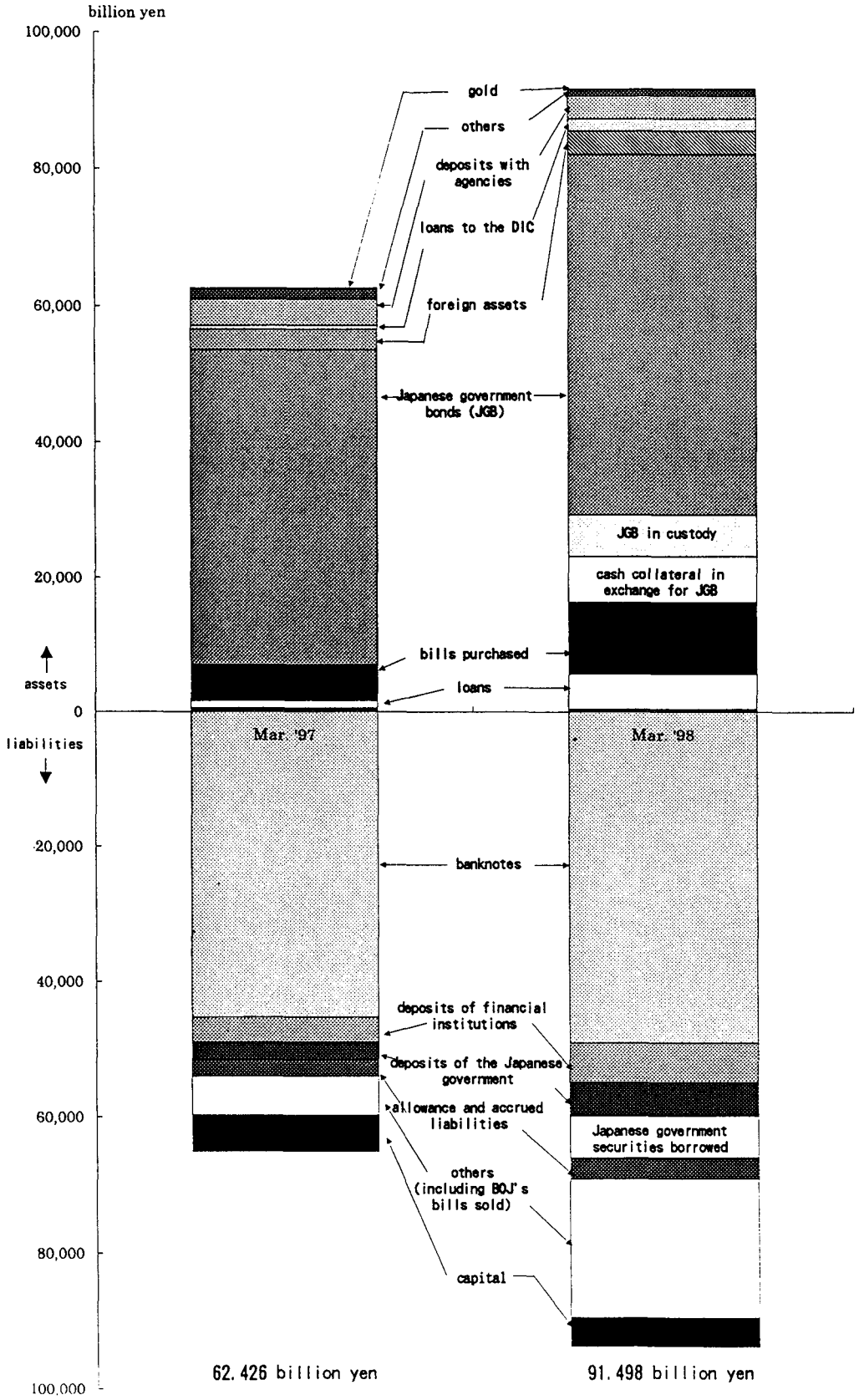


Note: The Japan premium is the extra expense Japanese banks must pay for raising funds in overseas financial markets. The premiums shown here are calculated as the interest rates quoted by Bank of Tokyo-Mitsubishi less those quoted by Barclays Bank in the eurodollar market (London).

Source: British Bankers' Association.

Graph 11

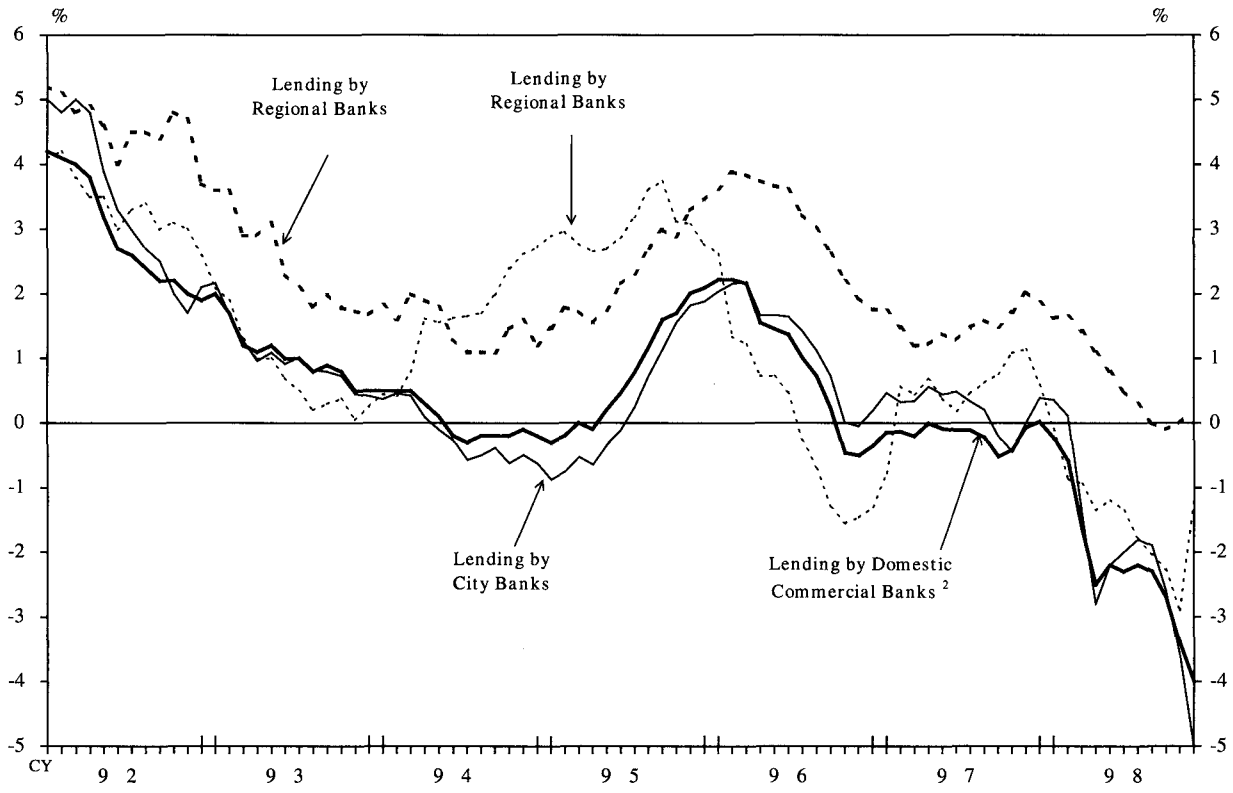
The balance sheet of the Bank of Japan



Source: Bank of Japan, *Financial Statements*.

Graph 12

Lending by domestic commercial banks[1]



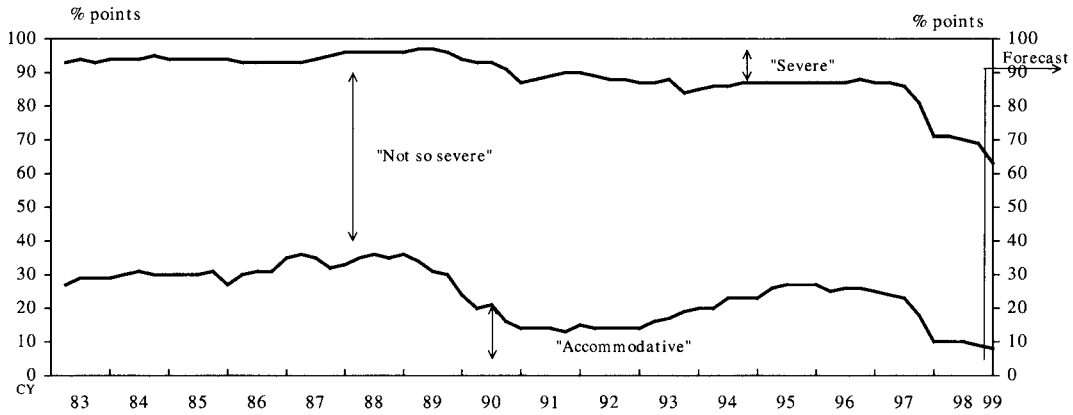
[1] Annual percentage changes in average amounts outstanding. [2] Domestic Commercial Banks refers to member banks of the Federation of Bankers Associations of Japan which consists of City Banks, Long-term Credit Banks, Trust Banks (excluding foreign-owned trust banks and trust banks that started business after October 1993), the member banks of the Regional Banks Association of Japan (Regional Banks) and the member banks of the Second Association of Regional Banks (Regional Banks II).

Source: Bank of Japan "Principal Figures of Financial Institutions".

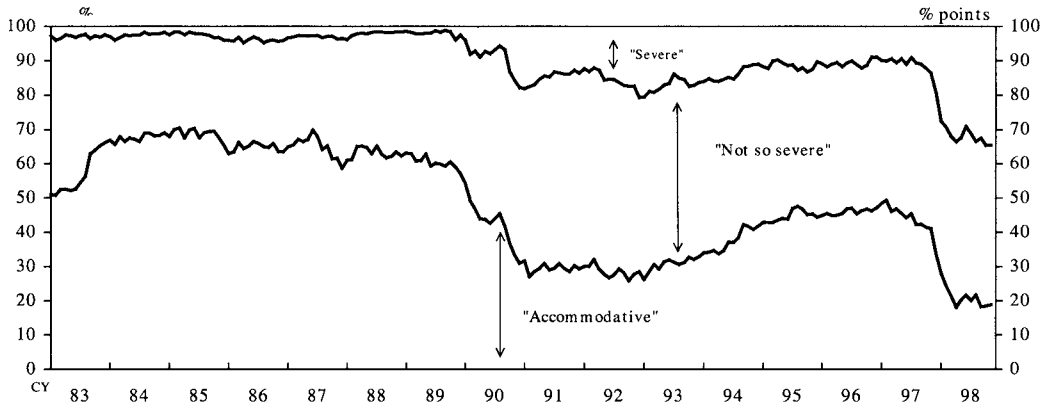
Graph 13

Lending attitude of financial institutions as perceived by small enterprises

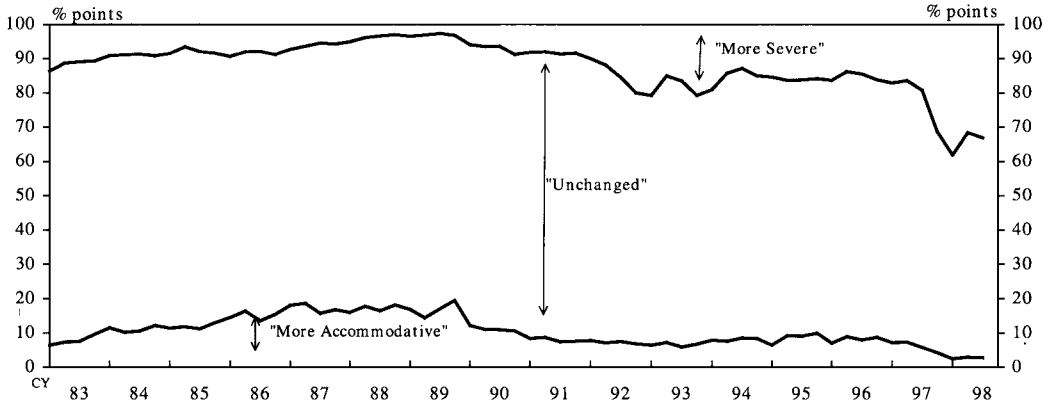
(1) "*Tankan* – Short-term Economic Survey of Enterprises in Japan" (December 1998)



(2) "Monthly Survey on Trends of Small Businesses" (Mid-November 1998)

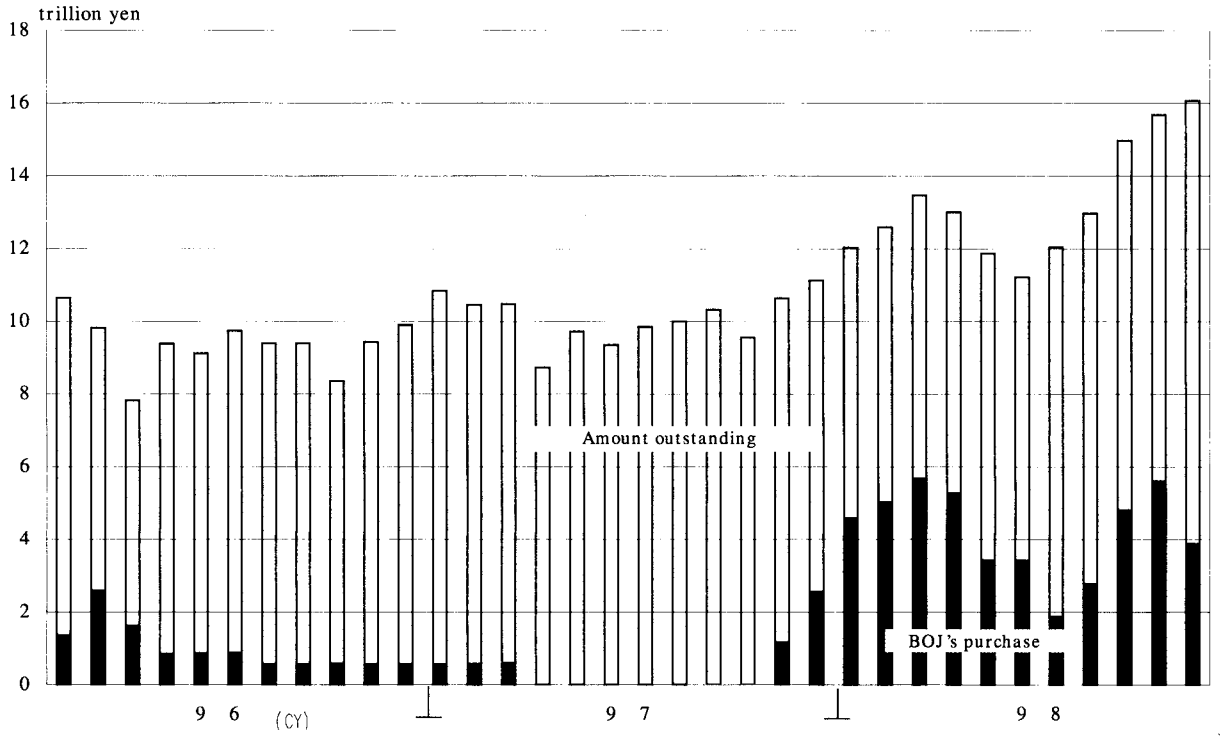


(3) "Quarterly Survey of Small Businesses in Japan" (Mid-September 1998)



Sources: Bank of Japan, (1); Japan Finance Corporation for Small Business, (2); and People's Finance Corporation, (3).

Graph 14
CP market



Source: Bank of Japan "Economic Statistics Monthly".

Table 1

Schedules of the "Japanese Big Bang"

Item of reform	1997 (Fiscal Year)	1998 (Fiscal Year)	1999 (Fiscal Year)	2000 (FY)	2001 (FY)
1. To diversify financial products and services					
• Assuring the validity of securities derivatives transactions	● introduction of trading of options on individual stocks (July)	⊙ authorisation of OTC trading of securities derivatives (Banking Law, Securities and Exchange Law)			
• Introduction of proprietary trading systems		⊙ defined as a securities business (Securities and Exchange Law)			
• Introduction of cash management account	● (October)				
• Introduction of investment companies and privately placed investment trusts		⊙ (Securities Investment Trust Law)			
• Authorisation for banks to lease office space to investment trust management companies for direct sale of investment trust certificates	● (December)				
• Authorisation for banks to sell investment trusts		⊙ (Securities and Exchange Law)			
• Authorisation for banks to sell insurance				Δ Long-term fire insurance and credit life insurance related to housing loans	
• Promoting securitisation of assets by use of asset-backed securities (ABS)		⊙ legislation for special purpose companies (SPCs) (September) (SPC Law)			
2. To improve the quality of intermediaries' services, to promote competition among them					
• Utilisation of holding companies	● bills to establish bank holding companies passed the Diet (December)	⊙ requirements for sound risk management of and within a group (Banking Law), downstream holding companies (Insurance Business Law)			
• Clarification of the range of subsidiaries of banks and insurance companies		⊙ clarification of the boundary of a financial group, requirements for sound risk management of and within a group (Banking Law, Insurance Business Law)			
• Abolition of license requirement for securities' companies (only registration will be required)		⊙ (Securities and Exchange Law)			
• Diversifying the business range of securities companies		⊙ abolishment of obligatory specialisation, introduction of rap accounts (Securities and Exchange Law)			
• Expansion of the business scope of separate subsidiaries (1) securities business / trust business	Δ all businesses excluding dealing in equities and joint money trust business (October)		⊙ abolish the remaining restrictions (by end-1999 FY) (Financial System Reform Law)		
(2) insurance business ⇔ banking business and other financial businesses		⊙ insurance → securities (Insurance Business Law)	⊙ insurance → banking (by end-1999 FY) (Insurance Business Law)	⊙ banking → insurance (by 2001) (Banking Law)	
• Liberalising issuance of ordinary bonds by ordinary banks			O (2nd half of 1999)		
• Liberalising brokerage commissions for stock trading		Δ liberalising commissions for transactions value over 50 million yen (April)	⊙ Complete liberalisation (by end-1999) (Securities and Exchange Law)		
• Authorisation of sub-contracting of fund-management businesses		⊙ (Securities Investment Trust Law, Law for Regulating Securities Investment Advisory Business)			
• Electronic money and electronic payment (clarifying legal uncertainties, eligibility for new entries, protection of individual users)			O (bill will be submitted to the 1999 Diet)		
• Diversifying borrowing instruments of non-bank financial firms		⊙ authorisation to issue bonds (Non-bank Bond Financing Law)			
• Abolishment of the compulsory use of rating organisation rates for non-life insurance		⊙ (July) (Law Concerning Non-life Insurance Rating Organisations)			

Item of reform	1997 (Fiscal Year)	1998 (Fiscal Year)	1999 (Fiscal Year)	2000 (FY)	2001 (FY)
3. To develop a market with further utility					
• authorisation of off-exchange transactions for listed securities		⊙ (Securities and Exchange Law)			
• promoting trades in OTC registered stocks	● introduction of stock lending (July), introduction of institutionalised stock lending (October)	⊙ (Securities and Exchange Law)			
• lifting the ban on transactions of unlisted or unregistered stocks by securities companies	● (July)	⊙ revision of deposit rates (Securities and Exchange Law)			
• originating the stock lending market		O implementation of sales practices rules (Stock-Exchange Rules, Japan Securities Association Rules)			
• real-time gross settlement (RTGS) on the BOJ-Net				O (by 2001)	
4. To establish a reliable framework and rule for fair and transparent transactions					
• revision of consolidated financial statements			⊙ (April) (Securities and Exchange Law)		
• establishment of accounting standards for financial instruments		⊙ public release of exposure draft on accounting standards for financial instruments	----------→	----------→	----------→
• strengthening fair trade rules of the Securities and Exchange Law	● strengthen penal regulations over insider transactions (December) (Securities and Exchange Law)	⊙ confiscation of unlawful profits (Securities and Exchange Law)			
• establishing a system to settle civil disputes in securities transactions		⊙ legislation of mediation system (Securities and Exchange Law)			
• introduction of Prompt Corrective Action		⊙ securities companies and insurance companies (Securities and Exchange Law, Insurance Business Law)			
• strengthening disclosure requirements		⊙ (Banking Law, Securities and Exchange Law)			
• assuring the legal validity of netting for derivatives contracts		⊙ (Netting Law)			
• protection of users of financial institutions	● sales practice rules for banks in selling investment trusts (December)	⊙ imposing banks the duty to explain to customers (Banking Law)	O (bill will be submitted to the 1999 Diet) (Consumer Credit Protection Law)		
• requirement of separate asset management for client assets by securities companies	● separate management of futures and option transactions (October)	⊙ (Securities and Exchange Law)			
• enhancing functions of the Securities Deposit Compensation Fund scheme		⊙ (Securities and Exchange Law)			
• establishment of the Policyholders Protection Corporation		⊙ (Insurance Business Law)			
• expansion of the definition of securities	● include trust certificates of loan assets as securities (June)	⊙ include DRs, covered warrants, ABS issued by SPCs as securities (Securities and Exchange Law)			
5. Review of taxation on Financial Transaction and Activities					
• abolition of securities transaction tax and exchange tax		⊙ reduction of tax rates (tax reform of 1998 FY)	O planned to be abolished concurrent with the reform of taxation on incomes from selling securities (by end-1999)		
• tax for stock options, holding companies, SPCs		⊙ exceptional treatment (tax reform of 1998 FY)			
• others (taxation on a total income basis, revision of the withholding tax system)				Study at the Government's Tax Commission	
		——————→	——————→	——————→	——————→
6. Financial Services Law		——————→	——————→	——————→	——————→

●: already carried out, ⊙: carried out from December 1998, O: planned to be carried out, Δ: partly (or partly planned to be) carried out.

Table 2

Recent cases of affiliation in the financial industry

Name of institution	Press release date	Contents
Yasuda Trust & Banking and Fuyo Group	November 1997	• Transfer businesses of 4 subsidiaries of Yasuda Trust & Banking to other Fuyo Group companies (Fuji Bank, Yasuda Fire & Marine, Yasuda Mutual Life).
Yamaichi Asset Management and Société Générale Asset Management	January 1998	• Société Générale acquired 85% of Yamaichi Asset Management's stocks (the new company's name is SG-Yamaichi Asset Management).
Chuo Trust & Banking and Hokkaido Takushoku Bank	February 1998	• Chuo Trust & Banking will succeed Hokakaido Takushoku Bank's Honshu branches in the last half of 1998.
Merill Lynch and Yamaichi Securities	February 1998	• Merill Lynch succeeds branches and employees of Yamaichi Securities to establish a securities subsidiary in Japan (Merill Lynch Japan Securities).
Toho Mutual Life and GE Financial Assurance	February 1998	• Establish a joint insurance company (GE Capital Edison Life Insurance). • Toho Mutual Life will only deal with maintaining existing contracts.
Sanwa Bank and Yamaichi Investment Trust Management	February 1998	• Sanwa Bank acquired 49.3% of the stocks of Yamaichi Investment Trust Management's stocks to strengthen mutual fund businesses (the new company's name is Partners Asset Management).
Nikko Securities and Salomon Smith Barney	March 1998	• Establish two joint ventures to provide wrap services (the companies' names are Global Wrap Consulting Group, Global Wrap Services).
Sanyo Investment Advisers and Fiduciary Trust Company International	March 1998	• Fiduciary Trust Company International purchased all of Sanyo Investment Management Adviser's stocks to conduct business in Japan (the new company's name is Fiduciary Trust International Investment Advisers).
Meiji Mutual Life and Dresner Bank	March 1998	• Merge investment adviser companies in Japan, be affiliated to strengthen mutual fund businesses, etc.
Orix (consumer loan) and Yamaichi Trust & Banking	March 1998	• Orix purchased all of Yamaichi Trust & Banking's stocks from Yamaichi Securities. • This becomes the first 100% subsidiary bank of a commercial firm.
Industrial Bank of Japan and Nomura Securities	May 1998	• Establish two joint ventures to provide new financial services such as derivatives and total asset management (the companies' names are IBJ Nomura Financial Products, Nomura IBJ Investment Services).
Chuo Trust & Banking and HSBC Group	May 1998	• Cooperate in areas of asset management, mutual funds and new product developments.
Fuji Bank, Yasuda Trust & Banking, Yasuda Fire & Marine, Yasuda Mutual Insurance	June 1998	• Establish a joint investment trust management company.
Mitsui Trust & Banking and Prudential Insurance Company of America	July 1998	• Establish a joint investment trust management company named Prudential Mitsui Trust Investment Management by autumn 1998.
Sumitomo Bank and Daiwa Securities	July 1998	• Daiwa Securities will transform into a holding company which holds subsidiaries specialising in retail business, wholesale business, derivative business, asset management business, etc. Sumitomo Bank will purchase newly issued stocks of Daiwa's subsidiaries relating to investment banking.
Lake (consumer loan) and GE Capital	July 1998	• Lake will transfer its business license to GE Capital Consumer Loan in November.
Tokyo Mitsubishi Bank, Mitsubishi Trust & Banking, Meiji Mutual Life, Tokyo Marine and Fire	September 1998	• Establish joint ventures in investment trust fields by the end of 1998, and develop joint customer management systems related to the "Japanese 401K Plan", etc. • A joint company evaluating investment trusts will be established on 25th December 1998 (the name of the newly established company will be Mitsubishi Asset Brains).
Sumitomo Mutual Life and Taiheiyo Securities	September 1998	• Sumitomo Mutual Life Group will acquire more than 50% of Taiheiyo Investment Trust Management's stocks to strengthen mutual fund businesses and investment advisor businesses, etc.
Tokai Bank and Asahi Bank	September 1998	• Merge outlets and ATMs, reorganise overseas operations, raise cross-shareholdings, etc. • Establish a multi-regional holding company after non-performing assets are written off.
Daiichi Kangyo Bank and JP Morgan	October 1998	• Establish a joint investment trust company by the end of 1998.
Sumitomo Bank, Daiwa Securities and Sumitomo Trust Bank	October 1998	• Sumitomo Trust Bank will join the affiliation relationship between Sumitomo Bank and Daiwa Securities.
Investment Bank of Japan and Daiichi Mutual Life	October 1998	• Strengthen capital relationships. • Merge investment advisor subsidiaries. • Cooperate in developing new financial products.

Table 2 (cont.)

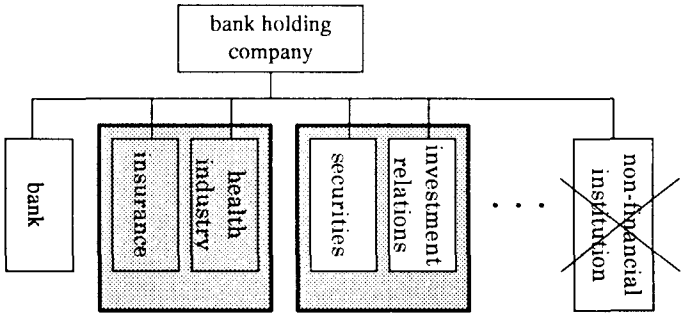
Name of institution	Press release date	Contents
Daiwa Securities and 4 Sumitomo Financial Group Companies	November 1998	• Establish a joint securities company specialising in electronic finance (i.e. intermediating securities and investment trusts transactions through the internet) with a US financial holding company (DLJ).
Fuji Bank and Daiichi Kangyo Bank	November 1998	• Merge trust bank subsidiaries (the name of the newly established bank will be Daiichi Kangyo Fuji Trust Bank). • Wholesale trust operations (i.e. corporate pension fund related businesses, fund management businesses) of Yasuda Trust Bank will be transferred to Daiichi Kangyo Fuji Trust Bank.
Nihon Mutual Life and Deutsche Bank	November 1998	• Establish a joint investment advisory company in London (the name of the newly established company will be Nissei Deutsche Asset Management Europe). • Develop new investment trust products together and sell them at Nihon Mutual Life's counters. • Nihon Mutual Life's affiliated investment trust company will provide investment trusts to Deutsche Bank to sell in Europe. • Cooperate in private banking business.
Daihyaku Mutual Life and Manulife Financial	November 1998	• Establish a joint life insurance subsidiary by the end of 1998 and transfer new life insurance policies of Daihyaku Mutual Life to the new subsidiary.

Graph 15

The range of businesses of a banking group

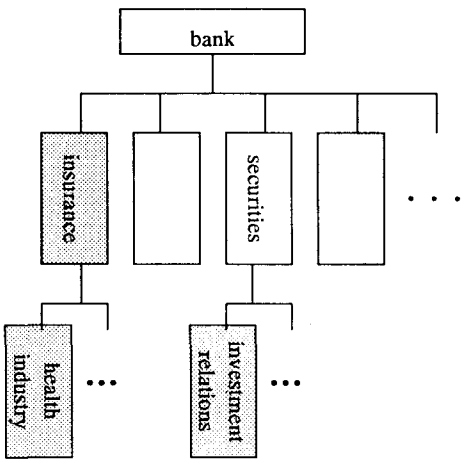
□ indicates the business scope newly permitted under the Financial System Reform Law (implmented from December 1998).

① bank holding company groups



• Bank holding companies can hold companies that operate businesses related to securities or insurance companies only when it holds a securities or insurance company as its subsidiary.

② banking group with the bank on top



• Banks can hold companies that operate businesses related to securities or insurance companies under its securities subsidiary or insurance subsidiary.

Bank restructuring and financial stability in the United States

Lawrence J. Radecki[1]

1. Introduction

The US banking sector is consolidating at a rapid pace. After peaking just under 14,500 in the early 1980s, the number of domestic commercial banks declined to 9,216 by the end of 1997. In 1997 alone, these institutions decreased in number by 359 (4%), capping a period going back to 1992 in which the number of US banks fell by almost 2,300 (20%). At the same time, commercial banking is becoming more concentrated at the national level: the fifty largest bank holding companies held 66% of total domestic commercial banking assets in 1997, compared with 48% in 1987. Alternatively, the largest 1% of banking institutions (about 170 in number) held just over three-quarters of total deposits, up from almost exactly one half held in 1984 (by about 300 in number).

But consolidation is only part of a more comprehensive restructuring. Besides merging with one another, banks are diversifying their loan portfolios, expanding over county and state lines to match their natural market areas, eliminating duplicate charters and taking business away from poor performers. Larger banks are also acquiring capabilities in investment banking, retail brokerage, mutual funds and insurance in order to expand their product lines and become "financial supermarkets". Along with these changes, banks are making many internal improvements. They are revamping their operations by adopting new technology, reorganizing by line of business and creating more centrally managed and operated firms.

The main purpose of this paper is to describe and analyze the consolidation and restructuring of the US banking sector and to demonstrate the effects. In the first half of the paper, we briefly review the fundamental forces prompting the actions being taken by banks and undertake a more detailed examination of both the near-term and long-run objectives of restructuring. We then focus on the considerations underlying some of the giant mergers that transpired in 1998. Of special importance are the business areas that leading banks point to as presenting the best growth opportunities; they suggest the future shape of the banking sector.

In the second half of the paper, we turn to the multiple effects that consolidation has on the banking sector and consider its potential impact on financial stability. It appears that consolidation has already led to an expansion of the geographical reach of markets for retail banking services, which puts banks in a more competitive environment. By restructuring and revamping operations, banks also intend to solidify and expand their position in the payments business. The size and prospective growth of payment-driven revenue imply that bank profitability should become more stable. But they also suggest indirectly that maintenance of the smooth operation of clearing and settlement systems, upon which financial markets depend, is an increasingly important goal of bank supervision and the safety net. Finally, bank consolidation and restructuring are likely to expand, rather than diminish, the role of institutional investors in the financial system.

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[1] Research and Markets Analysis Group, Federal Reserve Bank of New York. The views expressed are those of the author and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

2. Fundamental factors at work

The US banking sector has been consolidating and restructuring for at least fifteen years, a process that has been under constant examination. In evaluating the forces driving the process, most analysts do not assign a single fundamental cause but a combination of factors. In keeping with this view, we compile a list of multiple forces that are propelling consolidation and restructuring. Our list resembles prior ones but differs slightly due to incorporation of more recent developments.

Deregulation. Restrictions on bank products, interest rates and branch office location, which shielded the sector from all-out competition, have been loosened. First, protection of product markets was taken away. During the 1970s and 1980s, lawmakers removed interest rate ceilings on home mortgages, credit cards, household checking and savings accounts and small-denomination time deposits. Second, protection of geographic markets ended. From 1985 on, all restrictions on the geographic operations of banking organizations and branch locations have been steadily eliminated. And third, a combination of new legislation, judicial rulings and regulatory decisions extended the range of permissible activities, allowing banks to expand beyond traditional services. For example, banks can now manage mutual funds as well as distribute them to their own customers.

Shifts in the demand for financial services. As early as 1970, the largest and most creditworthy corporate borrowers began to switch from banks to the commercial paper market, the bond market and non-bank financial intermediaries. Since then progressively smaller firms have gained access to the securities markets. As of 1970, US banks held a 76% share of the short-term business credit provided by financial intermediaries and the commercial paper market; by 1997, this share had fallen to 51%. Over the past twenty years, the personal sector's demand for bank deposits has undergone a similar decline. Deposits were a growing category of household wealth through the mid-1970s, reaching 39% in 1978. Currently, deposits have fallen to 14%. Reflecting the shift in investment patterns, mutual fund assets now exceed commercial bank assets. Ironically, the pronounced decline in deposits occurred after the deregulation of rates paid to account holders, an action that should have sustained their demand. The sharp drop in the personal sector's use of deposits appears to be linked to changes in public attitudes, employer practices and government policies regarding pension plans and retirement income.

Advances in computers and communication equipment. Technological improvements have opened up new ways to both produce and distribute financial services. For example, cheaper computing power helped the emergence of liquid markets in complex over-the-counter derivative products and asset-backed securities. And the introduction of centralized call centers for customer sales and service transformed the distribution of no-load mutual funds.

Financial innovation. The services available to household and business customers have multiplied in recent years. Derivative contracts and non-standard mortgage products are just two new instruments changing the finances of businesses and households.

This list is only one way to organize the primary influences acting upon the banking sector. Unavoidably, the factors we identify are not completely distinct from one another and there is redundancy. For instance, a successful innovation – the introduction of money market mutual funds – prompted the removal of deposit interest rate ceilings, a binding regulation. As a consequence of overlap, it is possible to take the items appearing in our list, divide them more finely and recombine the elements into a new list of factors that looks different from our list.[2] Our list could also be revised because what we have identified as underlying influences are actually proximate causes and more fundamental forces are at work. We classified the shift in the demand for financial services as a fundamental force, but one might argue that it is actually a proximate cause because the shift away from banks can be traced back to regulatory burden, a more basic cause.

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[2] Many economists, consultants and bank analysts have compiled lists of the key factors bringing about change in the banking sector. See, for example, Freedman and Goodlet (1998) and Berger, Kashyap and Scalise (1995).

3. Objectives of restructuring

To appreciate the trends in banking, it may be more productive to identify the objectives of consolidation and restructuring than to dwell on their fundamental causes. To this end, we have compiled a list of purposes and goals of mergers. The list gets lengthy because several fundamentals have changed and banks are addressing many competitive problems simultaneously. It should be expected, however, that any particular transaction is motivated, not by a single goal, but by a combination of the objectives listed below and that these objectives do not figure equally in every merger or acquisition. Some goals are more applicable to the fifty largest banking companies, which hold 60% of aggregate bank assets and 56% of aggregate deposits (1998, second quarter) and less applicable to small community banks.

Geographic diversification. Diversifying the loan portfolio and customer base is a clear goal of out-of-market acquisitions made by medium-sized banks. Seeking diversification are banks with $5 to 25 billion of assets and whose operations are concentrated in areas radiating roughly 100 miles from their headquarters. Usually these banks are expanding from their home bases by entering neighboring states. While many banks of this size and geographic scope are aiming for better diversification, the marginal benefit of entering an additional state is probably small for the largest banks.

Cost cutting and near-term efficiency gains. Attacking a high cost structure may be the single most important factor motivating restructuring. Bankers feel that they are at a distinct cost disadvantage relative to mutual funds, discount brokerages and specialist intermediaries such as a monoline credit card issuer. Cost considerations are greatest in the distribution system and in payment services. Banks incur heavy non-interest expenses by operating a branch network, the primary delivery mechanism for retail depository services.[3] They use mergers in conjunction with the revamping of operations and internal reorganization to improve efficiency. Cost reductions and efficiency gains are achieved in several ways:

- *Rationalizing excess capacity.* In-market mergers make it easier to wring out excess capacity created by declining demand for traditional lending and depository services. While cutbacks can be made individually, it is more efficient to shed capacity in tandem with competitors. By shrinking after combining, banks can coordinate their efforts to reduce capacity in overlapping operations and thereby recover more of their "sunk" costs. For example, two banks together have more flexibility in pruning underutilized branch offices than they do separately. In addition, it is possible to operate a combined credit card division through the facility of one of the merged banks and close the other's facility. An individual bank, however, may experience little cost recovery from reducing the size of a credit card facility originally designed for a larger customer base.
- *Eliminating duplicate charters within a holding company.* While this is an obvious source of cost savings, we infer that the efficiency gain is relatively small. Some banking organizations have not been aggressively correcting this inefficiency stemming from prior interstate banking and intrastate branching restrictions.
- *Forming critical mass in geographic areas.* Contrary to the goal of geographical diversification, several large retail banks profess a strategy of concentrating their regional presence – in other words, striving for economies of density. Bankers say they execute in-market mergers (also called fill-in acquisitions when they are small) to build a significant market share (at least 20%, when measured by deposits) in every major city, region or state covered by their branch network. As well as bringing in a number of intangible benefits, regional concentration enhances name recognition, maximizes the effect of advertising and helps a bank capture a disproportionate share of the new business in an area. Creating monopoly power in local markets, however, does not appear to be a goal since many large banks set retail deposit and loan rates uniformly throughout a state. (Competition in retail banking markets is discussed later.)

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[3] Measured as a percentage of deposits, industry sources typically estimate the all-in non-interest cost of producing and distributing depository and payment services through a branch office to be on the order of 250 basis points; by comparison, the expense ratio of a typical money market mutual fund is less than 50 basis points.

- *Realizing economies of scale in retail banking.* Banks are attempting to close branch offices and convert to electronic delivery of their services, but they are duplicating their efforts to update their software, build call centers and develop electronic banking and brokerage services. Acquiring banks can spread the costs of lumpy investments across a larger depositor base.[4] Some banks claim that spending on technology adds 15% to their total non-interest expense. (Every bank has its own method for allocating expenses to the category "technology.") In addition, there is great uncertainty over which products and delivery mechanisms currently in the planning, testing or early stages of implementation will eventually turn out to be cost-effective and meet customer acceptance. Mergers are a way of sharing these high risks and costs.

- *Replacing poor management.* Because management quality is not readily measurable, it is difficult to provide quantitative evidence that mergers are the mechanism for effective managers to extend their reach. But a recent buyer of a large thrift institution remarked that its cost of processing an application for a residential mortgage was less than half the cost at its acquisition.[5]

Despite the claims of merger participants and bank equity analysts, most econometric studies cannot identify either efficiency gains following a merger or substantial economies of scale for a commercial bank whose total assets exceed $1 billion. At best, researchers uncover mixed empirical evidence of cost savings from in-market mergers of large banks. One does not know whether to discount these studies because they are plagued by erroneous data or by poorly defined measures of output and expenses. Since it is tricky to allocate the costs of shared resources among divisions of a bank, efficiency could be mismeasured. Improvements in the sector's efficiency ratios suggest that mergers do yield meaningful cost savings. Consultants also maintain that they can identify savings because their client banks provide them with better data than what are made available to outside analysts and economists.

Strategic positioning for long-run benefits. Besides becoming more efficient business firms in the near term, the largest banks are taking steps to position themselves in a changing marketplace for financial services:

- *Developing a national brand name.* With very few exceptions, the public does not recognize the names of the largest US banks. A brand name allows a bank to form a larger or more focussed customer base, from which it could better profit from the introduction of new products or innovations in its distribution channels.

- *Creating financial supermarkets.* Banks are expanding into investment banking, retail brokerage, mutual funds and insurance in order to offer retail and middle-market business customers "one-stop shopping" for financial services. Large corporate and institutional customers, however, do not seem attracted to the idea.

- *Expand payments services.* Banks' business customers have expressed interest in electronic formats for household-to-business and business-to-business payments. With respect to their retail customers, business firms can reduce overhead costs if banks make the monthly billing and payment cycle electronic from end to end. Similarly, with respect to both their suppliers and distributors, firms can streamline their accounting and inventory procedures if banks make payment and remittance processing entirely electronic. The Internet, which may be used for recurring bills, corporate purchasing cards and electronic data exchange (EDI) is also an area that looks very promising, although no one knows for sure which new services or devices will be successful.

- *Creating the scale needed to compete in global wholesale markets.* Greater size gives a securities dealer the capacity to place large volumes of new issues with institutional investors quickly and with

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[4] A common thread running through several large mergers is the fact that an acquired bank decided that it did not have the resources to make the technology investments necessary to remain competitive. Some acquired banks said explicitly that they had urgently needed to upgrade their hardware, software and electronic banking facilities, whereas their merger partner had already done so.

[5] It is sometimes also said that a merger permits cost-conscious management to take extraordinary steps, such as reducing the workforce. Only in the context of a merger are cost-cutting actions not harmful to staff morale and productivity.

less risk to itself. And placement power gives a larger dealer an edge in bidding for underwriting business. Conversely, the ability to offer more new issues helps a larger firm compete more effectively for the brokerage accounts of institutional investors. Underwriting and brokering thus complement one another. In addition, bigger underwriting and brokerage businesses can sustain a higher-volume trading floor.

This long list of objectives shows that banks are moving in several directions at once to achieve both near-term gains and long-run goals. Some industry analysts, however, doubt that these are the true aims of restructuring. Their qualms reflect skepticism of the need for restructuring, a view that is not entirely implausible considering the recent good health and profitability of the banking sector and the failure of researchers to confirm cost savings. Some analysts argue that the creation of increasingly larger banks through consolidation is motivated by monopoly power in individual product or geographic markets, "empire building" on the part of management or taking advantage of the safety net by getting "too big to fail".

One cannot readily evaluate these alternative explanations for mergers and they are almost impossible to confirm or to dismiss entirely. As identified earlier, however, there are several tangible factors that are clearly impacting the banking sector and they call for a sweeping response. It seems plausible that these factors are the principal drivers of restructuring rather than management acting entirely in its own interest, exploiting subsidized deposit insurance or amassing market power. Consequently, we believe that geographical diversification, efficiencies and strategic repositioning are banks' primary aims, although there is room for secondary considerations, such as a desire to build a financial services empire.

4. Directions the banking sector is taking

In the US banking industry, several mergers of unprecedented size have transpired during the past year, although some have not yet been finalized. In terms of total assets, the largest of these transactions created Citigroup from Citicorp and Travelers Group. In terms of domestic deposits, the largest combination is BankAmerica and Nations Bank, which created a company that holds 8.1% of total domestic deposits; the next largest, Banc One, holds 3.8%.

Public discussions and commentary illustrate the considerations underlying giant mergers. To a large degree, some conventional considerations motivate the moves. For example, the transactions allow the transfer of the acquiring bank's superior technology, service and sales skills and distribution systems to the acquired bank's franchise. In addition, management expects to quickly realize cost savings primarily in retail banking, but also in wholesale banking and, to a lesser extent, corporate overhead. Such savings are anticipated to amount to about 10% of combined expenses. The major sources of these cost savings are staff reductions, the closing of redundant facilities and lower expenses for software development.

Although the near-term gains have been discussed and commented on in detail, greater emphasis is placed on long-run considerations. The management teams identify several strategic benefits:

- The new bank will have the scale to spread out the costs and risks of developing and deploying new products and distribution channels.
- The new bank will cultivate a national brand name.
- The new bank will make available a full line of financial services for households, small businesses and middle-market firms.
- In the cities and states in which it operates, the new bank will hold a significant market share.

These considerations are included in our list of the objectives from consolidation and restructuring.

4.1 Growth areas

In public discussions and commentaries, the management teams identify and appraise the business areas presenting the best growth opportunities. These discussions reveal what major participants in the consolidation process see as the future course of the financial services industry in the United States. Although opinions differ, management frequently agrees on three areas that present the best opportunities: asset management, payment services and middle-market banking.

Asset management. Personal finances have become much more complicated as the average American household is now responsible for securing much more of its retirement income. Thirty years ago, traditional pensions and the Social Security program provided the bulk of a household's retirement income; thus a life insurance policy and some deposit accounts were the only financial services it needed. Today, however, the traditional defined-benefit pension plan, funded and managed by one's employer, is being replaced by self-directed retirement plans, which require detailed records, are subject to confusing tax treatments and often need to be restructured at the time of a job change. The average household now has a pressing demand for portfolio management, brokerage services, tax advice, retirement planning and recordkeeping. In this setting, a bank that can provide a full array of reasonably priced products – offering one-stop shopping for financial services – becomes increasingly attractive. In preparation for this transition, banks have upgraded their computer systems in order to create a complete profile of a customer. A sophisticated information system makes it possible for banks to offer advice, recordkeeping and comprehensive statements of an individual's net worth, investment performance and budget. As an alternative to consolidating most or all of its financial activities, a household could use multiple banks, brokerage firms, insurance companies and mutual funds. It could then hire a financial planner for personalized help, but this is a more costly approach.

Middle-market firms. The banking needs of medium-sized business firms – those with annual sales of $10 to 250 million – have also grown more complex. First, they must manage foreign exchange risk more carefully since they import and export larger shares of their inputs and outputs. Second, these firms have more choices when obtaining funds: loan, debt or equity; public issuance or private-placement; and domestic or overseas financing sources. Third, they more often require advice and financing as they engage in mergers, acquisitions and divestitures. To meet the needs of middle-market firms, a leading bank will offer securities underwriting, risk management and merger advice as well as credit, depository, payment and trust services. These firms may be highly receptive to one-stop shopping in order to reduce search costs and be assured of fair treatment from a financial intermediary or a trading partner that has superior information. By consolidating its financial business, a firm encourages its bank to base its decisions on the long-run value of their relationship and to not take advantage of the firm in any isolated transaction.

Payment services. Acquiring banks show considerable interest in the payments business. In the short run, they will internalize a higher proportion of customer transactions (making them "on-us" credits or debits), which confers advantages in terms of cost, time, funding, credit certainty and data mining. In the long run, however, the banks hope to convert most household-to-business and business-to-business payments to a convenient electronic format. By expanding their electronic payment services, banks are not only pursuing a profitable opportunity, but also executing a defensive stratagem: they are guarding their customer base from attack by "technology" firms. Banks want to avoid the fate foreshadowed by their arrangements with money market mutual funds, in which a bank supplies payment services but the organizer of the mutual fund becomes the primary contact for the customer.

Based on their best prospects for growth, we can develop a sketch of how the largest banking organizations will look. To household and small business customers, they will sell a wide range of services nationwide under a recognized brand. A full-line bank, however, may only produce some services in-house; many, even most, of the services a bank distributes to its customers may be produced by specialist firms.[6]

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[6] Other analysts argue that economies of scope in both the production and consumption of financial services are diminishing. They expect banking and the financial services industry to become more fragmented as financial intermediaries focus on well-defined specialties.

Among their business customers, most of the largest banks will concentrate on middle-market firms. If search costs and fair treatment induce a firm to cultivate a longstanding relationship, significant economies of scope underlie the consumption of financial services by a middle-market firm. In contrast, leading banks may seek large corporate and institutional customers only for selected services. Because large corporations engage in sizable transactions and can draw on considerable resources, they may always shop around to find the low-cost or high-quality specialists in equity or debt underwriting, risk management or merger and acquisition advice and financing. In other words, the economies of scope in the consumption of financial services are much weaker in the large corporate sector.

For both retail and wholesale customers, a leading bank will perform traditional payment services, including cash management, merchant processing and corporate trust, as well as support electronic payments. For individuals, the attraction of electronic payments is convenience and flexibility; for business firms, the benefits are reduced paperwork and overhead expenses.

4.2 Implications

The vision of a leading bank described above implies an even greater role for institutional investors and the securities markets in the US financial system. By familiarizing their customers with investment products, banks will further discourage the use of deposits while promoting direct holdings of securities in a brokerage account or indirect holdings through retirement plans, mutual funds or other collective investment vehicles. In addition, banks will make security issuance more widely available to middle-market business firms through their investment banking departments.

This plan for the future also indicates greater relative importance for banks as providers of payment services. At the retail level, leading banks will try to enlarge their role in both household-to-business payments and in business-to-business payments. At the wholesale level, greater securities issuance will mean more institutional and corporate trust business and larger daily flows of cash and securities generated by trading. (The current size of the payments business will be discussed later.) Greater issuance will also mean diminishing importance for a bank as deposit-taker and monitor of loans.

5. Expanding geographic markets

Our attention will now shift from the goals of consolidation and restructuring to their effects; in particular, we will look at the impact on competition in the banking sector. The longstanding view among policymakers and economists is that, since households and small business firms rely on nearby depository institutions, competition in retail banking takes place in very local markets.[7] Moreover, banks are thought to design their services and set their loan and deposit rates in response to demand and supply conditions prevailing in these small and confined markets. In keeping with this view, the effects of bank mergers on competition are assessed by examining the degree to which deposits in a particular city, county or metropolitan area are concentrated in a few large banks.[8]

We believe, however, that restructuring is making traditional definitions of retail banking markets obsolete.[9] First, geographic restraints on expansion have been removed. Although branch locations were heavily restricted in most states as late as 1985, banks are now essentially free to establish branches nationwide. Geographic deregulation has led to considerable growth in branch office networks and to substantial overlap in service areas.

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[7] It is recognized, however, that certain products, such as all-purpose credit cards, are offered in a national setting.

[8] For a description of current procedures for defining markets and evaluating the level of competition in these markets, see Amel (1997).

[9] This section draws heavily on Radecki (1998).

Second, banks are striving for greater efficiency in payment, credit and depository services not only by adopting new technology, but also by centralizing their operations and shifting decision-making responsibility from local managers to the head office. Until recently, bank holding companies have been decentralized business firms, operating under separate charters in every state or region of a state. Each bank owned by a holding company would post a different schedule of rates for its deposit and loan products. To eliminate inefficiencies arising from redundant facilities and nonstandard products, many holding companies are now centralizing their management structure organizing their operations along business, rather than geographic, lines and placing most, if not all, banking activities under a single charter. Consolidation of decision-making at headquarters encourages holding companies to adopt uniform deposit and loan rates.[10]

Intrastate deposit and loan rate patterns

To judge the breadth of markets, we first examine consumer deposit and loan rate data collected across cities in the same state to determine whether the patterns observed are consistent with the existence of local markets. If banks operate in narrowly confined markets, they should vary their retail interest rates in response to local demand and supply conditions and intracity differences in a bank's rate schedule ought to be observed. If banks operate in broad markets, they should set uniform rates over regions that are wider than metropolitan areas. Uniform interest rates across an entire state would indicate that retail banking markets are not local.[11]

Data collected by the *Bank Rate Monitor* during March 1997 reveal that the current practice among many banks is to set uniform interest rates for both deposits and loans across an entire state or wide regions of a large state. In Tables 1-3, interest rates for savings accounts, retail time deposits, auto loans and home equity lines of credit for a few banks are shown for the largest cities in California, Texas and New York, the country's three most populous states. The practice of uniform pricing, however, goes beyond the banks and cities appearing in the tables. For example, the survey contacted ten Texas banks at both their Dallas and Houston branch offices, although only four banks are shown in Table 2. These ten banks jointly hold 76 and 70% of total deposits in Dallas and Houston, respectively. All ten post identical deposit and loan rates in the two cities. This pattern among banks in these large states implies that the geographical reach of retail banking markets is much larger than a metropolitan area.

Unlike the banks in the prior examples, the major banks in Pennsylvania and Florida do not set uniform rates statewide, but their rates are uniform over extensive areas, spanning several local markets as currently defined (Tables 4 and 5). The patterns in these two states may not give unqualified support to state-level markets; however, they contradict the use of small local markets for the analysis of competition.

While the prevailing practice is to set uniform rates at all of a bank's branches within a particular state, rates usually differ among branches that are operated by the same bank or holding company but are located in different states. The banks owned by Fleet Financial Group, for example, set uniform rates within Massachusetts, Rhode Island, Connecticut, New Hampshire, Maine and upstate New York, but they do not set exactly the same rates in any two states (Table 6). The magnitude of these interstate rate differentials may be large enough to indicate separate markets at this time. Nevertheless, rate differentials such as these may fade away as banks take full advantage of the Riegle-Neal Interstate Banking and Branch Deregulation Efficiency Act, implemented on June 1, 1997 and as holding companies consolidate their operations into a single bank.

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[10] For example, Banc One Corporation, which operated seventeen banks and used seventeen corresponding pricing regions in the state of Ohio, has consolidated its operations in the state into a single bank and posts identical checking and savings accounts rates at all branches. See *Bank Rate Monitor* (1997).

[11] Although earlier studies that have looked at patterns in deposit rates across locations have yielded mixed evidence on the size of markets, they generally have found that markets are not national; see Keeley and Zimmerman (1985).

Table 1
Deposit and loan rates at selected banks: California
In percent

Bank	Cities to which the rates apply*	Savings account	Six-month time deposit	One-year time deposit	Auto loan	Home equity line of credit
Bank of America	all four	2.43	4.86	5.13	8.75	8.79
Wells Fargo	all four	2.38	4.87	5.15	NR	8.92
Great Western	all four	2.50	5.35	5.50	10.75	9.24
Home Savings	all four	2.45	5.03	5.75	10.25	6.00

* The four cities are Los Angeles, Sacramento, San Diego and San Francisco. NR: not reported.

Table 2
Deposit and loan rates at selected banks: Texas
In percent

Bank	Cities to which the rates apply*	Savings account	Six-month time deposit	One-year time deposit	Auto loan	Home equity line of credit
Banc One	all four	2.78	4.70	4.90	8.99	–
Bank of America	all four	3.05	4.39	4.65	13.50	–
NationsBank	all four	2.05	4.64	4.64	9.50	–
Texas Commerce	all four	2.12	4.28	4.65	9.50	–

* The four cities are Austin, Dallas, Houston and San Antonio. At the time of the survey, home equity lines of credit were not available in Texas.

Table 3
Deposit and loan rates at selected banks: New York State
In percent

Bank	Cities to which the rates apply*	Savings account	Six-month time deposit	One-year time deposit	Auto loan	Home equity line of credit
Key	all five	3.01	4.25	5.75	9.25	8.25
Chase Manhattan	all five	2.79	4.65	4.71	8.95	8.25
Fleet & Fleet, N.A.	all 4 upstate cities	2.32	4.34	4.55	9.25	10.00
	New York City	2.27	4.29	4.39	9.25	10.00
Marine Midland	all 4 upstate cities	2.79	5.10	5.48	10.75	9.50
	New York City	2.73	4.71	5.14	9.25	9.50
M&T and East New York Savings Bank	Buffalo, Rochester and New York City	2.28	5.00	5.50	9.95	8.25
First Federal S&L of Rochester	Buffalo, Rochester, Syracuse and New York City	2.55	5.50	4.74	9.75	6.49

* The five cities are the four upstate cities of Buffalo, Rochester, Syracuse and Albany, plus New York City.

Table 4

Deposit and loan rates at selected banks: Pennsylvania

In percent

Bank	Cities to which the rates apply*	Savings account	Six-month time deposit	One-year time deposit	Auto loan	Home equity line of credit
CoreStates	Philadelphia	1.90	3.10	3.50	8.99	8.75
	ABE, SCR, HAR	2.00	3.50	4.00	8.00	8.75
First Union	PHL, ABE, SCR	1.00	4.00	4.25	9.49	5.75
Mellon	PHL, SCR	2.00	2.75	3.25	9.49	(9.50 in PHL) (9.40 in SCR)
	HAR, PIT	2.02	4.25	4.65	10.50	8.99
PNC	Philadelphia	2.00	4.26	4.75	9.00	9.75
	Harrisburg	2.19	4.52	4.91	9.50	9.50
	ABE, SCR, PIT	2.49	4.30	4.75	9.25	6.99

* The five cities are: Allentown-Bethlehem (ABE), Harrisburg (HAR), Philadelphia (PHL), Pittsburgh (PIT) and Scranton (SCR).

Table 5

Deposit and loan rates at selected banks: Florida

In percent

Bank	Cities to which the rates apply*	Savings account	Six-month time deposit	One-year time deposit	Auto loan	Home equity line of credit
Barnett	Jacksonville	2.15	4.55	4.85	9.50	10.25
	DYB, LKD, ORL and MEL	2.15	4.55	4.85	10.50	8.49
	Tampa	1.75	4.55	4.85	10.50	8.49
	Sarasota	1.75	4.55	5.00	9.50	8.49
	West Palm Beach	2.15	4.55	4.85	10.50	11.75
	Miami	2.15	4.55	4.85	10.50	8.49
First Union	Jacksonville	1.90	4.00	4.25	9.33	NR
	DYB, LKD, ORL and MEL	2.00	4.10	4.35	9.33	10.25
	Tampa	1.90	3.85	4.20	9.33	10.25
	Sarasota	2.00	3.85	4.20	9.33	10.25
	West Palm Beach	1.90	3.90	4.20	9.33	NR
	Miami	1.90	4.00	4.25	9.33	10.25
Nations Bank	all 9 cities	1.01	4.15	4.60	10.00 (9.50 in WPB)	10.25
SunTrust	Jacksonville	2.20	4.81	5.00	8.50	10.25
	Daytona Beach	2.00	3.90	4.75	9.05	10.25
	Lakeland	2.00	4.75	4.95	10.35	10.25
	Orlando	2.00	4.75	4.90	8.50	10.25
	Melbourne	2.00	3.90	4.75	9.69	10.25
	TPA and SAR	2.00	4.55	4.86	8.50	10.25
	West Palm Beach	2.00	4.40	4.60	8.75	7.25
	Miami	2.00	4.30	5.20	8.50	7.25

* The nine Florida cities are: Jacksonville, Daytona Beach (DYB), Lakeland (LKD), Orlando (ORL), Melbourne (MEL), Tampa (TPA), Sarasota (SAR), West Palm Beach (WPB) and Miami. NR: not reported.

Table 6
Deposit and loan rates across states: Fleet Financial Group
In percent

State	Savings account	6-month time deposit	1-year time deposit	Auto loan	Home equity line of credit
Massachusetts	2.17	4.18	4.45	9.25	9.75
Rhode Island	1.61	4.08	4.34	9.25	10.00
Connecticut	2.02	4.18	4.39	8.75	9.75
New Hampshire	2.32	4.34	4.45	9.25	10.00
Upstate New York	2.32	4.34	4.55	9.25	10.00
Maine	2.02	3.82	4.03	9.25	10.00

5.1 Changing relationship between concentration and deposit rates

Next, we examine data collected in an annual national survey to determine whether local concentration tilts deposit rates to a bank's advantage. Several studies analyzing data collected by this survey in the mid-1980s find that higher local concentration – that is, the degree to which deposits in a particular locality are concentrated in a few banks – affected both the level of deposit rates and their speed of adjustment following changes in interest rates in the national money market. In particular, Berger and Hannan (1989) showed that a bank's savings account rate tends to run two basis points lower for every increase of three percentage points in the local market's three-firm concentration ratio (the combined deposit share of the three largest competitors). Other studies confirmed and refined the Berger-Hannan study or extended the analysis to home mortgages and small business loans. Nearly all of these studies, however, are somewhat dated because they use data on retail deposit accounts from the 1983-87 period. Since that time, the sector has changed markedly and uniform deposit rates over broad areas spanning several cities and the intervening regions are observed.

To investigate the relationship between concentration and deposit rates, we re-estimate some regressions specified in earlier research. Data on deposit rates are drawn from the findings of the June 1996 Survey of Selected Deposits and Other Accounts, conducted by the Board of Governors of the Federal Reserve System. The survey collects information on checking and savings accounts and time deposits from 399 commercial banks and thrift institutions nationwide.

In the regression analysis of the survey's findings, the interest rate a bank pays on savings account deposits is explained by concentration in the local area (measured by the Herfindahl-Hirschman index (HHI)) and some control variables to account for differences among banks and local areas related to their respective size and for regional differences in wage rates, population density or any other relevant characteristic (Table 7).[12] Using 1996 data, the regression analysis finds that the estimated coefficient of the concentration variable is not statistically significant – and it does not even have the expected negative sign (Table 8). This result indicates that concentration at the local level no longer matters for interest rates paid to retail depositors. By contrast, the importance of concentration in the mid-1980s is indicated by the high significance of the concentration variable in the equation estimated by Hannan from 1985 data (with a t-statistic of –6.79, shown in Table 8) and confirmed by other studies analyzing data from the same era. (Hannan's results obtained from 1993 data are also shown for comparison.)

[12] The Herfindahl-Hirschman index is defined as the sum of the squared market shares of all banks operating in an area. The local areas are determined by the US Census Bureau's metropolitan statistical areas (MSAs).

Table 7
List of variables used in regressions

Variable	Definition or explanation	Sample means	
		Number of observations	
		200	390
Savings account rate	The interest rate paid on money market savings accounts	2.59	2.54
HHI	Herfindahl-Hirschman index of concentration	local	state
		1,784	1,134
3-firm concentration ratio	Sum of three largest deposit shares	local	state
		63.3	49.0
Bank's total assets	In billions	$3.54	$4.67
Population	In millions	local	state
		2.65	9.57

Sources: Federal Reserve System's Monthly Survey of Selected Deposits and Other Accounts, SNL Branch Migration Data Base (version 6.1), FDIC.

Table 8
The relationship between a bank's savings account deposit rate and local area concentration

Explanatory variables	Year in which survey was conducted		
	1996	1993 (Hannan, 1997)	1985 (Hannan, 1991)
Intercept	2.35	2.62	7.12
	(10.85)	(20.79)	(96.05)
Local area concentration measured by the HHI	0.38E-4	–0.46E-4	–2.32E-4
	(0.53)	(–0.99)	(–6.79)
Bank total assets	0.22E-2	–0.64E-2	0.53E-2
	(0.43)	(–2.25)	(0.91)
Local area population	0.11E-1	–0.23E-1	–1.52E-2
	(0.53)	(–2.25)	(–1.26)
R-square	0.061	0.074	0.124
Number of observations	200	341	330

Notes: Regional dummy variables are included in the 1993 and 1996 regressions but the estimated coefficients are not reported. In the 1985 regression, the annual rate of business failures in the state in which a bank is located is included; the estimated coefficient for this variable was 0.12E-3 (1.26). Numbers shown in parentheses are t-statistics.

Next, we estimate regression equations comparable to those just discussed to see whether concentration at the state level influences retail deposit rates.[13] Table 9 reports the results from two regression equations: one using the state HHI as the concentration measure and the other using the state three-firm concentration ratio. The estimated coefficient of the concentration measure is significant in both regressions.

[13] Variables used earlier are redefined in order to take this step: deposit concentration at the state level replaces deposit concentration at the local level and state population replaces population in the local area.

Table 9

The relationship between a bank's savings account deposit rate and concentration at the state level

Explanatory variables	Year in which survey was conducted	
	1996	**1996**
Intercept	3.04	3.60
	(16.27)	(11.24)
State concentration measured by the HHI	–0.24E-3	–
	(–3.00)	
State three-firm concentration ratio	–	–0.16E-1
		(–3.42)
Bank total assets	–0.32E-2	–0.29E-2
	(–1.12)	(–1.01)
State population	–0.25E-2	–0.27E-2
	(–0.42)	(–0.45)
R-square	0.073	0.079
Number of observations	390	390

Notes: Regional dummy variables are included but their estimated coefficients are not reported. Numbers shown in parentheses are t-statistics.

5.2 Implications for stability

For many years, analysts delineating geographic markets for retail banking services have referred to demand forces and, consequently, have judged markets to be small and local. Current data suggest, however, that state boundaries now approximate the shape and extent of retail markets better. A shift to broader markets, determined from the supply side, is a development that is congruent with the growth of branch office networks and with the changes banks are implementing in both their operations and internal organization.

Changes that brought about broader markets, as well as the broader markets themselves, may affect the competitive environment and the stability of the banking sector. As a bank acquires a larger branch network to achieve a better geographic diversification, its revenue and profitability will become less cyclical and it will also be less vulnerable to a downturn in the local economy or a single key industry. As a result, broader markets are coinciding with changes that should make banking less prone to episodes of extreme weakness.

Broader markets, however, also suggest that banks are operating in a more competitive environment. At the state level, banking is usually less concentrated than it is at the local level. In addition, the expansion of markets is related to the lifting of interest rate ceilings and branching restrictions that protected banks from all-out competition. A natural outcome of more vigorous competition, however, is a higher incidence of failures, the market's punishment for poor performance. Heightened competition may also encourage risk-taking, which would also raise the incidence of failures.[14] More frequent failures increase the probability that a large bank may fail during a time of stress in the financial markets.

[14] The FDIC Improvement Act and its provisions for prompt corrective action may offset a tendency to take more risk and reduce the frequency of bank failures.

6. The future shape of the banking sector

Further consolidation will alter the prospective structure of the banking sector, but how radically is unclear. The mainline projection, made by extrapolating from the consolidation that has occurred over the past twenty years, is for the number of banking companies (the sum of bank holding companies and independent banks) to decline from about 7,100 in 1997 to about 4,000 in five to ten years. The largest fifty would hold 75 to 80% of total domestic banking assets in the industry, up from 66% today (Berger, Kashyap and Scalise, 1995). This projection, however, does not imply a sharply different structure from the present one. A projection of 4,000 banks preserves a meaningful role for community banks (assets of less than $1 billion), although their number and share of total bank assets would fall over time. Underlying this projection is the assumption that the main drivers of consolidation are geographical deregulation and rationalization of capacity.

Introducing uncertainty into any projection of consolidation are technological change, continued erosion of the deposit base and the effects they bring about. Factors such as more heated competition, the cultivation of national brand names and the declining value of branch office networks may combine to threaten the viability of community banks.[15] In a setting more favorable to large banks, the credit card business may offer a better model than the experience of 1970-90. The credit card segment of retail banking has already evolved into what is now essentially a mail and telephone operation, where large players serve a national market with a branchless distribution system. Measured by managed credit card loans (loans on the balance sheet plus securitized loans outstanding), the fifty largest companies currently appear to control around 95% of this business line and concentration is rising. If the sector as a whole were to follow the pattern in the credit card segment, no more than fifty banks would account for 95% of total business. The credit card model thus implies consolidation well below 4,000 banks, although the last 5% of the sector could be shared by either a thousand or more community banks or just a handful of fairly large banks. The strength of customer loyalty to local depository institutions would determine the number of surviving community banks.

Consolidation into a relatively few banks could exacerbate the so-called too-big-to-fail problem. In general, bigger institutions, if suddenly placed into receivership, imply more disruption to the financial system. But consolidation does not necessarily create institutions that are too big to fail. Mitigating the problem is the fact that several of the newly formed banks are not only well diversified but also oriented toward retail business segments. Because the activities of a retail bank are relatively simple and many households and small business firms have access to other sources of credit, the fallout from the failure of a predominantly retail, although very large, institution may be manageable. In contrast, specialization worsens the too-big-to-fail problem. Some specialist banks are heavily involved in the large-value payments business and in trading and market-making in foreign exchange, securities and derivative instruments. The failure of a payments specialist or a market-maker, even though it may not rank among the very largest banks, may be deemed too disruptive.

7. The payments franchise

One of the foremost aims of consolidation and restructuring is the solidification and expansion of a bank's payments business, which is seen as a prospective growth area. To some, these statements may be surprising since the size of the payments area is not widely appreciated. Payment services may be overlooked due to a lack of good information. In reports to supervisory agencies, banks provide quantitative information bearing primarily on their safety and soundness. By design, these reports transmit data on profitability, liquidity, capital and size and condition of the loan portfolio, but contain only limited information on individual business activities.

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[15] Network externalities and economies of scale in the payments business are additional reasons to project greater consolidation.

Table 10
Composition of operating revenue for the largest BHCs during 1996

Category of income	Combined totals, in billions of US$	As a percent of operating revenue	As a percent of assets
(1) Total non-interest income	62.4	44.5	2.32
Service charges on deposit accounts (in domestic offices)	9.5 *15.3% of total non-interest income*	6.8	0.36
Income from fiduciary activities	10.2	7.3	0.38
Trading revenue	7.9	5.6	0.30
Other foreign currency gains	–0.08	–0.06	–0.003
Other fee income	23.8	17.0	0.89
All other non-interest income	10.9	7.8	0.41
(2) Gross interest earned	181.2	129.3	6.75
(3) Gross interest paid	94.2	67.2	3.51
(4) Net interest income: (2) – (3)	87.0	62.0	3.24
(5) Provisions for loan losses	9.2	6.5	0.34
(6) Net-net interest income or net interest income less provisions for loan losses: (4) – (5)	77.8	55.5	2.90
(7) Operating revenue: (1) + (6)	140.2	100.0	5.22
Memo item: Total assets	*2,686.0*	–	–

Source: Y9C reports.

In the payments area, US banks record the amount of revenue earned through "service charges on deposit accounts in domestic offices" as one of the six designated components of non-interest income. In 1996, the twenty-five largest bank holding companies (BHCs) collected only $9.5 billion from fees on deposit accounts, compared with total combined non-interest income of $62.4 billion. At first glance, it appears that just 15.3% of non-interest income and a mere 6.8% of operating revenue, comes from payment services (Table 10). For two reasons the amount of "deposit account fees" understates revenue derived from payment services. First, some remuneration for payment services appears in other categories of non-interest income. Second, compensation for payment services is often received as foregone interest on deposits or extra interest on loans, rather than in the form of a fee, commission or other charge to a customer.

To establish the importance of transactions services, we give a comprehensive estimate of payment-driven revenue in this section. To gauge the amounts involved, we measure "missed" deposit account activity fees and fees for payment services provided outside of a deposit account. Then interest income earned as compensation for payment services is quantified. In making our estimates, we rely on information disclosed in the annual reports of the largest BHCs.[16] Particularly valuable is detailed information on the business activities that bring in non-interest income and the amounts earned. For example, the Chase Manhattan Corporation shows the sources of 88% of its non-interest income of $7.5 billion (Table 11). Disclosures of non-interest income, however, are not strictly comparable across banks, which imparts some imprecision to our estimates.

[16] During the past several years, BHCs have taken significant steps to improve their financial disclosures. Their efforts have been made in concert with initiatives by both public and private entities to promote advances in accounting, reporting and disclosure practices. See Bank for International Settlements (1994) and Edwards and Eller (1996).

Table 11
Disclosure of sources of non-interest income

	Categories of non-interest income	Amount earned during 1996, in millions of US$
1	Corporate finance and syndication fees	929
2	Trust, custody and investment management fees	909
3	Mutual fund fees	83
4	Other trust fees	184
5	Credit card revenue – from securitized revenues	318
6	Credit card revenue – all other	745
7	Service charges on deposit accounts	394
8	Fees for other financial services – commissions on letters of credit and acceptances	330
9	Fees for other financial services – fees in lieu of compensating balances	295
10	Fees for other financial services – mortgage servicing fees	204
11	Fees for other financial services – loan commitment fees	120
12	Fees for other financial services – other fees	580
13	Trading income – interest rate contracts	535
14	Trading income – foreign exchange contracts	444
15	Trading income – debt instruments and other	994
16	Other non-interest income – gains from equity-related investments	726
17	Other non-interest income – net losses on emerging market securities sales	–80
18	Other non-interest income – residential mortgage origination/sales activities	63
19	Other non-interest income – loss on sale of a building in Japan	–60
20	Other non-interest income – from credit card securitizations	23
21	Other non-interest income – all other revenue	344
Total non-interest income as defined in the Y9C report to the banking agencies		7,477
Memo: Securities gains		*135*
Total non-interest income as shown in the annual report to shareholders		7,512

Source: 1996 Annual Report of the Chase Manhattan Corporation.

7.1 Deposit account fees placed in the "other fee" category

In addition to those fees that a bank collects directly from its own deposit account customers, a bank charges fees for transactions initiated by customers of other banks or from the receivers of payments. Examples of these sources of fee income are debit card interchange fees and automated teller machine (ATM) interchange fees. Information on this type of non-interest income is, however, relatively sparse in annual reports. Most banks simply record the revenue in the residual subcategory "other non-fee income", although several cite electronic banking fees in explaining an increase in non-interest income from the previous year. Among the banks that do disclose a specific figure, these fees are on average equal to 28% of deposit account fees. Assuming that all the largest BHCs earn proportional amounts of revenue from fees for electronic banking services, we estimate that in aggregate these fees came to $2.6 billion during 1996, a nice supplement to the $9.5 billion in deposit account fees.

7.2 Fees for payment services provided outside a deposit account

Banks provide various payment services outside a deposit account relationship and consequently, they do not record the revenue earned from these services as "fees on deposit accounts". These services fall into two basic types: credit cards and payments processing. The transaction capabilities of credit cards must be

counted among the payment services that banks supply to retail customers. Non-interest revenue derived from the use of credit cards includes interchange fees and cardholder fees. A card-issuing bank may also earn fee income for servicing securitized credit card receivables, but analysis of these revenues will be deferred to a later section.

From total managed receivables, it appears that, in the data on credit card fees disclosed by the fourteen BHCs that clearly exclude revenue from servicing securitized receivables, these BHCs earned $3.1 billion of fee income, equivalent to 3.46% of managed receivables. By applying this percentage to the total volume of managed credit card receivables held by the top twenty-five BHCs, we estimate that the group earned a combined $5.4 billion. Credit card fees are, therefore, more than half as large as the revenue earned through fees on deposit accounts.

7.3 Fee income for securities handling and other processing services

Everyone is familiar with the fact that banks offer safekeeping, administration, reporting and transfers of money held in a deposit account. But they also furnish additional payment services to their corporate and institutional customers, including pension funds, mutual funds and endowments. These services involve safekeeping, administration, reporting and transfers of ownership and settling trades of securities and other assets held in a trust department account.[17] Additional services are performed on behalf of an issuer of debt or equity securities and wholesale or institutional customers through subsidiaries, including the processing of checks, airline coupons, remittances with their accompanying documents and debit card, credit card and other electronic banking transactions.

Nineteen of the twenty-five BHCs identify an amount of non-interest income earned by handling securities and performing related services. Eight of the nineteen BHCs specialize in wholesale services, producing them on a large scale and earning more from these services than they do from deposit account fees. Collectively for the nineteen BHCs, this business line brings in $6.5 billion of non-interest revenue, an amount that is almost three-quarters as large as their combined deposit account fees.

7.4 Interest income earned in return for payment services

An estimate of payment-driven revenue that only considers *non-interest* income whould understate the total amount of revenue brought in by payment services, because a component of *net interest* income is actually compensation for a payment service, not an extension of credit. Deposit account customers compensate banks for payment services not only by paying explicit account maintenance and activity fees, but also by foregoing interest on their deposits. Account holders earn no interest on demand deposits and earn below-market interest rates on deposits in checking and savings accounts. Interest substitutes for higher explicit fees. In an analogous way, credit card customers compensate banks for transactional services by paying interest above the cost of just the loan. Again, interest substitutes for explicit account maintenance and activity fees. Therefore, to construct a comprehensive figure for the contribution of payment services to operating revenue, we must break out some net interest revenue.[18]

To estimate the amount of foregone interest on deposit accounts, we first assume that all accounts that have payment capabilities, principally checkwriting privileges and immediate remote withdrawal, implicitly earn the overnight interbank (federal funds) rate. We also assume that foregone interest plus explicit fees paid by account holders equals all maintenance and activity costs incurred by a bank. Under these assumptions, in 1996 the top twenty-five BHCs earned $15.5 billion of foregone interest on $295.5 billion of demand deposits and an additional $13.3 billion of foregone interest on deposits of $502.6 billion in other accounts

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[17] Trust department services can be classified as master trust and custody, global custody, corporate trust and stock transfer.

[18] Studies of the aggregate demand for money recognize the phenomenon of foregone or implicit interest on deposit accounts. These studies estimate the amount of implicit interest earned on demand deposits for the purpose of calculating the opportunity cost of holding money (narrowly defined).

having payment capabilities. By comparison, $28.8 billion of interest foregone on deposit accounts is almost three times as large as the amount of fees collected on deposit accounts.

Implicit interest on deposits may seem extraordinarily large, but it must cover the sizable expenses of running a bank's branch network, whose primary purpose is to handle the transaction needs of household and small business customers. Some expenses are recovered by collecting fees on deposit accounts and on ancillary services offered at the branch office; the remainder must be recovered through foregone interest.

To estimate the extra interest revenue collected from credit card holders, we rely upon information disclosed on revenue earned for servicing securitized credit card receivables. In a securitization, most of the interest paid by cardholders passes to the holder of the security, who funds the loans and bears the credit risk. The card-issuing bank retains a smaller portion of the interest paid by cardholders. A card-issuer's revenue from securitized receivables serves as an estimate of the extra interest paid for payment services rendered through the account. In other words, this revenue equals the amount that cardholders would be assessed in explicit activity fees and maintenance charges on their account if interest were not used instead.

Ten of the twenty-two BHCs offering credit card accounts securitize part of their receivables and seven of those ten reveal detailed information on the volumes of their securitization programs and their impact on net interest income, provisions for loan losses and non-interest revenue. On average, securitization reduces net interest income by an amount equal to 8.33% of the dollar volume securitized. Smaller provisions for loan losses offset more than half of this reduction, 5.50% of the dollar volume securitized. The card-issuer keeps the remainder (plus a small residual), 3.05% and records the amount as non-interest income. This percentage is our estimate of extra interest paid on all credit card receivables. Applying the 3.05% estimate to the entire $156.1 billion of managed credit card receivables held by the whole group of twenty-five BHCs indicates that they collected $4.8 billion of extra interest as compensation for payment services.

Because a residual estimates the extra interest paid on credit card balances, it is likely that it represents more than just the amount paid to cover the costs of producing payment services. The estimate of extra interest may capture excess profits from credit card operations, an implicit charge for the unused portion of the cardholder's credit line, the cost of maintaining a loan account and compensation for any residual credit risk retained by a card issuer. For this reason, the estimate of $4.8 billion should be considered the upper bound of what cardholders pay in extra interest.

7.5 Summing up

By adding up all the pieces of revenue identified and estimated above, we find that payment services contributed as much as $57.6 billion or 41.1%, of the combined operating revenue of $140.2 billion earned by the twenty-five largest BHCs (Table 12). Payment-services brought in $24.0 billion of fee income; interest revenue accounted for a larger amount, between $28.8 billion and $33.6 billion. Among categories of payment services, deposit accounts generated the largest amount of revenue, $40.9 billion, although only $12.1 was recorded as service charges. Credit cards brought in between $5.4 billion and $10.2 billion and securities handling and other processing services provided another $6.5 billion.

The importance of payment-driven revenue varies considerably across individual banks. Table 13 ranks the top twenty-five banking organizations, not by size, but by share of operating revenue that is contributed by the payments business. The bank that is most dependent on its payment business earns three-quarters of its operating revenue from this business line. The magnitude of payment-driven revenue reflects the bank's specialization in both credit cards and securities processing. Several other banks among the top twenty-five also earn more than 10% of their operating revenue from either credit cards or securities processing.

Table 12
Summary of sources of operating income derived from payment services by the twenty-five largest bank holding companies

Category	Revenue earned	Comment
Fees on deposit accounts	$9.5 billion	As recorded in the Y9C reports
Fees on deposit accounts recorded in "other fees"	$2.6 billion	Estimated from a sample of BHCs
Credit card fees	$5.4 billion	Estimated from a sample of BHCs; excludes securitization revenue
Securities handling and processing	$6.5 billion	Amount disclosed in annual reports
Interest foregone by deposit account holders	$28.8 billion	Estimated; $15.5 billion from demand deposits and $13.3 billion from NOW, saving and money market accounts
Extra interest paid by credit card holders	As much as $4.8 billion	Estimated from a sample of BHCs
Total	Between $52.8 billion and $57.6 billion	Between 37.7 and 41.1% of operating revenue
Memo items:		
Amount of revenue earned in the form of:		
non-interest income	*$24.0 billion*	*38.5% of non-interest income*
net interest income	*Between $28.8 billion and $33.6 billion*	*Between 37.0% and 43.2% of net-net interest income*
Amount of revenue earned from:		
deposit accounts	*$40.9 billion*	
securities handling	*$6.5 billion*	
credit cards	*Between $5.4 billion and $10.2 billion*	

7.6 Implications

The very substantial amount of payment-driven revenues means that the performance of transaction services is an integral activity of the banking sector and is on an equal footing with credit services. Consequently, the production and distribution of payment services should be incorporated in both theoretical and empirical research on banking. By excluding payment services in a model of a bank, a researcher may be overlooking one of its defining characteristics. In fact, economists commonly offer two explanations for the prominence of commercial banks: specialization in information-intensive lending and provision of liquidity. But neither rationale explains why commercial banks produce payment services on a large scale or why they offer payment services together with deposit-taking and lending to relatively small-sized borrowers. An integrated theory of commercial banking is called for, one that identifies what banks need to do to succeed in providing payment services as well as taking deposits and intermediating credit.

The importance and sources of payment-driven revenue also suggest that transaction services are now what make banks special and justify their supervision and regulation as well as the safety net stretched beneath them. In looking at US financial history, Congress established the deposit insurance system in the 1930s primarily to keep illiquid banks in operation and support the availability of bank credit to the nonfinancial business sector. But more than sixty years later, with many varied sources of credit available to households and firms, the preservation of bank lending would create less concern and provide weaker justification for the safety net. In contrast, with a larger role played by securities issuance and institutional investors in channeling the economy's saving to business and household borrowers, timely clearing and settlement of trades in foreign exchange, securities and other instruments are absolutely necessary. Consequently, one could argue that to an increasing extent the safety net exists in order to come to the aid of a bank that processes large volumes of payments.

Table 13
Sources of payments-driven revenue across bank holding companies

Top 25 BHCs ranked by share of payments-driven revenues	Payments-driven revenue	Deposit account revenue	Credit card revenue	Securities processing revenue	Operating revenue, in billions of US$
	as a percent of operating revenues				
1	74.9	39.1	10.4	25.4	3.4
2	58.3	33.5	22.0	2.8	5.2
3	56.1	40.2	3.6	12.3	3.0
4	54.9	40.4	14.5	–	2.2
5	49.6	44.7	4.8	0.1	6.7
6	49.0	39.5	3.7	5.8	2.8
7	47.6	34.7	12.9	–	6.2
8	47.4	43.3	4.1	–	2.5
9	46.8	40.2	5.9	0.7	9.4
10	46.1	31.8	6.7	7.6	2.6
11	44.4	21.0	10.4	13.0	14.8
12	44.0	29.1	4.4	10.6	3.3
13	43.5	41.0	2.5	–	2.5
14	43.4	37.4	6.0	–	6.9
15	42.5	37.9	3.9	0.7	5.3
16	42.4	37.8	4.4	0.1	13.6
17	39.7	37.5	1.7	0.5	2.3
18	37.6	32.6	2.0	3.1	3.8
19	37.0	32.3	3.1	1.6	3.8
20	33.9	12.6	15.3	6.0	18.3
21	33.0	29.9	2.6	0.6	3.6
22	29.3	26.4	1.7	1.2	5.9
23	28.4	7.9	0.0	20.5	3.9
24	20.3	20.3	0.0	–	1.4
25	4.5	1.9	0.0	2.6	6.8

7.7 Payments and financial stability

Looking forward, the payments franchise may represent a growing proportion of banks' operating income. First, if current trends persist, trading of financial instruments will grow and banks will handle larger volumes of transactions and earn more fee income. Second, as growing proportions of household-to-business and business-to-business payments are converted to electronic formats, bank customers will make and receive payments faster and more conveniently. For improved payment services, banks should be able to raise their fees. And because payment-driven revenues are basically noncyclical, their growth should stabilize income and profitability.

At the same time, banks take substantial business risks whenever they make important decisions regarding the payments business. A larger share of non-interest expense is now devoted to investments in technology, which in the long run may turn out to be unpopular or cost-ineffective. In addition, banks must decide which services to offer and on what scale, what hardware and software investments to make, whether to produce in-house or to outsource some aspects of these services and which partners to take on in joint ventures. The business risks in the payments area have dimensions that differ from those in lending or trading, but they are present nonetheless. On this point, a bank executive stated that, in his opinion, making

the wrong decisions on technology plans was a greater threat to his bank's long-term success and survival than credit risks posed by lending decisions.

8. Summary and conclusions

The US banking industry is not only consolidating, but is also undergoing a multifaceted restructuring. Besides merging among themselves, banks are expanding their product lines and geographic reach (in some cases, internationally) and revamping their operations. Banks are working on several fronts simultaneously because many fundamentals have shifted for them and many needs must be addressed. The varied actions taken by the banking sector to address these needs would be expected to have multiple effects on the stability of the financial system. Some changes should promote stability; for instance, efforts to improve product and geographic diversification and derive a larger share of revenue from less cyclical payment services should make bank profitability more resistant to local or national business cycles. Other developments, however, may hurt stability. By operating in a more competitive environment, banks may take more risk and experience a higher rate of failure, although the FDIC Improvement Act of 1991 and the provisions for prompt corrective action should be working in the opposite direction. And because banks are adopting new and unproven technologies while still facing a declining demand for traditional depository and lending services, more disorder could occur. These prospects for stability were discussed in the context of consolidation, restructuring, the expanding reach of geographic markets and the payments business.

As stated at the outset of this paper, the transformation of the banking sector is part of a broader development: the increasing prominence of institutional investors and the receding role of patient intermediaries, not only commercial banks, but also insurance companies and traditional employer-sponsored pension plans. A contraction of banks' lending activities may signify a return to their roles as providers of payment services and managers of liquidity. At the same time, a bigger role for institutional investors, always focused on the short-run performance of the portfolios they manage, could lead to more short-run volatility in the financial markets.

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Financial intermediation in Austria and comparisons of value at risk methods with implications for regulators

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1. Introduction

Over the last decade, Austrian banks have experienced significant changes in their economic and legal environment. Increasing competitive pressure from non-bank financial intermediaries and foreign financial institutions have led to declining income from the traditional "core" business (lending and deposit taking) of Austrian banks. As a result, they are forced to substitute interest income with non-interest income to sustain certain levels of profitability. In addition, EMU will have a significant impact on the banking industry since Austrian banks will have to operate in a large and highly liquid euro financial market.

Another important issue for Austrian banks as well as for regulators is the new capital adequacy directive (CAD) which is part of the Austrian Banking Act since 1st January 1998. The intention of the CAD is to provide an international "level-playing field" for financial institutions and to ensure national and global financial stability. According to the CAD, banks have, in addition to the so-called "standard approach", the option to use Value at Risk (*VaR*) models to determine their capital requirements for market risk that arise from their trading books. These rather advanced methods already have an important impact on risk measurement, risk management and capital requirements of major Austrian banks and will be even more important in the future.

Both topics are of major importance for the Austrian banking industry and for the regulatory authorities as well. However, they cover rather different areas and are hard to present in an integrated manner. To get around these problems we have divided the paper into two parts.

Section 2 reviews the main driving forces behind the changes in Austrian banking during the last decade and their significance for bank profitability. It assesses the impact of these developments on the structure, strategy and profitability of Austrian banks and their competitiveness vis-à-vis other financial intermediaries. It further analyses how lending and deposit taking by banks have changed and will be further affected by EMU. It concludes that for the Austrian banking system, the consequences of EMU are comparable to those of the single market for the real economy.

Section 3 deals with particular issues concerning *VaR* models. We analyse variance-covariance methods and historical simulation approaches to estimate daily *VaR* numbers for one equally weighted and nineteen randomly chosen linear fx-portfolios over a period of one thousand trading days. In addition, we apply a new method based on mixtures of normal distributions that deals with fat-tailed distributions of risk factors. We ask whether *VaR* estimates generated by the different methods can easily be used for comparisons among financial institutions. Although the same parameters (confidence level, holding period) are used for all models, our results indicate that comparisons of *VaR* numbers among different financial institutions can be misleading. We also analyse how accurately the *VaR* estimates of the various models match specified confidence intervals. For our portfolios we find that the new methodology performs best.

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2. Financial intermediation in Austria

2.1 Introduction

Austria's banking and financial system experienced considerable shifts on both the supply and the demand side during the past decade. Rising volumes of assets and liabilities of households and enterprises required new forms of finance which deregulation and financial innovations made available. As demand for financial services became less "bank-specific" these new forms of finance increasingly competed with intermediation by banks and eroded the core function of banking, lending and deposit taking.[2] Thus the role of banking, which had dominated the Austrian financial system for all of Austria's post-war history, increasingly came under pressure. These developments will most likely be aggravated by monetary union which can be viewed as another major deregulation measure rendering all regulation tied to national currencies obsolete and thereby fostering disintermediation.

The aim of this part of the paper is first to analyse the significance of these changes for the core functions of the banking industry and the resulting effects on competitiveness of banking vis-à-vis other financial intermediaries.

The remainder of this part is organised as follows: Section 2.2 reviews the structure and the main driving forces for change of Austria's banking and financial system in the last decade and analyses the reasons for the shrinking market shares of banks in the financial assets and liabilities of households and enterprises. Section 2.3 discusses the strategies pursued by the banks to make up for the resulting losses of business and revenues. Section 2.4 examines the effects on banks' profitability. Section 2.5 assesses the consequences of EMU for the Austrian banking system

2.2 Financial intermediation in Austria

Disintermediation arrived later in Austria than in many other countries. Lack of private capital pervaded most of Austria's post-war history and foreign direct investments in Austrian corporations have been high for decades. For historical reasons, Austria has one of the largest shares of state ownership of all industrial countries, although the share has much diminished in recent years. Therefore, small and medium-sized (largely self-financed family-owned) enterprises[3] prevail whereas large Austrian-owned corporations are almost absent. According to a survey,[4] foreign firms owned 30.3% of the 600 largest Austrian corporations, domestic firms 33.6%, and families 22.6% in 1996.

In the past, investment and business promotion schemes (including a more favourable tax treatment of debt than equity) were strongly biased towards credit financing so that demand for direct financing was to some extent crowded out by, now declining, subsidised credit. In the last few years, however, investment rules and tax treatment have been largely remodelled to encourage capital investments.[5]

Therefore, enterprises in Austria have relied heavily on bank credit for financing. The importance of bank lending is much higher for small businesses than for medium-sized and large companies.[6] Direct finance via organised capital markets, on the other hand, has played a minor role in Austria.[7] The Austrian capital market is smaller than those of most other small European countries; bonds and shares in circulation amounted to 82.5% of GDP in 1997. Assets of financial intermediaries in 1996 equalled

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2 For a survey of issues related to the role of financial intermediation see, for example, Becsi and Wang (1997).

3 In January 1998, only 429 companies (or 0.18% of all companies in Austria) had 500 or more employees, of which 149 had 1,000 or more employees (0.06% of the total).

4 Gugler (1998).

5 See, for example, Böheim (1998).

6 Quehenberger (1997), p. 66.

7 For 28 years, between 1956 and 1984, there had been no IPO on the Vienna Stock Exchange.

276% of GDP (see Appendix Table A.1). Financial intermediation is still dominated by banks; in 1996, their share, although declining, was still the highest of all EU countries.[8]

Rising levels of corporate debt, however, increased the attractiveness of other forms of finance. Additionally, privatisations in the past decade have lowered state ownership and increased private equity at the stock exchange. The surge in outward foreign investment since the beginning of the 1990s[9] may also have altered the financial requirements of enterprises. The share of bank lending in total external financing of the private non-bank sector[10] has decreased from 71% in 1988-90 to 58.9% in 1994-96.[11]

Table 1
Outside financing by private non-banks in Austria
Percentage shares, three-year averages

	1988-90	1991-93	1994-96
Bank loans	70.6	63.5	58.9
Loans by public sector incl. ERP	6.0	9.6	10.7
Loans by insurance companies	–0.1	1.4	–0.2
Bonds	1.3	5.8	7.5
Equity and of near-equity	13.7	12.9	10.1
Foreign	8.4	6.8	13.1
Total	100.0	100.0	100.0

Sources: Staatsschuldenausschuß (1998), Bericht über die Finanzschuld des Bundes 1997, Vienna and own calculations.

As wealth increased,[12] investors had more opportunities to diversify. Bank deposits are appropriate for small amounts of savings, whereas many non-bank financial instruments require a minimum investment. The share of banks in acquisition of financial assets fell by 16 percentage points between 1991-93 and 1994-96. Savings deposits, for decades the favourite savings vehicle in Austria, lost 19.5 percentage points; net of capitalised interest they have shrunk in absolute terms since 1995. Acquisition of financial assets outside banks, on the other hand, is continuously on the rise. Investment funds registered the most vigorous growth, but insurance policies gained shares, too.

As the financial requirements of households and enterprises became less bank-specific, the competitiveness of other intermediaries rose. Financial innovations, which in due course arrived in Austria, increased the alternatives to "traditional" bank lending and deposits and reduced the reliance of investors and corporations (and the public sector) on the intermediation by banks. Thus other financial intermediaries have gained ground in recent years. Investment funds' assets rose from 1.9 to 22.5% of GDP between 1987 and 1997, while the assets of insurance companies and pension funds rose from 13.5 to 24.9% (in 1996; see Appendix, Table A.1). However, in 1995, this was still below the EU average which in turn was lower than the US average.

8 For an international comparison of assets of financial intermediaries, see CEPS (1998).

9 Between 1989 and 1996, the nominal equity of foreign direct investments by Austrian companies rose from ATS 16.8 billion to ATS 83.2 billion (OeNB, Austrian Outward and Inward Direct Investment in 1996: Stocks at Year End, Focus on Austria 3/1998).

10 Separate data for business and private households are not available.

11 Another reason was an enhanced self-financing capacity (although it is still below the EU average) of Austrian manufacturing which has increased the ratio of equity to total assets (and therefore financial independence) over the past decade (see Peneder and Pfaffermayer (1998)).

12 Between 1998 and 1996, financial assets of Austrian non-banks rose by ATS 2,015 billion.

Table 2
Acquisition of financial assets in Austria
Percentage shares, three-year averages

	1988-90	1991-93	1994-96
Cash	3.36	4.06	3.78
Schilling financial assets	48.17	56.68	49.58
Of which: savings deposits	*35.01*	*44.91*	*25.39*
Foreign currency financial assets	7.16	11.06	4.19
Other	2.76	1.50	–2.75
Acquisition of financial assets at banks	56.71	68.49	52.40
Insurance	11.13	12.32	17.80
Investment certificates	8.64	3.84	23.55
Other domestic securities	14.02	4.34	0.47
Foreign investments	6.14	6.96	2.01
Acquisition of financial assets outside banks	39.93	27.46	43.83
Total	100.00	100.00	100.00

Source: OeNB.

The balance sheets of banks already reflect this changing environment: The expansion of loans and deposits has slowed down markedly whereas the growth of holdings and own issues of securities has accelerated: Between 1993 and 1997, holdings of domestic securities grew by 40% (or more than three times as fast as in 1989-93) whereas loans grew by 20% (which was somewhat less than in the four preceding years). Growth of deposits slowed from 31% in 1989-93 to 16% in 1993-97. But despite these profound changes in the behaviour of flows, the importance of lending and deposits remained high in terms of stocks. As a ratio of total domestic assets, loans to non-banks have even risen somewhat in recent years (from 57.4% in 1993 to 58.1% in 1997) and deposits have remained stable (50.2% in both 1993 and 1997).

Due to the universal banking system in Austria, however, the channels of disintermediation are controlled to a large extent by the banks. They play a substantial role in the capital markets and at the Vienna Stock Exchange; they own most of the non-bank financial intermediaries such as investment and pension fund companies; and interconnections between banks and insurance companies are rising, too. All major banks have established "strategic partnerships" with insurance companies in recent years to arrange for mutual cross-selling agreements. Income from participations which rose by some 40% between 1994 and 1997 is therefore partially offsetting "traditional" bank income. Recently, however, the numbers of foreign investment funds as well as insurance companies active in the Austrian market has increased.[13]

Therefore, at present a sizeable fraction of funds that are shifted away from bank deposits remain under the control of the banks as long as they are channelled into investment certificates. This enables the banks to earn commissions (or dividends on their participations in investment fund companies) instead of interest. But shifting revenues from interest to non-interest income reduces net income of banks. Fees usually are lower than net interest margins since they comprise fewer productivity components, and since prime borrowers are more likely to substitute other forms of finance for bank loans, loan portfolios are set to deteriorate.[14] Moreover, fees and commissions are more volatile than interest income, especially in an environment of relationship banking.

[13] The number of foreign investment funds registered in Austria rose from 572 at end-1994 to 1,197 at end-1997 (Die Presse, 3rd March 1998, p. 19).

[14] This poses no problem as long as higher risks are reflected by appropriate risk premia. Interest statistics in Austria do not indicate risk premia in bank lending, but given the tight competition in Austrian banking lending rates in Austria do probably not sufficiently account for risk. Provisions have not risen in recent years, however.

2.3 The responses of the banks

The first response of the banks to shrinking revenues was to expand their customer base by targeting other bank's customers. During the past two decades, the differences between the banks as well as the banking sectors[15] have become less distinctive which has intensified competition considerably. Apart from building societies[16] and special purpose banks, banks (or the sectors, respectively) now offer a comprehensive range of financial services and, for all purposes, are predominantly universal banks. As a consequence, Austria has one of the densest networks of bank branches in Europe.[17] The growth of banking outlets has only very recently started to abate as a result of the mergers within the banking sector.

A comparison of interest rates charged by banks in Austria and Germany could serve as one (admittedly crude) measure of competitive intensity. Since money market rates and bond yields are very similar in Austria and Germany due to Austrian monetary policy, other interest rates should be more or less equal for comparable customers, too. Owing to differences in the design of the statistics, interest rates are not completely comparable. Nevertheless, they show that loan rates are lower in Austria than in Germany.[18]

Table 3
Bank lending rates in Austria and Germany
1997 averages, in percent

Germany	
Long-term fixed-interest loans to enterprises and self-employed persons	
up to DM 1 million	6.68
up to DM 10 million	6.43
Advances on current account	
up to DM 200,000	10.01
DM 200,000 to DM 1 million	9.13
DM 1 million to DM 5 million	7.74
Austria	
Commercial loans	6.65

Sources: OeNB and Deutsche Bundesbank.

[15] Nearly 85% of all banks are part of one of the three so-called multi-tier banking sectors ("dezentrale Sektoren"): the savings banks sector, the rural credit cooperatives (Raiffeisenkassen), and the industrial cooperatives (Volksbanken). Member banks of multi-tier sectors do not compete with each other, but co-operate in the fields of marketing, liquidity management, data processing, training etc. and are linked by a mutual assistance obligation. Each sector has a central institution that serves as a liquidity manager and does much of the international and investment banking business for their sector affiliates. Most of the sector members are relatively small savings and cooperative banks that focus primarily on retail banking with private customers and small and medium-sized companies. Large-scale business, such as lending to larger corporations, and wholesale operations, such as foreign exchange transactions, are handled by their central institutions.

[16] Building societies are owned by the banks. For example, each of the multi-tier sectors has its own building society.

[17] The scope of a bank branch in Austria might, however, be somewhat broader than in countries with clear distinctions between banking and other forms of finance. Due to the large extent of bank intermediation and the fact that much of the disintermediation is handled by the banks, their branches serve as points of sale for investment funds, insurance policies and the like. Therefore, a somewhat higher banking density than other countries could be expected in Austria.

[18] Other components of the banks' income are lower in Austria than in other countries, too. A study by McKinsey (1995) showed that in 1994 the ratio of cost and revenues from payment services was 62% in Austria but 95% in Germany and 103% in Italy.

At the point when all major banks were universal banks with a branch network covering all or large parts of Austria (or a central institution of a multi-tier sector whose members covered all of Austria), new areas of business could only be found abroad. After trying (unsuccessfully) the euro-markets in the 1980s and retrenching subsequently, opportunities arose in Central and Eastern Europe.[19] The share of foreign assets in the balance sheet total climbed from 19.8% at end-1991 to 24.2% at end-1997. Austria's banks have established a strong position in Central and Eastern Europe and – according to BIS data – in 1997 were number one foreign lenders in Slovenia and Slovakia and number two in the Czech Republic, Hungary and Croatia.

Table 4
Foreign and domestic assets and liabilities
Shares, in percentages

	Foreign	**Domestic**	**Total**
Cash	0.34	1.70	1.37
Interbank claims	51.92	19.59	27.40
Securities and participations	19.88	16.95	17.66
Loans to non-banks	27.13	57.90	50.46
Other	0.73	3.86	3.10
Total assets	**100.00**	**100.00**	**100.00**
Interbank liabilities	54.48	21.30	30.42
Deposits of non-banks	18.22	50.20	41.41
Own securities	26.19	16.78	19.37
Other	1.11	11.72	8.80
Total liabilities	**100.00**	**100.00**	**100.00**
Net interest income as a percentage of the balance sheet volume	*0.57*	*1.84*	*1.49*

Source: OeNB.

The contribution to revenues, however, did not match the contribution to business volumes. In 1997, net interest income in international business was only 0.57% of foreign assets, compared with 1.84% in domestic business.[20] The main reason is that, internationally, interbank business (and to a much lesser extent securitised assets and liabilities), where interest margins are much slimmer, has a considerably higher share in assets and liabilities. Conversely, the shares of loans to and deposits from non-banks are much smaller than in the respective domestic balance sheet volumes.

Another option for at least the largest banks was to "play the markets", such as foreign exchange trading or derivatives, both proprietary and as intermediaries for corporate customers. Off-balance sheet items rose by more than 600% between 1987 and 1997 and thus much faster than the balance sheet; in terms of total assets they rose from one quarter in 1987 to more than 100% in 1997. By international standards, the volumes traded by Austrian banks are rather small, however. The share of net income from financial transactions in gross income has risen by approximately 1 percentage point to roughly 5½% between 1994 and 1997, its contribution to net income rose from 14 to 17½%. Although earnings from financial transactions have grown steadily over the past few years for which data are available, they are, of course, subject to a much higher degree of volatility.

[19] Another important reason for Austrian banks to step up business with Central and Eastern Europe was, of course, to follow their corporate customers. Austrian enterprises have invested heavily in the region.

[20] The total contribution of international business to interest income might be underestimated by income of subsidiaries, for which data are not available.

Table 5
Special off-balance sheet items of Austrian banks

	In billions of ATS	As a % of total assets
1987	842	24.62
1988	1,182	32.67
1989	2,019	52.71
1990	2,778	68.76
1991	2,996	70.06
1992	4,043	89.04
1993	3,510	72.73
1994	3,771	74.26
1995	4,786	88.90
1996	5,341	94.52
1997	6,200	103.34

Source: OeNB.

Banks sought to reduce competition by decreasing their numbers and hence the number of competitors. Between 1987 and 1997, the number of independent banks in Austria sank by 255 or approximately 20% to 995. Although by European standards the cutbacks in Austria were relatively strong, the number of banks is still comparatively high,[21] and market concentration has remained relatively low. The market share of the five largest banks is 44% which is considerably less than in most other small European countries.[22] Most of the reductions have taken place in the multi-tier banking sectors where smaller institutions were taken over by larger members of the sectors resulting in the establishment of regional institutions. Frequently these take-overs target banks that show weak earnings or a high risk exposure and therefore do not influence the banking infrastructure as a whole. Mergers have also taken place across banking sectors, whereby the acquiring bank almost always was a multi-tier sector member.[23]

Table 6
Change in the number of independent banks in Austria, 1988 to 1997

Joint-stock banks	8
Savings banks	–56
Mortgage banks	–1
Rural cooperative banks	–189
Industrial cooperative banks	–31
Building societies	1
Special purpose banks	13
Total	**–255**

Source: OeNB.

[21] In part, this is attributable to the sectoral structure of the banking system. In Switzerland, there are 892 legally independent Raiffeisenkassen, which in Swiss banking statistics are counted as one bank. (Schweizerische Nationalbank, Die Banken in der Schweiz, Zürich (1998), p. 21). If their number were added to the total of Swiss banks, it would exceed the corresponding number for Austria.

[22] The international comparability of market concentration is somewhat limited, however, as, due to rising international business volumes, an increasing fraction of balance sheet volumes concerns foreign business and hence does not reflect the size of the home market.

[23] The sectoral structure makes it almost impossible for outsiders to purchase (stakes in) banks within one of the sectors.

Table 7
Corporate restructurings at the ten largest banks (1988)

Creditanstalt	1996	Acquisition of majority by Bank Austria
Girozentrale	1992	Merger with Österreichisches Credit-Institut to form GiroCredit
	1992	Acquisition by Erste österreichisches Spar-Casse and merger to Erste Bank
Länderbank	1991	Merger with Zentralsparkasse to Bank Austria
Zentralsparkasse	1991	Merger with Länderbank to Bank Austria
Postsparkasse	1997	Reorganisation as joint-stock company, 49% are to be sold to strategic partner
BAWAG	1994	Acquisition of minority stake by Bayrische Landesbank
RZB	–	
Erste österreichische Spar-Casse	1992	Merger with GiroCredit to Erste Bank
ÖVAG	1996	Acquisition of minority stake by DG Bank
Oberbank	–	

In the course of these mergers, the ownership of Austrian banks has undergone considerable changes over the past decade. Beginning in 1991, most major banks have seen changes in their ownership, up to fully-fledged mergers. Of the ten largest Austrian banks in 1988, the first three have completely changed hands. State ownership in banking, which had long been an important feature of the Austrian banking system, has been reduced over the past years. From nearly a quarter in 1992, public ownership of the seven largest Austrian banks fell to 7% in 1998.

2.4 The effects of disintermediation on banks' earnings

According to OECD Bank Profitability Data, the income of banks in Austria was still below the European average in 1995 (the last year for which data are available) but its relative performance had improved since the late 1980s. In 1987,[24] net income in terms of the average balance sheet total in Austria was 47% of the average of 12 EU countries, in 1995 it was 85%. Net income improved considerably until 1993 but, since then, has fallen back to (and even below) its end-1980s levels.

In terms of the respective year-end balance-sheet items, lending and deposit-taking by non-bank customers still yield by far the highest returns: in 1997, the margin between income and expenses equalled 2.8%; on the balance sheet as a whole, the margin was 1.7%.

Table 8
Income and expenses by type of assets and liabilities[1]

	Assets		Liabilities		
	Income	"Interest rate"	Expenses	"Interest rate"	"Margin"[2]
	million of ATS	%	million of ATS	%	%
Interbank	76,368	4.5	74,204	4.1	0.4
Non-banks	184,478	6.0	80,886	3.3	2.8
Securities	41,418	6.1	57,760	5.5	0.6
Shares	5,500	4.6			
Participations	7,469	4.6			
Other	2,098	0.8	2,051	0.3	0.4
Total	317,331	5.3	214,901	3.6	1.7

[1] Net interest income and earnings from securities and participations. [2] The margin for the different types of assets and liabilities is purely hypothetical since their respective volumes differ markedly.

Source: OeNB.

[24] Comprehensive data on banks' income and profitability in Austria are available from 1987. Due to changes in the reporting requirements for banks, however, time series for many items are available only from 1994 or 1996.

The rising competitive pressures from other forms of finance and the resulting losses of market shares and/or possible price concessions to stay in business begin to show in the income statement of the banks. Substitution of (on aggregate) lesser-yielding securities for loans and deposits as well as the expansion of foreign business have exerted pressure on banks' interest earnings, too. Net interest income in terms of total assets has declined by 0.23 percentage points to 1.49% since 1993 (see the Appendix, Table A.5). The largest reduction was registered in the multi-tier sectors,[25] but joint-stock banks recorded a fall, too. Non-interest income as a percentage of total assets, however, has shown very little fluctuations over the past decade and could not compensate for falling net interest ratios. So, up to now, disintermediation has led to an increased ratio of non interest income mainly by decreasing interest revenues.

The data do not allow a breakdown of activities that do not show up in the balance sheet. So profitability of off-balance sheet activities cannot be registered directly. Apart from a few specialised investment banks and investment banking activities by the large commercial banks in Austria (which, however, do "traditional" banking business as well), it is the so-called "central institutions" of the multi-tier sectors which most of all are comparable to investment banks. Including the regional institutions of the three-tier rural cooperative sector (Raiffeisen-Landesbanken) there are ten[26] such central institutions. They differ considerably from commercial banks in aim and scope of business. In a sense, they might serve to show what the average (at least medium-sized) Austrian banks could be like in the future: less direct lending and deposit taking but more brokerage and counselling services. In order to get an idea of what this future could look like, we compared their performance in 1997 with that of other large and medium-sized banks. By the end of 1997, there were 65 banks with a balance sheet total of more than ATS 5 billion.[27] We grouped them according to size and the medium-sized banks (with a balance sheet volume of ATS 20 billion to ATS 100 billion) according to their affiliation to a multi-tier sector as data show that multi-tier sectors are consistently more profitable than joint-stock banks.

Net income of banks with a balance sheet total of between ATS 5 billion and ATS 20 billion in terms of total assets was twice as high as that of the five largest banks – irrespective of sector affiliation (see the Appendix, Table A.4). Apart from lower net interest income, the larger banks and central institutions also have significantly lower non-interest income in terms of total assets. Disregarding the item "other"[28] and net results of financial operations there is no large difference in the shares of interest and non-interest income across the respective sub-groups of the panel with the exception of the central institutions. The relation between interest and non-interest income is roughly 2:1.

The reason might be that much of the non-interest income is generated via lending or deposit taking or even tied to it (e.g. commissions for loans). Credit is still to a large extent the cornerstone of a banking relationship. This could in part explain the low levels of both interest and non-interest income at the central institutions which do much less business with domestic non-banks.[29] On the other hand, the central institution fulfil some non-interest-bearing functions for the sector affiliates. Prima facie these findings would imply that by growing, Austrian banks may not expect their share in non-interest

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[25] Due to reclassifications following cross-sector mergers, data are not perfectly comparable, however. Especially noteworthy in this respect are the two major takeovers in the early 1990s of joint-stock banks by members of the savings banks sector. Moreover, since 1994 income statements of building societies have been reported separately.

[26] Erste Bank, the central institution of the savings bank sector, has for the purpose of this analysis been excluded from the "central institutions", since it has an extensive branch network and is therefore not exclusively a "central institution".

[27] With the exception of mortgage banks, building societies and special purpose banks.

[28] These consist mainly of one-off measures and activities that are not related to the usual banking business.

[29] In parts, the lower income ratios can be explained by their large share of international business which yields considerably lower margins for Austrian banks than domestic business. Within the sample, there are seven medium-sized banks with a share of foreign assets of more than 50% of the balance sheet. Both interest and non-interest income are lower than in the domestically-oriented peers. But again, the ratio between interest and non-interest income is about 2:1.

income to rise. Furthermore, substituting interest income for fees would not be so easy to achieve to the extent they are interconnected.[30]

2.5 Outlook: financial intermediation in EMU

Austrian banks are going to enter into monetary union with their core business already under considerable pressure. Monetary union is almost certain to intensify these pressures. It will mean for the banks one more major deregulation measure stepping up disintermediation. For the Austrian banking system, the effects of EMU are comparable to those of the single market for the real economy, since a host of financial regulation is tied to national currencies, such as investment regulations, restrictions of foreign currency positions or national legislation concerning securities issues. The euro will reduce the number of existing barriers to cross-border investment and eliminate some restrictions on currency exposure of various pools of capital (pension funds, insurance companies etc.). Monetary union therefore abolishes the non-tariff trade barrier "different currencies" that up to now has segregated the national financial markets.

All banks in the euro area will have access to primary funds in the same currency. At the moment, foreign banks are severely disadvantaged in extending loans to Austrian customers, as without a branch network in Austria they have only limited access to schilling primary funds and therefore have to buy schilling in the interbank market. This reduces the interest margin to such an extent that foreign banks at present play a relatively minor role in Austria – their overall share in the balance sheet total did not exceed 3% in 1995.[31] Foreign banks tend to focus on special market segments and primarily engage in the lending and deposit business on a large-scale basis.[32] In monetary union, however, all banks in all EMU countries have access to euro deposits which they can lend in the entire euro area and – at least in this respect – will be able to compete with domestic banks on a level playing field. Not all customers, of course, will be equally attractive targets. Along with possible regional peculiarities, the high costs associated with lending (e. g., acquisition, risk assessment) will be an obstacle to exhaustive market penetration by foreign competitors. They will focus instead on those market segments that can be serviced without full presence in Austria, mainly on lending to larger corporates.[33] In the light of the probable imperfect reflection of risk in interest rates in Austria it can be expected that foreign competitors will especially target enterprises with the highest standing, since the interest rates those customers are charged in any case reflect risk appropriately. Austrian banks are therefore expected to lose business volume and at the same time see their average loan portfolio deteriorate. Pressure on interest income of Austrian banks is therefore expected to keep on.

In addition to enhanced competition from foreign banks, monetary union will further erode the core function of banks (lending and deposit taking) that in recent years already has waned. Austrian banks will no longer operate within the small and often rather illiquid Austrian financial market, but in the large and highly liquid euro financial market. With the much higher number of market participants, the role and importance of fungibility of financial assets will increase. This will reduce the cost of financing via capital markets and increase the relative cost of bank loans which will lead either to increased pressure on banks' margins or to a loss of volume (or both). Additionally, non-interest

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30 However, the falling share of gross that is spent on funding points to rising efficiency of intermediation. Between 1990 and 1997, the ratio of interest income and interest expenses fell from 80 to 71%.

31 One obstacle to foreign ownership of Austrian banks is that it is almost impossible to buy into one of the sectors. Therefore the by far largest share of foreign participation is joint-stock banks. The relatively high share in the industrial credit cooperatives sector is due to a participation in the sector's central institution. High branch density also had the effect of deterring entry by foreign banks into retail banking.

32 In recent years, however, foreign banks acquired substantial shares in major Austrian banks for the first time which means that foreign influence is spreading from the formerly rather specialised business segments (the foreign and inter-bank business) to the retail market (see Mooslechner (1997)).

33 Of some relevance for Austrian banks due to the high degree of foreign direct investments is that multinational companies are expected to concentrate their euro cash management at their respective headquarters. This could lead to additional losses of business for banks which now do business with Austrian subsidiaries of multinational companies.

income banks now earn due to their dominant role in the Austrian capital markets could decrease. For example, underwriting fees might diminish since monetary union will facilitate underwriting of Austrian securities by foreign investment banks.[34]

Within the banks' balance sheets, securitised assets will therefore be likely to continue to gain volume from non-securitised assets. This will reduce banks' income as margins on direct lending and deposit taking are higher than for securitised business. Moreover, given that the changes in attitudes of investors and enterprises seen over the last decade mean that bank customers are now more prepared to reap the benefits of this large euro market today than in the past, the effects for banks will be even more striking.

So, even if Austria's banks succeed in maintaining their business volumes in the face of continuing disintermediation the pressure on their margins is likely to continue. Banks are already faced with slimmer margins, higher volatility and a shift of demand towards products and services that employ fewer resources than traditional banking services. In the past few years they began – albeit slowly – to reduce their capacities, such as their number of employees (which has been falling since 1995) or their branch network (mostly redundancies as a result of mergers). Operating expenses have accordingly come down somewhat in recent years. The overall pattern of earnings and expenditures which moved very much in line over the past decade as well as the very strong correlation between earnings and expenses in the cross-sectional analysis (see the Appendix, Table A.4), however, imply the existence of at least some form of X-inefficiency in the Austrian banking sector which would give banks some leeway to improve profitability if earnings continued to deteriorate.[35]

3. Comparisons of value at risk methods with implications for regulators

3.1 Introduction

Over the last decades many financial institutions have significantly increased their trading activities in general and in derivatives markets in particular. Jorion (1997) identifies increased volatility, technological change in physical equipment, advances in finance theory and political developments (like more market-oriented policies and deregulation of financial markets) as the driving forces behind this process. In addition, many new financial products have been developed, sometimes as a response to regulation. Although these products can have certain advantages in hedging financial risks or provide speculative opportunities, they can also create large losses in certain instances. Indeed, spectacular financial disasters related to derivatives trading have been observed during the last decade. The 233-year-old British bank Barings went bankrupt on 26th February 1995 when Nick Leeson lost $1.3 billion from derivatives positions. Another well-known case is the $1.3 billion loss by the German firm Metallgesellschaft. Most of these (and other) financial disasters could probably have been avoided if properly functioning internal controls and adequate risk management had been in place.

With the aim of assuring financial stability the need for accurate measurement of financial risks and sound risk management has clearly been recognised by the financial industry and regulatory authorities. In particular, the concept of Value at Risk (*VaR*) has gained much attention and is now widely accepted as a useful measure of financial risk. In short, *VaR* is the expected maximum loss over a target horizon for a given confidence interval. To be more precise, let P be the price of a portfolio that contains m contracts C_j ($j = 1,...,m$) where the changes in value of the contracts ΔC_j depend on n risk factors r_i ($i = 1,...,n$). These risk factors are stochastic and might be specific equity

[34] In this market segment, market penetration of foreign competitors is already rather high. For example, the share of foreign institutions at all privatisations in Austria between 1987 and 1996 was 38% (Walter Springer, Kapitalmarkt Österreich, Vienna (1998), p. 153).

[35] On the other hand, the fact that profitability of banks is to a large extent determined by expenses possibly indicates a tight price competition in the Austrian banking sector (see Mooslechner (1995), p. 107).

prices, interest rates, exchange rates, etc. The portfolio profit/loss ΔP over a given horizon is a function of the changes in the value of the contracts. Thus the change in the value of a portfolio $\Delta P(r_1,...,r_n) = \Sigma_j \Delta C_j(r_1,...,r_n)$ can be expressed as a function of the underlying risk factors.[36] Let $F(\Delta P)$ be the cumulative probability distribution of the changes in the market value of a portfolio, then *VaR* can formally be defined as:

$$(1) \qquad VaR = F^{-1}(p)$$

where p is a specified probability (for example 0.05 or 0.01) and $F^{-1}(p)$ denotes the inverse of $F(.)$. Thus losses greater than the estimated *VaR* should only occur with probability p. For example, if a *VaR* calculated at the 95% confidence level is accurate, then losses greater than the *VaR* measure (so called "tail events") should occur on average only five times in every hundred trading days.

VaR is attractive because it is easy to understand (the measure is units of money) and it provides an estimate of the amount of capital that is needed to support a certain level of risk. Another advantage of this measure is the ability to incorporate the effects of portfolio diversification. Many banks (and other financial institutions) now base their assessment of financial risk and risk management practices on *VaR* or plan to do so in the future.

According to the Basle Committee proposals, many countries' banks have an option to use *VaR* models (after approval by their regulatory authorities) to determine their capital requirements for market risk. For capital requirement purposes the model parameters are standardised and require banks to use a one-sided confidence interval of 99%, an assumed holding period of 10 days and at least one year of historical data for the market risk factors underlying their trading books. Although the model parameters are standardised, no particular approach to estimate *VaR* has to be used by all banks. Thus banks can choose their individual approach to *VaR*. This liberal view makes sense because there is no single "best" approach to *VaR*, and the ongoing research in this area is far from being completed.

While financial institutions use their *VaR* models in their daily business, reported *VaR* numbers can also provide useful information for regulators. From a regulator's point of view it would be important if reported *VaR* numbers could be utilized to compare risk-taking across different banks at a given point in time and to track market risk exposures over time. For example Hendricks and Hirtle (1997) argue that:[37]

"...the information generated by the models will allow supervisors and financial market participants to compare risk exposures over time and across institutions."

And that:[38] "...a capital charge based on internal models may provide supervisors and the financial markets with a consistent framework for making comparisons across institutions".

We think that this view is unduly optimistic since different approaches and assumptions might produce systematically different *VaR* estimates. The purpose of this section is twofold. First, we investigate whether it makes sense to compare *VaR* numbers generated by different models. We analyse variance-covariance methods and historical simulation approaches to estimate *VaR* numbers for one equally weighted and nineteen randomly chosen linear foreign exchange portfolios over a period of one thousand trading days. In addition, we apply a new method recently proposed in Hull and White (1998) that deals with fat-tailed distributions which are typical for foreign exchange returns but also for many other financial returns. The second goal is to compare the performance of the various models over the simulation period with a simple "backtesting" procedure to see how accurately the models match the specified confidence intervals.

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[36] The risk factors r_i are typically measured as logarithmic returns $r_{it} = ln(p_{it}/p_{it-1})$ or as arithmetic returns $r_{it}=(p_{it}-p_{it-1})/p_{it-1}$. Using a Taylor series expansion it can be shown that for small r_i both expressions are approximately equal. In all our calculations we use arithmetic returns.

[37] Hendricks and Hirtle (1997), p. 1.

[38] Hendricks and Hirtle (1997), p. 8.

The remainder of this part is organised as follows: in Section 3.2 we briefly describe the *VaR* approaches on which our calculations are based. Section 3.3 provides a description of our data. Section 3.4 describes the application of the various methods, Section 3.5 presents and explains the results. Finally, Section 3.6 contains some concluding remarks.

3.2 *VaR* methods

To generate our *VaR* estimates we use variants of the variance-covariance approach, historical simulations and Monte Carlo methods based on mixtures of normal distributions as proposed in Hull and White (1998).[39] The variance-covariance approach assumes that the risk factors that determine the value of the portfolio are multivariate normally distributed which implies that the changes in the value of a linear portfolio are also normally distributed. Since the normal distribution is completely described by its first two moments, the *VaR* of a portfolio is essentially a multiple of the standard deviation and is given by:

$$VaR = -\alpha\sqrt{w'\Sigma w} \tag{2}$$

where w is a vector of absolute portfolio weights, w' its transpose, Σ a variance-covariance matrix and α a scaling factor which is 1.65 for a 95% confidence interval and 2.33 for a 99% confidence interval. Equation (2) implies that an estimate of the covariance matrix of the risk factors is needed, and it is usually estimated from daily historical time series of the returns of the relevant risk factors using equally weighted moving averages such as:

$$\sigma_{ijT}^2 = \sum_{t=T-n}^{T-1} r_{it} r_{jt} / n \tag{3}$$

where the mean is often assumed to be zero.[40] σ_{ijT}^2 denotes a variance (or covariance) at time T, r_{it} and r_{jt} are returns and n is the number of observations (i.e. the window length) used to calculate the variances and covariances.

Another frequently used estimator is the exponentially weighted moving average (*EWMA*). In contrast to equally weighted moving averages, the *EWMA* weights current observations more than past observations to calculate conditional variances (covariances). The *EWMA* estimator in its recursive form is given by:

$$\sigma_{ij/t}^2 = \lambda\sigma_{ij/t-1}^2 + (1-\lambda) r_{i/t-1} r_{jt-1} \tag{4}$$

where the parameter λ (sometimes called the "decay factor") determines the exponentially declining weighting scheme of the observations.[41] One difference between the two estimators is that the equally weighted moving average does not account for time dependent variances whereas the exponentially weighted moving average does.[42] From equation (4) it can be seen that an *EWMA* model is equivalent to an *IGARCH* (1,1) model without intercept.[43]

The second approach that we use is historical simulation. In contrast to variance-covariance methods, no specific distributional assumptions about the individual market risk factors (i.e. returns) are made,

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[39] For a comprehensive discussion of variance-covariance-approaches and historical simulation methods, see, for example, Dowd (1998) or Jorion (1997).

[40] The assumption of zero means is quite common since the means of most daily financial return series are very close to zero and are hard to estimate precisely. For more details and a comprehensive study of this issue, see Figlewski (1994).

[41] The allowed range of λ is between zero and one.

[42] A variance-covariance approach in conjunction with variances (covariances) based on exponentially weighted moving averages assumes conditional normality.

[43] For this and other issues concerning the estimation of variance-covariance matrices, see Alexander (1996) or Kroner (1996).

and no variances or covariances have to be estimated. Instead it is only assumed that the distribution of the relevant market returns is constant over the sample period. To calculate *VaR* numbers, the returns of the risk factors for each day within the historical sample period are viewed as a possible scenario for future returns. The portfolio is evaluated under each of the scenarios and the resulting profits/losses are ordered in ascending order with respect to their size. The resulting empirical distribution is then viewed as the probability distribution of future profits and losses. The *VaR* is then determined as the quantile of the empirical profit/loss distribution that is implied by the chosen confidence level.

The approaches described above have their particular advantages and disadvantages. For example, the variance-covariance approach is relatively easy to implement and *VaR* numbers can be calculated quickly. On the other hand, the method is problematic if the portfolio contains a significant amount of nonlinear financial instruments (such as options) because then the resulting profit/loss distribution is typically not normally distributed. Another problem arises if the distributions of the underlying risk factors are not normal. Then the joint distribution of the risk factors cannot be derived analytically in most cases. Finally the resulting *VaR* depends crucially on the method used to estimate the variance-covariance matrix. Historical simulation methods avoid many of the problems of the variance-covariance approach because the underlying risk factors need not be normally distributed and the method can deal with nonlinear portfolios. In addition no variance-covariance matrices have to be estimated. On the other hand, the method is data intensive and requires more computer power. What is more, the resulting *VaR* depends heavily on the chosen window length of historical data.

The main idea of the third approach is to transform the original data in such a way that the transformed data are normally distributed. Then the convenient properties of the normal distribution can be exploited. Let e_{it} be the return of risk factor i on day t and let G_{it} be the assumed probability distribution for e_{it}. The goal is to transform e_{it} into a new variable f_{it} that is normally distributed using the transformation:

$$(5) \qquad f_{it} = N^{-1}[G_{it}(e_{it})]$$

where N is the cumulative probability function of a standard normal distribution and N^{-1} is its inverse. Thus the original variables e_{it} are mapped into variables f_{it} that are standard normally distributed on a "fractile to fractile" basis. To make this method operational the functional form of the G-distributions of the risk factors must be chosen and the parameters of these distributions have to be estimated using historical data. The choice of the G-functions obviously depends on the characteristics of the distributions of the risk factors that drive the value of the portfolio (our specific choice will be presented in a later section). Given the parameters of the G-functions, the f_{it} variables can be mapped back into actual outcomes using the relationship:

$$(6) \qquad e_{it} = G_{it}^{-1}[N(f_{it})]$$

This methodology has the advantage that it can deal with risk factors that are not normally distributed which is important when we want to calculate *VaR* numbers using financial returns which are typically fat tailed. Fat tailed distributions imply that extreme observations are more likely to occur than in a normal distribution. In addition, the method can easily deal with nonlinear portfolios.

We exploit the methodology by running Monte Carlo simulations to generate a large number of f_{it} variables from standard normal distributions. To simulate the joint distribution of market risk factors, we incorporate the correlation between the risk factors via Cholesky factorisation. The generated f_{it} variables are mapped into actual outcomes using relationship (6). Individual portfolios can then be evaluated under each simulation trial. From the resulting profit/loss distribution (under the mapped outcomes e_{it}) *VaR* numbers can be calculated using the appropriate quantile of this distribution.[44]

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[44] For other possible ways of implementing this methodology, see Hull and White (1998).

3.3 Data

We apply the methods described above to one equally weighted portfolio and nineteen randomly chosen foreign exchange portfolios. We assume that an investor holds a certain amount of dollars in foreign currencies. Thus changes in the value of these portfolios depend solely on changes in exchange rates. In our calculations we assume that the amount invested in each portfolio is US$ 100 million. The reason for the choice of simple linear portfolio structures is that we do not want to complicate matters by issues concerning the valuation and mapping of complicated financial instruments. These complications would only add additional noise to our comparisons.

All of our portfolios contain the Australian dollar (AUD), Belgian franc (BEF), Swiss franc (CHF), Deutsche mark (DEM), Danish krone (DKK), Spanish peseta (ESP), French franc (FRF), British pound (GBP), Italian lira (ITL), Japanese yen (JPY), Dutch guilder (NGL), Swedish krone (SEK) and Austrian schilling (ATS). We use daily exchange rates over the period from 16th June 1986 to 15th June 1998 which gives a total of 3,131 observations for each individual time series.[45] All distributions of the returns of the individual currencies display excess kurtosis (see Table 9).[46]

Table 9
Excess kurtosis of exchange rate distributions

Currency	Excess kurtosis	Currency	Excess kurtosis
AUD	4.84	GBP	3.44
BEF	2.91	ITL	8.49
CHF	2.04	JPY	4.81
DEM	2.30	NLG	3.50
DKK	4.18	SEK	6.07
ESP	5.69	ATS	2.87
FRF	3.04		

As mentioned above, the fat tails of the distributions imply that extreme market shocks are more frequently observed than under normal distributions.[47] For example, if we wanted to calculate the *VaR* for a position in a single currency at the 99% level of confidence we would use 2.33 times the standard deviation if we assume a normal distribution. If the true distribution has fat tails, we would

Table 10
Multiples of standard deviations

Currency	5% quantile	1% quantile	Currency	5% quantile	1% quantile
AUD	1.49	2.46	GBP	1.60	2.60
BEF	1.64	2.61	ITL	1.57	2.54
CHF	1.66	2.80	JPY	1.64	2.80
DEM	1.68	2.66	NLG	1.62	2.64
DKK	1.63	2.56	SEK	1.53	2.53
ESP	1.56	2.49	ATS	1.66	2.60
FRF	1.62	2.75	Average	1.61	2.62

[45] The data were retrieved from Datastream.

[46] The return distributions (for various frequencies) of major exchange rates are studied in Müller, Dacorogna and Pictet (1996).

[47] Fat-tailed distributions can, for example, arise from jump diffusion processes, stochastic volatility or Markov-switching. Further discussion can be found in Duffie and Pan (1997).

underestimate the *VaR* because of the higher probability mass of the distribution on the left tail. Table 10 demonstrates this problem for the 1% and 5% quantiles of the empirical distributions.

For each currency the 1% quantile exceeds the 2.33 multiples implied by a normal distribution. On average the 1% quantile is located 2.62 standard deviations below the mean. At the 5% quantile some multiples are above the 1.65 as implied by the normal distribution but the majority are below, indicating a tendency for slightly too conservative *VaR* estimates.

3.4 Application of the various *VaR* models

In this section we describe the specific applications and variants of the *VaR* models that we use in our comparisons. With each model we generate daily *VaR* estimates of the overnight risk (i.e. we assume a one-day holding period) for the last thousand trading days of our sample for each of the twenty portfolios at the 99% and 95% confidence intervals. In all calculations we assume that the means of the daily return series are zero.

The first model used in our calculations is the variance-covariance approach. The first variant of this model is based on daily variances and covariances estimated with equally weighted moving averages with a window length of 250 actual trading days. The equal weighting scheme implies that the *VaR*s generated by this model do not account for time dependent variances.[48] Since there is much empirical evidence that variances of financial returns are predictable, equally weighted moving averages do not seem to be very attractive estimators.[49]

The next model is the variance-covariance-approach with exponentially weighted moving averages. In contrast to the first model, the resulting *VaR* estimates incorporate effects (for example the well known volatility clustering) of time dependent variances. It follows from equation (4) that the persistence of the estimated variances (and covariances) depend on the chosen lambda. Following J.P. Morgan we set λ to 0.94 when we estimate the daily variances and covariances.[50]

The third and the fourth model are based on historical simulation with a time window of 250 and 1,250 historical scenarios, respectively. To obtain our *VaR*-numbers we interpolate linearly between the neighboring observations that are implied by the 1% and 5% quantiles of the ordered changes of portfolio values. Due to the equal weighting of each historical scenario these models do not discriminate between recent scenarios and scenarios further away in the past. All scenarios (implicitly) carry the same probability of occurrence. Let us assume that markets would not be very volatile at the moment and consider that the sample to simulate *VaR* still contains a significant fraction of scenarios from a highly volatile period. In such a case we would overestimate our *VaR* numbers. On the other hand, if we were in a highly volatile period we would underestimate the *VaR* if the scenarios are based on a low volatility period. We will return to this point later when we present the results.

To implement the Monte Carlo Methods based on Hull and White we have to assume a particular form of the distributions of the risk factors that determine the values of our portfolios. Following Hull and White (1998) we assume that the empirical distribution of an individual risk factor i at time t is generated by a mixture of two normal distributions according to:

$$(7) \qquad G_{it}(e_{it}) = p_i N\left(\frac{e_{it}}{u_i \sigma_{it}}\right) + (1-p_i) N\left(\frac{e_{it}}{v_i \sigma_{it}}\right)$$

where $G_{it}(e_{it})$ denotes the value of the cumulative probability distribution function for observation e_{it}, p_i and $(1-p_i)$ are probabilities, N denotes the cumulative probability distribution function of a standard

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[48] This is obvious because this estimator produces the same variances and covariances for every possible ordering of the observations contained in the time window.

[49] See Campbell, Lo and MacKinlay (1997), Chapter 12.

[50] This is of course not the best λ for each individual time series since the lambdas can be estimated separately for each time series. For an empirical justification of the choice of 0.94 see RiskMetricsTM Technical document (1996).

normal distribution and u_i and v_i are parameters that scale the standard deviation σ_{it}.[51] The parameters of the distribution must satisfy the restriction:

$$(8) \qquad p_i u_i^2 + (1 - p_i) v_i^2 = 1$$

since the variance of the mixed distribution must be the same as the variance of the observed empirical distribution.[52]

The p, u, v and σ parameters have to be estimated for each individual risk factor. For technical reasons we do not maximize the implied likelihood functions directly. Instead we group our data for each risk factor i into four categories: less than one standard deviation ($|e_{it}| \leq \sigma_{it}$); one to two standard deviations ($\sigma_{it} < |e_{it}| \leq 2\sigma_{it}$); two to three standard deviations ($2\sigma_{it} < |e_{it}| \leq 3\sigma_{it}$); and more than three standard deviations ($|e_{it}| > 3\sigma_{it}$). We than maximise the log-likelihood function:

$$(9) \qquad \sum_{j=1}^{4} \alpha_{ij} \log(\beta_{ij})$$

that results when we compare the predicted fraction of data β_{ij} implied for particular values of p, u and v with the proportion α_{ij} of the data actually observed in each category (i.e. we search for the values of p, u and v that provide the best fit for the empirical distributions of the individual risk factors).

We estimate two different versions of the model for each risk factor using 1,880 historical observations. In the first version we categorise our data using equally weighted moving averages according to equation (3) with a window length of 250 trading days. In the second version we estimate the standard deviations using exponentially weighted moving averages according to (4) with a weighting parameter of 0.94. The estimated parameters for both versions of the model are summarised in Table 11.

Table 11
Parameter estimates for mixture of normal distributions

Currency	Equal weights			*EWMA*		
	u	***p***	***v***	***u***	***p***	***v***
AUD	0.68	0.71	1.52	0.64	0.36	1.15
BEF	0.71	0.68	1.43	0.45	0.21	1.10
CHF	0.74	0.63	1.33	0.45	0.15	1.07
DEM	0.73	0.74	1.53	0.44	0.19	1.09
DKK	0.77	0.81	1.65	0.45	0.18	1.08
ESP	0.70	0.72	1.52	0.49	0.25	1.12
FRF	0.74	0.77	1.59	0.47	0.14	1.06
GBP	0.64	0.68	1.50	0.45	0.24	1.12
ITL	0.69	0.71	1.51	0.48	0.22	1.10
JPY	0.71	0.73	1.53	0.67	0.49	1.24
NLG	0.72	0.73	1.52	0.45	0.18	1.08
SEK	0.78	0.81	1.63	0.49	0.20	1.09
ATS	0.69	0.71	1.51	0.47	0.23	1.11

[51] It can be shown that a mixture of normal distributions model like equation (7) produces distributions with fatter tails than a normal distribution. For a discussion, see, for example, Duffie and Pan (1997), Hull and White (1998) or Campbell, Lo and MacKinlay (1997).

[52] The variance of the mixture of normals distribution is given by $pu^2\sigma^2 + (1\text{-}p)v^2\sigma^2$.

Under both sets of parameters we run 10,000 Monte Carlo trials for each of the thousand trading days to simulate the joint distributions of the market risk factors for each of our twenty portfolios. In our simulations we use the estimated correlation matrices according to equation (3) and (4) that correspond to each individual trading day. Thus for day t we simulate the joint distribution of the risk factors using the Choleski-factorisation that is implied by the estimated variances and correlations for day t for both versions of the model.

Since there is no closed form solution for the transformations of the simulated values into the "actual" outcomes implied by the mixture of normal distributions, we iterate these values using the Newton-scheme. Having obtained the transformed values for day t we evaluate the portfolios under each of the 10,000 scenario vectors for day t and calculate the *VaR* numbers as the corresponding quantiles from the resulting profit and loss distributions.

3.5 Results

In this section we report and discuss the results of the daily *VaR* estimates at the 99% and 95% confidence level. In all calculations we assume a holding period of one day. In addition, we present the results from the "backtesting" of each method. The backtesting results should provide information on how accurately the various methods perform.

We start our discussion with an inspection of the plots of *VaR* numbers generated by the different models. Graph 1 shows the daily *VaR* at the 99% confidence interval for the hypothetical portfolio with equal portfolio weights for each of the six methods.[53] The patterns are clearly quite different for the different methods, although all methods measure the *VaR* for the same portfolio. The historical simulation with 1,250 days of historical data produces the highest *VaR* on average. It is also easily seen that the plots for both historical simulation methods look rather different from the plots for all other methods. The *VaR* computed by historical simulation often does not change for rather long periods of time, but if they change, they do so in an abrupt fashion. These changes are more drastic in the case where only 250 historical observations are used. These patterns are driven by extreme events that influence the *VaR* numbers over long time periods.

The *VaR* numbers computed with variance-covariance approaches are driven by the methods for estimating the daily variance-covarianc matrices. The equally weighted moving average estimator produces a much smoother *VaR* series than the *EWMA*-estimator. The *VaR* obtained with the *EWMA* reflects to some extent the kind of "volatility clustering" that is typical for most financial return series. If we compare the *VaR* series computed with unweighted and weighted moving averages more closely, we see that the unweighted *VaR* reacts more slowly to changes in market volatility. For example, although market volatility falls sharply over the period from the 300th to the 500th day of our simulations according to the *EWMA* based *VaR* series, it stays high and approximately constant until around the 400th day and than falls only gradually for the equally weighted *VaR* series. Over this period, the *VaR* is always above the *EWMA* based *VaR*.

Next we examine the differences between the different methods with the *EWMA* based variance-covariance approach as a benchmark for the 99% confidence interval. We decided to take this approach as a benchmark because it is frequently used and the variance-covariance matrices are freely available on the Internet (provided by J.P. Morgan/Reuters). Table 12 reports the results of the comparisons. As can be seen, the differences can be extremely large, as large as 276% as observed for the historical simulation method with a window length of 250 trading days.

Consider a regulator who would compare the *VaR* numbers of two banks in that period, when bank A uses the parametric approach with *EWMA* and bank B a 250-day historical simulation. Relying solely on the reported numbers, he would conclude that bank B's trading book is nearly three times as risky as that of bank A, although both banks hold identical portfolios. It is obvious from Table 12 that similar conclusions hold for all other comparisons with the exception of the *EWMA* based mixtures of

[53] The plots for the other portfolios are quite similar and do not change the conclusions.

normal distributions model.[54] The results in Table 12 clearly demonstrate that comparisons of risk exposures across financial institutions with *VaR* measures generated by different methods can lead to serious misinterpretations.

Table 12
Differences between *VaR* methods with 99% confidence interval in percent
Benchmark model: variance/covariance model with *EWMA*

Model	Min	Max	Mean
Vcunw	0.0	133.7	25.7
HS1250	0.0	243.1	59.1
HS250	0.0	276.5	53.0
MNunw	0.0	167.6	31.0
MNewma	0.0	11.2	4.1

Legend: Vcunw: variance-covariance approach with equally weighted moving averages.
HS250: historical simulation with 250 days of historical data.
HS1250: historical simulation with 1250 days of historical data.
Mnunw: mixtures of normal distribution approach with equally weighted moving averages.
Mnewma: mixtures of normal distribution approach with exponentially weighted moving averages.
Min (max) denotes the minimal (maximal) difference observed over all portfolios, while mean denotes the average difference over all portfolios.

Although the differences between the methods can be very large, one should not conclude that the Value at Risk concept itself is flawed. First, on average the differences range from 25 to 59%, which is not negligible but far below the observed maximum differences. Second, comparisons of risk exposures within institutions (e.g. among trading desks or different risk categories etc.) are useful if the calculations are based on the same methodology and *VaR* numbers are not only interpreted in an absolute sense but also in a relative context.

It is interesting to compare the *VaR* estimates from the mixture of normal distribution methods and the variance-covariance approaches. From Graph 2 it can be seen that at the 99% confidence interval the mixtures of normal distribution model with variances based on equally weighted estimators always produces higher *VaR* numbers than the corresponding variance-covariance approach. This result reflects the fact that the mixture of normal distributions method incorporates the excess kurtosis of the underlying market risk factors. On the other hand, the differences are small for both methods if the variances are estimated with exponentially weighted moving averages, although in this case the mixture of normal distributions *VaR*s provide a kind of upper boundary (see Graph 3). This finding indicates that the *EWMA* based variances reduce the effects of excess kurtosis of the distributions of the risk factors but do not eliminate it.

Graph 4 shows the *VaR* numbers at the 95% confidence level for the mixtures of normal distributions model and the variance-covariance approaches. In the case of equally weighted estimators the mixture of normal distributions method generates *VaR* numbers that most of the time are slightly below the numbers of the corresponding variance covariance approach. The reverse pattern occurs in the case of *EWMA*-based *VaR* calculations.

Having discussed the *VaR* patterns of the various approaches, it is interesting to compare the methods via "backtesting" to evaluate their accuracy with respect to the specified confidence interval. We test our models by comparing the estimated *VaR* of each portfolio for day t with the profits/losses of the portfolios realized at day t. We count the cases in which the realized losses exceed the estimated *VaR* for each portfolio and method. Table 13 presents the percentages of observed "outliers" or "tail

[54] The results for the 95% level are quite similar and therefore not reported.

events" for each method averaged over the twenty portfolios. We also report the minimum and maximum number of tail events in percentages. The average percentage of tail events provides information about how accurate a method matches a specified confidence interval (i.e. the implied quantile of the profit/loss distribution).

Table 13
Backtesting results

99% confidence interval				
Method	**Min**	**Max**	**Mean**	**Std**
VCunw	1.3	2.1	1.790	0.20494
VCewma	0.9	1.6	1.305	0.17614
HS250	1.3	2.1	1.790	0.20494
HS1250	0.9	1.6	1.305	0.17614
MNunw	0.8	1.6	1.170	0.23864
MNewma	0.7	1.7	1.010	0.22455
95% confidence interval				
Method	**Min**	**Max**	**Mean**	**Std**
VCunw	4.3	5.3	4.780	0.28023
VCewma	3.8	4.8	4.250	0.23508
HS250	4.3	5.3	4.250	0.28023
HS1250	3.8	4.8	4.250	0.23508
MNunw	4.6	5.6	5.030	0.28488
MNewma	3.7	4.6	4.160	0.25215

Legend: Vcewma: variance-covariance approach with exponentially weighted moving averages. Otherwise, see Table 12.

For example, a "perfect" model would produce 1 and 5% tail events at the 99 and 95% confidence interval, respectively. At the 99% level the variance-covariance method with equally weighted moving averages and the historical simulation with 250 historical scenarios show the weakest performance. Both methods tend to produce the greatest fraction of outliers on average. Note that even the minima are above 1% in both cases. If we interpret the average percentages of tail events as tail probabilities, we see that for both methods the probability of losses greater than the estimated *VaR* is 1.8% and not 1% as implied by a 99% confidence interval. The historical simulation with 1,250 days of data and the *EWMA* based variance-covariance approach produce somewhat better results. Not unexpectedly, the Monte Carlo methods based on a mixture of normal distributions are the most accurate ones. Both methods come very close to the specified probability of 1%. The Monte Carlo simulation with the *EWMA* updating scheme matches the 99% confidence interval almost precisely. Generally, models that do not account for fat tails tend to underestimate *VaR* numbers at the 99% confidence interval. At the 95% confidence interval five of the six methods generate somewhat too conservative *VaR* estimates. The Monte Carlo simulations based on the equal weighting scheme come closest to the 5% fraction implied by a 95% confidence interval. Note that the Monte Carlo approach based on the mixture distributions with *EWMA* produces the lowest fraction of tail events in this case.

3.6 Conclusions

In this part of the paper we have analysed six different approaches to estimate Value at Risk. Two methods were based on the variance-covariance approach with equally and exponentially weighted moving averages, and two methods on historical simulation with different period lengths. Both types of models are commonly used in financial institutions to compute Value at Risk. Since many financial

return distributions display excess kurtosis, we also applied a new method based on mixture of normal distributions to incorporate fat tails in our *VaR* estimates.

A comparison of the various methods revealed that for identical portfolios differences in the resulting *VaR* numbers can be extremely large. For linear fx portfolios we found differences sometimes larger than 200% when we compared the methods with the *EWMA* based variance-covariance approach as the benchmark. Even the average differences between the methods range from 25 to 59%. Hence, it can be very misleading to compare *VaR* numbers across financial institutions if the reported numbers are based on different methods. However, it has to be pointed out that the Value at Risk concept itself is extremely useful for risk management inside financial institutions. If *VaR* calculations are based on a single methodology then comparisons across trading desks, risk categories etc. provide valuable information for risk management purposes.

We also investigated the performance of the various methods with respect to specified confidence intervals via backtesting. The results are consistent with the conjecture that methods that do not incorporate excess kurtosis tend to underestimate *VaR* at the 99% confidence interval. On the other hand, the same methods tend to overestimate *VaR* at the 95% confidence interval. For both confidence intervals one particular version of the Monte Carlo simulations based on mixtures of normal distributions incorporateing fat tails performed best.

Appendix

Table A.1

Assets of financial intermediaries and volumes on the capital market in Austria

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	In million of ATS										
Banks' assets	3,419,130	3,617,329	3,830,858	4,040,476	4,276,192	4,540,454	4,826,676	5,078,727	5,382,997	5,650,976	5,999,832
Insurance companies' assets	202,217	226,388	250,704	285,691	318,461	365,372	417,488	458,979	519,013	573,650	
Investment funds' assets under management	68,427	119,713	150,648	152,829	161,380	171,341	222,112	255,732	332,827	431,600	567,441
Pension funds' assets under management					8,985	11,025	13,821	16,313	22,670	29,832	43,655
Total	3,689,774	3,963,430	4,232,210	4,478,996	4,765,018	5,088,192	5,480,097	5,809,751	6,257,507	6,686,058	6,610,928
Shares at the Vienna Stock Exchange	83,220	110,498	263,017	281,016	259,126	230,105	330,003	321,341	314,389	357,491	451,948
Bonds outstanding	699,179	763,469	823,685	881,465	944,453	1,009,501	1,152,734	1,277,086	1,401,007	1,494,881	1,623,810
	In percent of GDP										
Banks' assets	228.8	231.0	228.5	222.8	219.8	220.7	227.1	226.8	230.6	233.4	238.4
Insurance companies' assets	13.5	14.5	15.0	15.8	16.4	17.8	19.6	20.5	22.2	23.7	
Investment funds' assets under management	4.6	7.6	9.0	8.4	8.3	8.3	10.5	11.4	14.3	17.8	22.5
Pension funds' assets under management					0.5	0.5	0.7	0.7	1.0	1.2	1.7
Total	247.0	253.1	252.4	247.0	244.9	247.3	257.8	259.4	268.1	276.1	
Shares at the Vienna Stock Exchange	2.3	2.8	6.2	6.3	5.4	4.5	6.0	5.5	5.0	5.3	6.8
Bonds outstanding	18.9	19.3	19.5	19.7	19.8	19.8	21.0	22.0	22.4	22.4	24.6
	In percent of total financial intermediation										
Banks' assets	92.7	91.3	90.5	90.2	89.7	89.2	88.1	87.4	86.0	84.5	
Insurance companies' assets	5.5	5.7	5.9	6.4	6.7	7.2	7.6	7.9	8.3	8.6	
Investment funds' assets under management	1.9	3.0	3.6	3.4	3.4	3.4	4.1	4.4	5.3	6.5	
Pension funds' assets under management					0.2	0.2	0.3	0.3	0.4	0.4	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Table A.2
Banks and banking outlets in Austria, end-1997

	Headquarters	Branches	Banking outlets	Inhabitants per outlet
Vienna	145	600	745	2,141
Lower Austria	162	1,081	1,243	1,226
Styria	121	615	736	1,640
Upper Austria	201	805	1,006	1,372
Salzburg	87	317	404	1,261
Tyrol	122	461	583	1,132
Carinthia	72	343	415	1,356
Vorarlberg	37	219	256	1,344
Burgenland	50	232	282	976
Austria	997	4,673	5,670	1,421

Source: OeNB.

Table A.3
Foreign capital in Austrian banking (1995; in percentages)

Joint-stock banks	30.5
Savings banks	3.2
Regional mortgage banks	0.0
Rural credit cooperatives	0.1
Industrial credit cooperatives	7.1
Building societies	1.3
Special purpose banks	7.2
Total	10.6

Source: Mooslechner (1997), p. 25.

Table A.4
Profitability of banking groups
As a percentage of total assets

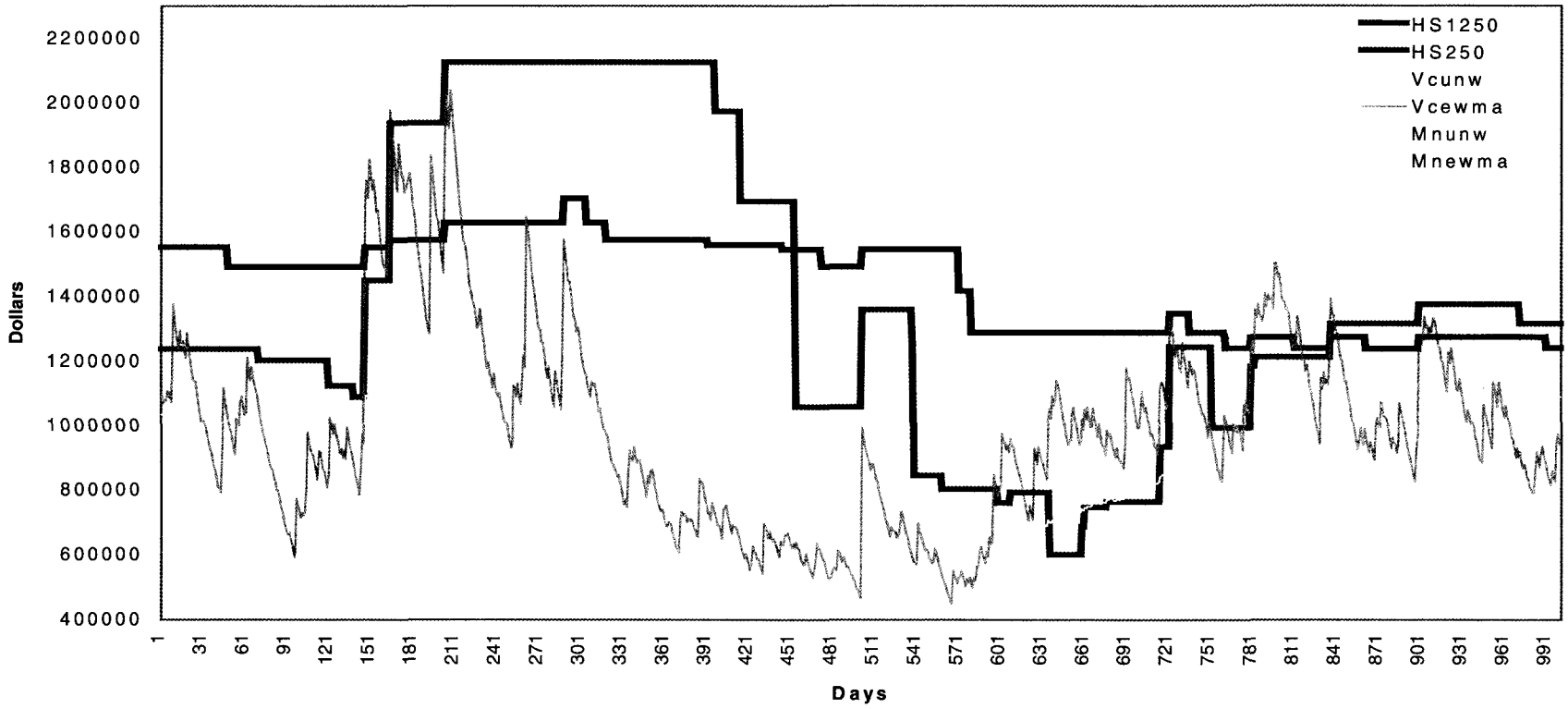
	Non-sector members			Sector members		
	Total assets above ATS 100 bn	**Total assets between ATS 20 bn and ATS 100 bn**	**Total assets between ATS 5 bn and ATS 20 bn**	**Total assets between ATS 20 bn and ATS 100 bn**	**Total assets between ATS 5 bn and ATS 20 bn**	**Central institutions**
Number of members	5	6	13	5	26	10
Average balance sheet total (ATS mn)	519,956	42,530	9,314	46,682	7,876	71,820
Interest income	5.07	4.90	5.31	5.19	5.37	4.36
Interest expenses	3.83	3.05	3.40	3.02	2.94	3.52
Net interest income	1.24	1.86	1.91	2.17	2.43	0.85
Earnings from securities and participations	0.18	0.12	0.14	0.32	0.27	0.30
Net fees and commissions	0.40	0.76	0.91	0.62	0.84	0.40
Net profits or loss on financial operations	0.18	0.11	0.19	0.19	0.11	0.15
Other	0.07	0.10	2.31	0.09	0.19	0.25
Non-interest income	0.76	1.00	1.23	1.13	1.22	0.85
Gross income	2.08	2.95	5.45	3.38	3.84	1.95
Staff expenditures	0.80	1.23	1.35	1.62	1.49	0.63
Other administrative expenditures	0.50	0.57	0.70	0.60	0.63	0.41
Provisions	0.09	0.17	0.18	0.23	0.26	0.11
Other	0.03	0.04	1.83	0.02	0.13	0.07
Operating expenses	1.42	2.00	4.06	2.48	2.51	1.21
Net income	0.65	0.95	1.39	0.90	1.33	0.73
	As a percentage of net income					
Non-interest income without items "other" and "financial operations"	35.7	35.2	39.6	31.5	32.6	49.8
Net interest income	64.3	64.8	60.4	68.5	67.4	50.2

Table A.5
Profitability of Austrian banks

	1989	1990	1991	1992	1993	1994	1995	1996	1997
	As a percentage of total assets								
Net interest income	**1.55**	**1.58**	**1.58**	**1.60**	**1.72**	**1.68**	**1.68**	**1.63**	**1.49**
Joint-stock banks	1.24	1.23	1.26	1.31	1.43	1.32	1.26	1.28	1.35
Multi-tier sectors	2.03	2.08	1.94	1.93	2.08	1.97	1.97	1.88	1.69
Other	0.90	0.96	1.00	1.02	1.05	1.34	1.42	1.38	1.05
Non interest income	**1.36**	**1.14**	**1.01**	**1.09**	**1.14**	**1.10**	**1.06**	**1.12**	**1.13**
Joint-stock banks	0.98	1.02	1.06	1.11	1.28	1.17	1.10	1.10	1.21
Multi-tier sectors	0.86	0.90	0.94	1.05	1.00	0.93	0.90	0.97	1.01
Other	3.56	2.09	1.13	1.22	1.34	1.55	1.55	1.68	1.38
Gross income	**2.91**	**2.72**	**2.58**	**2.69**	**2.86**	**2.78**	**2.74**	**2.75**	**2.62**
Joint-stock banks	2.22	2.25	2.32	2.42	2.71	2.49	2.37	2.38	2.56
Multi-tier sectors	2.89	2.97	2.88	2.98	3.09	2.90	2.87	2.85	2.70
Other	4.46	3.05	2.14	2.24	2.40	2.88	2.97	3.06	2.43
Operating expenses	**2.06**	**1.90**	**1.81**	**1.86**	**1.83**	**1.90**	**1.90**	**1.89**	**1.81**
Joint-stock banks	1.42	1.55	1.64	1.69	1.71	1.70	1.66	1.65	1.77
Multi-tier sectors	1.91	2.01	2.03	2.04	1.97	1.96	1.95	1.92	1.84
Other	3.07	1.62	0.77	0.84	0.87	1.10	1.11	1.21	0.99
Net income	**0.86**	**0.82**	**0.77**	**0.84**	**1.04**	**0.88**	**0.84**	**0.86**	**0.81**
Joint-stock banks	0.81	0.70	0.68	0.73	1.00	0.79	0.71	0.73	0.79
Multi-tier sectors	0.98	0.96	0.85	0.94	1.12	0.94	0.91	0.93	0.86
Other	0.62	0.68	0.69	0.69	0.84	0.84	0.84	0.85	0.69
Non-interest income in % of net income	**46.81**	**41.92**	**38.99**	**40.68**	**39.83**	**39.49**	**38.79**	**40.79**	**43.04**
Joint-stock banks	44.17	45.43	45.55	45.99	47.24	46.94	46.64	46.05	47.40
Multi-tier sectors	45.19	44.58	46.31	51.42	50.93	47.35	46.03	50.78	54.70
Other	92.81	88.16	78.39	78.85	86.47	75.56	72.53	75.97	79.30

Source: OeNB.

Graph 1: VaR Approaches over 1000 Trading Days (99% Confidence Interval)



Legend: HS1250 historical simulation with 1,250 days of historical data

HS250 historical simulation with 250 days of historical data

VCunw variance-covariance approach with equally weighted moving averages

VCewma variance-covariance approach with exponentially weighted moving averages

MNunw mixture of normal distribution approach with equally weighted moving averages

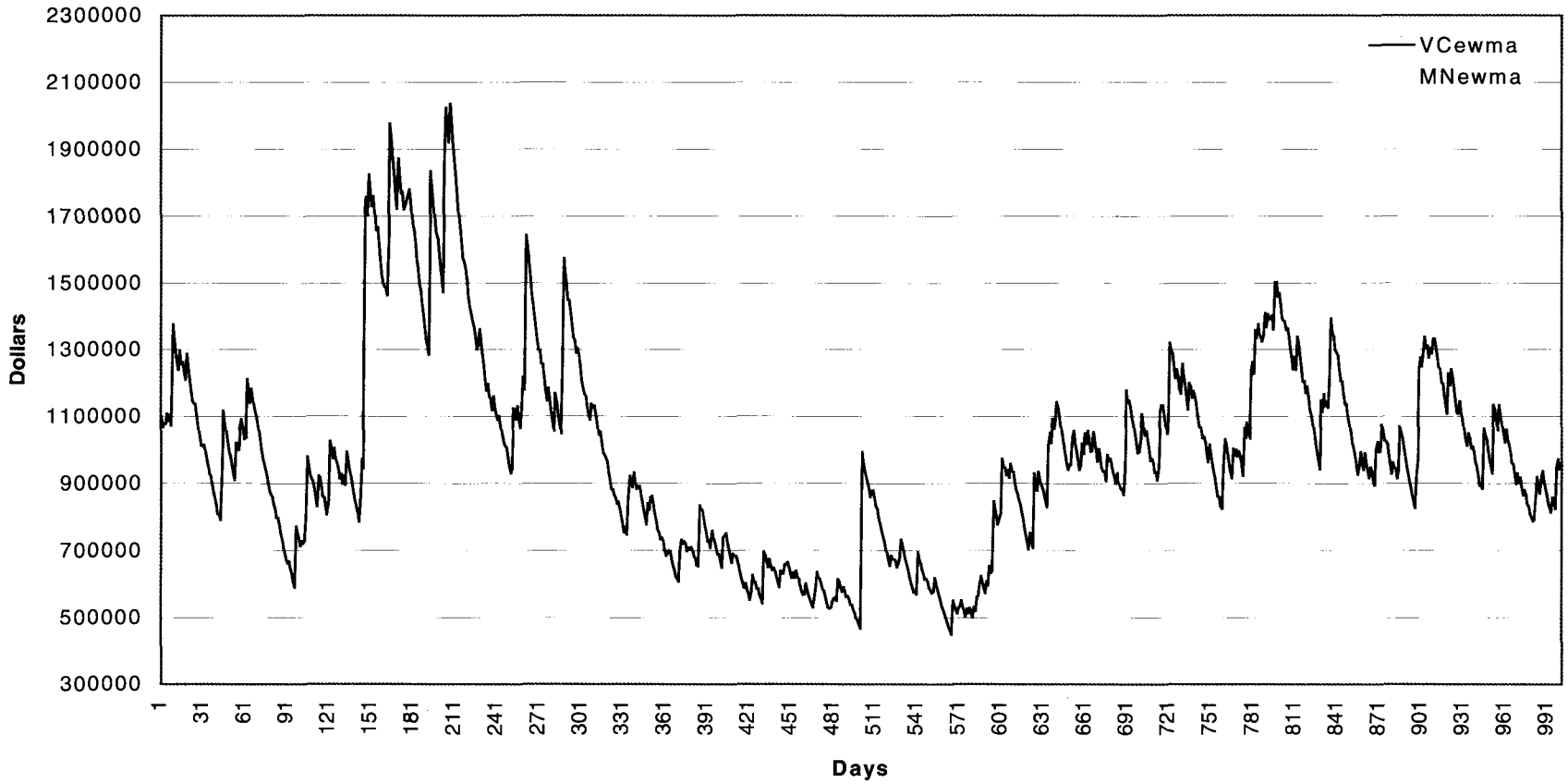
MNewma mixture of normal distribution approach with exponentially weighted moving averages

Graph 2: Mixture Of Normal Distribution Approach Vs. Variance-Covariance Approach (Equally Weighted Moving Averages, 99% Confidence Interval)

Legend: VCunw variance-covariance approach with equally weighted moving averages

Mnunw mixture of normal distributions approach with equally weighted moving averages

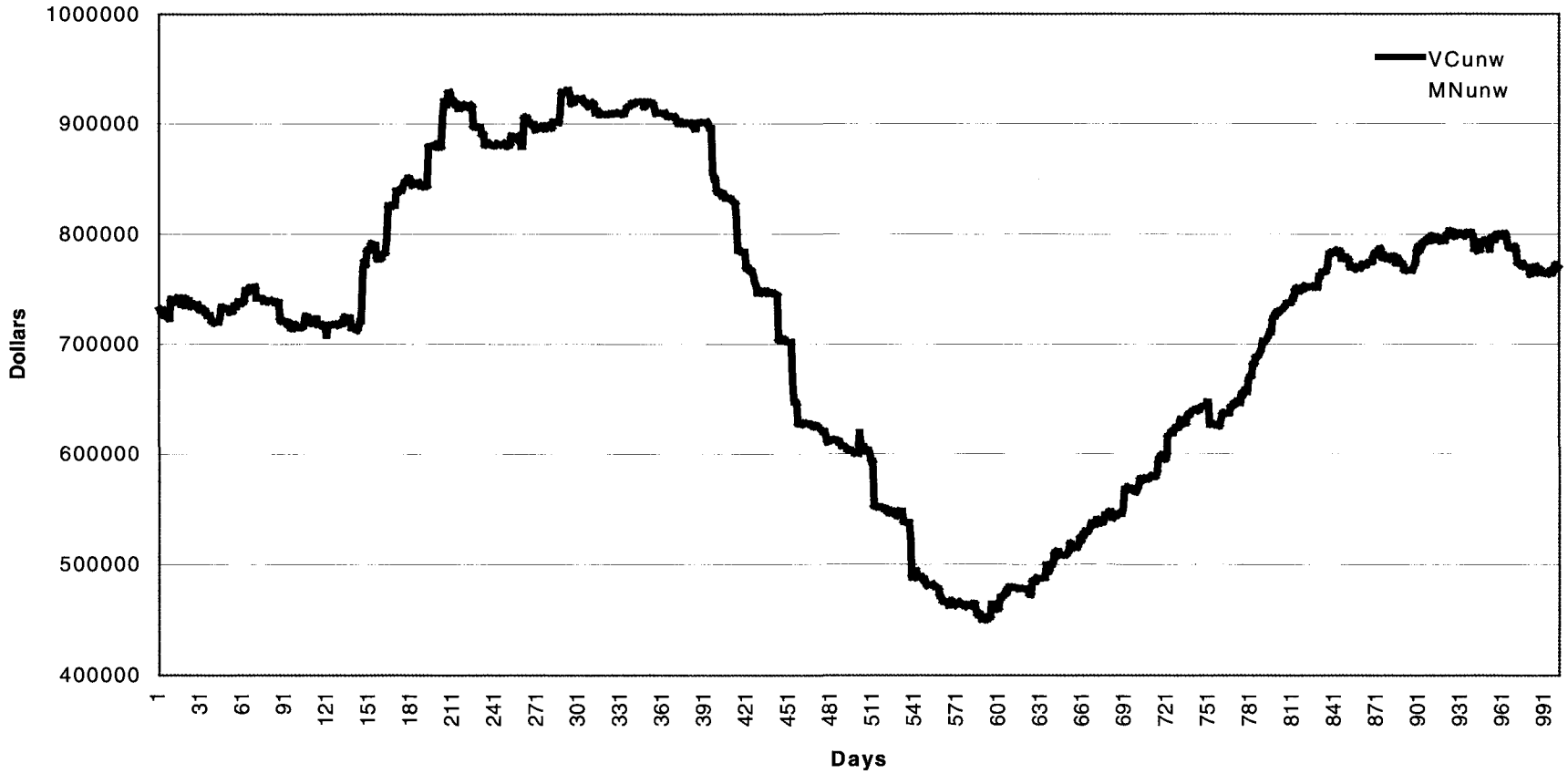
Graph 3: Mixture Of Normal Distribution Approach Vs. Variance-Covariance Approach (Exponentially Weighted Moving Averages, 99% Confidence Interval)



Legend: VCewma variance-covariance approach with exponentially weighted moving averages

MNewma mixture of normal distribution approach with exponentially weighted moving averages

Graph 4: Mixture Of Normal Distribution Approach Vs. Variance-Covariance Approach (Equally Weighted Moving Averages, 95% Confidence Interval)



Legend: VCunw variance-covariance approach with equally weighted moving averages

MNunw mixture of normal distribution approach with equally weighted moving averages

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Trends in the Australian banking system: implications for financial system stability and monetary policy

Christopher Kent and Guy Debelle[1]

1. Introduction

The broad goal of monetary policy is to achieve the highest possible rate of non-inflationary economic growth. To achieve this goal, the conduct of monetary policy in the post-war period has concentrated predominantly on counteracting standard demand and supply shocks. However, recent events have demonstrated that financial shocks can have a major detrimental impact on the growth performance of an economy. A fragile financial system can greatly magnify the effect of real shocks and make it difficult for the central bank to pursue its price stability objective.[2] Thus financial stability considerations are important for the conduct of monetary policy.

Over the past decade and a half, the Australian financial system, and the banking sector in particular, has undergone substantial changes which have influenced the stability and efficiency of the system. These changes have altered the probability of a systemic crisis occurring – some positively, some negatively – and have influenced the likely magnitude of such a crisis.

The driving forces behind these changes have been financial deregulation, technological progress and globalisation, supported by increased demand by consumers for a greater variety of sophisticated financial products and services. The influence of these forces has been manifest in three major developments in the structure of the Australian financial system. First, pressures have increased for further consolidation within the banking sector. Second, there has been a trend towards the development of conglomerates that can supply a wide range of financial products within the same organisation. Third, competitive pressures on traditional banks have increased, partly from large non-bank financial firms offering bank-like products, and partly from smaller specialist financial firms that are able to compete successfully with banks by unbundling and re-bundling financial products.

The paper draws out the implications of these developments for the stability of the financial system, and for policy. It discusses how they are likely to affect the probability of a systemic event occurring and the economic magnitude of such an event should it occur. It also discusses some implications for monetary policy.

In Section 2 of the paper we present a broad definition of system stability and introduce the possibility of a trade-off between system stability and the efficiency of financial intermediation. We then discuss the interaction of standard monetary policy and policies for financial system stability, and we emphasise the importance of financial system stability for achieving monetary policy objectives.

In Section 3 we describe the four major driving forces for change in the financial system: financial deepening, globalisation, deregulation and technological advances. We discuss recent trends in both market structure and product availability in the Australian banking sector in light of these forces of change.

Section 4 of the paper focuses on the implications of consolidation for the efficiency and stability of the financial system, while Section 5 discusses the implications of conglomeration, and the rise of the

[1] We would like to thank Philip Lowe, John Laker, David Gruen and Marianne Gizycki for their helpful comments and suggestions, Chay Fisher for his excellent research assistance and Graham Anderson for providing data. The views expressed are those of the authors and should not be attributed to the Reserve Bank of Australia

[2] Such information is not new, as the experience of the 1930s attests.

competitive fringe. In Section 6 we then draw out the implications of these changes for both system stability policy and more traditional monetary policy.

2. Monetary policy, financial system stability and efficiency

Before discussing the linkages between monetary policy and the stability of the financial system, it is worthwhile to discuss what we mean by system stability.[3] We can define a crisis as being a sufficiently widespread disruption of the normal operation of financial intermediation such that there are significant macroeconomic effects. Stability can then be defined in terms of the expected macroeconomic losses that arise from financial system disturbances. Thus in measuring the degree of stability it is necessary to consider both the probability of various financial disturbances and the size of the macroeconomic costs arising from such disturbances. Both the probabilities and costs of financial disturbances are likely to change through time under the influence of ongoing developments in the financial system.

It is unlikely that a financial system can be perfectly stable, such that the probability of macroeconomic losses arising from financial system disturbances is reduced to zero. With sufficiently heavy-handed regulations in place, it may be possible to reduce this probability to very low levels. However, it is likely that this would be at the expense of reducing the efficiency of financial intermediation. In general, the objective of policy should be to enhance both the stability and efficiency of the financial system, recognising that in some cases there may be a trade-off between the two. An overly regulated financial system may be very stable, which itself is beneficial for growth, but this may be at the cost of inefficient intermediation which is detrimental to growth. In many cases, developments in the financial system are likely to increase both stability and efficiency.

2.1 The interaction between monetary policy and system stability

The primary aim of monetary policy is to maintain the highest possible non-inflationary growth rate. Instability of a financial system can impinge on that goal both directly through a breakdown in financial intermediation, and indirectly through an interruption of the transmission mechanism.

Concerns about the stability of the financial sector have been paramount at various times in the first half of this century. In the late 1920s in the United States, credit growth helped fuel the run-up in stock prices, and then the impact of the stockmarket crash was greatly amplified by subsequent bank failures. At the time, this influence of the intermediation process on monetary policy goals was emphasised by Irving Fisher (Fisher 1933). More recently, there has been a growing literature on the "credit channel" of monetary policy which, in part, builds on Fisher's debt-deflation model.[4] However, that literature tends to emphasise the balance sheet positions of debtors. The experience of the past decade highlights the key role that the balance sheets of banks can play in the transmission process.

Over most of the post-war period, such concerns have been of second order in monetary policy deliberations. Shocks such as the OPEC oil price rises and increased inflationary pressure from an over-heating real economy have been the focus of policy-makers' attention. However, financial shocks have increasingly been coming to the fore in the wake of the banking-sector problems in a number of OECD countries in the late 1980s and early 1990s, and particularly in light of the Japanese experience in the 1990s. The current crisis in Asia highlighs the importance of the two-way interaction between financial system instability and macroeconomic instability, the speed at which

[3] For a recent discussion of the issues related to defining financial system stability see Crockett (1997). Mishkin (1997) describes financial instability as occurring when information flows are disrupted to such an extent that the financial system cannot channel funds to productive investment projects in an efficient manner.

[4] Bernanke and Gertler (1995) summarise this literature.

crises can unfold and the impact of contagion, both within and across countries. The financial system has been of concern not only as a direct source of instability but also in worsening the impact of a real shock.

Because of these links between the real sector of the economy and the financial sector, monetary policy needs to be cognisant of the potential for financial system instability. One of the major threats to financial system stability has been the substantial and prolonged deviation of asset prices away from fundamental levels. Changes in the nature of intermediation can have implications for the behaviour of asset prices. This was particularly evident in the asset price bubbles that developed in a number of OECD countries (including Australia) in the late 1980s. These were, in large part, fuelled by the increase in intermediation following deregulation of the financial system in the first half of the 1980s (see Section 3.2 below).

To emphasise this linkage between financial instability, asset prices and monetary policy, Kent and Lowe (1997) develop a Fisherian model in which monetary policy-makers may want to raise interest rates in response to an emerging asset price bubble with the intention of bursting this bubble before it becomes too large. This helps to reduce the possibility of an even larger bubble developing and the likely eventuality that its collapse would lead to significant financial instability and therefore a prolonged period of weak output performance and inflation below target. In this way monetary policy, with the sole objective of stabilising inflation around a target, can act to help prevent major financial instability. However, Kent and Lowe also emphasise that adopting other policies to ensure financial system stability will reduce the likelihood and the effect of asset price bubbles. Monetary policy may be a second-best method of dealing with such occurrences.

Alternatively, there may be circumstances in which there is upward pressure on inflation in the short term, but with the financial system already in a weak condition. In this case it may be inappropriate to tighten monetary policy in response to concerns about short-term inflation, because such a response would exacerbate the problems in the financial system and lead to a sustained downturn over the medium term. This suggests that monetary policy with a medium-term horizon needs to take account of the stability of the financial system in ways that may imply a non-standard response to short-term inflationary pressures.

The financial system also plays an integral role in the standard textbook description of the transmission mechanism of monetary policy. A critical process in the transmission mechanism is the increased use of bank-intermediated credit to fund consumption and investment spending following a decrease (say) in interest rates. It is generally implicitly assumed in such expositions that the financial sector is sufficiently stable to act as a reliable conduit of monetary policy actions. However, a breakdown in the process of intermediation will reduce the potency of monetary policy actions.

There are also important interactions that run from monetary policy to financial system stability. High rates of inflation of goods and services prices are clearly bad for system stability. They distort the incentives of individuals to invest in worthwhile projects (in part through the interaction between inflation and the tax system). They can also lead to speculation in asset markets, funded through borrowing and growth in the value of collateral. Variable rates of inflation can also lead to unanticipated wealth transfers between debtors and creditors, which may jeopardise their financial situations.

On the other hand, while low inflation is beneficial for system stability, it does not guarantee it. This was demonstrated in Japan in the early 1990s. Further, the effectiveness of monetary policy in Japan has been significantly curtailed despite the presence of low inflation, because of the state of the financial system. Good monetary policy is necessary for system stability but it is not sufficient. Therefore, central banks (with standard monetary policy objectives in mind) need to devote considerable attention to issues relating to system stability.

3. Trends in the financial system

In this section of the paper we review recent trends in the Australian financial system and the factors driving these changes.[5] The main factors that we identify are financial deepening, globalisation, technological progress and deregulation.

3.1 Forces of change

3.1.1 Financial deepening

As real incomes of households have increased, there has been an increasing demand for a greater variety of sophisticated financial products. This has led to general financial deepening. The pressure for change in this regard has been ongoing for a long time, but was not realised under the financial repression prior to the early 1980s. In Australia there have been additional factors that have fostered greater financial depth, including legislative changes affecting compulsory superannuation and a growing realisation of the need for individuals to self-fund their retirement, rather than rely entirely on the public provision of pensions.

Figure 1
Household financial assets
As a percentage of GDP

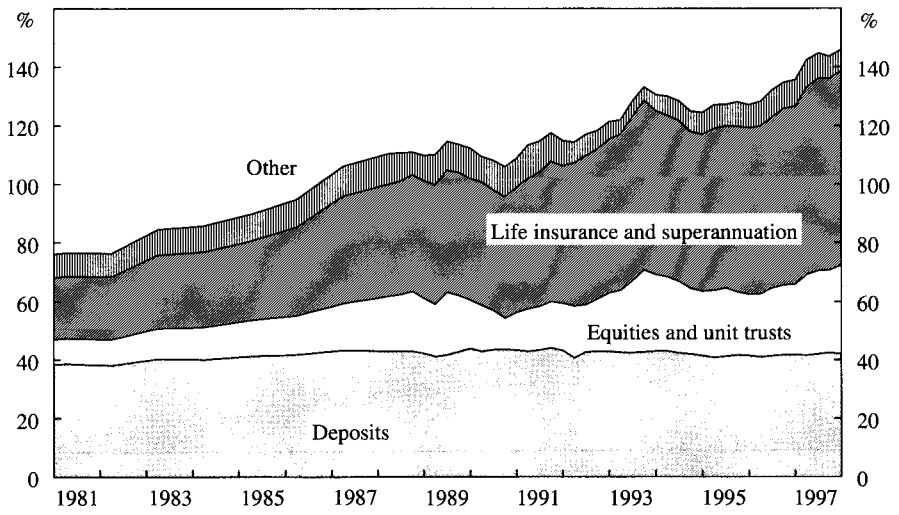


Figure 1 illustrates the extent of financial deepening that has occurred since the deregulation in the early 1980s (a description of the data and sources for this and other figures and tables is contained in the Appendix). The rise in household financial assets held in the form of superannuation is particularly apparent.

3.1.2 Globalisation

Globalisation has both demand and supply-side effects. On the demand side, liberalisation of the capital account, the floating of the Australian dollar, and increased trade openness have caused non-financial firms to demand more sophisticated financial products and services to help them compete in the global market for general goods and services, and particularly to help them manage risk (Lowe 1995).

[5] For a more detailed discussion see Edey and Gray (1996) and Reserve Bank of Australia (1996).

Domestic financial institutions have also made increasing use of foreign sources of funds (Figure 2). Deposits remain the major source of bank funding; however, when new sources of funding opened up following deregulation, the proportion of liabilities accounted for by Australian dollar deposits fell from a peak of nearly 75 to less than 60%. Funding decisions are now made on the relative costs across a wide spectrum of potential sources, both domestic and foreign, which serves to increase the efficiency of the intermediation process.

On the supply side, domestic financial firms now have to compete with foreign financial firms – both in the domestic marketplace and in the world marketplace for financial services. Before 1985, the Australian financial system was essentially closed to foreign entrants. In 1985 and 1986 fifteen foreign banks began operations in Australia. Further liberalisation and entry occurred from the early 1990s, to the point where today, there are no limits on the number of foreign bank branches or subsidiaries operating in Australia.[6] However, foreign bank branches can only take deposits in the wholesale market.

Figure 2
Bank liabilities to non-residents
As a percentage of total liabilities

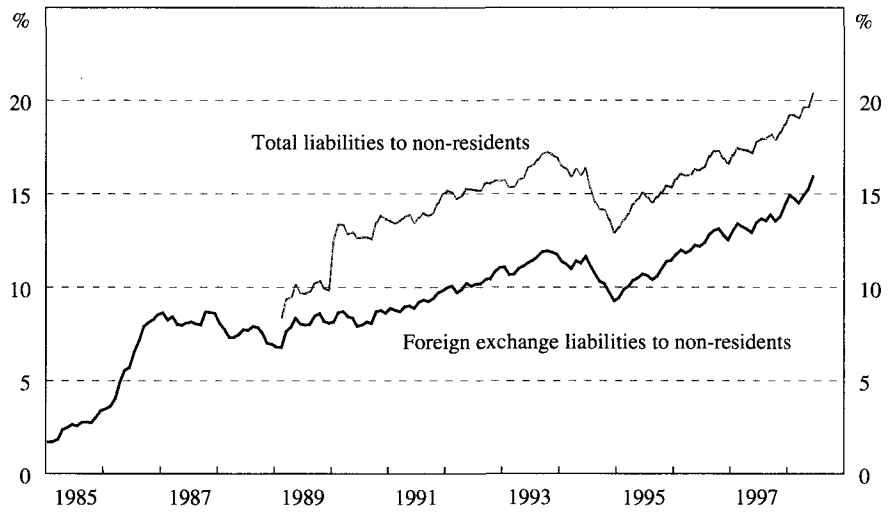


Table 1 shows the increased presence of foreign banks in the Australian financial market, in terms of numbers. However, their share of business, after an initial surge, has increased only gradually. Some foreign banks have subsequently exited, while more recent growth has come about through new entrants.

Table 1
Authorised foreign banks in Australia

	1984	1986	1988	1990	1992	1994	1996	1998
Branches	2	3	3	3	3	8	17	24
Subsidiaries	0	15	15	15	14	13	13	12
Total	2	18	18	18	17	21	30	36
Share of total bank assets (%)		6	9	12	11	11	15	17

[6] Nevertheless, applicants for a banking authority have to satisfy the criteria set down in the Australian Prudential Regulation Authority's Prudential Statements J1 and J2 that they "make a worthwhile contribution to banking services in Australia, and not merely add to the number of banks."

To date, globalisation appears to have had a bigger (more visible) impact on the wholesale market. On the whole, foreign entrants into the domestic financial market have utilised their experience with international markets to participate in large wholesale transactions, rather than in retail transactions. Large non-financial corporations are also more able to access foreign markets directly in their financial dealings.

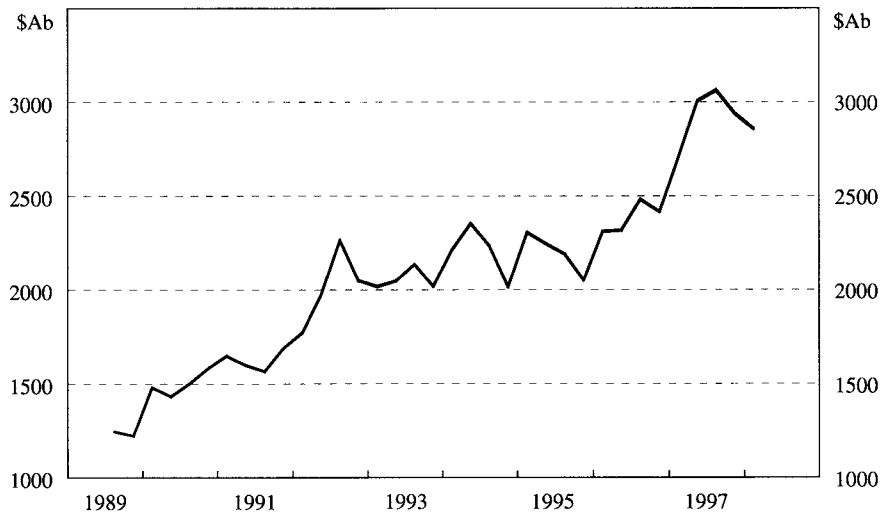
Foreign entrants have the potential to reduce the risk of systemic instability because they are diversified globally. Consequently, their balance sheets should be better placed to withstand any idiosyncratic shock to Australia, and thus reduce the probability that they pose a risk to the system. On the other hand, their exposures to other countries may result in them importing troubles in foreign financial systems into the Australian system.

3.1.3 Technological advances

Advances in information technology have reduced the cost of transmitting, processing and storing information. This has reduced the costs of providing a range of financial services and transformed the way in which these services are produced and delivered. Advances have also been made in the development and pricing of complex financial products used for risk management – in part this is closely related to improvements in computer power, but it also owes to the application of more sophisticated financial and mathematical methods, and to the use of more highly trained personnel in the field of finance.

One obvious manifestation of technological advance is the increased use of derivative products. Figure 3 shows that banks' derivative activity in Australia has almost tripled over the past ten years.

Figure 3
Banks' derivative activity
Gross, notional principal outstanding



Other technological developments that have delivered cost savings to banks and thereby increased the efficiency of intermediation include the geographical separation of back- and front-office operations and the increased use of Automatic Teller Machines (ATMs) and Electronic Funds Transfer at Point Of Sale (EFTPOS).

3.1.4 Deregulation

The impact of the above three factors on the structure of the financial system would have been significantly curtailed in the absence of the deregulation of the system that began in the early 1980s.

Prior to the 1980s, banks were regulated in terms of the types of products they were allowed to offer and the prices they were allowed to charge. Credit was rationed through direct controls, and banks competed for business through the provision of extra services such as extensive branch networks, rather than on price. Non-bank financial institutions (NBFIs) were less heavily regulated and were increasing their share of the market at the expense of banks. This made the implementation of monetary policy, which primarily relied on control of the banking sector, problematic. As a proportion of the financial system, banks' market share declined over the 1960s and 1970s (Table 2).

The main transformation of the financial system followed from the report of the Campbell Committee in 1979. The primary reasons put forward for deregulation were to increase monetary policy effectiveness and reduce the inefficiencies in the financial system created by the differing regulatory treatment of banks and NBFIs.

Table 2
Assets of financial institutions
Percentage of total*

	1955	1960	1970	1980	1985	1990	1995	1998
Banks	64	54	46	42	41	44	46	43
NBFIs	10	17	20	30	28	19	14	12
Life and superannuation	22	23	25	19	19	22	27	29
Other managed funds	1	2	1	1	4	6	6	8
Other	3	4	7	8	8	8	7	8

* The total excludes assets of the Reserve Bank of Australia.

Initially, interest rate ceilings on bank deposits were removed. The restrictions on minimum and maximum terms of deposit were also progressively removed from 1980, with the process completed by 1984. On the asset side of the balance sheet, the quantitative controls on the growth in banks' advances were formally ended in 1982, with the last credit directive issued in September 1981 (Grenville (1991)). Other important regulatory changes affecting the composition of banks' balance sheets and their cost structure were the replacement of the Liquid Government Securities (LGS) ratio with the Prime Assets Ratio (PAR) in 1985 and the replacement of statutory reserve deposits in 1988 with the requirement to hold non-callable deposits that paid a market rate of interest.[7]

Following deregulation the banks regained market share in the financial system (their share rose from 41 to 46% over the decade to 1995).[8] However, this did not occur at the expense of a decline in assets of other financial institutions. Rather, the banks gained a larger share of the increasing depth of the financial system.

3.2 Developments in the financial system

In general, the above four factors have worked in concert to bring about changes in the structure of the financial system. Technological innovations have made it possible for banks to convert some of their activities into "commodities" that can then be shifted onto the wholesale market (for example, securitisation of home loans) and, in turn, can potentially lead to the globalisation of this business. Volatility in financial variables such as exchange rates and interest rates, and increased exposure to international trade has led to an increase in the demand for risk management services. Technological change has played a role in meeting this demand.

[7] For more detail on the process of deregulation see Grenville (1991) and the appendix in Battelino and McMillan (1989).

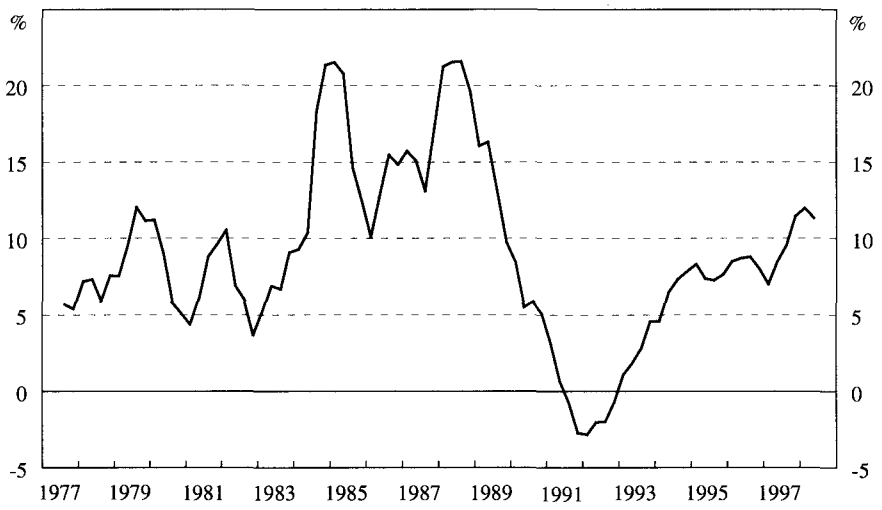
[8] The figures in Table 2 are influenced by the conversion of NBFIs (particularly building societies) to banks following deregulation and also the reabsorption of non-bank affiliates onto bank balance sheets (Edey and Gray (1996)).

The combination of these forces helped underpin the asset price bubble that developed in Australia in the late 1980s. Macfarlane (1989, 1990) discusses the relative roles of demand and supply factors that contributed to the bubble. On the supply side, there was a large expansion in credit (Figure 4) as domestic banks took advantage of their new-found ability to respond to the competition from NBFIs and new foreign banks sought to establish their presence in the market. Furthermore, there was increased direct access to overseas sources of funds to finance speculative asset purchases.

On the demand side, the interaction of the tax system with relatively high rates of inflation encouraged individuals to invest in assets to hedge against inflation. The deregulation of the financial system removed the constraint that had existed on this behaviour in the past.

The replacement of a quantity mechanism with a price mechanism in allocating the supply of credit also contributed to the emergence of the asset price bubble. The price mechanism took longer to have an impact in the face of high and increasing rates of return. As long as the growth in asset prices persisted, lending seemed profitable even at high real rates of interest. In the past, the direct quantitative restrictions limited such developments, although asset price bubbles did occur in the early 1970s. At that time, as quantitative restrictions applied to the banking system, the speculative lending associated with the earlier episodes of asset price inflation was confined primarily to the non-bank sector.

Figure 4
Real bank credit growth
Percentage change over four quarters



The recession of the early 1990s saw the bursting of the asset price bubble and a move to a low-inflation environment. A number of banks were left in a substantially weakened position, in part due to earlier expansion on the back of weak credit assessment techniques. Impaired assets rose substantially, and the returns on equity dropped sharply (Figures 5 and 6).

The banks attempted to rebuild their balance sheet positions by maintaining relatively high margins. This helped provide opportunities for new players to enter the market. These firms competed successfully with banks through specialisation in the provision of only one or two product lines. This unbundling of services was also aided by technological innovations.

Unbundling occurred across many types of services, including the provision of mortgage finance, payment services (through credit cards) and deposits (for example, cash management accounts with cheque facilities). This process was aided by the globalisation trend – many of these techniques were "imported" from overseas – as well as innovations in information technology. Although not large in volume terms, specialist new players appear to have had a significant impact by increasing the degree of contestability and thereby acting to reduce bank margins and unwind cross-subsidisation of bank

services. For example, in the housing loan market, mortgage managers currently account for around 9% of new housing loan approvals.[9] This has placed downward pressure on housing loan interest rate margins, with the margin between the standard rate paid on mortgages and the cash rate having fallen from around 4% in 1992 to just over 1½% in August 1998.

Figure 5
Ratio of banks' net impaired assets to capital
Major banks

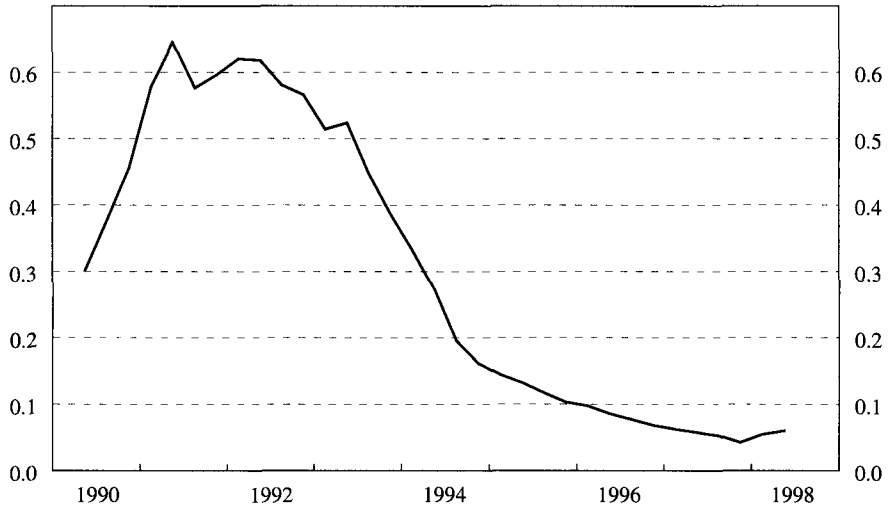
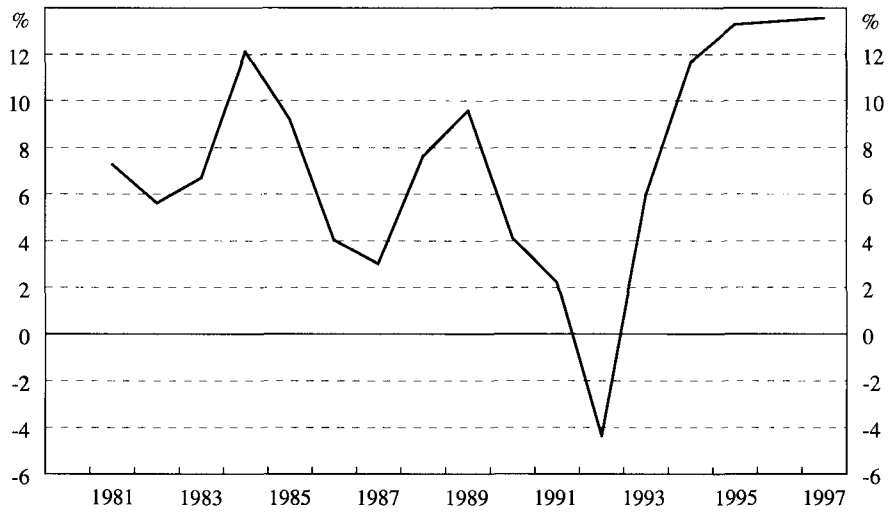


Figure 6
Real return on shareholders' funds
Major banks



The weak state of some banks' balance sheets in the early 1990s resulted in some consolidation. The largest example of this was the merger in 1991 of a state-owned bank (that was at the time the fifth largest bank in terms of assets) with one of the major banks. Further, each of the four major banks has acquired at least one smaller bank over the 1990s.[10] In addition, some large NBFIs have converted to banks. The net outcome of this process has been the maintenance of a high degree of concentration in

[9] Mortgage managers provide housing loans which are funded by mortgage-backed securities rather than deposits.

[10] National Australia Bank acquired a number of banks overseas.

the banking system over the 1990s — the four majors holding two-thirds of total bank assets — after a slight drop in the 1980s.

Over the 1990s, there has been a reduction in banks' branch networks and staffing levels. In part this reflects pressures for rationalisation driven by technological advance and a reversal of earlier over-expansion which had been a way of attracting customers in the heavily regulated environment.

Looking forward, there are three principal pressures on the financial system. First, there is pressure for mergers amongst the largest banks. Second, there is pressure for financial institutions to increase their scope through the formation of large conglomerates, combining a traditional bank with other financial institutions such as life offices or superannuation funds. Third, counterbalancing these first two pressures, technological developments are significantly reducing the costs of unbundling financial services, creating opportunities for smaller niche institutions. Each of these three forces for change has an impact on the efficiency and the stability of the financial system.

In response to the significant developments and current pressures in the financial system that we have outlined above, in 1996 the Australian Government initiated the Financial System Inquiry (commonly referred to as the Wallis Inquiry). The Inquiry documented many of the changes that we have discussed above. In broad terms the Inquiry's recommendations sought to create a flexible regulatory structure more responsive to the current forces for change, with the goal of promoting greater efficiency in the financial system. One of the problems highlighted was the increasingly difficult task of distinguishing between the activities of banks and non-banks, coupled with diversity in the ways in which different types of financial firms were regulated. The Inquiry's recommendation in this regard was to establish an independent supervisory authority (outside of the central bank), with the task of overseeing a wide range of deposit taking financial institutions, insurance companies, life offices and superannuation funds. In addition, the Inquiry recognised the need for greater competitive neutrality across the financial system. The Australian Government accepted this recommendation and established the Australian Prudential Regulation Authority (APRA) which commenced operations from 1st July 1998. This saw the responsibility for supervising banks and protecting depositors move from the Reserve Bank of Australia to APRA.

At the same time as the establishment of APRA, the Reserve Bank of Australia gained extensive regulatory powers to help ensure payments system stability and efficiency. These powers are exercised by the newly formed Payments System Board within the Reserve Bank. In addition, the Reserve Bank maintains the responsibility for ensuring that shocks to any part of the financial system do not ultimately threaten the stability of the Australian economy (Reserve Bank of Australia (1998), p. 7).

4. Consolidation: efficiency and system stability

Although the Australian Government has abandoned the "six pillars" policy that ruled out mergers between the four major banks and the two largest insurance companies, it has rejected the possibility of mergers between the four major banks until competition has increased sufficiently. In this section of the paper, we focus on the broad implications of consolidation for the stability and efficiency of a financial system. We leave a discussion of the implications of financial conglomeration and the rise of the competitive fringe to Section 5.

The debate regarding the impact of mergers between banks has been a long-standing one, both in Australia and around the world. This debate has typically emphasised the effect of mergers on efficiency. We begin the section with a discussion of efficiency in Section 4.1. In Section 4.2 we introduce a broad framework to analyse policy questions relevant to both efficiency and system stability, recognising that there may be a trade-off between these two objectives. In Section 4.3 we use this framework to analyse the impact of consolidation on system stability.

4.1 Consolidation and efficiency

Many studies find a positive and significant relationship between market concentration and measures of bank profitability. There are two alternative hypotheses that might explain this result – with different implications for economic efficiency.[11]

The Structure-Conduct-Performance (SCP) hypothesis is that a more concentrated market permits banks to behave in non-competitive ways so as to boost their performance (usually in terms of profits).[12] If this hypothesis is true, consolidation will lead to higher prices for consumers and a reduction in economic efficiency.

The Efficient-Structure (ES) hypothesis is that some banks have greater efficiency, and hence profitability. These banks increase their market share, either by gradually forcing out less efficient banks or by merger and acquisition. According to the ES hypothesis, it may be that some banks are inherently more efficient than others, perhaps through idiosyncratic management ability. Alternatively, it may be that there are economies of scale or scope which allow larger banks to force out smaller banks.[13] In either case, the ES hypothesis implies that greater concentration will be accompanied by a mixture of higher profits and lower prices (and/or better services) for customers and hence greater economic efficiency over time.

On balance, a review of the evidence from a multitude of studies does not strongly support one hypothesis in favour of the other (Berger and Humphrey (1997)). A consistent finding is that although some consolidations improve cost efficiency, others worsen the performance of the combined institutions. The net effect across all institutions is no significant gain in cost performance. In addition, these studies find that cost efficiency is a better explanator of financial institution profitability than market power, but together these two effects explain only a small proportion of variation in performance across institutions.

Recent studies distinguish between cost efficiency and profit efficiency, and show that the latter may improve with mergers and acquisitions (Akhavein, Berger and Humphrey (1997)). Cost efficiency improves when costs per unit of output fall for given output quantities and input prices. Profit efficiency is more general because it includes cases where profits increase in response to changes in the output mix. Akhavein et al. show that mergers between large banks in the US provided some diversification benefits. By itself, this should reduce risk. However, the response of the merged bank has typically been to shift the production mix towards higher risk products, that is, away from securities towards loans (Berger (1998)). As a consequence, profits increased but without a substantial reduction in the overall risk of the bank.

Most of the empirical studies of mergers and banking efficiency are based on foreign markets.[14] The nature of the Australian banking industry makes it difficult to apply the overseas evidence to the Australian situation. There are a number of points worth mentioning in this regard. First, the Australian market is increasingly becoming a national market (see below). The largest banks already have extensive geographic and product diversification, and thus further consolidation will produce smaller diversification benefits than suggested by overseas studies. On the other hand, this high degree of geographic diversification may imply greater duplication of branch networks, so that mergers in Australia could generate greater cost savings through branch closures. Second, many of these foreign markets remain relatively unconcentrated compared to the Australian market. Third, many studies conclude that substantial economies of scale exist, but only up to a relatively small size

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[11] For an earlier discussion see Berger and Hannan (1989).

[12] In addition, inadequately supervised managers may choose to use market power to provide benefits for themselves and other employees while not necessarily increasing profits (Berger and Humphrey (1997)).

[13] For a recent discussion of the ES hypothesis see Goldberg and Rai (1996).

[14] Walker (1998) is one of the few studies of economies of scale in the Australian banking industry. He concludes that significant economies of scale exist. However, his study is based on a very small sample of twelve banks – many of which are (or were) government-owned – over a period which straddles the significant deregulation of the mid 1980s.

(Berger, Hunter and Timme (1993)). While there is a wide variation in the exact size of this cut-off point, the largest Australian banks are clearly above this point.[15]

There are two additional arguments to consider with regards to the impact of consolidation on efficiency. These are recent trends which may imply greater contestability of the market, and the implications of new technology. The potential for both of these developments to increase efficiency may not yet have been captured by existing studies.

4.1.1 Contestability and the competitive fringe

To determine the degree of contestability, it is first necessary to define the extent of the market. It is then possible to examine the ease with which either existing smaller suppliers and/or new entrants can provide effective competition to the large Australian banks. A strong competitive fringe, or even the potential for this fringe to develop, may ensure competitive behaviour in a market dominated by a few large suppliers.

The first distinction to be made is the difference between the retail and wholesale markets. There are a number of reasons to believe that the Australian banking wholesale market is strongly contestable. First, the market has a sizeable competitive fringe of domestic banks, foreign banks and non-banks providing a wide range of wholesale products and services. Second, the wholesale market is a national one and does not require an extensive branch network in order to conduct business. Finally, there are few barriers to entry, particularly for larger foreign-owned banks experienced in the provision and development of new and sophisticated products.

The degree of contestability in the Australian retail banking market is arguably lower than in the market for wholesale banking. However, this depends in part on the precise definition of the retail market both in terms of the degree to which retail banking products are viewed by customers as being "bundled", and in terms of the extent of geographic boundaries.

The Australian Competition and Consumer Commission (ACCC) has defined the product dimension of the market to be "the cluster or bundle of services provided by banks to their retail customers" (ACCC (1996), p. 15). The argument was that there are no close substitutes for a cluster of services that includes loans, deposits and payments. While there is undoubtedly some convenience value to bundled services, there is evidence that a sizeable proportion of consumers use unbundled banking products (Wallis (1997)). Furthermore, although demand for transaction accounts is relatively insensitive to price (p. 437), this is not the case for home loans for which price differentials have more substantial wealth effects (p. 438). The success of mortgage managers and other providers of non-bundled products (including cash management trusts, credit card services, etc.) suggests that fringe providers are able to apply competitive pressure to banks. This is especially true when banks cross-subsidise or otherwise overprice certain products. Many of these developments are the result of technological innovations, which may not yet have been fully reflected in existing studies of the competitive effects of consolidation. Increased contestability across many retail product lines is likely to remain a continuing trend for some time.

In 1995, the ACCC determined that the relevant market for retail banking was state based, rather than national. More recent developments suggest that for many products the relevant market is becoming increasingly national. Improvements in technology have reduced the cost of data transmission, and hence the cost of delivering many financial products. In addition, there is no reason why previously state-based banks cannot establish branch networks in other states.[16]

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[15] The smallest of the four largest Australian banks has domestic assets of about US$ 50 billion. The cut-off in terms of assets is estimated to range up to US$ 500 million.

[16] There is evidence that this has already occurred for some banks. For example, the proportion of branches of the State Bank of NSW (now the Colonial State Bank) outside of its home state rose from 3% in 1990 to 16% in 1997.

4.1.2 New technologies

Recent advances in technology may imply that there are economies of scale even for larger banks, thereby creating pressures for further consolidation. However, if these advances have not yet been fully exploited, they may not have shown up in existing studies of cost efficiencies. While it may be true that the most recent technological advances imply cost efficiencies from scale, it is also possible that technological advances in the future may work in the opposite direction. To demonstrate this point we draw parallels between developments in technology and market structure in the banking and steel-making industries. The steel-making industry has already progressed through three distinct phases of technological innovations – the latest phase is helping to reverse an earlier trend towards consolidation.

The mass production of steel began with small decentralised production facilities located near to where inputs were mined (Ashton (1969)). This was necessary because of the high costs of transporting these inputs. In a similar fashion, until recently, back-office operations in banking were located in individual branches because of the high cost of communicating and storing data.

Falling transportation costs and advances in production technology led the steel industry to move towards large centralised production facilities that were able to take advantage of economies of scale. Similar advances in communication and computing technologies have recently allowed many back-office operations in banking to be undertaken centrally in order to take similar advantage of economies of scale.[17]

It is not clear that further consolidation in banking is necessary to take advantage of these economies of scale. It may be feasible in the future for banks to contract out some of these services to a single large provider that can take full advantage of economies of scale.[18] However, there are at least two constraints on this practice becoming widespread: the issue of efficient access (including pricing) which might be difficult to establish; and the problem of proprietary rights to information gained by the firm running such a system.

More recently in the steel industry, new technology (embodied in mini-mills) has allowed a substantial portion of production to move back to smaller decentralised facilities (Barnett and Crandall (1986)). These facilities can benefit from being closer to customers and more responsive to their requirements. Similarly, in the financial sector the fixed costs of providing risk-management services may have fallen considerably over the previous decade.[19] In particular, many products, which even two decades ago were not priced correctly, have now become standardised,[20] and there appears to be a greater availability of highly trained personnel in the field of finance. A fall in the fixed costs of head-office risk-management operations would make it easier for smaller banks to enter the market for these services. Whether this type of change eventuates in the case of back-office operations in banking is purely speculative. However, given the trend of rapid advances in computing technology, this prospect is not implausible.

So far in this section of the paper, we have focussed most of our attention on the impact of consolidation in terms of the domestic banking market without considering the international market for banking services. However, there is an argument that domestic consolidation is necessary in order for banks to become large enough to compete successfully in the global market for financial services. In part, this reflects the need for substantial capital investment to keep banks at the forefront of

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[17] For example, many back-office operations of Australian banks operating in New Zealand are being gradually shifted to Australia.

[18] There is some evidence that this is already occurring in Australia. For example, Westpac's loan-processing facilities currently provide capacity to at least one other institution. Also, the ANZ Banking Group has recently outsourced many of its electronic card operations (Australian Financial Review, 15/9/98, p. 33).

[19] Risk-management services are an important part of wholesale banking. Intermediaries (especially banks) are the principal participants in markets for financial futures and options rather than individuals or firms (Allen and Santomero (1997)).

[20] Developments in finance theory by Black, Scholes and Merton were instrumental in this regard. For a recent discussion of these developments see Schaefer (1998).

international best practice in terms of the optimal use of computing and communications technology and the development of sophisticated financial products. Whatever the merits of this argument, it still needs to be weighed against the *potential* costs of increased domestic concentration. It is also worth noting that there is scope in global markets for niche players to provide specialised products, and more generally for smaller players to take advantage of their ability to maintain closer relationships with their customers.

4.2 A framework for the analysis of system stability and efficiency

The objective of the policy maker is to enhance both financial system stability and financial system efficiency, recognising that in some cases there may be a trade-off between the two. In this section of the paper we introduce a general framework that helps formalise a number of important concepts. Many aspects of the model are clarified in Section 4.3 when we apply it to an assessment of consolidation.

In our model, the policy maker cares about two things: the macroeconomic losses that could originate from disturbances to the financial system, and the efficiency of the financial system. For simplicity, we assume that financial disturbances are associated with the failure of financial institutions, and that the macroeconomic losses are a function of the number of institutions that fail in a particular episode. We assume that the policy maker faces an uncertain world, but knows the macroeconomic costs that could arise with various financial disturbances. The policy maker's task is to choose a set of policies that maximise utility subject to a set of constraints about how the financial system works. The set of policies might include: the maximum degree of market concentration; conditions of entry; or the terms and conditions for central bank liquidity support.

While intentionally simple, the model draws out a number of issues, including the impact that consolidation and conglomeration might have on system stability, the relevance of contagion and the implications of central bank support for institutions experiencing difficulties.

More formally, the problem of the policy maker is to choose a course of action x so as to maximise expected utility subject to a collection of constraints:

$$\text{(1)} \qquad \underset{x}{\text{Max}} \int_i u(L(P_i),E) f_x(i)di$$

The constraints (which we do not spell out here) describe the trade-off between stability and efficiency.

The policy maker's utility function $u(L,E)$ depends negatively on the macroeconomic loss L, and positively on the efficiency of the system E. For simplicity we assume that the measure of efficiency E is independent of the state of the world i.

The measure of loss L represents the lost output that follows from the failure of some proportion P_i of the financial system and hence a reduction in the extent of intermediation. The greater the proportion of the financial system which fails, the greater will be the loss L.

The state of the world can be characterised by the proportion of institutions that have failed. The policy maker is assumed to know the impact of their actions on the probability density function $f_x(i)$ that a proportion P_i of institutions will fail. The state of the world i is revealed after the policy maker has determined a course of action.

We assume that the relationship between the proportion of the system that fails and the macroeconomic loss L is represented by the function $L(P_i)$, where $L'(\circ) \geq 0$ and $L''(\circ) > 0$. In words, the complete failure of the system results in a loss which is more than ten times greater than the loss from the failure of one-tenth of the system.

The assumption regarding the shape of $L(P_i)$ follows from a reasonable assumption about the macroeconomic consequences of a reduction in financial intermediation and the costs of resolving

financial crises.[21] Provided that contagion is contained, smaller failures are relatively easy to resolve rapidly without substantial disruption to the process of intermediation. When a relatively small number of financial firms fail, the remaining assets of these firms can be sold rapidly, or the failed banks restructured and sold with considerable ease. Losses to depositors and creditors may be relatively minor and meanwhile the process of intermediation in the healthy portion of the system continues largely unaffected. However, in the case of the failure of a substantial proportion of the system, resolution becomes problematic and disruption of intermediation becomes extreme. Invariably, governments cannot sell the assets of the failed banks (particularly large failed banks) without severe consequences for the asset values of the healthy institutions. Restructuring failed institutions may require the government to cover a large amount of non-performing loans. Even after restructuring (and perhaps a break up of larger failed institutions) it may be difficult to find buyers willing to pay a reasonable price during the crisis for such a sizeable portion of the financial system.

The range of policy options x that policy-makers have at their disposal include the maximum level of concentration permitted in the financial system, the ease of entry of new firms, the extent of conglomeration permitted, and the terms and conditions for the provision of central bank liquidity or lender-of-last-resort loans. The policy action can work through a number of channels: it may affect the probability density function $f_x(i)$; it may also influence the loss function $L(P_i)$ – for example, the government may provide some form of support to failed institutions. Policy may also influence the trade-offs implicit in the constraints.

An index of financial system instability

If we assume that the policy maker is risk neutral with respect to the macroeconomic loss, then we can define an index of financial system instability (for a constant level of efficiency) to be:

$$(2) \qquad S = \int_i L(P_i) f_x(i) di$$

The index S is the expected macroeconomic loss that results from financial system disturbances – low values of S indicate stability. This is consistent with our earlier notion that system stability describes both the probability and size of incidents of financial stress in terms of the impact on the real economy. Although risk neutrality on the part of the policy maker is unlikely to be true in practice, this assumption is mostly one of convenience. Otherwise, the policy maker may not be indifferent between two outcomes with the same levels of S if they are based on different variances of macroeconomic loss. Increasing the degree of convexity of the loss function $L(P_i)$ would produce similar results to a model which incorporated risk aversion explicitly.

4.3 Consolidation and system stability

The influence of consolidation on *system* stability remains an open question, and to date has been largely unanswered by existing empirical and theoretical studies (Boyd and Graham (1998)). In this section we use our framework to examine a number of stylised examples relevant to the impact of consolidation on system stability.

For expositional purposes we present a simple version of our more general framework described in Section 4.2. We assume that the financial system initially consists of a number, $n > 1$, of equally sized banks. For reasons outside of the model, there is pressure for these banks to merge to form m banks of equal size (where $1 \leq m < n$). The policy maker must determine whether or not to allow this consolidation to proceed – that is, their policy action can be described as $x = n$ for no consolidation, or $x = m$ for consolidation.

[21] This assumption is not essential – the same qualitative results apply if the function $L(P_i)$ is linear, so long as preferences are such that the policy maker is risk averse in terms of economic losses.

To focus our attention on system stability we assume initially that consolidation is neutral with respect to efficiency. Though efficiency is still a crucial consideration, we have already discussed the broad implications of consolidation for efficiency in Section 4.1. We also assume that the policy maker is risk neutral with regard to the macroeconomic loss. These two assumptions simplify the problem to one of determining whether consolidation leads to an increase in system stability.

In the case where $n = 2$ and $m = 1$, there are three states of the world: either no banks fail ($P_1 = 0$); half the banks fail ($P_2 = 0.5$); or all banks fail ($P_3 = 1$). Of course in a system with only one bank, the probability that half the banks will fail is zero.

We assume the loss function is quadratic:

(3) $\quad L(P_i) = P_i^2$

The probability density function for states of the world can be determined from the probability of individual bank failure, which is p_j when there are j banks in the system ($j = n,m$). We simplify the analysis by assuming $p_n = p_m = p$, that is, consolidation does not, by itself, alter the unconditional probability of a single failure. This assumption is appropriate if the merger between two banks provides little scope for reduced risk through greater diversification.

The crucial question, however, is whether a bank failure is independent of other bank failures. This will depend on the nature of shocks that cause bank failures. We consider three cases: a common shock which implies complete dependence; an idiosyncratic shock which implies independence; and an intermediate case which arises because of contagion.

(i) Common (macroeconomic) shock

Given the assumptions that we have made, if a bank failure is caused by a common shock (to the macroeconomy for example), then consolidation will have no impact on system stability. The instability indices, S_n and S_m, are both equal to the probability of individual bank failure p. In other words, if one bank fails, it indicates a bad macroeconomic shock, and all banks will fail.

(ii) Idiosyncratic (management) shocks

On the other hand, bank failure may be entirely due to idiosyncratic shocks. A common element of many cases of bank distress and failure is poor management and operational procedures.[22] Invariably during times of poor macroeconomic performance, some banks experience substantial losses while other banks – doing business in essentially the same market and under the same conditions – survive these periods relatively unscathed. Therefore, variation of management across banks can help to explain some of the variation in banking performance.

Almost by definition, consolidation will lead to a reduction in the degree of managerial diversification of the banking system. Such a reduction in diversification may be a good thing for both stability and efficiency if consolidation occurs through the acquisition of poorly managed banks by well-managed banks. However, if higher market concentration implies a reduction in competition, then managers may find it easier to reduce their efforts and the efficiency and the stability of the system may suffer.[23]

If all managers have equal ability and the probability of one bank failing is independent of the performance of other banks, then consolidation reduces the stability of the financial system. In a system with fewer banks we expect to see fewer bank failures; however, if these banks do fail there is

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[22] Dziobek and Pazarbasioglu (1997) found that management deficiencies caused problems in all cases of banking crises they studied, and that correcting these deficiencies was crucial for successful reform.

[23] Management discipline could be maintained in a more concentrated market through the threat of removal by the owners. However, given that distress is often used as a signal of poor management, this seems like an inefficient way of ensuring high management effort and management diversification across the system.

a much larger macroeconomic loss because the banks are bigger in a more consolidated system.[24] This general result is demonstrated using our model for the case of $n=2$ and $m=1$ in Table 3. Consolidation increases our index of system instability from $S_n = 0.5(p+p^2)$ to $S_m = p$.

Table 3
Indices of instability

	Proportion of system failure	Loss function	No consolidation	Consolidation
			Probability	
State 1	0	0	$(1-p)^2$	$1-p$
State 2	0.5	0.25	$2p(1-p)$	0
State 3	1	1	p^2	p
Index of instability, S			$S_n = 0.5(p+p^2)$	$S_m = p$

In addition to consolidation leading to less management diversification, highly concentrated markets may make it more difficult for agents to monitor the performance of bank managers.[25] By reducing incentives for management to behave appropriately, a reduction in the ability to monitor management will reduce both the efficiency and stability of the banking sector. If banking performance depends on a common macroeconomic component and an idiosyncratic management component, which are only observed indirectly through their combined impact on banking performance, it will be impossible to perfectly observe management ability (or effort). However, the inference of management ability from a bank's performance will improve with the number of banks in the system. In a market with a sufficient number of banks, the law of large numbers implies that management ability will be reflected in the deviation of a bank's performance from the industry average. In contrast, in a market with only a few banks, bad luck and poor management may be more difficult to distinguish.

(iii) Contagion

Contagion can lead to the failure of otherwise healthy financial institutions. This possibility can be incorporated into our framework as follows. Suppose that the state of the world is revealed in two stages. During the first stage, banks fail on their own account with probability p_n and p_m in the non-consolidated and consolidated cases respectively. In the second stage, conditional on the initial failure of at least one bank, other banks can fail as a result of contagion with probability q_n and q_m.[26]

Once again we assume that shocks that lead to failure in the first stage are independent (that is, due to idiosyncratic management behaviour), and that $p_n = p_m = p$ and $q_n = q_m = q$. In the presence of contagion, it is no longer the case that consolidation always leads to greater system instability. This is easily demonstrated in the case of a system of only two banks which merge into a single institution. (Note that in the consolidated system there is no contagion because there is only one bank.) The system instability indices, S_n and S_m in Table 4 show that consolidation leads to greater instability only if the likelihood of contagion is not too great (that is, $q < \frac{1}{3}$).

[24] The key to this result is the convexity of the loss function, $L(P_i)$. If this function is linear (for example, if the loss is proportional to the share of the system that fails), then consolidation will not alter system stability.

[25] Tevlin (1996) discusses issues related to management performance, monitoring and incentives.

[26] In a more complex model, the likelihood of failure due to contagion, q, could be made an increasing function of the proportion of the banking system that fails on its own account.

Table 4
Indices of instability – with contagion

	Proportion of system failure	Loss function	No consolidation	Consolidation
			Probability	
State 1	0	0	$(1-p)^2$	$1-p$
State 2	0.5	0.25	$2p(1-p)(1-q)$	0
State 3	1	1	$p^2+2p(1-p)q$	p
Index of instability, S			$S_n = 0.5p + 0.5p(p+3q(1-p))$	$S_m = p$

The intuition for this result is that for a given sized financial system, it is preferable to have many smaller banks if shocks are idiosyncratic. This "management diversity" leads to greater system stability. However, with more banks, there is a greater chance of at least one bank failing, and therefore of contagion, which reduces system stability. The policy maker can attempt to address the problem of contagion directly by providing some form of liquidity support to solvent banks, thereby helping to prevent runs on otherwise healthy banks. In our model this would be captured by a reduction in the probability of failure due to contagion, q_n and q_m. However, governments may face incentives to provide preferential support to larger banks.

The perception that banks might become too big to fail is closely related to the issue of contagion. There are three different effects to consider in this regard. First, there is the potential for greater contagion following the collapse of a larger bank. That is, $q_m > q_n$, which implies that consolidation lowers system stability. Second, governments recognising this effect may attempt to offset it by taking measures to avoid the failure of a large bank. The public perception of a large bank being too big to fail will tend to prevent runs on large banks following the collapse of some other bank – this will tend to increase system stability. Third, if the public perceive large banks as being too big to fail, then depositors and creditors face a reduced incentive to actively monitor and discipline very large banks so as to ensure both efficient and prudent behaviour. This can allow managers to take greater risks, which in our model represents an increase in p_m – implying lower system stability. The net effect of these three opposing forces on system stability is unclear.

In summary we draw a number of broad conclusions from our analysis of the impact of consolidation on system stability.

- There are circumstances in which consolidation may reduce system stability. This is the case if a substantial proportion of shocks leading to bank failure are idiosyncratic, if the probability of a bank failing of its own accord is not affected by size, and if there is little chance of contagion. In this case, consolidation has two opposing effects. A more consolidated system has fewer banks, so that we expect to see fewer bank failures. However, in a more consolidated system the banks are bigger, so that a single bank failure has a much greater impact. If doubling the proportion of the system that fails more than doubles the macroeconomic loss, then this latter "size" effect dominates and consolidation reduces system stability.
- Contagion can introduce a third effect, which may imply that consolidation increases system stability. Contagion describes the circumstance in which the failure of any one bank (on its own accord) leads to the possibility of the failure of otherwise healthy banks. Consolidation reduces the number of banks, which reduces the possibility of *at least one* bank failing, and therefore, reduces the possibility of otherwise healthy banks failing from contagion. If contagion is sufficiently strong, system stability can increase with fewer banks in the system. On the other hand, if the failure of a larger bank is more likely to cause contagion (than the failure of a small bank), then consolidation may reduce system stability.

- If a merged financial institution is perceived to be too big to fail, the incentives of managers and depositors can be distorted, leading to increased risk taking which reduces the stability of the system. An excessively large institution may impose large costs on any attempt to bail it out in the event of difficulties. On the other hand, the perception that larger banks may receive greater support during crises implies that consolidation can reduce the probability of contagion, thereby increasing system stability.

5. Conglomeration and the competitive fringe

In this section we briefly consider the impact of conglomeration and the rise of the competitive fringe on the efficiency and stability of the banking sector.

5.1 Conglomeration: efficiency and system stability

The trend towards the formation of large conglomerates has implications for both the efficiency and stability of the financial system. There are a number of arguments to suggest that conglomeration can lead to efficiency gains, whereas in terms of stability there are two opposing forces, the net effect of which is unclear.

There are three reasons why conglomeration is likely to lead to efficiency gains: increased convenience, increased competition and reduced information costs. First, conglomerates can deliver efficiency benefits by providing customers with the convenience of "one-stop shopping" facilities – that is, a multitude of related financial products provided in a single location. Indeed, the marrying of a number of financial products is consistent with the trend towards financial deepening, and with the demand for a greater variety of increasingly sophisticated financial products.

Second, the forces leading to conglomeration have the potential to provide efficiency benefits in the form of greater competition. Just as banks are diversifying into non-bank products such as insurance and superannuation, large non-banks are expanding into banking products. For example, the Australian Mutual Provident Society (AMP) formed a banking arm in 1998 and the Colonial Mutual Life Assurance Society Limited purchased the State Bank of New South Wales in 1994.

Third, information sharing across different types of business activities within the conglomerate may help to reduce costs. For example, customers may have just one account and file with the conglomerate, helping to cut costs and enabling the conglomerate to tailor its range of products to individual needs.

There are two offsetting factors to consider when determining the impact of conglomeration on the stability of the banking sector. These are diversification, which will reduce the probability of individual bank failure, and contamination, which can lead to contagion flowing from failures in non-core banking activities. Institutions that are involved in a range of business activities should be less likely to fail because of the benefits of diversification. Mishkin (1998) emphasises that banks' diversification into non-core activities is a way of supplementing bank profits that are being eaten into by niche players.

In contrast to diversification, contamination reduces stability. Losses in one arm of the business may impair the ability of the conglomerate to undertake its core-banking activities. Because of this, regulators might force the conglomerate to construct "firewalls" in an attempt to separate the different activities into individual business units – in part, the motivation behind these regulations is to restrict the safety-net provisions of explicit depositor-protection schemes (or implicit central bank support) to the area of banking business. However, effective firewalls will also lead to a reduction in the benefits of diversification.

Experience with firewalls between banks and related finance companies has reinforced the popular perception that all too often firewalls are ineffective.[27] So even if new and effective regulations are put in place to prevent cross-contamination within conglomerates, these firewalls may lack credibility. Without credible fire-walls, the risk of brand-contamination remains – that is, there could be a run on an essentially healthy banking unit within a conglomerate because of a *fear* of contamination from a financially distressed non-banking unit.

5.2 The competitive fringe: efficiency and system stability

We have already argued that technological change and deregulation have combined to increase the contestability of the banking sector. In particular, innovations that have allowed unbundling and re-bundling of financial products have helped to increase the degree of competition from smaller "fringe" financial firms.

These developments imply greater efficiency; however, they also imply that large banks will suffer from lower margins across a range of products as a result of a more competitive fringe. This is consistent with the evidence of falling lending margins over recent years. Smaller banks and non-banks have naturally tended to encroach upon the lower risk and higher profit activities. Offsetting this effect is the potential for expansion and diversification when banks shift into non-core financial activities previously dominated by non-banks.

The development of new financial products – in part driven by technological progress – has increased the ability of non-banks to participate in the process of financial intermediation. One notable innovation has been securitisation, which has offsetting implications for the stability of the system. On the one hand, because securitisation transfers loans off the balance sheets of banks, banks' balance sheets will not be directly affected by an increase in loan defaults, and so the intermediation process should not be greatly impaired. This should serve to increase financial system stability. On the other hand, there may be a tendency to limit securitisation to only high quality assets, thereby weakening banks' balance sheets and reducing the stability of the banking system. Furthermore, some might argue that the investors who buy the securitised loans may not be as well placed as banks to absorb the impact of a rise in defaults, with possible adverse consequences for wealth and spending. However, the net loss of wealth is the same regardless of who is the end holder of the security, whether they are holders of bank shares, or investors (some of whom may be offshore) in the institutions that purchase the securitised loans.

6. Implications for system stability and monetary policy

In this section we draw together the implications of current trends in the financial system for policy. We have presented a wide range of arguments regarding the implications of consolidation, conglomeration and other changes in the financial system on system stability and efficiency.

Certain changes appear to have been associated with efficiency improvements. In particular, following deregulation of the banking sector (and aided by technological innovations and the move towards globalisation) there has been a trend towards greater financial depth, wider availability of increasingly sophisticated financial products, and more recently, greater competition from non-banks and thus lower margins on many core banking products. However, the impact of further consolidation on efficiency remains a widely debated issue. No clear consensus exists on the implications of these changes for system stability.

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[27] In Australia, well known examples include the problems of the Financial Corporation of Australia affecting the Bank of Adelaide in the late 1970s (Stanford and Beale (1988)), and the problems of the Australian Guarantee Corporation affecting Westpac in the early 1990s (Carew (1997)).

One lesson is clear. Monetary policy-makers cannot remain indifferent to developments affecting financial system stability. Furthermore, central banks need to pay some attention to questions of efficiency, since both efficiency and stability have implications for long-run macroeconomic performance. However, some developments may imply a trade-off between stability and efficiency.

One crucial question is what can central banks do to contribute to the stability (and efficiency) of the financial system? Beyond the need to ensure a strong supervisory system (for central banks that maintain this responsibility), there are at least four important contributions that can be made:

(i) *Low inflation and stable growth.* Maintaining low inflation and stable growth is a necessary (though not sufficient) condition for financial system stability. The experience of Australia and some other OECD countries has been that higher inflation rates can encourage the movement of intermediated funds away from projects that are profitable over the longer term, and towards excessive speculation in asset markets. This speculation can lead asset prices far away from levels justified by fundamentals, which in turn can destabilise the financial system.

(ii) *Payments system access.* Central banks can influence the terms and conditions under which financial institutions can participate in the payments system. In this way the central bank can have an influence on the level of contestability, and hence the degree of efficiency of the financial system. At the same time, developments that reduce the risks in the payments system, such as the widespread move towards Real Time Gross Settlement (RTGS), can reduce the possibility that the payments system either initiates or propagates an episode of financial system instability.

(iii) *Emergency liquidity support.* Central banks are the ultimate source of domestic liquidity. In some cases, a preparedness by the central bank to extend emergency liquidity, either through the market or to institutions directly, can play an important role in preventing disturbances having macro consequences. However, care is needed to minimise the distortion of incentives for prudent management and private monitoring of risk, both of which can enhance both stability and efficiency.

(iv) *Contributing to the debate on consolidation and conglomeration.* As the above discussion highlights, there are many ways in which recent trends and pressures might influence system stability, although the net effect of these changes is not clear. Central banks can emphasise the importance of these developments for system stability. These are often overlooked in the ongoing debate, which tends to focus on the more microeconomic issue of efficiency.

A second important question is as follows. Given the structure of the financial system, what should central banks do if they see a rise in system instability? There are two broad approaches. First, monetary policy with a medium-term horizon may need to take account of the stability of the financial system in such a way as to imply a non-standard response to short-term inflationary pressures. The second approach for central banks and financial system supervisors might be to adopt prudential standards that more explicitly depend upon the degree of risk in the financial system. Both of these approaches are worthy topics for future research.

Appendix: data sources

Figure 1: All data from 1988 onwards are obtained from ABS catalogue no. 5232.0 *Financial Accounts*. Prior to 1988, some estimation is required. The level of deposits includes bank, NBFI and cash management trust deposits. Prior to 1988 it is estimated from data contained in Reserve Bank of Australia *Occasional Paper 8* and Reserve Bank of Australia *Bulletin*.

Figure 2: Total bank liabilities are calculated as the sum of Australian dollar liabilities from RBA *Bulletin* Table B1 and foreign exchange liabilities in Table B6. Table B6 provides a breakdown of foreign exchange liabilities into resident and non-resident liabilities. Prior to 1989 a breakdown of Australian dollar liabilities (in Table B1) into resident and non resident is unavailable.

Table 1: Reserve Bank of Australia, internal calculations.

Figure 3: Bank derivative activity is calculated from data contained in RBA *Bulletin* Table B21 and is on a global consolidated basis. It is calculated from banks' global off-balance sheet activity in foreign exchange, interest rate and other market-related contracts.

Table 2: Total assets of financial institutions are calculated from data in the RBA *Bulletin*. They exclude assets of the Reserve Bank of Australia.

Figure 4: Bank credit is defined as the sum of loans and advances by banks to the private sector and bank bills on issue. It is adjusted for breaks in the series. Real rates are calculated using the Treasury measure of underlying CPI inflation.

Figure 5: Net impaired assets for the four major banks are obtained from the Impaired Asset Return and are net of specific provisions. Prior to September 1994 they are reported as Non-performing, Renegotiated and Doubtful Items.

Figure 6: The return on shareholders' funds for major banks is an internal RBA calculation and is on a global basis. Real returns are constructed using the Treasury measure of underlying CPI inflation.

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Managing and preventing financial crises – lessons from the Swedish experience

Martin Andersson and Staffan Viotti[1]

In the early 1990s Sweden went through a severe banking crisis. This paper gives a short presentation of how the crisis developed and how it was managed. We then discuss what lessons can be learned from the crisis. We also review the measures that have been taken since the crisis to reduce the risk of future banking crises and to handle the various phases of a banking crisis should one occur.

1. The Swedish banking crisis in the early 1990s

1.1 Characteristics of the crisis[2]

The banking crisis was one ingredient in a general economic crisis in Sweden and it is relatively easy to see what caused it. During the 1980s, the process of full deregulation of the Swedish financial markets took place. At the time it was undertaken, the Swedish economy was experiencing a protracted economic upswing. This led to high investment, especially in the real estate sector where prices skyrocketed. Due to the earlier restrictions on borrowing there was a strong pent-up demand for credit, which was exacerbated by a tax-system that favoured borrowing instead of saving, especially in times of high inflation. The deregulation of financial markets also led to increased competition between banks, which lowered credit standards in their struggle for larger market shares. Banks entered into this competition despite the fact that they were unfamiliar with doing business in a deregulated environment and lacked adequate knowledge and procedures to make proper credit assessments. Nor did the Financial Supervisory Authority (FSA) have the competence and the instruments to assess the financial risks and other important developments in credit institutions. The volume of credits expanded rapidly from 1985 to 1990. A large part was lent to investors in housing or commercial real estate and most of it was collateralised by real estate, thus concentrating a large share of risk to this sector.

In the early 1990s, interest rates were historically high. Swedish monetary policy with its target of a fixed exchange rate, first towards a currency basket and from 1991 against the ECU, contributed to the upward pressure on interest rates. Given the high level of nominal interest rates for Swedish krona loans, a large segment of borrowers preferred to denominate their loans in low-interest currencies, such as the Deutsche mark. Banks funded loans denominated in foreign currencies mainly in the international interbank market. These funds were predominantly short-term, whereas the lending was partly medium or long-term. The mismatch of maturities in loans and funding in foreign currencies exposed banks to large liquidity risks.

A number of events that took place around the year 1990 set the stage for the ensuing crisis. The strong economic cycle ended and turned into a sharp recession with negative output growth for three consecutive years. The recession coincided with a milder downturn in the international economy, which in turn weakened the demand for Swedish exports. The unemployment rate increased dramatically as a result. Property prices plunged by more than 50% over a period of only 18 months.

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[2] A description of the Swedish banking crisis in English can be found in Drees and Pazarbasioglu (1998).

At this time, the major political parties agreed on a tax-reform that favoured saving and sharply reduced the incentives to borrow. The Government supported a strong and successful anti-inflationary stance. The combination of new tax laws, high nominal interest rates and low inflation lifted real interest rates to levels unimaginable a few years earlier.

Credit losses in the banking system began to accumulate rapidly, and during the summer and autumn of 1992, the situation grew worse. The recession, combined with the rapid decline of real estate prices, caused big losses for banks and other financial institutions, that, in most cases, were owned by banks and therefore caused even bigger losses for the banks. The European currency crisis in 1992 forced the Riksbank to hike the short term interest rates, and the depreciation of the Swedish krona, following the abandonment of the fixed exchange rate policy in November 1992, led to a rapidly deteriorating situation in the financial markets. Many borrowers had foreign currency debts, whose values in one day rose to uncontrollable levels. Foreign lenders cut their credit lines to Swedish banks. This created a shortage of liquidity and foreign currencies within the financial system. The risk of a credit crunch became real.

In the late summer of 1992, the threat of a systemic crisis was evident. The seven largest banks, which accounted for approximately 90% of the banking market, all had serious problems in their loan portfolios. The credit losses of these banks during the crisis amounted to 12% of the Swedish GDP. Six of these seven banks needed more capital from their owners or the Government.

1.2 How the crisis was managed[3]

During the autumn of 1992, the Ministry of Finance (MoF) together with the Riksbank and the FSA decided to assign the highest priorities to the following actions:

- Restore confidence in the financial system;
- Attain political consensus about the necessary actions;
- Organise and divide the work.

The official guarantee[4] from the Government to depositors and other counterparts of the Swedish banks laid the foundation for renewed confidence in the financial sector. No limit was set on the amount of the guarantee in order to minimise the political cost of renewed petitions for government support in later phases of the crisis. Moreover, the Riksbank transferred parts of its reserve of foreign currencies to the banking system to avoid a credit crunch. Further actions to restore confidence were information to the financial markets, especially the international market, about the guarantee and the steps to be taken by the Government.

To attain a political consensus the Government kept the opposition informed and let it express its views on the proposed actions. The opposition was also represented in the Bank Support Authority (see below).

It was obvious that the crisis was too large to be handled by the MoF alone. Moreover, the Riksbank and the FSA were not considered to be the proper authorities to manage the crisis. Hence, the solution was to create a new separate organisation, the Bank Support Authority (BSA), governed by the MoF.

When the organisation of the BSA was in place, the next challenge was to find the best method for providing the support. The banks that had applied for support, that is to say all the major Swedish banks except Svenska Handelsbanken, had to report their real and expected credit losses, suspended interest rates payments, liabilities and securities to the BSA. The method for providing the support was based on these figures. The main purpose was to choose the form of support that was most

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[3] For a more detailed description see Ingves and Lind (1996).

[4] At the time of the bank crisis there was no deposit insurance scheme in Sweden.

efficient and cheapest for the economy and society as a whole. A balance was maintained between using a minimum of government funds and providing the banks with adequate capital. The best way of striking that balance was by providing part of the support in the form of guarantees. If the capital ratio fell below a certain threshold, the guarantee would be converted into loans or equity capital. One important question was the risk of moral hazard. To reduce that risk, it was decided that when the Government supported a bank with capital, the owners would loose an amount of money equivalent to the capital from the Government. In order to reduce uncertainty concerning a bank's future, it was decided that the majority of its bad loans and assets would be transferred to some form of asset management company (AMC) not owned by the bank.[5] The idea was that the specialised management of loans would probably lead to a higher degree of loan-loss recoveries.

The fundamental paradigm guiding the support operations was the so-called hammock approach. This was a common yardstick for analysing the banks' need of support and adequate measures. The objective of this model was to anticipate each bank's economic strength in terms of its earning capacity and capital buffer. All financial information obtained from banks and from other sources, including macroeconomic data and forecasts, was fed into this computer-based forecasting model, which could then produce an estimate of the bank's likely financial development over the next three to five years. The result of the analysis would be used to divide the banks into different groups, designated as A, B and C banks, depending on their potential for profitability in the short and medium term. In the next stage, the forecasts were used to decide the amount of financial support that a bank qualifying for support needed. The guiding principle in this context was that the restructuring of the banking sector should preserve a satisfactory level of cost efficiency and competition.

An A bank was a bank that was forecast to overcome its current problems and show a profit within the medium term. Its capital base would probably decrease, but stay above the required level of 8%. The problems in these banks could be solved by capital infusions from the owners. An example was SE-Banken, which never received any direct support from the Government.

The B banks were, like the A banks, profitable in the medium term, but the temporary problems were more serious. The capital could be expected to decrease below 8% for a limited period of time. The B banks were deemed to need capital from their owners together with guarantees from the Government. According to the design of the latter, if the capital ratio fell below the required ratio, the guarantee would be converted into loans or equity capital. The guarantees were necessary to induce the owners to take the risk of buying new shares. Also, as mentioned above, a majority of B banks' non-performing loans and assets were transferred to the AMC in order to facilitate a more efficient handling of the "good" and "bad" parts of the bank. An example of a B bank was Föreningsbanken (The Cooperative Bank), which in the end managed to survive without any financial aid from the Government.

C banks were those with no future prospects, not even after official support or reconstruction. Capital was on its way down to and below zero. Those banks were to be closed or merged with other stronger banks depending on which alternative was the least costly to society as a whole. An example of a C bank was Göta Bank. The bad loans in Göta Bank were transferred to a new company – Retriva – and the rest of the bank was put up for auction and later merged with Nordbanken. By separating the bad loans from the remaining sound parts of the bank, it was possible to get a higher price.

A number of foreign consulting firms were engaged with the task of providing the competence and expertise on the management of bank crises that was needed at this juncture. These consultants had gained competence through earlier experiences with bank crises in the United States and Norway. The tasks were divided among them to avoid a situation in which any of the consultants gained too much influence. One of the firms helped the MoF and the BSA in analysing banks' loans and other assets and in separating the sound ones from the non-performing ones. Other firms did the work of analysing

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[5] The functioning of these asset management companies is described in Ingves and Lind (1997) and Lind (1998).

banks' risk management systems and still others analysed their strategies and efficiency levels. The result was an important input into the design of adequate bank support measures.

The remaining banks in the Swedish system recovered from the crisis within a couple of years. As early as 1993, the owners of both SE-Banken and Sparbanken Sverige agreed to put more money into the banks, and the banks managed to fulfil the capital requirement of 8%. After 1993, there were no further commitments from the BSA, and in 1994 the banking system as a whole showed a profit.

The total amount of commitments by the BSA during the crisis was SEK 88 billion, but the total amount actually paid by the BSA to the banks was 65 billion. Most of that money, however, has been paid back to the Government through dividends, selling of shares and the value of retained shares.

2. What can be learned from the banking crisis?

In discussing the lessons to be drawn from the Swedish banking crisis we identify three different "phases": the building-up phase, the phase of acute payment system risk and the crisis management phase. For each phase we try to draw on the experiences from the crisis and discuss the measures that have been taken or are planned to reduce the risk of future crises and to mitigate the consequences, should a crisis actually erupt.

2.1 Phase one: the building-up of the crisis

An examination of the *first* phase of the Swedish banking crisis, like other banking crises in the world, reveals a number of factors that contribute in a rather complicated way to triggering the crisis development. One factor stands out, however, as crucial and that is the consistency and credibility of macroeconomic policy. Here, macroeconomic policy should be interpreted in a broad sense not just to include conventional stabilisation policy. One should rather look for the consistency and longer-term viability of various policy regimes concerning for instance fiscal and monetary policy. It is also important to analyse how these policy regimes conform to the general developments in the real and financial sectors of the economy.

With hindsight, it seems clear that the building-up of the Swedish financial crisis should have attracted attention at an earlier stage, which, perhaps, might have led to a less severe course of events. One basic problem with the macro-policy mix in Sweden at that time was the choice of monetary policy regime. As mentioned, the Swedish currency was pegged to a basket of currencies within a fairly narrow band. With lax fiscal policy, the burden of defending the krona was entirely borne by monetary policy. During the crisis there was clearly a conflict between the price stability (through the exchange rate target) and financial stability goals of the central bank. To defend the krona interest rates had to be raised, in the end to astronomical heights. This naturally hit the already problem-stricken banks hard and contributed to the acceleration of the crisis.

It is interesting to compare the crisis regime with the current inflation target regime. In the current regime, the above-mentioned policy conflict is basically eliminated. In a situation where the payment system is threatened with collapse a lowering of interest rates would be appropriate not only for financial stability reasons but also to avoid deflationary tendencies in the economy.

Looking back at the Swedish financial crisis it is also clear that neither the banking sector nor the supervisory authorities were prepared to handle the new situation caused by the rapid deregulation of the financial system. It is easy to understand, although difficult to accept, that both banks and supervisory authorities entered this new world without paying much attention to risk management and risk control issues. Seen from the point of view of the regulatory authorities even a rudimentary evaluation of the development of, for instance, the loan portfolios in banks and other financial institutions should at least have revealed the lack of consistent risk analysis in loan decisions and the

tensions created by the rapid and biased expansion of loans to certain sectors, in particular the real estate sector.

One has to be careful in making too much of the fact that, in retrospect, there seems to have been a number of indicators that should have given early warnings about what was building up in the financial sector. Still we should try to learn from the mistakes of ignoring these early warning signals and try to use the experiences from the crisis in searching for better methods to detect and handle crisis phenomena at an early stage.

Recent work aimed at reducing the risk that future financial crises will be allowed to reach proportions like the recent one can be divided into two categories. *First*, the Riksbank and the FSA have been working systematically on building up an analytical framework, through which relevant macroeconomic and financial sector data and information are regularly evaluated with the purpose of making judgements about the health of the Swedish financial system. A major product of this effort is the *Financial Markets Report* that disseminates the Riksbank's analysis of the financial system. *Second*, a major revision of the regulatory and legislative framework for the financial sector is underway. This work focuses particularly on the banking sector and includes the supervisory activities based on this regulation.

2.1.1 The analytical framework of the Riksbank

The financial crisis made it clear that the Riksbank needs to put as much emphasis on its goal of preserving financial stability as on its price stability goal. This has meant clarifying the Riksbank's role as overseer of the payment system, establishing the areas of emphasis for gauging financial stability and publishing the Riksbank's views on developments in the financial markets in a biannual publication, the *Financial Market Report.*

The *Financial Market Reports* are public reports with the general purpose, as stated by the Governor, to regularly comment on the Bank's views about the stability conditions in the financial sector. Since one of the Riksbank's two main tasks – the other is of course price stability – is to promote a stable and efficient payment system, it is considered natural for the Bank to report on developments in this area for much the same reason as Inflation Reports are a natural and important ingredient in the Bank's inflation policy. With these reports the Riksbank also aims to encourage debate about topics related to financial markets while providing relevant information and methods of analysis to policy makers, the public, the media and participants in the financial markets. This approach reflects the Riksbank's general appraisal of the benefits derived from openness and transparency in policy making. The response to this report has been positive. It has already proved to be a valuable conduit for communicating the Riksbank's concerns to those active in the financial arena.

These reports are an organic part of the Riksbank's analysis of financial markets. The starting point for this analysis was constructing a working definition of the Riksbank's role as overseer of the financial system. The Riksbank, like many central banks, has responsibility for financial stability but not for supervision. The Riksbank Act describes this responsibility as the goal of promoting a safe and efficient payment system. The operationalisation of the oversight role was built up from insights gained in operating the central payment system and in providing liquidity to banks as part of payment system and monetary policy operations. The oversight responsibility of the Bank also encompasses the analyses and techniques which are essential for its role as lender of last resort when it provides liquidity in exceptional circumstances.

Banks and the payment system infrastructure are very closely linked to each other. Even though the central bank has the primary objective of promoting the efficiency and stability of the payment system, ensuring a smoothly operating and well designed system is not enough. For some years, the Riksbank had tried to ensure that the infrastructure would be able to withstand any disturbance that could occur in the system. However, it became clear that it was necessary to identify the threats to the system by analysing the stability of the banking sector, with special emphasis on the major banks.

The analysis of banking system stability is based on three parts. First there is the analysis of profitability and efficiency. If the banking system is not profitable there is a risk that banks will try to increase their risk exposure in order to show, at least in the short term, a better return on equity. As regards non-efficient banking systems, history has shown that banks do not have the proper incentives to manage their risk taking in a prudent way. In both these situations the analysis could be used as a possible early indicator of excess risk taking in the banking sector, which in the longer run could lead to financial fragility.

Second is the analysis of the banking system's credit risks. In evaluating bank lending and comparing it to the macroeconomic development, important insights can be gained about the stability in the banking sector. This part of the analysis focuses on different categories of borrowers' ability to pay back their loans. The main categories are the household and corporate sectors. In the latter the real estate sector receives special attention because of the substantial exposure that banks have towards this sector. In the past, the real estate sector has been the source of large credit losses for banks.

The third, and last, part of the banking stability analysis involve the counterparty and settlement risks. In this, the analysis of the banks and the payment and clearing systems are combined. A bank run today will most certainly come from the international interbank market, as banks are becoming more and more dependent on other financial institutions in their trading and financing activities. Very large exposures towards liquidity and credit risks are built up in the foreign exchange and bond trading, for example. The extent of these risks depends on the creditworthiness of the counterparties but also on settlement procedures.

A combination of these three parts of the analysis of the banking sector provides a good picture of the overall stability of the financial system. One can argue that operational and market risks should be included as well. However, these are mainly bank specific risks, which are being supervised in detail by the FSA. Even if one major institution were to face severe problems caused by exposure to such risks, this would not lead to a systemic crisis if counterparty risks, both liquidity and credit risks, were to be managed properly. A deterioration of credit quality, on the contrary, will almost certainly affect all banks, even though their respective risk management systems will make the difference as to how they will be affected (as shown by the previous crisis).

2.1.2 The new legislative framework

As explained above, another lesson from the banking crisis was the need to review the legislative framework. A government committee was given the task of carrying out this review by examining and suggesting amendments to the legislation regulating banks and other financial institutions. As part of its work, the Committee is also directed to suggest methods for the supervisory implementation of the new legislation. The general purpose of the Committee work, as stated in its directives, is to build up a framework that could help to reduce the probability of a financial crisis occurring in the future.

The main report of the Committee[6] has recently been published and presented to the Government. A brief account of the general approach gives an indication of how it fits into the crisis management scheme. It should be noted that the report is a *suggestion* that, in the end, will lead to a government proposal to Parliament on a new Banking Act.

The Committee takes as a starting point a clear identification of the reasons why banks and other financial institutions require special attention from regulators. The main reason why banks are considered especially important is their strategic role in the payment system. In modern payment systems with their rapid expansion of large-value payments, the daily turn-over amounts to astronomic sums and even the suspicion that one of the major banks is in trouble could cause serious disruptions to the payment system. The contagion effects of a sudden bank failure are potentially very large and

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[6] SOU (1998).

the inherent system instability problem gives the usual "market failure" motivation for state intervention.

The Committee makes it quite clear, however, that interventions must be designed in such a way that competitive conditions as well as proper incentives for innovation and product development are preserved. The regulatory framework needed to safeguard the stability of the payment system therefore must be set up in such a way that the stability in the banking system can be promoted without unduly hampering the competitiveness of banks. At the same time, moral hazard effects of the regulatory framework must be avoided. Bankruptcies of individual banks must be an economic reality faced by all actors in the financial sector and the bailing out of management and equity owners in crisis-stricken banks is not an alternative.

From these considerations a couple of basic requirements for the management and status of banks are formulated in terms of core paragraphs in the suggested Banking Act.

The *first* core paragraph concerns the solvency of banks. With a satisfactory capital base a bank would have a buffer against unexpected losses. With a reasonable amount of buffer capital, the incentives of bank managers and shareholders would basically coincide with those of the regulators. The health of the bank would be as much in their interest as in that of the society. Whether the capital base of a bank can be considered satisfactory or not depends, of course, on the risk exposure of the bank. Although this is the main philosophy behind the Basle Accord, it is also well known that the Basle rules in many respects are quite primitive and, in some cases, even misleading, especially the rules concerning the banking book. The Basle Accord will be updated and modernised, but since this is likely to take time, the Committee has taken the view that the Basle capital adequacy rules are minimum standards, to be refined and developed by national authorities.

The *second* general paragraph emphasises the importance of having well developed systems of risk management and risk control in the banks. It goes without saying that risk-based capital adequacy requirements without appropriate risk control systems are an empty shell. Also, one of the pillars of banking business (and that of other financial institutions as well) is *controlled* risk-taking. To discover that a bank does not have a clear strategy for its risk-taking or a clear picture of its risk exposure is certainly an ominous sign.

The *third* main paragraph of the proposed new regulatory framework focuses on the transparency of banks. To measure their capital base and risk exposure in a meaningful way, banks must be required to have high standards for their reporting and information systems. Business activities in the banking sector cannot be allowed to be too opaque.

The *fourth* main paragraph is an attempt to formulate a standard of good conduct for the banking industry as a whole. This is done with the intention of capturing the possible negative externalities caused by a bank, which happens to fulfil the solvency and risk management requirements but whose business methods are considered to endanger the reputation of the whole banking sector.

By necessity, the proposed main paragraphs are a bit vague in their formulations. The purpose is that they give as clear as possible a picture of what should be considered the main focus in the regulators' attempt to reduce the risk that failure in one bank leads to the collapse of the payment system. This should also enhance the scope for the supervisory authorities to focus their attention on a major source of risk, systemic instability. The Committee proposes that the supervisory authority get a clear responsibility for implementing the framework given in the aforementioned main paragraphs. This emphasises that the supervisory authority, together with the Riksbank, should make judgements on the whole banking and financial system as a summary statement of its investigations into how well the individual banks conform with the regulatory requirements.

It is worth emphasising that we have spent time on presenting the proposed new banking legislation not because of over-confidence in the formal framework per se but because we think that it may help to bring concerns about financial stability to the forefront and provide the supervisory authorities with an agenda that is much more clearly focused on that task. The legislative and regulatory framework that was in place in Sweden when the crisis broke out was definitely lacking such focus.

2.2 Phase two: threats of payment system collapse

So far we have discussed crisis prevention, with the major focus on trying to detect and handle at an early stage tendencies toward macro-economic inconsistencies that will, in the end, lead to serious financial disruptions threatening the stability of the financial system. We have also dealt with attempts at following more closely the developments among the most strategic players in the financial system i.e. the banks. All that work has, however, focused on conditions, when the banks (and other financial institutions) are still functioning reasonably well and the requirements set up by the regulators are (seemingly) met. Let us now continue our analysis of what we can learn from the crisis and look at what we have called the *second* phase.

This phase is the short period when problems in the banking sector threaten to develop into a systemic crisis with a collapse of the payment system. It should be pointed out that the vulnerability of modern payment systems lies much more in the member banks' exposure to short-run interbank funding, especially from abroad, than in the traditional retail customer bank run problem. In the Swedish crisis, the imminent risk of a payment system collapse was avoided through the government guarantee. At a first glance, the only lesson to be drawn from the Swedish crisis experience might then be that the Government should be alert and not hesitate to declare that it stands ready to issue a similar guarantee in case of a future emergency. In our view this oversimplifies the lessons from the Swedish crisis. It is true that the Swedish political system proved capable of prompt action when the crisis became acute. In many respects, the political situation was a bit special, however. Other crisis symptoms, that need not necessarily be part of a banking crisis, had created an atmosphere of national emergency of an almost war-like kind. The most spectacular illustration of this was the crisis packages agreed between Government and opposition to rescue the fixed exchange rate, on which much of the confidence in the declared low inflation regime seemed to rest.

A future banking crisis may very well erupt without being preceded by (or coinciding with) other macro-economic calamities. Normally, the decision-making process in democracies is rather slow and often characterised by time-consuming wheeling and dealing, which could be devastating in a financial crisis situation. Since interbank funding can dry up extremely quickly – it could be a matter of minutes – there is very little room for hesitation in crisis situations. A clear mandate to an institution at arm's length from the political process to act as lender of last resort may be a natural alternative. This is, of course, one of the classical roles assigned to central banks. It has, however, been clearly demonstrated by a number of analysts of modern central banking that the main reasons for assigning a lender of last resort function to central banks were quite different and of little relevance to today's advanced financial systems. Today central banks still provide very short-term (intraday and overnight) lending facilities to banks, but they are typically part of the normal working of the payment system and more or less fully collateralised. These lending activities are not performed by central banks because they have unique access to liquidity, but because they have found it natural to take a leading role in the inter-bank clearing and settlement system. But in a world of well developed money markets, the fully collateralised loans the banks acquire from the central bank could, under normal market conditions, as well be channelled via private institutions. In Sweden, the Riksbank Act also contains a paragraph specifying the *lender of last resort* mandate: Under extraordinary circumstances the Riksbank may extend loans to institutions that stand under the supervision of the FSA without requiring full collateral. The spirit of the paragraph is the idea that last resort loans should be given to banks (or other financial institutions of vital importance) which have acute liquidity problems but are basically solvent. This is, of course, a prescription as easy to formulate as it is difficult to implement.

Some critics of the lender of last resort function have drawn the conclusion that since there is no reason why the central bank knows better than the market which banks are temporarily illiquid and which are basically insolvent, the central bank should abstain from directed loans. It should instead focus on injecting liquidity into the banking system through the ordinary monetary policy channel. Although there are few attempts to show rigorously the need for a lender of last resort role for central

banks,[7] the consensus view among central bankers seems to be that reliance on general liquidity injections would not be enough when a payment system crisis is imminent. As mentioned, the time perspective in such a situation is extremely short and the uncertainty among the private actors in the financial system about each other's positions may be so deep that the system gets paralysed. Regardless of how much liquidity the central bank injects into the financial system, it is doubtful that it will be channelled to those banks, which need it quickly enough to avoid systemic problems. Central bank lending aimed directly at the illiquid banks seems to be the only short-run alternative to prevent the liquidity problems from quickly developing into insolvency problems.

There seems also to be consensus that the task of the central bank is really to provide liquidity to the banking system but not to take responsibility for the longer term financing or even recapitalisation of banks that may prove necessary. Consequently, last resort loans from central banks should be clearly short term. The basic idea would be that central banks could offer "bridge" loans at short notice and that other sources, ultimately the Government if that turns out to be necessary, should come in as soon as the picture gets clearer, allowing the central bank loans to be repaid.

Again, this simple idea is easier to formulate than to put into practice. Not much reflection is needed to see that the question of delegating a lender of last resort role to the central bank cannot be considered in isolation. The lender of last resort function should be seen as one of a number of ingredients in a well-designed crisis management package. In a broader sense, it could also be considered as part of the general safety net that is built around the financial sector, where deposit insurance and regulation and supervision of banks and other financial institutions are other ingredients.

It seems obvious that the central bank cannot take on the responsibilities for last resort lending without reasonable knowledge about the health of the banks that get loan support and of the banking system as a whole. One piece in the information process is the on-going attempts by the central bank to make judgements concerning the health of the banking system (see Phase 1 above). A crucial issue here, however, is what measures the central bank and/or supervisory authority could take when they have detected tendencies toward financial weakness in a bank that might develop into a bank failure with systemic consequences. At the time of the Swedish banking crisis (and this is the case even today), the supervisory authority did not have (nor did the Riksbank) much legal support for any actions going further than declarations about unsound behaviour in the weakening banks. The only really powerful measure at the disposal of the supervisory authority was the withdrawal of the banking licence. The problem with this measure is that it is usually too strong. In impending payment system crises, the threat of using this measure would most certainly contribute to aggravating the crisis.[8]

The only clear triggering point is when a bank's capital base dips below the level required by the capital adequacy rules. Formally, the consequence of such an event should be withdrawal of the licence, if the bank is not promptly recapitalised. On the one hand, this would be too crude a measure to be taken in a delicate situation; on the other hand, the capital adequacy measures seem to react with a considerable lag to a deterioration in the financial health of a bank. During the acute phase of the Swedish banking crisis, for instance, *no* bank violated the capital adequacy requirements.

In short, there was not much of a formal framework for the crisis managers to lean on during the acute phase of the Swedish banking crisis. Therefore, most actions had to be improvised. With the

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[7] One interesting example is Flannery (1996).

[8] In the case of the Riksbank, the only sanction is to exclude a bank from the payment system run by the Bank – the RIX system. This would most certainly have a rather negative effect on payment system stability and is therefore a sanction that is both very drastic and very difficult to use in practise.

government guarantee issued in time to prevent a payment system collapse, the lender of last resort function of the central bank was not really tested.[9]

In our view, the regulatory system should be supplemented with a framework that provides a reasonable environment for the lender of last resort function of the central bank. What we have in mind is the creation of a legal basis for some kind of trigger point system. Based on this system, the supervisory authority (in close co-operation with the central bank) can take corrective steps vis à vis banks that seem to be entering the danger zone. These actions should include the final removal of the incumbent management. They should also include requirements of recapitalisation without consent or claims of priority from the former shareholders. A proposal on how such a supplement to the regulatory framework should be designed is one of the tasks given to the aforementioned Government Committee.[10]

To be prepared for its role as lender of last resort, the Bank has set up an action plan.This is based on the experiences of acting as lender of last resort during the ERM-crisis in 1992. The plan consists of the logistics of crisis resolution, answers some legal questions connected with extraordinary lending and describes the documentation which is necessary should the Riksbank need to act as lender of last resort. The plan also includes an information strategy and some guidelines for crisis analysis.

The plan centres around a crisis staff consisting of key Riksbank personnel as well as representatives of the Financial Supervisory Authority whose task it is to recommend actions to the Executive Board of the Riksbank. A financial system analysis group will also be set up. A parallel group made up of members of the Bank's trading room will monitor developments in the financial markets. The financial system analysis group is supposed to base its work on the ongoing analysis of bank profitability, case studies of different types of financial disturbances and legal evaluation of the Riksbank's options. The legal and technical analysis will provide guidance to the range of actions which the Riksbank can take, how lender of last resort activities can be carried out so as to minimise moral hazard and the freedom with which the Riksbank may target its lending in accordance with the legislative framework.

2.3 Phase three: crisis management

The analysis of financial system stability mentioned earlier attempts to identify unstable situations in the banking sector at an early stage. Building on the lessons from the past, we hope to avoid this kind of problem or limit its scope. Although the Riksbank has increased its competence and preparedness, there is no foolproof system that can completely eliminate the danger of a new bank crisis. However, by drawing lessons from the crisis management in the early 1990s, the likelihood of a successful management of future crisis can be increased.

These are basic principles that are to be followed in a potential future crisis. The crisis management policy should be characterised by a high degree of openness in combination with information efforts towards market participants, both regarding the extent of the problems faced and the measures to be taken. This contributes to reducing uncertainties in the market that tend to create even larger problems. The authority in charge of executing the implementation of the support policies should be kept separate from the political sphere and from the central bank in order to avoid a conflict of

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9 It should be added that the Riksbank did act as lender of last resort on a few occasions before the government guarantee was announced. Subsequently, the Riksbank formally acted as lender but the government had, of course, taken over the risk. The "bridge loan" phase, for which we have argued that the modern version of the lender of last resort facility is designed, was not needed, because of the prompt government intervention.

10 A reasonable starting point for this work would be an analysis of the system for prompt corrective action (PCA) and structured early intervention and resolution (SEIR) recently codified in the Federal Deposit Insurance Corporation Improvement Act (FDICIA) in the United States. Of course, the legal system, the structure of the banking sector and the way supervision is organised are all very different in Sweden than in the United States. The framework to be established must, therefore, get a rather different design.

interests. In the Swedish banking crisis, the Ministry of Finance set up the Bank Support Authority to deal exclusively with all matters of unwinding, recapitalisation etc. of the ailing banks. The task of the central bank is clearly to provide emergency *liquidity*, not to get involved with recapitalisation. Experience also shows that it is problematic for a supervisor to be responsible for the actual management of ailing banks. The authority should have an analytical framework guiding the work of bank reconstruction. It should include a strategy as to the desired future structure of the banking sector. The risk of moral hazard should be minimised, with support measures constructed in such a way that the credit institutions have an incentive to use them as little as possible. Official support should, whenever possible, take the form of "participation capital" rather than loans – the aim being to benefit financially from the "upside" when the bank once again becomes profitable. Some form of asset management company should be established to handle non-performing and otherwise impaired loans.

Summarising, considering the extent of the problems in the bank sector in the early 1990s, Sweden came out of the acute phase of the crisis swiftly and at a relatively low cost. This was due to a good portion of luck but also, we believe, to successful crisis management. The key elements in the successful management of the crisis of 1992 were the speed with which confidence in the financial system was restored and the efficient division of tasks that involved the creation of the BSA – a separate entity from both the FSA and the central bank. The main impression is that the scheme set up for the BSA was appropriate and that the implementation was performed in accordance with this scheme. Our conclusion is that future crisis management in phase three could draw heavily on the experiences made by the BSA.

Regarding the acute phase of the crisis, the rapid restoration of confidence was achieved through the unlimited government guarantee, followed by distinct information efforts directed towards both domestic and international market players. This demanded a high degree of political consensus, which fortunately could be achieved at that moment. However, although this was a crucial aspect of the successful management of the crisis, there can be no certainty that it will be present in a future crisis. Clearly, the alternative to this "political consensus" approach to the preservation of confidence is the central bank's role as a lender of last resort.

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