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**LEVERAGE AND FINANCING OF
NON-FINANCIAL COMPANIES:
AN INTERNATIONAL PERSPECTIVE**

by
C.E.V. Borio

BANK FOR INTERNATIONAL SETTLEMENTS
Monetary and Economic Department
BASLE

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Leverage and financing of non-financial companies: an international perspective*

Introduction

The financing mix and leverage of non-financial companies have historically differed substantially across countries. This paper explores possible reasons for this range of experiences. In the process it provides a broader perspective from which to assess a typically US phenomenon which has recently focused the attention of policy-makers, academics and the public at large: the wave of highly leveraged transactions (HLTs) which has dramatically raised the debt burden of a significant number of corporations. Leveraged buy-outs (LBOs) have been the most conspicuous facet of this trend.¹

Section I provides a stylised picture of differences in financing patterns and leverage, with a more detailed discussion of definitional issues being relegated to Appendix I. Section II briefly

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¹ HLTs are divided into three categories: LBOs, leveraged acquisitions and recapitalisations. In *LBOs*, a public company is purchased by a group of investors who establish a new ("shell") corporation with that sole purpose. The investors may be existing management (management buy-outs), employees in general (ESOPs) and outsiders. When publicly quoted, the target company's shares are then removed from the stock market, i.e. the company is taken private. In contrast to buy-outs, in *leveraged acquisitions* the acquirer is already an established corporation with other sources of revenue. In *recapitalisations* (or "recaps" for short) an existing corporation retires part of its outstanding shares from the public markets, substituting debt for equity. Typically, recapitalisations are defensive measures against takeover threats.

summarises the main lessons which can be drawn from the theory of financing decisions and leverage which is reviewed in more detail in Appendix II. The theory is then used to explain basic financing patterns and cross-country differences. Section III applies the general theoretical framework to the interpretation of the wave of HTLs in the United States and considers the prospects for similar developments in other countries.

Among the conclusions reached, at least four deserve particular attention.

While the traditional stylised distinction between low-leverage countries (e.g. the United States, the United Kingdom and Canada) and high-leverage countries (Japan, Germany, France and Italy) still provides a useful classification, differences have tended to narrow since the early 1980s.

The unique experience of the United States is a primary factor behind the lower dispersion of leverage levels across the two groups of countries. In contrast with all other countries in the sample, US companies have retired substantial amounts of equity, substituting them with debt.

A number of complementary, and partly overlapping, factors could in principle explain leverage and financing patterns: taxation, investment needs in relation to internal availability of funds, and institutional characteristics favouring particular financing forms. Above all, examination of historical cross-country differences suggests that in high-leverage countries a number of institutional features primarily related to investor/company relationships have been conducive to the support of relatively high debt burdens. These characteristics tend to increase informational flows to lenders and reduce the costs of resolving financial crises, notably through long-term relationships between borrowers and lenders. Three such characteristics are lower fragmentation of debt claims, simultaneous holding of debt and equity, and government policy.

There is little evidence that the increase in US corporate indebtedness has been accompanied by a convergence towards

those characteristics of high-leverage countries which would point towards greater debt capacity, although some such elements can be found in HLTs. The new financial structures may indeed raise the efficiency and profitability of segments of the company sector by bringing managers' incentives more into line with those of equity holders and by reducing their leeway to pursue other goals. Even so, they also imply greater vulnerability to system-wide shocks such as an economic downturn.

At least three characteristics are critical for the feasibility of US-style HLTs: availability of low-grade debt finance, a liquid stock market for the refloating of companies and dispersed ownership, if hostile bids are to succeed. Only in the United Kingdom and, to a lesser extent, France have HLTs reached significant volumes. The growth potential for these operations does exist in the other Group of Seven countries, but primarily on a friendly basis. Hostile operations would require further institutional changes. Above all, however, the spreading of HLTs outside the United States will depend on how restructured companies fare in the next economic downturn.

I.

International leverage and financing patterns: a stylised picture

1. The object of the analysis

For its operations an enterprise requires financial capital. That capital can be raised in a variety of forms which differ in terms of a number of characteristics such as contractual remuneration conditions, control rights over the deployment of the funds, and ease of transferability of the claim among agents, e.g. its marketability.¹ Capital structures vary substantially across firms not only in terms of these characteristics but also in relation to the number and type of investors who hold these claims.

Within the broad spectrum of types of financial capital, particular attention has traditionally been paid to the distinction between debt and equity. This distinction can be used to classify all claims on a firm on the basis of remuneration and control characteristics. In stylised terms pure equity holders have a claim on that portion of the income of the company in excess of contractual payments to all other claimants. As long as the firm can meet its contractual payments (does not default), equity holders are *de jure* in control of the firm's assets. Conversely, debt holders have a claim to a contractual stream of payments which is independent of the income of the firm except when the

¹ Economic organisations differ in terms of the ways in which they can raise financial capital. The main focus of this paper is on corporate forms. Incorporated businesses, unlike simpler organisations such as sole proprietorships and partnerships, confer limited liability. Their legal owners (shareholders) are only liable for any residual claims on the enterprise to the extent of their original investment. In addition, corporations are the only organisational form which can raise funds through securities issues – although the liabilities of private, as opposed to public corporations, are subject to a number of restrictions on their transferability. Broadly similar organisational forms exist in all the Group of Seven countries, although the specific characteristics differ. For an overview, see Nobes and Parker (1985).

firm defaults on its debts. In that case they are entitled to the residual income and are de jure in control of the deployment of the company's assets.² The complexity of financial arrangements in the real world makes it sometimes difficult to draw a clear line between debt and equity.³ Nevertheless, debt/equity or debt/total assets ratios (leverage) are often used as succinct indices of the structure of claims on a firm.

The main reason why financing patterns, particularly the distinction between debt and equity, have received so much attention from economists and policy-makers alike is the conviction that the real performance of enterprises and their economic value are significantly dependent on their financing possibilities and decisions. From this perspective leverage has often been associated with financial fragility since, *ceteris paribus*, higher indebtedness implies a higher probability of default and bankruptcy. The implicit view is that bankruptcy may result in liquidation⁴ even if, all things considered, the firm would be more valuable as a going concern.⁵ For that reason, in countries where equity markets have traditionally been under-

² They may not be de facto in control if the mechanisms for controlling those in charge of running the enterprise, i.e. management, are inadequate. This important distinction is further considered below.

³ A typical example is preference shares for which, depending on the contract specifications, the pay-off may be partly or totally independent of the firm's income, voting rights are restricted or non-existent and ranking is senior to ordinary shares in the event of liquidation.

⁴ Bankruptcy is defined as the transfer of residual ownership from equity holders to creditors. Liquidation is the piecemeal sale of the firm's assets. For the distinction between bankruptcy and liquidation, see Haugen and Senbet (1978) and White (1989).

⁵ The value of the firm as a going concern could be a purely private return to the firm's claimants or, more appropriately in this case, a return to society at large once externalities are taken into consideration. For instance, in the presence of temporary nominal wage rigidities the failure of one company could cause the failure of other enterprises, thus exacerbating a recession (see, for example, Guttentag and Herring (1984), Davis (1987), Bernanke and Campbell (1988)) and causing instability in the financial system. Alternatively, the risk of a debt-amplified recession may induce the monetary authorities to tolerate higher inflation (see, for example, Friedman (1988)).

developed, concerns have often been expressed that firms would be largely constrained to rely only on the internal source of equity financing, i.e. on retained earnings. Somewhat paradoxically, concerns about high indebtedness have recently been voiced also in the United States, whose equity market is the most sophisticated in the world, as firms have severely curtailed external equity financing.

2. An international comparison

Any international comparison of leverage and financing patterns should start with a salutary warning. Statistics in this area are not easily comparable across countries. Accounting standards vary significantly (Gray (1980), Nobes and Parker (1985), CEC (1987)) and national flow-of-funds statistics differ in terms of classification of sectors, degree of consolidation and treatment of a number of items (notably direct investment). No doubt this is an area to which future efforts should be directed.⁶ At present, however, there is no alternative but to rely on existing sources, whatever their shortcomings.⁷

Traditionally, a distinction has been drawn between what have been referred to as Anglo-Saxon countries (the United States, the United Kingdom and Canada) and the other major economies (Japan, Germany, France and Italy). The former have been found to be characterised by lower leverage and greater reliance on retained earnings.⁸

Table 1 presents *leverage ratio* estimates *at book value*⁹ for the Group of Seven. The stylised distinction between high and low-leverage countries is broadly confirmed.^{10, 11}

⁶ For some preliminary steps in this direction at the EC, see Green and Sananes (1987).

⁷ With regard to flow-of-funds statistics, some of the peculiarities of national sources are discussed in Davis (1986). The methodological notes to the OECD Financial Statistics also explain some of the differences.

⁸ See, for example, OECD (1967), Lamfalussy (1972), Rybczynski (1974), Corti (1984) and Mayer (1988).

Table I
Ratios of gross debt to total assets (book values)

Countries	1970	1975	1980	1985	1986	1987
Low-leverage						
United States ^{1,2}	0.49	0.45	0.44	0.48	0.50	0.51
United Kingdom	0.53	0.54	0.53	0.53	0.53	n.a.
Canada ^{1,4}	0.54 ⁵	0.61	0.59	0.58	0.57	0.57
High-leverage						
Japan ⁶	0.85	0.85	0.84	0.81	0.81	n.a.
Germany ⁷	0.65	0.65	0.66	0.63	0.62	0.60
France ⁸	0.66	0.70	0.69	0.71	0.67	n.a.
Italy ⁹	0.63	0.68	0.68	0.64	0.61	0.61

¹ Estimates of book value based on historic-cost flow-of-funds statistics. Estimates are not fully comparable.

² Non-financial corporations excluding farming. Consolidated at enterprise level and largely at sectoral level.

³ Sample of large non-financial corporations estimated to account for some 80% of total capital employed in the industrial and commercial companies sector. Consolidated at enterprise level.

⁴ Non-financial corporations. Partly consolidated at enterprise level.

⁵ 1971.

⁶ Total private non-financial corporations. Non-consolidated.

⁷ Corporate and non-corporate non-financial business. Non-consolidated.

⁸ Sample of industrial and commercial corporate business. Non-consolidated.

⁹ Sample of relatively large manufacturing companies. Non-consolidated.

Sources: OECD Financial Statistics and national flow-of-funds statistics.

⁹ See Appendix I for an explanation of the various definitions used here.

¹⁰ The figure for the United States is somewhat higher than those presented in some earlier studies (see, for example, Corbett (1987) and Rutterford (1988)) because these studies refer to OECD figures as book values. In fact, for the United States (and Canada) those are estimates of replacement cost from national flow-of-funds statistics. Here the historic cost estimates from the same source were employed, as they should be closer to book value figures. Studies which have made more detailed pair-wise comparisons of leverage (book value) in the United States with that in high-leverage countries (mainly Japan and occasionally Germany) typically find that leverage in the United States is lower (see, for example, Sarathy and Chatterjee (1984), Michael and Shaked (1985), Kester (1986) and Prowse (1988)).

¹¹ For Germany estimates for the corporate sector only ("Kapitalgesellschaften") for 1980 are equal to 55 and 74% depending on whether provisions are considered equity or not. Much of those provisions reflect companies' pension commitments which are senior claims in bankruptcy proceedings and should therefore best be treated as debt. On this, see also Rutterford (1988) and McCauley and Zimmer (1989).

Looking at the evolution of leverage over time, which should be less sensitive to data problems, the performance of the United States in the 1980s stands out. The United States is the only country where leverage has been rising, and at a rather steep rate.¹² Leverage does, however, remain relatively low by international standards and at levels not much different from those reached in the early 1970s. In the rest of the sample, leverage has either been broadly stable (the United Kingdom and Canada) or tended to fall. This has resulted in a certain degree of convergence between high and low-leverage countries.

The overall distinction between high and low-leverage countries is essentially confirmed by estimates of *gross leverage at market value*, although for some countries (the United Kingdom, Germany and France) the samples are broader and hence not directly comparable (Table 2).¹³ Leverage at market value is significantly lower than at book value in Japan.¹⁴

Measured at market value, the gross leverage of US corporations has remained broadly stable in the 1980s in contrast with a generalised tendency for indebtedness to decline elsewhere, particularly in Japan. The different behaviour of market and book value estimates mainly reflects the general buoyancy of market valuations since 1982.

Most of the theoretical literature on leverage and financing does not recognise the possibility of companies holding financial

¹² Leverage calculated at replacement cost exhibits a similar trend. For the definition, see Appendix I.

¹³ For Germany estimates for public corporations ("produzierendes Gewerbe" only) point to leverage ratios equal to 47 and 36% in 1980 and 1984 respectively, if provisions are not considered debt, and to 57 and 51% if they are so considered. See also Paulus (1987) for alternative estimates.

¹⁴ While no consensus exists, most studies making pair-wise comparisons with US corporations confirm that leverage in Japan remains higher (see, for example, Paulus (1987), Prowse (1988) and, for a review, Wall (1988)).

Table 2
Ratios of gross debt to total assets (market values)¹

Countries	1970	1975	1980	1985	1986	1987
Low-leverage						
United States ²	0.45	0.52	0.50	0.50	0.49	0.51
United Kingdom ³	0.51	0.64	0.63	0.52	0.48	0.48
Canada ⁴	0.50	0.58	0.54	0.47	0.45	0.45
High-leverage						
Japan ⁴	0.86	0.83	0.84	0.73 ⁵	0.63	0.59
Germany ⁶	0.72	0.76	0.81	0.71	0.70	0.77
France ⁷	0.58	0.67	0.64	0.50	0.41	0.47

¹ Estimates are not fully comparable.

² Private non-financial corporations, consolidated, equity at market value.

³ Private non-financial corporations, non-consolidated, equity and bonds at market value.

⁴ Private non-financial corporations, non-consolidated, equity at market value.

⁵ Break in the series.

⁶ Private and public sector non-financial corporations and unincorporated businesses, non-consolidated, equity at market value.

⁷ Private corporate and unincorporated businesses excluding sole proprietorships, non-consolidated, equity at market value.

Sources: National flow-of-funds statistics and own estimates.

assets.¹⁵ In fact, these holdings range from around 30% to well over 50% of the book value of total assets. Table 3 considers *net leverage* ratios at market value, where holdings of debt and equity have been deducted from equivalent claims on the liability side of the balance sheet. It captures leverage only in terms of the value of *real* assets.¹⁶

¹⁵ In most models this results from assumptions which make financial assets "perfect complements" with financial liabilities so that only net amounts are considered. Even when they are not perfect complements, however, they are generally disregarded.

¹⁶ This measure has the additional merit of partly allowing for those differences in the observed ratios that result from failure to consolidate at sectoral level. Distortions can be particularly important for countries in the high-leverage group, where holdings of equity are substantial (see below). It also helps to overcome differences related to the inclusion, to varying degrees in Japan, Germany and Italy, of companies' pension funds, which lengthens both sides of the balance sheet. See, for example, Rutterford (1988) and McCauley and Zimmer (1989).

Table 3
Ratios of net debt to real assets (market values)¹

Countries	1970	1975	1980	1985	1986	1987
Low-leverage						
United States	0.21	0.19	0.17	0.21	0.21	0.24
United Kingdom	0.21	0.32	0.25	0.08	0.07	0.04
High-leverage						
Japan	0.68	0.66	0.65	0.51 ²	0.42	n.a.
Germany	0.74	0.80	0.84	0.70	0.67	0.76
France	0.56	0.63	0.56	0.51	0.42	0.52

¹ See table 2 for sectoral definitions. Estimates are not fully comparable.

² Break in the series.

Sources: National flow-of-funds statistics and own estimates.

The estimates underline the distinction between low and high-leverage countries. The uniqueness of the US experience in the 1980s is confirmed. The significant fall in leverage in the United Kingdom largely reflects the substantial accumulation of financial assets.

Tables 4 and 5 present estimates of *gross financing proportions* (i.e. sources of funds) for the periods 1970–87 and 1983–87.¹⁷ The United States is excluded since flow-of-funds sources and uses for the corporate sector are largely treated on a net basis. The data suggest that the United Kingdom has tended to rely somewhat more heavily on retained earnings than the rest, especially if the figure for Germany is adjusted to exclude transfers, which are particularly high as a result of the inclusion of nationalised enterprises in the sample. Similarly, new share issues have been somewhat greater in the United Kingdom and Canada.¹⁸ In 1983–87 issues of debt securities increased in all countries.

¹⁷ The estimates relate to cumulative real flows but are not adjusted for the erosion of the value of outstanding debt resulting from inflation. For estimates based on such an adjustment, see McCauley and Zimmer (1989).

¹⁸ In Germany the raising of external equity is underestimated since there are no figures for issues of participations of GmbHs (roughly, private corporations), whose aggregate nominal capital is comparable to that of AGs (public corporations).

Table 4
Gross financing proportions,¹ 1970-87

	Low-leverage countries		High-leverage countries		
	United Kingdom	Canada	Japan	Germany	France
	in percentages of total sources				
Retained earnings . .	68	52	45	65/58 ²	39
Share issues	5	8	3	2	8
Direct investment . .	1	5	0	1	2
Total debt	27	34	51	32	51
- credit institutions .	20	15	34	20	22
- securities	2	8	3	1	2
- trade credit	2	7	14	2	19
- other	2	3	-	10	7
Residual	-	-	-	1	-
<i>Memorandum item</i> depreciation	66	37	33	54	n.a.

¹ See Table 2 for sectoral definitions. Estimates are not fully comparable.

² Excluding transfers.

Sources: National flow-of-funds statistics and own estimates.

Table 5
Gross financing proportions,¹ 1983-87

	Low-leverage countries		High-leverage countries		
	United Kingdom	Canada	Japan	Germany	France
	in percentages of total sources				
Retained earnings . .	66	64	53	72/65 ²	42
Share issues	10	13 ³	3	3	17
Direct investment . .	1	4 ³	0	0	2
Total debt	22	18	44	22	39
- credit institutions .	18	6	40	14	13
- securities	4	9	5	2	3
- trade credit	0	4	4	0	15
- other	0	- 1	-	6	9
Residual	-	-	-	3	-
<i>Memorandum item</i> depreciation	66	44	38	60	n.a.

¹ See Table 2 for sectoral definitions. Estimates are not fully comparable.

² Excluding transfers.

³ Rough estimate of breakdown between share issues and direct investment.

Sources: National flow-of-funds statistics and own estimates.

On a *net basis* – subtracting, that is, the accumulation of financial assets from the change in financial liabilities – the differences across countries are starker (Tables 6 and 7).¹⁹ Low-leverage countries tend to rely more heavily on retained earnings, in line with the traditional characterisation. This is true even if the exceptionally high figure for the United Kingdom is adjusted downwards by the amount of the suspiciously large negative residual and especially so if the German figure is net of transfers.²⁰ Moreover, in contrast with other countries, in the United States net share issues were actually *negative* for the period as a whole. They would also have been negative in the United Kingdom had the 1960s been included in, or 1986–87 excluded from, the sample. Among low-leverage countries, only in Canada were share issues significantly higher than those in the other countries considered.

Debt securities issues were larger in low-leverage countries, particularly in the United States and Canada. By contrast, high-leverage countries tended to obtain a greater proportion of net funds from credit institutions (mainly banks). The partial exception is Germany, where the share of these funds was similar to that in the United Kingdom and Canada though still significantly higher than in the United States. That partly reflects the increase in pension liabilities (included under “other”).²¹

¹⁹ These estimates are broadly comparable with those in Mayer (1988).

²⁰ The German figure, however, should be treated with particular caution. An important source of funds included under “other” liabilities is additions to pension commitments, which in the flow-of-funds are set off against retained earnings (“saving”). These constitute “debt” in the sense that they are a fixed liability which is, furthermore, senior in bankruptcy proceedings. On the other hand, and in contrast with the United States and the United Kingdom, the company has ample discretion over the use of the related cash flow which effectively means a greater pool of uncommitted internally generated funds (see, for example, McCauley and Zimmer (1989)).

²¹ Provisions for future pension payments were included under equity in the table on leverage at book value. Here the flow-of-funds classification is followed. Since pension liabilities cannot readily be offset against “equivalent” financial assets, they appear as a net liability irrespective of whether they are fully funded or not.

Table 6
Net financing proportions,¹ 1970-87

	Low-leverage countries			High-leverage countries		
	United States	United Kingdom	Canada	Japan	Germany	France
	in percentages of total sources					
Retained earnings	90	108	83	64	83/74 ²	74
Share issues	- 3	1 ³	10	3	1	9
Direct investment	- 1	- 6 ³	- 6	- 2	- 1	- 0
Total debt	16	10	19	17	15	28
- <i>credit institutions</i>	9	14	15	23	12	26
- <i>securities</i>	14	3	9	- 1	- 0	2
- <i>trade credit</i>	- 2	- 2	- 3	- 6	- 2	- 2
- <i>other</i>	- 5	- 5	- 3	-	5	2
Residual	- 2	- 14	- 6	18	1	-11
<i>Memorandum item</i> depreciation	71	106	59	43	70	n.a.

¹ See Table 2 for sectoral definitions. Estimates are not fully comparable.

² Excluding transfers.

³ Rough breakdown between share issues and direct investment.

Sources: National flow-of-funds statistics and own estimates.

Table 7
Net financing proportions,¹ 1983-87

	Low-leverage countries			High-leverage countries		
	United States	United Kingdom	Canada	Japan	Germany	France
	in percentages of total sources					
Retained earnings	100	117	95	72	94/84 ²	88
Share issues	-17	9 ³	16	3	2	13
Direct investment	4	-13 ³	- 8	- 2	- 2	- 2
Total debt	20	3	3	6	0	8
- <i>credit institutions</i>	8	8	7	14	9	13
- <i>securities</i>	18	7	6	- 3	- 1	3
- <i>trade credit</i>	- 2	- 2	- 1	- 6	- 2	- 2
- <i>other</i>	- 3	-10	- 8	-	- 5	- 7
Residual	- 7	-15	- 6	22	5	- 7
<i>Memorandum item</i> depreciation	86	116	65	52	78	n.a.

¹ See Table 2 for sectoral definitions. Estimates are not fully comparable.

² Excluding transfers.

³ Rough breakdown between share issues and direct investment.

Sources: National flow-of-funds statistics and own estimates.

In all seven countries there has been a tendency since 1983 to rely more heavily on retained earnings which has coincided with the improvement in profitability. With one exception, share issues have also become a more important net source of finance, notably in the United Kingdom and Canada, while net debt financing has been cut sharply. The clear outlier is the United States, where, reflecting the wave of leveraged mergers and acquisitions, net share repurchases have accelerated and reliance on debt has increased. This has been associated with a more than 20% rise in net debt securities issues. Interestingly, despite a significant increase in gross issues, net issues have become more negative relative to the past in both Germany and Japan, indicating that they have been associated with the acquisition of similar assets.

Summarising, the main points to bear in mind in the analysis which follows are:

1. In all countries retained earnings are the main source of financing, followed by borrowing and share issues.
2. The data broadly confirm the distinction between high-leverage (Japan, Germany, France and Italy) and low-leverage (the United States, the United Kingdom and Canada) countries, particularly when leverage is measured on a net basis.
3. In terms of financing patterns, the difference stems primarily from the relatively greater reliance on retained earnings in low-leverage countries. Indeed, on a net basis, in both the United States and the United Kingdom share issues have been negative for lengthy periods.
4. The differences between the two groups have tended to narrow in the 1980s, largely because leverage in the United States has tended to converge to levels more in line with those of high-leverage countries. The increase in indebtedness in the United States has primarily taken the form of securities issues.
5. With the exception of the United States, since the early 1980s in all countries rising profitability and cash flows have been associated with a decline in leverage, particularly when measured on a net

market-value basis. Japan is the primary example. Debt securities issues have also increased and tended to be associated with the purchase of similar financial assets.

II.

Explaining observed historical leverage and financing patterns

1. Lessons from the theory

The basic intuition behind the theoretical framework used to analyse financial decisions is that a company is primarily a bundle of assets which produce income streams to be distributed among the company's claimants. From this perspective, financial decisions taken by companies, and hence their debt/equity ratio, would be indeterminate unless they affected the perceived pay-offs of their investors. As examined in detail in Appendix II, this can arise for the following reasons:

- (a) for any given perceived income stream associated with the firm's assets, investors may be unable to offset changes in the form of its finance and related distribution or incur costs in the process (transaction costs, constraints on arbitrage);
- (b) for any given perceived income stream, the *net* amount received by investors may vary depending on the form of finance and related distribution (taxes, bankruptcy costs, other costs);
- (c) because of informational asymmetries between those in charge of the firm's policy (insiders) and those providing the funds (outsiders), the perceived income stream may be a function of the form of finance and related distribution (signalling, screening, agency issues).

Under any of these realistic conditions real and financing decisions cannot be regarded as independent: output and real investment cannot be determined independently of the financing mix. More specific statements require additional assumptions about the preferences of financial investors, the valuation of income streams

and the relevance of that valuation to the objectives of, or constraints on, the decision-maker(s) in charge of firm policy.

Transaction costs and constraints on arbitrage per se ((a) above) have little predictive content unless specific cases are considered, e.g. institutional barriers to external equity finance. The factors that drive a wedge between the income stream of the firm and that of investors ((b) above) have more specific effects. With few exceptions tax systems are such that investors prefer debt to all equity forms and retained earnings to share issues. Bankruptcy costs and the loss of non-debt tax shields (i.e. tax benefits crowded out by higher debt) result in a preference for equity. These factors combined would suggest a preference for a mixture of debt and equity.

Informational asymmetries ((c) above) suggest that a firm would not seek external finance if it had surplus funds to invest. Retained earnings, and any accumulated financial slack, would be the preferred source of funds. There are also grounds to believe that, on balance, debt would be preferred to new issues as an external source of funds, at least over the range for which the risk of default is not significant. These models therefore suggest a certain inertia in financing patterns. They also indicate that the ownership/control structure of the enterprise and the characteristics of the informational flows between insiders and outsiders should be significant in determining financing patterns and financial structure.

When considering what factors might explain the main characteristics of international leverage and financing patterns in the light of the theoretical framework described above, taxation seems a good starting point. Despite considerable problems, taxation is perhaps the factor most easily amenable to quantification. Institutional features, explanations based on asymmetric information and other important aspects of government policy are then considered.

2. Taxation

The relevance of the tax system can in principle be measured by considering what is the after-tax income stream that the "typical" financial investor receives depending on the form of distribution

Table 8
Taxation and forms of finance

	Forms of finance (and distribution)		
	Retained earnings (capital gains)	Shares issues (dividend payments)	Borrowing (interest payments)
After-tax income.	$(1-\tau)(1-z)$	$(1-\tau)\theta(1-m)$	$(1-b)$

(capital gains, dividends or interest payments). The following symbols will be useful:

τ = profits tax

θ = unit of gross dividends received per unit of retained earnings distributed

z = effective capital gains tax (accrual basis)

m = personal income tax

b = tax on interest income

An investor receiving one unit of firms' pre-tax income in the form of interest payments (debt finance) gets $(1-b)$, since interest payments are tax-deductible at firm level. If he receives it in the form of capital gains (retained-earnings finance), he gets $(1-\tau)(1-z)$ because the profit is taxed at firm level. Similarly, if income is distributed as dividends (share-issues finance), his after-tax receipt is $(1-\tau)\theta(1-m)$. It is thus relatively simple to see what is the theoretical ranking between the various forms of finance (Table 8).²² For instance, the traditional "pecking order" model, where retained earnings are strictly preferred to debt which is in turn superior to new share issues, can be generated by a specific tax configuration, namely

$$(1-\tau)(1-z) > (1-b) > (1-\tau)\theta(1-m)$$

The tax systems of the various countries can be classified in terms of the tax parameters above (see King (1974) and (1977) and Alworth (1988)). In practice, because of the complexities of the tax code (such

²² It is also straightforward to show that if the gains from leverage are capitalised at the post-tax borrowing rate, letting e stand for the effective tax on equity income, the present value of such gains is equal to $B\{1-(1-\tau)(1-e)(1-b)^{-1}\}$, where B is the debt of the levered firm. This reduces to the Modigliani and Miller (1963) formula, $B\tau$, when $e = b$.

Table 9
Tax parameters

Countries	τ		z_s^1		θ^2		m		b	
	1985	1988	1985	1988	1985	1988	1985	1988	1985	1988
Low-leverage										
United States	0.46	0.34	0.12 ³	0.22 ³	1.00	1.00	0.33	0.25	0.33	0.25
United Kingdom . . .	0.40	0.35	0.28	0.28	1.43	1.33	0.45	0.40	0.45	0.40
Canada	0.52-	0.44-	0.21	0.10	1.50	1.25	0.42	0.42	0.32	0.32
	0.45 ⁴	0.38 ⁴								
High-leverage										
Japan	0.43	0.38	0.00	0.14	1.10	1.00	0.29	0.29	0.10	0.10
Germany	0.56	0.50 ⁵	0.00	0.00	2.27	2.00	0.46	0.39	0.46	0.39
France	0.50	0.45	0.00 ⁶	0.00	1.50	1.50	0.53	0.53	0.26-	0.26-
									0.46 ⁷	0.46 ⁷
Italy	0.46 ⁸	0.46 ⁸	0.00	0.00	1.56	1.56	0.45	0.46	0.25	0.25

¹ Statutory rate on realised capital gains. The effective rate (z) on accrued gains is calculated as $z = (0.1/(0.1 + 0.07)) z_s$. See King and Fullerton (1984), p. 23.

² The value of θ exceeds unity in imputation and hybrid systems where the investor effectively receives a rebate related to the tax already paid by the corporation in the form of corporation tax (τ).

³ Lower than the statutory rate because an adjustment for the step-up basis at death is included.

⁴ Rates for non-manufacturing and manufacturing enterprises, respectively. Includes local taxes (from Ontario).

⁵ 1990 tax reform.

⁶ Capital gains tax applies to net gains exceeding Fr. fr. 272,000.

⁷ The lower rate applies to bonds and the higher to bank deposits.

⁸ Including local taxes (ILOR).

Sources: Alworth (1988), Alworth and Castellucci (1987), Daly (1987), Iwata et al. (1986), Conseil des Impôts (1987) and own estimates.

as non-linearity of tax schedules, tax exemptions, etc.) and the possibilities for arbitrage, it may be difficult to establish what are the most representative tax rates.²³ The comparisons which follow rely on what seemed to be the best approximations on the basis of previous studies which have considered relevant tax rates in more detail (Table 9). For comparability, this restricted the analysis to 1985.

²³ See Miller and Scholes (1977) and Hamada and Scholes (1985) for the view that, at least in the United States, capital gains and dividend taxes are effectively zero. For some sceptical evidence, see Poterba and Summers (1985).

Table 10
Tax-favoured sources of finance, 1985¹

Countries	After-tax income ratios			
	Dividends/ capital gains	Dividends/ interest	Capital gains/ interest	Tax-favoured equity income/ interest
Low-leverage				
United States . . .	0.72	0.54	0.76	0.76
United Kingdom	0.94	0.68	0.72	0.72
Canada	0.99	0.66 ²	0.67 ²	0.67 ²
High-leverage				
Japan	0.78	0.49	0.63	0.63
Germany	1.23	1.00	0.82	1.00
France	0.71	0.66 ³	0.93 ³	0.93 ³
Italy	0.86	0.61	0.71	0.71

¹ Values lower than unity indicate that the form of distribution (and related finance) shown in the denominator is preferred to that in the numerator for tax reasons.

² Average.

³ Using the tax rate on interest from bank deposits.

As Table 10 indicates, on the basis of representative statutory *income* tax rates, in practically all countries there is the same ranking of sources of funds in the period considered: borrowing is superior to all equity forms and retained earnings dominate new issues. The exception is Germany, where for income tax reasons alone financial investors would (on average) be indifferent between borrowing and new issues while retained earnings would be inferior to both. Neither of these findings is *prima facie* consistent with the relatively heavy reliance on retained earnings in all countries documented in Tables 4–7. By contrast, income taxes might partly explain why share issues are so sparingly used – though not in the case of Germany – and why a number of countries have adopted restrictions on share repurchases, especially when these could be regarded as disguised dividend payments.²⁴

²⁴ In the United States *pro rata* share repurchases are taxed as dividend payments. In the United Kingdom they were illegal until 1981, when they were allowed subject to certain restrictions. In France, Italy and Canada restrictions have been relaxed recently. In Japan share repurchases are still illegal under the Commercial Code. For an overview, see City Capital Markets Committee (1988).

Table 11
Taxation and leverage (book values), 1985

Countries	Ranking of tax advantage of debt relative to:			Ranking of leverage
	Share issues	Retained earnings	Tax-favoured equity finance	
Low-leverage				
United States . . .	2	5	5	7
United Kingdom	6	4	4	6
Canada	5	2	2	5
High-leverage				
Japan	1	1	1	1
Germany	7	6	7	4
France	4	7	6	2
Italy	3	3	3	3

Table 12
Taxation and leverage (market values), 1985

Countries	Ranking of tax advantage of debt relative to:			Ranking of leverage	
	Share issues	Retained earnings	Tax-favoured equity finance	Gross	Net
Low-leverage					
United States . . .	2	4	4	4	4
United Kingdom . .	5	3	3	3	5
Canada	4	2	2	6	N.A.
High-leverage					
Japan	1	1	1	1	2
Germany	6	5	5	2	1
France	3	6	6	5	3

Whether the relative advantage of debt vis-à-vis other sources of finance goes some way towards explaining the dispersion of debt/equity ratios across countries is considered in Tables 11 and 12. They suggest, however, that there is relatively little correlation between the ranking of countries in the sample in terms of the tax advantage of

debt over equity and observed leverage.²⁵ That seems to be independent of the specific leverage measure used. This conclusion is broadly in line with earlier findings (Mayer (1988) and Rutterford (1988)).²⁶

The evidence above does not take into account a number of ways in which taxes may affect leverage. The possibility of tax exhaustion, whereby an increase in debt cannot reduce the tax burden of the firm, is not considered.²⁷ Nor are other taxes which may have a bearing, directly or indirectly, on the leverage decision (e.g. wealth and turnover taxes). It is also clearly possible to find a variety of situations in which tax considerations have played a decisive role, notably in the choice of particular instruments or of forms of legal organisation.²⁸ Nevertheless, it would appear that on balance tax factors

²⁵ Plotting the tax advantage coefficient against leverage would produce similar results. This procedure, however, appeared too precise, given the basic quality of the data.

²⁶ As mentioned in Appendix II, in a "Miller equilibrium" leverage could still be indeterminate at firm level while being determinate at aggregate level if the tax schedule on interest payments was sufficiently progressive and arbitrage allowed equity income to be taxed at a flat, partly zero, rate. Note that this type of equilibrium could not exist in Germany, where equity is never inferior to debt independently of the personal income tax rate. Nor is it possible in Italy, France or Japan, where taxes on interest payments have tended to differentiate between financial instruments rather than income levels and treat some debt instruments at rates below the minimum rate paid on equity income. In these countries debt should always dominate.

²⁷ Tax exhaustion as a phenomenon has been quite extensive (for the United States, see Cordes and Sheffrin (1983) and the more sceptical view, Auerbach and Poterba (1987); for the United Kingdom, see Devereaux (1987) and for Canada, Mintz (1988)). However, empirical studies have tended to find statistically insignificant effects on leverage (see Masulis (1988) for a review and Allen and Mizuno (1989) for Japan). For a comparative study on average effective corporate tax rates, see Kay and Sen (1983).

²⁸ Leasing is a clear example of a financial arrangement used to exploit tax arbitrage possibilities between tax-exhausted and non-tax-exhausted firms. The increase in the number of incorporations in Germany in the wake of the 1977 changes in the tax code designed to ease the tax burden on corporations is another typical example.

alone are not the overriding element accounting for fundamental financing choices of companies.²⁹

3. Impediments to external equity finance

A popular explanation of the relatively lower leverage in the United States, the United Kingdom and Canada has been the comparatively early development of stock markets in these countries, as a number of institutional impediments retarded their growth elsewhere. According to this view, companies in the other countries have been forced to rely more heavily on debt as the generation of internal funds has not been sufficient to keep up with their investment needs and growth opportunities and the availability of external equity finance has been limited.

Table 13 provides some backing for this view. With the exception of Japan, the capitalisation and volume of activity of the stock markets in high-leverage countries appears significantly lower. In addition, both the historical growth performance and investment/GDP ratios of high-leverage countries have, by and large, been relatively higher.

The alleged institutional impediments to external equity financing in high-leverage countries are not hard to find. On the demand side, disclosure standards and insider-trading legislation have generally tended to be less stringent. Similarly, traditional institutional investors like pension funds or mutual funds have not been present in Germany nor, until recently, in either Italy or France.³⁰ On the supply

²⁹ This conclusion is also backed by studies of the evolution of leverage and financing in the United Kingdom, where tax regimes have changed radically over the years (see Rutterford (1985), Devereaux (1987) and Mayer (1987) and, specifically on dividends, Bank of England (1980)). In the case of the United States, where no such major changes have taken place, the evidence is more mixed. On the issue of whether changes in the tax code may have increased any tax gains from leverage views are somewhat divided, see Pozdena (1987), Warshawsky (1987b), Miller (1988) and Modigliani (1988).

³⁰ For Germany, see Friedmann et al. (1984) and Deutsche Bundesbank (1984a); for Italy, OECD (1986); for France, OECD (1987) and Metais (1986).

Table 13
Stock market development and investment needs

	Low-leverage countries			High-leverage countries			
	United States	United Kingdom	Canada	Japan	Germany	France	Italy
Stock market indicators, 1985							
Capitalisation, % GNP	51	90	48	71 ¹	29 ¹	15 ¹	16 ¹
Volume, ² % GNP	25	19	10	29	7	3	4
Listings ²	2,227	2,116	912	1,456	451	489	156
Investment and growth 1960-87							
Average investment/GDP ratio	0.16	0.18	0.21	0.31	0.24	0.23	0.19
Average growth.	3.2	2.4	4.4	6.6	3.0	3.7	3.8

¹ Because of double counting, stock market capitalisation tends to be artificially high when non-financial companies hold shares in significant amounts, especially in the case of interlocking shareholdings, which are particularly widespread in high-leverage countries.

² Domestic shares only.

Sources: Goldman Sachs, National Accounts and National Statistical Year Books.

side, issuing costs have tended to be higher, partly as a result of the absence of effective competition in the securities industry. In Germany, Italy and France the dominant position of the banking sector within the financial system may itself have been a factor hindering the development of the stock market,³¹ as has the absence of appropriate legislative initiatives. Furthermore, in Germany the requirement that one-third of the supervisory board of the public corporations (AGs) be made up of labour representatives has discouraged the formation of the only organisational form which can raise funds in the open markets.

Although appealing, this explanation can only be a partial one. As observed in Section I, at least in net terms, since 1970 among low-leverage countries only in Canada have corporations obtained a substantially higher proportion of their funds through external equity when compared with high-leverage countries. Moreover, share repurchases have actually occurred in the United States and the

³¹ For Germany, see Studienkommission (1979) and Deutsche Bundesbank (1984b).

United Kingdom. Indeed, in Japan, where until the mid-1970s increases in external equity almost exclusively took the form of rights issues to existing shareholders at par value, the shift to market-value (higher-priced) issues was not associated with a rise in the proportion of external equity financing³² and was in some cases positively resisted.³³ Similarly, the decision of so many companies not to be listed in the stock exchanges may reflect not so much the lack of liquidity and high flotation costs in those markets, but unwillingness to comply with any additional disclosure requirements or the fear of losing control over the company. It is interesting to note that the increase in equity financing in Italy and France during the 1980s has largely taken the form of shares with no or limited voting rights. Even in the United States preference share issues have been particularly important in the wake of the relaxation of restrictions by the New York Stock Exchange in 1984.³⁴

4. Asymmetric information

The conjunction of relatively inactive capital markets with the predominant role of credit institutions in the financial sector in high-leverage countries may go some way towards explaining their comparatively higher debt capacity. If so, companies in those countries may also have been able to exploit the gains implicit in the tax system to a greater extent.³⁵ At least two factors favouring debt

³² For an overview, see Sudo (1988).

³³ This resistance resulted from certain peculiarities of dividend policy in Japan. See Hodder and Tschoegl (1985).

³⁴ For Italy, see IRS (1988); for France, *Metals* (1986); and for the United States, Jensen and Warner (1988).

³⁵ Friend and Tokutsu (1987), for instance, argue that the average cost for capital for Japanese corporations is lower than that of US corporations partly because of higher leverage, though they also suggest that the marginal cost may be higher because of less generous depreciation allowances and investment tax credits. These estimates, however, are mechanical weighted averages of costs which cannot take into account, for instance, the possibility of rationing. For similar analyses extended to a broader sample of countries, see McCauley and Zimmer (1989).

capacity can be mentioned: the smaller fragmentation and lower marketability of debt claims, and the simultaneous holding of debt and equity.³⁶

Concentration of debt can favour leverage in at least two ways. Firstly, it may help to resolve financial crises as it tends to limit free-riding opportunities, i.e. the possibility of benefiting from the resolution of a crisis without incurring a proportionate burden of the risk and cost (see, for example, Bulow and Shoven (1978) and White (1989)). Individual bond holders would have little incentive to accept a reduction in their contractual claims because the outcome of the negotiations would tend to be perceived as independent of their individual decisions while organising joint action would be costly. Debt concentration may therefore reduce the expected costs of financial distress. Secondly, high concentration, particularly in non-marketable claims, tends to promote longer-term relationships between borrower and lender which, by enhancing information flows, can make the credit institution more tolerant of leverage.

The limited reliance on securities relative to loans from credit institutions may be taken as a rough indicator of the fragmentation of debt claims (Table 14). A second indicator is the regulatory limits on banks' exposures to individual customers or "groups" (Table 15). According to both indicators, in high-leverage countries debt concentration should be expected to be higher. More specific evidence from Japan suggests that debt concentration has been relatively high there, with the "main bank" of a typical group of non-financial enterprises (Keiretsu) nowadays providing between one-fifth and one-third of the group's borrowings, though the

³⁶ A complementary factor which would deserve close attention is the possibility of obtaining collateral (see Appendix II). Unfortunately, information in this area is extremely scarce. In addition, there may be substantial differences between legal requirements and actual practices. For instance, in Japan a widely used loan agreement entitles banks to call loans, seize collateral or use deposits against possible losses if the company fails to meet its obligations even if no actual default takes place (see, for example, Corbett (1987)). In practice, however, banks with close ties with companies tend to act very much like subordinated creditors.

Table 14
Composition of companies' credit market debt¹, 1985

	Low-leverage countries			High-leverage countries			
	United States	United Kingdom	Canada	Japan	Germany	France	Italy
	in percentages						
Domestic banks . . .	32	62	40	53	73	58	56
Other domestic credit institutions	9	6	21	38	5	18	29
Securities	56	19	32	8	4	15	7
Other ²	4	13	6	2	17	10	7

¹ Excluding trade credit.

² Mainly non-residents.

Sources: National flow-of-funds statistics and own estimates.

Table 15
Regulatory limits on banks' large exposures

	Low-leverage countries			High-leverage countries			
	United States	United Kingdom	Canada	Japan	Germany	France	Italy
Limit (% capital)							
- individual borrower	15 ¹	informal ²	25	30	50	40	100 ³
- group	50	informal ²	25	40	50	40	n.a. ⁴
Total large exposures	none	informal ²	none	none	800	800	yes ⁵
Characteristics							
- bank groups, consolidated? . .	yes	yes	yes	no	yes	yes	yes

¹ Generally. May be as high as 25% in some cases or states.

² Close examination of exposures exceeding 10%. A 25% reference limit (the authorities might require a more or less stringent one, depending on the circumstances) applying to consolidated banking groups has recently been proposed. The proposed reference limit on aggregate exposures is 300%.

³ Can be 20% if the limit on aggregate large exposures is exceeded.

⁴ Intended.

⁵ The limit is set as a coefficient in relation to total customer deposits. The coefficient is an increasing function of the ratio of capital to those deposits.

Sources: National sources.

proportion was significantly larger in the 1960s (see Horiuchi et al. (1988)).³⁷

The importance of debt concentration and long-term relationships in favouring debt capacity is in principle consistent with three further pieces of evidence. Firstly, smaller enterprises are generally more leveraged.³⁸ And these are precisely the companies which, as a result of informational shortcomings, cannot normally have access to capital markets and hence tend to rely on customer relationships with few credit institutions. By contrast, well-established enterprises, which, given their reputation, can borrow from the markets at a lower cost than from credit institutions, are characterised by higher leverage. Secondly, with the exception of the United States, since the early 1980s a generalised improvement in the internal cash flow of companies, greater use of equity instruments and hence a tendency for leverage to decline have been associated with a weakening of relationship banking (see, for example, Banca d'Italia (1988), Walter and Smith (1989)) and, in some countries, greater use of debt securities. The case of Japan has been particularly conspicuous (see, for example, Hoshi et al. (1989a)).³⁹ Thirdly, when in the mid-1930s Japanese companies were relying almost exclusively on capital markets for their funding, debt/total assets (book) ratios were much lower, in the region of one third (see Hodder and Tschoegl (1985)).

³⁷ It has been suggested that main banks might probably have lent proportionately more had it not been for credit exposure limits (see Hodder and Tschoegl (1985)).

³⁸ For Japan, see Elston (1981); for Germany, Deutsche Bundesbank (1984b); for the United States, Titman and Wessels (1988); for the United Kingdom, Benzie (1988); and for Canada, Economic Council of Canada (1987). Italy seems to be an exception (see Banca d'Italia (1988) and Cotta Ramusino (1989)).

³⁹ The debt securities issued by Japanese companies have had important equity elements (convertible bonds, warrants). This may partly have resulted from certain regulatory restrictions (see, for example, Osugi (1990)), but it also seemed to serve the purpose of raising equity for existing shareholders at relatively lower issuing costs. It would in fact appear that a significant proportion of the equity raised found its way back to those investors' portfolios (see Hodder and Tschoegl (1985)).

Table 16
Distribution of equity holdings,¹ 1985

	Low-leverage countries			High-leverage countries			
	United States	United Kingdom	Canada	Japan ²	Germany ³	France	Italy
	in percentages						
Non-financial companies	- ⁴	10	1	30	43	41	66
Banks ⁵	0	0	4	17	8	4	3 ⁶
Other financial institutions	28	52	21	22	9	8	3
Households	67	24	69	23	18	24	13
Government	-	5	2	0	9	10	9
Non-residents	4	10	4	7	13	13	5

¹ Includes equity issued by both financial and non-financial companies.

² Fiscal year.

³ Includes only shares, as data on participations (non-marketable claims of GmbHs) are not available.

⁴ Consolidated.

⁵ For the United Kingdom, monetary sector.

⁶ Only equity of non-financial companies.

Sources: National flow-of-funds statistics and Tokyo Stock Exchange.

The relationship between the credit institution and the company may go a step further. The intermediary may *hold simultaneously equity and debt claims*.

Besides cementing the long-term relationship between the intermediary and the company, the simultaneous holding of debt and equity clearly reduces the scope for conflict between equity and debt holders over the choice of policies, particularly in situations of financial distress. As such, it provides an environment more favourable to leverage.

In both Germany and Japan and, to a lesser extent, in France credit institutions, especially banks, own a significant proportion of the equity outstanding (Table 16). By contrast, for a variety of reasons, in low-leverage countries the simultaneous holding of equity and debt claims is rare.

In Germany banks (mainly the large ones) directly own close to 10% of the stock of shares.⁴⁰ However, their influence extends much further. Over 40% of total shares are held in their custody, and, with the consent of the final owners, they may exercise proxies at shareholders' meetings. A study in 1975, for instance, found that banks had over 50% of the voting rights represented at the annual meetings of seventy-four listed public corporations, which accounted for over 80% of the capital of all listed companies (see Studienkommission (1979)). In addition, as almost half of total shareholdings are held by enterprises themselves, the degree of control of banks runs deeper (see Cable (1985)). They are also well represented on supervisory boards (see Kogut (1981) and Cable (1985)). These shareholdings partly date back to operations mounted to rescue enterprises in financial difficulties (see Deutsche Bundesbank (1984a)).

In Japan banks hold directly one-fifth of total shareholdings while corporations themselves have about one-third. Besides supplying large proportions of the Keiretsus' borrowing, "main banks" have strategic participations in these groups of enterprises, whose members are tied by interlocking shareholdings.⁴¹ "Main banks" are closely involved in management, and personnel exchanges between the bank and group members are common (see Corbett (1987) and Masami et al. (1989)).

In France the direct holdings of banks are less than 5%. However, banks indirectly control considerably more through holding companies and interlocking shareholdings (see Mabilie (1989)). The only high-leverage country in the sample where banks do not control

⁴⁰ Banks also hold significant participations in private corporations (GmbHs).

⁴¹ Keiretsus were in fact created after the Second World War to replace the disbanded Zaibatus, family-controlled enterprise groups which often had banks as captive financial institutions. For a discussion of the Keiretsus and differences with the pre-war Zaibatus, see, for example, Goto (1982). According to a recent report by the Fair Trading Commission, the six major Keiretsu groups consist of 163 non-financial and thirty financial corporations and account for about 15% of the total sales and capital of Japanese companies. See Masami et al. (1989).

Table 17
Regulation of bank shareholdings in non-financial companies

	Low-leverage countries			High-leverage countries			
	United States	United Kingdom	Canada	Japan	Germany	France	Italy
Direct holdings possible?	yes	yes	yes	yes	yes	yes	no
limit in % of company's capital . . .	5/25 ¹	informal	10	5 ²	no	no	
limit in % of bank's capital							
-each participation					50 ³	15 ⁴	
-total participations	5				100 ⁵	50	
Holdings through subsidiaries possible?	yes	yes	yes	yes	yes	yes	yes

¹ Bank holding companies are allowed to hold up to 5% of voting stock and up to 25% of total shareholders' equity in the company. Commercial banks are permitted to own up to 49% of small businesses only as defined by the Small Business Administration (SBA).

² It was 10%, effectively, until 1987 given the ten-year grace period allowed with the more restrictive regulations adopted in 1977 (Antitrust Law).

³ Includes also credits to the same company or group.

⁴ The limit is equal to 5% for non-controlling participations.

⁵ The limit applies to the sum of participations, investments in real estate and ships.

Sources: Pepe (1986), Comptroller of the Currency (1989) and national sources.

the equity of non-financial companies to any significant extent is Italy. This was not true in the early decades of the century, however, when universal banks came to acquire controlling stakes in a number of industrial groups. The financial crisis which accompanied the Great Depression led to the separation of commercial from investment banking and to the takeover of both banks and industrial groups by the Government through a holding company (IRI) (see, for example, Pepe (1986)).⁴²

Strict regulations (Table 17) in the United States and Canada, and a mixture of penalising supervisory standards and a certain

⁴² In the mid-1970s the difficult financial situation faced by companies led to proposals for the partial conversion of those debts into shares (see, for example, Carli (1988)). These proposals never came to fruition. For an elaboration on the possible problems originating from strong ownership links between banks and non-financial companies, see, for example, Borio (1989).

reluctance on the part of the financial intermediaries in the United Kingdom, are primarily responsible for the generally negligible amounts of equity held by credit institutions in these countries.

Some econometric work on Japan appears to support the relevance of the simultaneous holding of debt and equity in favouring leverage (Prowse (1988)). Variables which proxy for the conflict of interest between debt and equity holders are significant in explaining observed leverage in the United States but not that in Japan.⁴³ There is also ample evidence that during financial crises Japanese “main banks” assume a leading role in organising rescue operations and are ready to subordinate their position to that of other creditors in order to keep the firm operating (see, for example, Prindl (1981), Pascale and Rohlen (1983) and Corbett (1987)).⁴⁴ Japanese firms without such close banking relationships have been more vulnerable (see, for example, Sheard (1985)). In Germany banks appear to have played a similar role (see, for example, de Jonquieres (1989)).

5. Government policy

The government influences the leverage of companies through a number of channels. Some of these have already been mentioned: taxation, the legal framework which largely determines both the relative advantages of different organisational forms and the rules governing the resolution of financial crises (Company and Bankruptcy Law respectively), and the broader regulatory environment

⁴³ Non-Keiretsu companies tend to have lower leverage than those belonging to Keiretsus. Hoshi et al. (1989b) report debt/equity ratios of 0.70 and 1.09 for, respectively, non-affiliated and affiliated companies. Similarly, Nakatani (1984) finds that the equity/total assets ratio is 5–9% higher for independent companies.

⁴⁴ In his comparative study on bankruptcy, Altman (1984) presents figures suggesting that bankruptcy rates in Japan and Germany are lower than those in the United States. Those in the United Kingdom appear higher. It is unclear, however, how comparable these rates are. Altman also notes that predictive models of bankruptcy for Japan have to be adjusted in order to take into account the higher debt/equity ratios there. Similarly, Corbett (1987) reports evidence which shows that leverage has little predictive power in Japan.

concerning the operations of the financial system. Three factors which favour debt capacity deserve further attention: government ownership of financial and non-financial companies; the extension of financial assistance for companies through credit institutions; and, related to the latter, impediments to the development of debt securities markets.

In at least three out of four high-leverage countries (Italy, France and, to a lesser extent, Japan) the government has owned substantial fractions of the financial system. In these countries credit institutions, particularly those specialised in medium and long-term lending, have been used as important channels for the provision of assistance to companies through a variety of mechanisms: subsidised credit, artificially low interest rates, and government guarantees.⁴⁵ In addition, in both France and Italy the government has owned or co-owned extensive parts of the company sector in the pursuit of public policy objectives.⁴⁶ This has at times permitted the underwriting of losses.

At least until recently, the policies pursued by the governments of high-leverage countries have tended to hinder, either directly or indirectly, securitised channels of debt finance. If the previous analysis is correct, they should also have contributed to higher debt capacity. Typical examples of such policies are: the provision of assistance to companies through credit institutions, controls discouraging direct financing in international markets (Italy and France), restrictions on conditions or issuance or the range of permissible instruments (especially Japan), and the tax regime (all four high-leverage countries). Relaxation of restrictions has recently been accompanied by a greater use of such instruments, notably in France and Japan.

⁴⁵ For Japan, see Elston (1981); for France, OECD (1987) and for Italy, Pontolillo (1978), Ministero del Tesoro (1983) and Cotta Ramusino (1989).

⁴⁶ On Italy, see Stefani (1988).

III.

The leveraging of US corporations from an international perspective

1. The questions

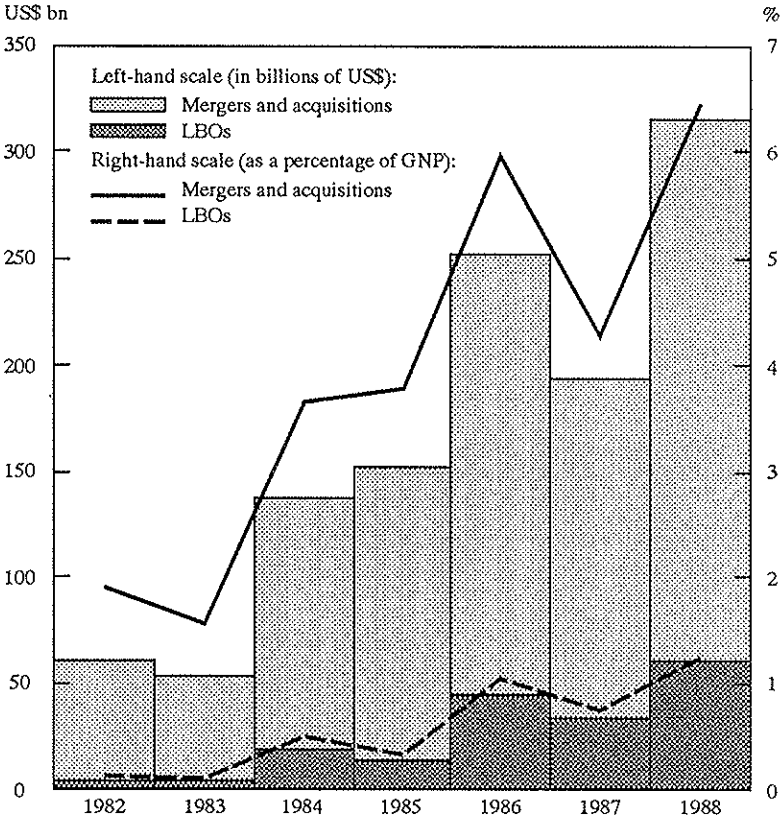
The increase in the indebtedness of US corporations during the 1980s has been rather atypical by past standards as it has occurred during a period of relatively rapid economic expansion and recovery of profit margins. It is, furthermore, unique when compared with trends in other industrial countries during the same period.⁴⁷ This raises three related questions: has the tendency for the level of US leverage to gravitate towards those of higher-leverage countries been accompanied by a process of convergence towards the financial arrangements typical of those countries which favour debt capacity? If not, how should the US process be interpreted and assessed? Does it foreshadow similar developments in other industrial economies?

2. Convergence?

The rise in leverage since the early 1980s in the United States has been closely associated with the wave of corporate restructurings that has swept the country. Between 1982 and 1988 the value of mergers and acquisitions (M&As) – the bulk of these transactions – rose from around 6% to close to 20% of GNP (see Graph 1). While there is no necessary connection between M&A activity and leverage, debt financing has been a much more prominent component of the current wave than of previous ones, such as that of the 1960s (see, for example, Ravenscraft (1987) and Jensen (1987)). Leveraged buy-outs (LBOs) – highly debt-financed acquisitions through which a company is often taken private (Table 18) – have made a growing contribution to this trend, with their share in total M&A activity rising from over 5% to around 20% between 1982 and 1988. On the

⁴⁷ Outside the Group of Seven, Australia is an exception.

Graph 1
US mergers and acquisitions and LBOs



Note: The data for 1988 include the \$25 billion RJR deal arranged in that year but completed in early 1989.

Source: Morgan Stanley & Co. Incorporated.

Table 18
Typical financial structure of companies after an LBO (in percentages)

Equity	5-20
Senior debt	40-70
Junior debt	10-30

basis of some tentative estimates, possibly as much as half of the increase in the gross market debt of corporations during the period might have been associated with corporate restructurings and not much less than 15% with LBOs alone (see, for example, Roach (1988)). While the actual number of hostile takeovers is not high, a significant proportion of restructurings has been the end-result of perceived takeover threats.⁴⁸ Share repurchase programmes are a typical example.

The broad outlines of the leveraging process do not suggest much convergence towards those characteristics of high-leverage countries which are indicative of higher debt capacity. Obviously, US corporations have not benefited from special government assistance. Nor do resemblances with regard to debt concentration and long-term relationships appear important, at least at the *aggregate* level.

As shown in Tables 5 and 7, since the early 1980s US corporations have relied more heavily on debt securities issues for their financing, implying a shift away from credit intermediaries towards capital markets.⁴⁹ Between 1982 and 1988 the percentage of securities in total corporate credit market debt rose slightly, from 54 to 56%. Moreover, a growing proportion of this debt has been in the form of non-investment-grade ("junk") bonds,⁵⁰ a financial innovation specific to the United States. Their share of outstanding corporate bonds rose from less than 7% to over 20% over the same period. Initially mainly a source of investment funds for less well-established

⁴⁸ See Fortier (1987) for a review of hostile takeover mechanisms and defenses.

⁴⁹ At the same time there has been a trend towards greater use of private placements (see, for example, Chu (1989)). To the extent that the trend implies closer ties with institutional investors, the statement in the text should be qualified. Apparently, however, the main reason for the trend is reduction in transaction costs. The introduction in 1990 of the SEC's Rule 144A removes the remaining resale restrictions for large institutions, effectively eliminating much of the distinction between private and public placements.

⁵⁰ Non-investment-grade ("junk") bonds are securities with low credit rating. For overviews of the market, see Altman (1987) and (1988), Taggart (1988) and Winch (1988).

corporations, these securities have come to play a crucial role in the financing of highly leveraged transactions. At least one-third of total junk bond issues may have been LBO-related in 1987-88 (see, for example, Doyle and Ammidon III (1989)).

If the greater reliance on bonds is indicative of a continually high, and possibly increasing, degree of dispersion of debt claims, so is the practice of selling down portions of participations in syndicated loans made in highly leveraged transactions (see, for example, Comptroller of the Currency (1989)). While important as a means of diversification and useful for protecting individual banks, the procedure results in a de facto fragmentation of creditors' claims which may complicate the resolution of financial distress (see, for example, Doyle et al. (1987)). Although partly dictated by the sheer size of some of the operations, the practice is a further symptom of the relatively limited reliance on established customer-relationships, as are the rather strict and complex covenant requirements in the loans and other debt forms involved in the deals (see, for example, Ram (1988)). Indeed, the significant number of hostile takeovers and the constant takeover threat sometimes undermine existing relationships and possibly the establishment of future ones.

At the same time some elements of financial investor/company relationships which tend to favour debt capacity can be found. Not surprisingly, they appear in the most highly leveraged transactions, such as LBOs, where debt/asset ratios typically range from 80 to 95% on completion of the deal (see Table 18).

In those operations, some financial investors may simultaneously hold debt and equity or equity-convertible claims (see, for example, DeAngelo and DeAngelo (1987)). "Strip financing", whereby equal portions of debt and equity are held by the same investor, is an example. There are, however, no useful statistics regarding the quantitative significance of these practices. In addition, partly in an effort to secure deals, banks have also purchased some equity investments in companies (either directly or via LBO funds) through their holding companies or independent subsidiaries. Still, in quantitative terms, this form of indirect involvement remains minor.

3. US-specific features

Several factors specific to the US experience can moderate financial risk. Interest rate risk can be reduced through greater use of new financial techniques such as swaps, interest rate caps, futures and options. In the case of LBOs, hedging part of interest rate risk is common and often demanded by banks as a condition for lending. In the largest deal to date, for instance, the \$25 billion RJR-Nabisco buy-out, the company is reportedly required to keep an interest rate hedge on half of the outstanding bank debt until its total declines below \$5 billion – or about a third of the original amount. According to the terms of lending, that should mean for two years. Arrangements of this type appear increasingly common (see Ram (1988)).

Recession-induced cash-flow risk can be attenuated by a careful choice of LBO targets. A past record of cash-flow stability appears to be a relevant consideration. According to some estimates (see Giordano (1989)), about 60% of all LBOs have taken place in relatively less cyclical sectors, notably food and tobacco, and wholesale and retail trade.⁵¹ More detailed statistical evidence also indicates a significant positive correlation between indicators of past cash-flow stability and LBO intensity (see Waite and Fridson (1989)).

Ultimately, however, the underlying increase in the ability to support higher debt burdens must rely on higher gross profitability. For, if the above analysis is correct, the levels of leverage attained in HLTs are clearly not sustainable in the long run since the conditions which tend to reduce the costs of financial distress do not appear to be present. The new financing arrangements, therefore, should best be interpreted as innovations designed to permit *temporarily* higher debt burdens in order to generate increases in profitability. These increases would in turn allow the subsequent reduction of leverage to levels more in line with the traditional “arm’s length” characteristics of US financial markets. If so, HLTs can be seen as the limiting case of a more generalised battle for corporate control, partly spurred by

⁵¹ Often retail trade is considered a cyclical sector, however.

deregulation and by the perceived need for reorganisation and deployment of assets.⁵²

There is indeed little doubt that expectations of higher profitability have been the driving force behind the leveraging process. These have been reflected in capital gains to selling shareholders in acquisitions averaging some 30% in hostile transactions (see Jensen (1987))⁵³ and estimated at an average of 40–50% in more highly leveraged operations. Neither taxation gains associated with higher leverage⁵⁴ nor the losses sometimes incurred by bondholders can reasonably be expected to account for these premia.⁵⁵ This suggests that the agents involved are anticipating substantial improvements in the income stream associated with the company's assets (Table 19).

Whether such improvements will materialise largely depends on the effectiveness of the new financial arrangements. The main channels through which they are expected to raise profits involve the alignment of managers' incentives with those of shareholders and

⁵² For an overview of these issues, see the volume edited by Browne and Rosengren (1987), Warshawsky (1987a) and Winch and Jickling (1989).

⁵³ Jensen estimates that over the period 1977–86 capital gains to selling-firm shareholders calculated at the time of the transaction amounted to \$346 billion (1986 dollars) or some 8% of 1986 GNP. The evidence on whether shareholders of the purchasing corporation make any "abnormal" returns (i.e. above the average) is mixed for the United States. For the United Kingdom the evidence suggests that when abnormal returns to acquirers are positive, they tend to be small and short-lived. Taken together, the gains of the shareholders of the acquiring and acquired company also appear insignificant or negative except in the short run (see Hughes (1989) for a review). By contrast, a study by Eckbo (1986) on Canadian data shows gains for all shareholders.

⁵⁴ See Jensen et al. (1989). This study also suggests that, if efficiency gains are significant, overall tax revenue may plausibly increase.

⁵⁵ Shleiffer and Summers (1988) argue that the gains could largely come from the abrogation of explicit or implicit contracts with employees in the form of (unnecessary) wage cuts and redundancies which may undermine the future performance of the corporations. For a critique of this view, see Holström (1988) and Williamson (1988) in the same volume and, for some negative evidence, Medoff and Brown (1988). This issue, however, remains open.

Table 19
Shareholders' and bondholders' changes in wealth in LBOs

	Equity premium in %	Number of transactions	Average bondholders' return in %
DeAngelo, DeAngelo, Rice	56.3	72	
Lowenstein	56.0	28	
Lehn and Poulsen	40.0	89	-1.2
Easterwood, Hsieh, Singer	48.6	110	
Kaplan	45.9	75	
Amihud	42.9	15	
Mean	48.3	65	
Tavlos and Millan			-3.5
Marais, Schiffer, Smith			0.0

Source: Amihud (ed.) (1989).

limitations on the managers' discretion to pursue goals other than the maximisation of the firm's value.

One reason is that HLTs reduce the dispersion of equity holdings. Partly as a result of the final narrow equity base, in an HLT equity is typically closely held amongst a small number of investors.⁵⁶ By internalising free-riding problems inherent in the dispersed shareholdings of public companies, these arrangements favour the monitoring of the company's management and hence of its performance (see, for example, Jensen 1989a)). Especially where managers end up holding significant proportions of their wealth in the equity of the firm (common to all LBOs but particularly to those initiated by management (MBOs)), this should go a long way towards resolving the manager/shareholder conflict of interest.⁵⁷

A second reason is that the very stream of contractual payments

⁵⁶ More generally, the present trend towards higher leverage and a narrower equity base should have led to a somewhat higher degree of equity concentration for the corporate sector as a whole. Recently there has been growing interest in the implications of relatively large equity stakes. See the articles in the special volume edited by Jensen and Warner (1988) and Barclay and Holderness (1989).

⁵⁷ Furthermore, since managers, *qua* insiders, should be better informed about the intrinsic value of the firm, the presumption of possible gains is particularly convincing in the case of MBOs.

associated with the higher debt burden is expected to narrow the managers' margin of manoeuvre (see Jensen (1986) and (1987)). This would oblige them to sell assets which could be more valuable in alternative uses, to cut unnecessary costs and to come under the scrutiny of markets for their investment funds.

At the same time, even if the new financial arrangements do raise the income stream associated with the restructured firms' assets, they need not result in an improvement in the ability to service debt at any given *observed* debt/equity ratio. This depends primarily on the extent to which the future gains are reflected in the price at which the company is bought and hence appropriated by pre-existing shareholders. Undervaluation of the deal by selling shareholders is an important factor mitigating the likelihood of financial distress for the restructured company.⁵⁸

Empirical evidence in support of the gains from higher leverage is often based precisely on the significant premia over market returns earned by selling shareholders.⁵⁹ As such, however, it provides little guidance as to the size of the income cushion over the higher servicing obligations of the restructured company.

Some preliminary studies of actual ex post gains from HLTs do point to improvements in the companies' operating performance and to substantial gains by new company owners.⁶⁰ They cannot, however, consider the more recent wave of transactions. With the

⁵⁸ This consideration also indicates that even if greater concentration of equity holdings raises a company's value, there need not be a positive correlation between equity concentration and leverage. That is because the extra value may be reflected in the valuation of equity. Moreover, greater concentration *per se* may in fact exacerbate the conflict of interest between equity holders and creditors, even though it could reduce some of the costs of financial distress by moderating coordination problems among shareholders. Among the Group of Seven countries, the high-leverage ones and Canada are characterised by relatively low dispersion of equity holdings of individual companies (see, for instance, Charkham (1989) and Khemani et al. (1988)).

⁵⁹ See Jensen and Smith (1985) and Jensen (1987). The evidence clearly relies on the premise that expected gains are unbiased estimates of future gains (the so-called capital-market efficiency hypothesis). This premise, however, has recently come under increasing criticism. For a review, see, for example, Borio (1988).

ageing of the market and increasing competition, initial quasi-rents may have disappeared. Moreover, their observations are drawn from a period of relatively stable growth of the economy.

Evidence on the profitability of M&As in general tends to depend on the methodology adopted: *ex ante* gains implicit in stock market valuation (see, for example, Jensen (1987)) do not seem to be justified by *ex post* performance (see, for example, Caves (1987)). Earlier disappointing evidence on *ex post* profitability may not be entirely pertinent, however, as the recent wave has tended to undo much of the conglomerates built in the past from which some of the evidence was drawn (see, for example, Ravenscraft (1987) and Remolona (1988)).

On balance, it would be surprising if the present process, at least through HLTs, did not involve an improvement in the operating efficiency and profitability of the corporate sector. Nonetheless, it seems inappropriate to conclude, as some appear to have done,⁶¹ that it does not imply a significant increase in financial risk and hence in the vulnerability of the sector to system-wide shocks such as a recession.⁶²

4. Highly leveraged transactions outside the United States: past and future

A wave of corporate restructurings has also taken place in other countries, notably within the European Community. At least in value terms, however, the global volume of these operations remains small relative to that in the United States. Available statistics suggest that over the period 1982-88 the value of M&A activity⁶³ outside the United States not involving US firms was of the order of \$300 billion,

⁶⁰ See Kaplan (1989), Lichtenberg and Siegel (1989) and Smith (1989).

⁶¹ See, for example, Ellsworth (1983), Jensen (1987) and (1989b), Roach (1988), Giordano (1989) and Paulus and Waite (1989).

⁶² See, for example, Kaufman (1986), Bernanke and Campbell (1988) and Friedman (1988) for strong views on the risks involved.

⁶³ Defined broadly to include also acquisitions of stakes.

or some 30% of that between US corporations within the United States (see Walter and Smith (1989)). Cross-border transactions between US and non-US companies amounted to a further \$200 billion. The character of those operations has been rather different from that of their US counterparts: they have been motivated primarily by long-term strategic concerns, have predominantly resulted in larger companies and often raised concentration in fragmented sectors. In terms of their financial aspects, with the partial exception of the United Kingdom, the acquisition of minority or majority stakes, as opposed to 100% acquisitions, has been predominant, very rarely have the operations been hostile in nature, and debt-financing has been less important.⁶⁴ The characteristics of the various financial systems have largely determined these differences, in particular the degree of control exercised by equity holders and the development of capital markets.

The country where operations have most closely resembled those in the United States is the United Kingdom, where ownership dispersion, though lower than in the United States, is relatively high and capital markets are well developed.⁶⁵ Even there, however, until recently the limited availability of low-grade debt (“mezzanine”) finance, illustrated by the absence of a junk bond market, had set a limit on the possible levels of leverage attainable and to the size of the deals (see Euromoney (1989)). In 1988, a record year, over 300 HLTs (mostly MBOs) amounted to just under £5 billion, with an average size of only £10.5 million and a maximum size of £751 million.⁶⁶ That was clearly dwarfed by LBOs in the United States, whose total value

⁶⁴ For general information on M&As in Europe, see Lorenz (1988), Euromoney (1988) and (1989a), and Walter and Smith (1989). More specifically, for the United Kingdom, Benzie (1989) and Fairburn and Kay (1989); for Germany, Euromoney (1989b); for France, Mabile (1989); and for Italy, Bianchi et al. (1988).

⁶⁵ See Walker (1987) for an interesting comparison of takeover norms and regulations in the United Kingdom and the United States.

⁶⁶ These figures include both buy-outs and buy-ins, i.e. operations where existing and outside management teams, respectively, take over the firm. In the United States these transactions are all referred to as LBOs.

was some \$60 billion and where one operation alone amounted to around \$25 billion. The significant proportion of equity financing associated with M&A operations in general (see Benzie (1989)) is also consistent with the limits on the availability of high-risk debt finance. However, in July 1989 the £13 billion takeover bid for BAT, almost exclusively financed through debt, represented a quantum jump towards US standards.

Even in Canada, despite the major role played by capital markets in the financing of corporations, US-style operations have been rare. The main constraining factor has been the relatively high degree of concentration of ownership and control. This restricts the likelihood of hostile operations by outsiders and, by reducing the degree of asymmetric information between shareholders and managers, lessens the latter's potential gains from a buy-out.

At the other end of the spectrum are those countries where HLTs and hostile operations are, for the moment, hard to envisage on any significant scale: Japan, Germany and Italy.⁶⁷ A confluence of factors militates against this possibility: close degree of control by credit institutions (Japan, Germany), underdevelopment of securities markets (Germany, Italy),⁶⁸ limited information available to outsiders (possibly all three countries) and close control, exercised through networks of corporate participations either belonging to the same "group" or in friendly hands (Japan,⁶⁹ Italy⁷⁰ and, to a lesser

⁶⁷ Most continental European countries would fall into this category.

⁶⁸ The underdevelopment of the securities markets hinders these operations in two ways: it makes it difficult to obtain low-grade debt finance and it raises doubts about the possibility of refloating the company at a subsequent date, the typical objective of LBOs.

⁶⁹ The origin of much of the present cross-holdings was precisely the so-called "stockholder stabilisation operation" in the late 1960s. Then, in an attempt to safeguard Japanese corporations against foreign control as Japan was working towards liberalisation of foreign investment, a large volume of shares was purchased by friendly corporations (see Goto (1982)).

⁷⁰ About 70% of the total capitalisation of the stock exchange is controlled by five groups. Only one corporation (Generali) is relatively widely held. For an overview of the Italian stock market, see IRS (1988).

extent perhaps, Germany). It is not a coincidence that none of these countries has as yet defined a framework for tender offers. In Germany and Italy those LBOs that have so far taken place have been very small and involved mainly the sale of unwanted subsidiaries by foreign corporations (see *The Economist* (1988)).

The high-leverage country which has taken the most significant steps towards US or UK models of financial arrangements is France: its stock market has in recent years undergone a true revolution, fuelled on the demand side by the creation of institutional investors (SICAVs and FCPs) and, on the supply side, by privatisations; futures and options markets have quickly developed (the MATIF) in an effort to increase the liquidity of the underlying instruments; the French equivalent of the SEC (COB) has recently been endowed with significant powers against insider trading; and a new framework for tender offers has been adopted with a view to making hostile offers more attractive. It is not surprising, therefore, if among the high-leverage countries in the sample France has seen the largest number and volume of LBOs (over 200 deals between 1980 and 1988) and even a number of hostile takeover attempts. The main obstacle to the future development of hostile operations remains the close relationship between banks and non-financial companies as well as the solid cross-participations amongst corporations.⁷¹

Looking ahead, the country where US-style operations are probably least likely to develop in the near future is Japan, also partly as a result of deeply held cultural attitudes which militate against the hostile purchase of companies.⁷² Japanese banks, however, have shown few qualms about participating in foreign HLTs, for which they have exhibited a growing appetite. Some 60% of the bank finance involved in the \$25 billion RJR-Nabisco deal has been provided by Japanese institutions.

⁷¹ See Encaoua and Jacquemin (1982) and Mabilie (1989).

⁷² There is some evidence that in Japan the degree of cross-participation has changed very little in the 1980s (see Masami et al. (1989)).

Developments in Europe will hinge particularly on the configuration of the financial system as shaped by the process towards a single market. With corporate restructurings likely to gather pace in anticipation of 1993 and with a particularly large number of family concerns in Germany coming to the end of their life cycle as the present ruling generation hands over control to the younger one, the raw material for leveraged operations will not be lacking. Whether these will take the form of their US counterparts will partly depend on the extent to which existing financial arrangements come under pressure.

The present progress towards more open and active capital markets is likely to continue, raising the possibility of the development of a European junk bond market. Accounting and information barriers are likewise expected to decline significantly. A more uniform framework for tender offers should in due course be developed. These are all factors which should favour the emergence of US-style operations. On the other hand, it would seem that German banks will be allowed to retain substantial interests in corporations. More generally, the web of cross-participations and related protection that exists in some countries is more immune to legislation and may be longer-lasting.⁷³ That suggests a differentiated pattern of leveraged activity across countries. It also points to a possible continuation of tension between corporations in more vulnerable environments (like those in the United Kingdom) and those in more protected ones (for example, Germany or Italy).

⁷³ Evidence concerning Italy indicates that while the concentration of ownership has declined somewhat in the 1980s, that of control has not (see Brioschi et al. (1988)).

Conclusions

International comparisons suggest that companies in the United States, the United Kingdom and Canada tend to have lower leverage ratios than the rest of the Group of Seven. They also appear to rely relatively more heavily on retained earnings. Retained earnings, however, are the most important source of finance in all the countries sampled. Borrowing comes next. Share issues have invariably provided a relatively small fraction of overall funds. Indeed, over the period 1970-87 there were actually net share repurchases for the corporate sector as a whole in the United States and, up to 1985, in the United Kingdom – the countries with the most highly developed and liquid equity markets.

There exist theoretical conditions under which financial investors would be indifferent to firms' financial structure. However, taxation and problems of asymmetric information and control suggest that these conditions are violated in practice. In that case output and real investment decisions cannot be regarded as being independent of the financial mix. Financial arrangements are not neutral with respect to micro and macro-economic performance.

An analysis of international leverage and financing patterns suggests that corporate and personal income taxation is likely to account for a number of decisions, especially among relatively substitutable instruments and when the balance of other elements is unclear, but not for the basic financing patterns. This is broadly consistent with conclusions concerning the impact of taxation in individual countries over time.

Structural impediments which have retarded the development of the stock market and hence the possibility of external equity finance in high-leverage countries, possibly in combination with these countries' greater investment needs, can only provide a partial explanation of international leverage patterns. As mentioned above, among the low-leverage countries, only in Canada have corporations raised substantially greater net volumes of finance in equity markets.

Explanations ultimately based on asymmetric information

between fund users and suppliers seem more appealing. They are broadly consistent with the heavy reliance on retained earnings in all countries. They can also go some way towards rationalising the observed dispersion of financing patterns and capital structures. High-leverage countries (Japan, Germany, France and Italy) tend to be characterised, to varying degrees, by a relatively smaller dispersion of debt among creditors and closer long-term relationships between credit institutions and corporations. These arrangements tend to reduce asymmetric information between borrower and lender, help to resolve financial distress and thereby provide an environment more conducive to high leverage. The close relationship goes one step further in countries like Germany, Japan and, to a lesser extent, France, where credit institutions (mainly banks) hold both equity and debt. This reduces the traditional conflict of interest between creditors and equity holders, particularly in situations of financial distress.

Government policy is an important complementary factor behind different leverage levels. Apart from its possible impact through corporate and personal taxation, government regulations help to determine the relative advantages of different organisational forms (Company Law), the rules for the resolution of financial crises (Bankruptcy Law), the broader regulatory environment for the operation of the financial system and hence intermediation patterns (intermediated versus non-intermediated channels; forms of admissible relationships between financial institutions and companies). Thus, government policy can ultimately be one of the primary determinants of the mechanisms through which informational asymmetries are dealt with. In addition, in some high-leverage countries the provision of subsidised financing through credit institutions as well as Government participation in the ownership of companies, both financial and non-financial, have favoured high debt levels. Italy, France and, to a lesser extent, Japan are examples.

The United States is the only country where during the 1980s leverage appears to have increased significantly, at least according to some measures. This rise has been largely fuelled by a wave of

corporate restructurings. Indebtedness has attained unprecedented levels even by high-leverage country standards in a significant number of operations, notably LBOs. Such operations have also tended to grow substantially in size.

Parallels with those financial arrangements which favour leverage in high-leverage countries can be found in some of the most highly leveraged transactions, such as LBOs (e.g. simultaneous holding of debt and equity). However, the main features of the leveraging process are not taking the United States closer to arrangements characterised by long-term relationships between intermediaries and companies – witness the high dispersion of debt claims and the greater reliance on debt securities. By bringing managers' incentives more into line with those of equity holders and reducing their margin of manoeuvre through high debt, these arrangements may indeed raise the operating efficiency and profitability of segments of the company sector. They also imply, however, greater vulnerability to system-wide shocks such as a recession. It is not easy to assess quantitatively this greater vulnerability.

At least three characteristics are critical for the feasibility of highly leveraged US-style transactions: availability of low-grade debt finance; a liquid stock market where companies can be refloated; and dispersed ownership, if hostile bids are to succeed. It is not surprising, therefore, that it is the United Kingdom where operations have resembled those in the United States most closely. In all other countries, including Canada, concentration of ownership and control have hindered or precluded hostile operations. So far difficulties in raising low-grade debt or even cultural factors have also been a limiting factor. For the future, in Europe much will depend on the configuration of the single market in financial services. While the availability of finance may in the end not be a crucial impediment – not least because of the possibility of raising funds in international markets – close ownership in a number of countries will probably be a serious obstacle to hostile operations. Friendly LBOs, on the other hand, are certainly feasible and likely.

In the end, however, the real test determining the popularity of

highly leveraged transactions outside the United States may well be how these operations fare in the next recession. Then, all bets will be off and all speculation over. Losers and winners will not be hard to identify.

Appendix I

Alternative measures of leverage

“Financing” relates to a flow of cash and, as such, is a clearly measurable quantity. By contrast, leverage is intimately linked to the valuation of assets and hence of uncertain income streams. It is, therefore, harder to quantify. Furthermore, it is not an unambiguous concept, and the most appropriate measure depends on the purpose of the analysis.

The measure that is often focused on by economists is leverage at *market value*. This is the monetary value that equity and debt holders attach to their claims on the firm. Market values are important because they affect the incentives of agents to take actions which would alter the investment and output decisions of the firm and hence its performance (see below). In practice, they are quite difficult to measure, especially if the claims are not transacted in the market so that their price cannot be observed. Market values are essentially forward-looking.¹

If the primary focus of the analysis is the assessment of the solvency of the firm, however, measuring debt at market value could provide a misleading picture. Declines in the value of debt, and hence leverage, could arise because of higher expected probabilities of default and bankruptcy. This could, for instance, mirror the perception of a shift of the firm’s assets towards riskier projects, which would increase expected returns to shareholders at the expense of those of debt holders.² When solvency is the focus, it is the default-adjusted value of the debt, i.e. the discounted value of the *contractual* obligations, which appears more relevant.

The value of a firm’s assets can also be estimated at *replacement cost*, i.e. at the cost of replacing them. Replacement cost valuations

¹ Assume that a firm finances a project from debt only. As long as the value of the project exceeds the amount borrowed, leverage at market value would be *less* than 100%. Equity holders could sell their claim for the difference.

² It could also reflect expectations of additional, possibly more senior, debt in the future, as exemplified by the fall in the market value of bonds of *potential* LBO targets.

are not forward-looking. Nevertheless, they are possible indicators of the value of the firm's assets in the event of piecemeal liquidation and hence could be used in conjunction with default-adjusted debt valuations as potential indicators of future financial distress. This is especially true when equity prices are particularly volatile and possibly biased estimates of future income streams – a view that has commanded increasing support as a result of recent experience, most clearly illustrated by the 1987 stock market crash (see, for example, Borio (1988)).³

Accounting or book values are conceptually, and empirically, closer to replacement cost than to market values. However, assets are largely measured at historic cost, which is troublesome in periods of high inflation, especially if the assets are renewed slowly. In addition, depreciation and other accounting provisions against future contractual payments are often arbitrary, mostly reflecting tax considerations in those countries where tax and financial accounting cannot be kept separate (see, for example, Nobes and Parker (1985)). This makes it difficult to draw a line between debt and equity.

³ Where the replacement cost of the firm's assets is below their market value, this suggests that the scale of the activity should be expanded to eliminate the implicit rents. This is the basis for Tobin's (1969) Q-theory of investment. Conversely, if the opposite is true, then it is presumed that the activity should be contracted.

Appendix II

The theory of leverage and financing

The setting

Firms' financial decisions would be of no consequence for their investors, and therefore the optimal debt/equity ratio indeterminate, if they did not affect the investment/consumption opportunities and hence perceived pay-offs of claimants on the firm. This is the key to understanding the link between firms' financial and real decisions. Therefore, as a clarifying bench-mark, it is useful to start from the set of conditions under which financial policy would indeed be indeterminate.

Firms can in principle affect the pay-offs received by claimants in two ways: they can alter the income stream produced with their assets and distributed; and they can repackage that stream by changing the mixture of the claims held against it. The theory can therefore be usefully divided into that part which prevents the first channel from operating and that which does not. Thus the first section of the following analysis assumes:

A.1 *Independence of real decisions*: perceptions of the firms' real decisions and of the stream of resources to be distributed are given and independent of financial structure.

The plausibility of the assumption, and the implications of its relaxation, will then be considered.

Theory based on the Independence Assumption

If real decisions are given, then the only case in which a firm's financial decisions can affect pay-offs to individuals is if the firm has some *monopoly* on distribution possibilities i.e. on the carving out of the income stream resulting from its given real decisions. Otherwise, whatever the "firm" does can be undone by portfolio rearrangements by individual investors which realign the pattern of returns with their risk preferences. The firm may have a monopoly on real return patterns but, given these, its value and hence the total potential amount of finance available would be beyond manipulation through mere financial arrangements.

In order to prevent the firm from having monopoly power over distribution patterns, two key assumptions are sufficient:

A.2 *Perfect capital markets*. Costless contracting and no transaction costs; no legal or other constraints on the transaction possibilities of agents; identical prices for assets with identical (perceived) pay-off patterns.

A.3 *No taxes* or at least symmetric treatment between firms and individuals.

A number of results of increasing generality¹ have been developed on the basis of these assumptions, starting from the seminal papers of Miller and Modigliani (1958) and (1961). Consider, for instance, the firm's decision between retained earnings and share issues. Given the real investment and borrowing decisions, lower retained earnings (higher dividends) imply higher share issues.² These, however, can be taken up by existing shareholders with the dividends received so that their claim on the firm's future payment streams remains unchanged. Consider next the debt/equity decision. Even if a firm were to buy back all its debt and issue only equity, previous debt holders could lend the proceeds of the debt repayment to the previous equity holders, re-creating exactly the same return configuration. Debt holders would in effect still be lending the same amount to the "firm", i.e. to the shareholders who now have an unlevered claim on the total return from the enterprise. Similarly, for equity holders, borrowing by the firm on their behalf has been substituted by borrowing on personal account.

¹ See Stiglitz (1969) and (1974), Fama (1978) and also Ross (1988).

² The stylised identity relating sources and uses of funds in these models is the following: let π_t be gross operating profits which are a function of the capital stock in place at the beginning of the period $\pi_t(K_{t-1})$, D_t dividend payments, ΔB_t new borrowing, $r_t B_{t-1}$ interest payments on outstanding borrowing and V_t^N new share issues. Then if I_t stands for real investment and R_t for retained earnings, the usual budget constraint is written as:

$$I_t = R_t + V_t^N + \Delta B_t$$

where $R_t = \pi_t(K_{t-1}) - r_t B_{t-1} - D_t$ is given at time t except for D_t . For given I_t and ΔB_t , higher D_t (lower retained earnings) implies higher V_t^N .

The firm may again acquire some monopoly on the carving-out of income streams if *taxation* varies with financial structure.³ Unless the tax regime is neutral with respect to distribution in the form of dividends, capital gains and taxes, a ranking of the various sources of finance would emerge.⁴ On tax grounds alone, if the effective tax rates were exogenous and common to all firms and individuals, firms would tend to specialise in the most tax-advantaged form of finance. The details depend on the precise characteristics of tax systems (see below). But in most countries these favour debt over equity finance and, within the latter, retained earnings over share issues. If so, it is unclear why firms should finance themselves through shares or pay dividends while issuing new shares – the so-called “dividend puzzle” (see Black (1976)).

Explanations of the dividend puzzle rely crucially on the relaxation of the Independence Assumption (see below). By contrast, the main line of enquiry to allow for equity financing has been to search for additional costs of debt that might at some point outweigh its interest deductibility advantage.⁵ Still within the realm of

³ Note, however, that taxation accrues to the government and is not siphoned off from the system. In turn, taxation is presumably tied to the provision of public services. These general equilibrium effects are not taken into account in these analyses.

⁴ See Modigliani and Miller (1963), Stiglitz (1973) and King (1977).

⁵ Miller (1977) has pointed out that indifference to the debt/equity ratio at *firm* level could still be established in the presence of taxation under certain restrictive conditions: risk-neutrality, the interaction of a progressive income tax rate on interest payment with a zero or flat tax on equity income (dividends and retained earnings), no arbitrage on the part of individuals in different tax brackets and value-maximisation debt/equity adjustments on the part of firms. Firms would then issue debt taken up by investors in progressively higher tax brackets until the marginal investor had no preference for either debt or equity. The aggregate tax preference of investors would thus determine the leverage ratio for the firm sector as a whole, while individual (small) firms would be indifferent with respect to debt and equity. See also DeAngelo and Masulis (1980a) and Auerbach and King (1983) for extensions and critiques. Under risk aversion, agents would generally trade off tax with diversification advantages and “clienteles” would be formed. The specific configuration of tax parameters in the model need not apply to all countries.

taxation, a possible explanation is the loss of non-interest tax shields (such as depreciation allowances or investment tax credits) as a result of tax exhaustion (see DeAngelo and Masulis (1980b)). When gross profits fall short of tax allowances, asymmetries in the tax code do not allow firms to benefit from an equivalent tax credit.⁶ Thus, increasing debt financing may eventually nullify its tax advantage over equity. Another possible solution is to relax A.2 and to postulate bankruptcy costs, i.e. those costs associated with the transfer of ownership and control rights from equity holders to creditors. These could be direct (legal and other costs) or indirect (loss of sales, liquidation rather than re-organisation when the going concern value is in effect higher).⁷ While doubtless relevant beyond certain leverage levels,⁸ these costs, as well as those of “financial distress” (see Gordon and Malkiel (1981)), are better rationalised if perceptions of investment decisions and pay-offs are not assumed independent of financial decisions.

Relaxing the Independence Assumption: general issues and results

The Independence Assumption does away with a number of potentially crucial problems relevant to the function of financial choices. Conceptually, however, the assumption can only be justified if information acquisition, both about agents’ actions and about the outcomes of those actions, is costless. In that case information asymmetries between those who deploy the funds and those who supply them would be eliminated. Otherwise, these asymmetries determine the cost and limit the type of contracts which can be written to restrain conflict of interests among suppliers and users. The reason is that only commonly observable, i.e. verifiable, actions and outcomes can be terms of contracts. The issue of *control* over the

⁶ Excess tax allowances are normally carried forward without the benefit of accrued interest. They may also be partially charged against past profits.

⁷ See, for instance, Baxter (1967), Kraus and Litzenberger (1973) and Scott (1976).

⁸ Partly as a result of biased sample characteristics, these costs were originally thought to be small (see Warner (1977)). Subsequent studies (Altman (1984) and White (1984)) have seriously challenged this view. Evidence relates only to the United States.

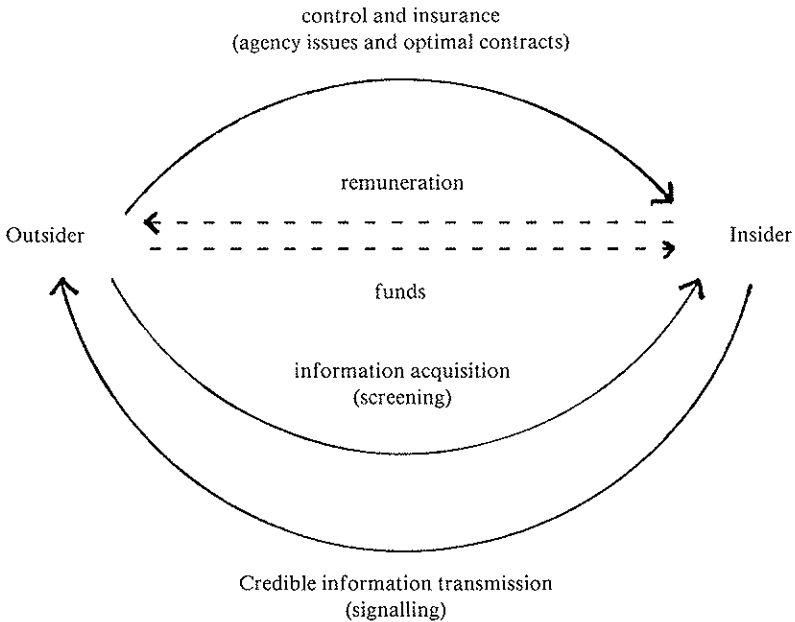
use of the funds provided to a firm and over the distribution of the associated returns becomes crucial since suppliers may no longer be able to “insulate” themselves against actions taken by those who obtain the funds which could undermine the value of their claim (see, for example, Stiglitz (1985)). Financial assets confer different remuneration conditions and control rights. They therefore deal in different ways with asymmetric information and with the related scope for conflicts of interest between the parties to the contracts (e.g. managers, shareholders and creditors).⁹ In fact, costly information invalidates not only the Independence Assumption (A.1) but also the postulate of a perfect capital market (A.2) from which irrelevance propositions have been derived.

Diagram 1 provides a graphical representation of the key issues. “Insiders” are responsible for the firm’s real investment and output decisions and typically have privileged information about project quality, specific outcomes and/or their actions. These actions in turn partly affect project quality and/or the amount declared and actually distributed to suppliers of funds. The “outsiders” are at an informational disadvantage and must give up control of the funds to the “insiders”. The identity of “insiders” and “outsiders” will vary depending on the situation. Treating owner-managers or shareholders as insiders appears to be justified in the case of small or closely held companies while managers seem to be better suited in the case of large corporations with diffused ownership. But more generally, the approach suggests that in practice the distinction between insiders and outsiders cannot be made without considering the structure of control over the company’s decisions.

In order to raise external funds, insiders must be able to *commit themselves* credibly to remunerating outsiders sufficiently. Thus the

⁹ For the general issues involved, see Radner (1982), Strong and Walker (1987) and Hart and Holström (1988). If such contracts must be enforced by a third party, the relevant terms should be verifiable by this third party. The literature implicitly assumes that this condition holds whenever insiders and outsiders in a transaction can verify adherence to the contract terms. Hart and Moore (1989) have recently explored some of the implications of relaxing this assumption.

Diagram 1



impossibility of making credible commitments about unverifiable actions sets a limit on the capital that can be raised and hence on the feasible projects and associated total income to be distributed (“agency problem”).

Even if insiders have no discretion over project choice or distribution, residual uncertainty about the quality of the insiders’ project may exist. In that case high-quality insiders have an incentive to distinguish themselves from low-quality insiders (the issue of “credible information transmission” or “signalling”; see Spence (1976)). That would avoid payment of a “lemons premium” for their funds: when outsiders cannot distinguish good from bad projects but have an idea of their possible distribution, they price the funds according to the *average* quality so that excess returns on high-quality projects compensate for losses incurred with low-quality ones. The

above-average projects are therefore underpriced, i.e. their cost of funding is relatively higher (the "lemons premium"). Similarly, outsiders have an incentive to distinguish or "screen" the quality of insiders if by so doing they can raise their expected payoff (the problem of "information gathering" and "screening"; see Stiglitz (1975)).¹⁰

As long as the outsiders are *correctly*, even if limitedly, informed and act rationally on their information, the costs implicit in the failure to achieve successful pre-commitment or those of signalling and screening are ultimately borne by insiders. This is true in the sense that the terms under which outsiders are prepared to enter transactions will incorporate proper safeguards so that they can obtain their required expected return.¹¹

There are a number of general results or broad indications which can be extracted from the literature dealing with asymmetric information. Firstly, one should observe a predominance of internal funds financing either because of rationing of external funds or as a means of avoiding the costs associated with informational asymmetries (the "lemons premium"). Internal funds should be defined in terms of whether they are under the insiders' control. It is a relatively

¹⁰ There is in fact no explicit process of information acquisition in the literature. Rather, the focus is on whether the quality of projects can be inferred from the response of insiders to changes in the terms under which financial assets are exchanged (e.g. their form, volume or price). One can think of signalling and screening equilibria as games where the informed and uninformed, respectively, act as Stackelberg leaders. Given the advantage of the informed, it is not entirely surprising that Stiglitz and Weiss (1983) show that the set of screening equilibria is a sub-set of that of signalling equilibria.

¹¹ The "lemons premium" is a purely redistributive cost from above-average to below-average-quality projects unless some high-quality projects are abandoned, in which case there is also a social cost. As discussed further below, that can occur if the relative cost of funds for good-quality projects is so high, and hence the returns to the users of funds so low, that they drop out of the market ("adverse selection"). The risk that this will occur rises with the degree of uncertainty about project quality, i.e. with the dispersion of project types perceived by outsiders. For in that case the underpricing of good-quality projects relative to the average must be greater in order to compensate for larger anticipated losses with low-quality projects. In "agency models" there is always a social cost resulting from failure to commit to the first-best project.

short step to infer from this a general preference for *retained earnings*.¹² This conclusion is consistent with the evidence unveiled in Section I.

Secondly, the higher cost/lower availability of external finance can be mitigated by those factors which tend to reduce the importance of asymmetric information.¹³ In general, the more insulated the returns to outsiders from the unverifiable (or costly to verify) fortunes of the firm and insiders' actions, the more valuable the source of finance. This would tend to favour unsecured debt over equity at least within the range of operations where the probability of default is not a major concern. Within that range, the returns on debt are not sensitive to unverifiable outcomes and/or actions. The situation is different where default risk becomes an important consideration. Even then, the possibility to collateralise or guarantee debt can give it an edge. External equity, of course, can remedy some of these disadvantages to the extent that it provides sufficient control (through voting rights).

Thirdly, the passage of time may alleviate the costs of asymmetric information by reducing these asymmetries, especially through long-term relationships, and by allowing reputation-building and a greater range of penalties for deviant behaviour.¹⁴

¹² This is clearly true when insiders are managers. It is also true when insiders are shareholders of closely controlled enterprises as long as there exist transaction costs in raising external finance. Otherwise, they could simply issue additional shares to themselves at no extra cost. It need not necessarily hold once taxation or other constraints exist. The insider may wish to finance the venture by nominally *lending* his own money to the enterprise so as to take advantage of tax concessions. Legal minimum capital requirements partly limit these tax arbitrage possibilities. Note that internal finance for *real* projects can also be provided by accumulated liquid assets (financial slack) (see, for example, Myers (1984)).

¹³ One such factor relates to the structure of *assets* and the ease with which they can be diverted to uses favoured by insiders without being detected by outsiders. This has recently been referred to as "fungibility" (see, for example, Myers (1984), Gertler and Hubbard (1988) and Titman and Wessels (1988)).

¹⁴ See, for example, Moore (1987), Webb (1987), Diamond (1989) and the articles referenced in Gertler (1988).

Fourthly, the simultaneous holding of debt and equity claims clearly reduces the scope for conflict between creditors and shareholders. In particular, it reduces debtors' exposure to the risks normally incurred in situations of financial distress, when shareholders would otherwise have powerful incentives to expropriate part of the creditors' claims in a variety of ways, such as taking risky gambles. What follows is a more detailed description of some of the models formalising these issues.

Relaxing the Independence Assumption: specific models¹⁵

Optimum contract models. A set of studies has been unique in attempting to derive existing financial arrangements as optimum contracts on the basis of specific information asymmetries and verification costs. The formal procedure is to maximise the (expected) utility of the insider subject to the constraint that the outsiders receive a competitive return and that the insider has the incentive to comply with the contract. Because of its low verification costs, debt can be shown to be a possible optimum outcome under certain restrictive conditions which limit the set of contingencies which can be allowed for in contracts.¹⁶ These models can also be used to justify rationing of funds. The contractual interest rate may not clear the market since higher rates increase the probability of bankruptcy, which raises expected verification (monitoring) costs. At some point the net expected return from a further increase may be zero. Rationing then occurs if at that contractual rate the demand for funds exceeds the supply (see, for example, Townsend (1979), Gale and Hellwig (1985) and Williamson (1987)).

¹⁵ More detailed reviews of the individual models can be found in Strong and Walker (1987), Edwards (1987) and Gertler (1988).

¹⁶ In particular, it is assumed that the outsider commits ex ante to monitoring in default states and that there are no observable contingencies correlated with the (unobserved) return from the project on which a contract could be based. See Gertler (1988) for references.

Signalling and screening models. For the actions of higher-quality insiders to reveal information credibly, it should not be in the interest of lower-quality insiders to imitate them. The cost of these actions ("signals") must therefore be relatively higher for lower-quality insiders.

On this basis it has been suggested that if managers (insiders) are concerned about the probability of bankruptcy and are partly remunerated on the basis of the market value of the firm, higher debt/equity ratios can act as a signal of higher-quality projects (see Ross (1977)). This assumes that higher-quality projects are also less risky so that they involve a lower bankruptcy probability for any given degree of leverage. In that case the cost to managers of a given level of leverage is relatively lower for better-quality projects.

A number of studies have explored the role of dividends as signals on the basis of the common observation that stock prices typically react favourably to the payment of dividends.¹⁷ They have, however, been rather unconvincing as explanations of the simultaneous payment of dividends and issue of shares (see Edwards (1987)).

More generally, the models concerning quality uncertainty typically assume implicitly that although the *projects* (probability distributions) are unobservable by outsiders, the specific *outcomes* (realisations of those stochastic processes) are verifiable. The proceeds of projects must therefore be distributed according to the contract terms. Under these conditions the preference for debt or equity boils down to which attributes of the projects are unobservable. When uncertainty relates to the *riskiness* (and hence default probability) of the project rather than to its *average (expected) return*, unsecured debt is inferior to equity. On average, equity holders will receive the same return for a given share in the profits independently of the specific project.¹⁸ Conversely, when uncertainty

¹⁷ See Ang (1987) for a review of the models and the evidence and Battanchaya (1979) and (1980), Miller and Rock (1985) and John and Williams (1985) for some examples.

¹⁸ Presumably, strong risk aversion and failure to hold a diversified portfolio could mitigate this result.

relates to average return rather than riskiness (the spread of the distribution), equity is inferior since its returns will be more sensitive to misperception of project type. In either case, since it is to the advantage of lower-quality insiders to exploit the possibility of relative overpricing by outsiders, attempts to obtain funds with the financial instrument most sensitive to the specific form of uncertainty would be interpreted as a sign of inferior quality. Rationing of external equity or debt can therefore easily emerge.¹⁹

*Agency models.*²⁰ The agency literature focuses broadly on the conflicts of interest between the various agents that constitute a firm (equity holders, debt holders and managers) and on the way in which financial arrangements alter behavioural incentives of those in charge of firm policy.²¹ An influential number of contributions are mostly non-formal in nature.

The literature generally confirms the inferiority of external equity to debt when the outcome of real decisions or the actions leading to that outcome are costly to verify. In that case those in charge of real investment and output decisions (owner-managers, managers) upon acquisition of funds have powerful incentives to understate the outcome and/or make decisions more in line with their own

¹⁹ Myers and Majluf (1984) and Greenwald et al. (1984) discuss the problems raised by external equity and possible rationing. Myers (1984) argues that, given the preference of debt to equity under those circumstances, a "pecking order" theory of financing not based on (exogenous) differential transaction costs could be developed. Retained earnings would always be preferred to debt, which in turn would be preferred to equity issues. Giammarino and Neave (1982) argue that when uncertainty relates to riskiness, unsecured debt may be inferior. Stiglitz and Weiss (1981) and (1986) show the possibility of rationing debt when uncertainty relates to riskiness rather than expected returns. As higher contractual rates have less of an effect on the returns of bad projects, those who accept to borrow are on average worse risks. If the volume of finance rather than the contractual rate is the choice variable similar results can be obtained (see Jaffee and Russell (1976)). Further variations on this theme are provided by De Meza and Webb (1987) and Calomiris and Hubbard (1988). Milde and Riley (1988) establish a set of conditions under which rationing need not occur.

²⁰ For a review, see Barnea et al. (1985).

²¹ For a general discussion, see Fama and Jensen (1983a) and (1983b) and Jensen and Smith (1985).

preferences. Returns on debt are less sensitive to such actions, essentially because the return on debt depends on them only in default states.²² This disciplinary role of debt has recently been emphasised by Jensen (1986) in connection with the discretion over the use of funds enjoyed by managers in large corporations. It is also the basis for suggestions that dividend payments may be a form of (implicit) contract to provide equity with debt-like characteristics (see Rozeff (1982) and Easterbrook (1984)). The penalty here is not default and loss of control over existing funds but a drop in the price of equity and consequent difficulties in obtaining future funds.²³

The agency literature has highlighted the inadequacy of unsecured debt in situations where the probability of financial distress (possible default) becomes significant. In that case there exist powerful incentives to expropriate debt holders in a number of ways. Firstly, riskier projects can be chosen which have higher pay-offs if successful but a lower probability of success. This dilutes the claim of debt holders through a higher probability of default and lower returns in states of default (see Jensen and Meckling (1976), Galai and Masulis (1976)).²⁴ Secondly, it is possible to reject projects which, even if valuable at the margin, would not produce any residual income to shareholders. That occurs when the project proceeds, though in excess of the additional outlay required from shareholders, would be insufficient to cover outstanding obligations to creditors (see Myers (1977)). Thirdly, insiders may provide a more senior claim (e.g. collateral) to new creditors so as to obtain funds to maintain the firm in operation (see White (1989)). This reduces the claim of existing debt holders in the event of liquidation. Fourthly, any sales or accelerating dividend payments before liquidation achieve a similar result (see Kalay (1982)). Covenants in bond and loan contracts are

²² See Grossman and Hart (1986) for a formal model which considers this issue.

²³ Lang and Litzenberger (1989) have recently found some evidence suggesting that these "agency" explanations of dividends may be superior to signalling ones.

²⁴ That is, given two projects of identical expected value but different riskiness, the riskier one would be preferred. Note the parallel with the models concerning quality uncertainty discussed above.

designed to mitigate these possibilities (see Smith and Warner (1979), Jensen and Smith (1985)). Hybrid instruments such as convertible bonds or bonds with option elements (calls or puts) can serve a similar purpose (see, for example, Barnea et al. (1985)).

There is no consensus on the practical importance of agency costs in producing deviations from value-maximising (“efficient”) policies, especially those associated with the separation of ownership (shareholders) from control (managers). Some argue that, at least in the long term, a competitive managerial labour market combined with the market for corporate control through takeovers is effective in compensating for the free-rider and informational problems associated with shareholders’ intervention (see, for example, Fama (1980)). Others maintain that those very informational and incentive problems render these mechanisms particularly problematic (see, for example, Grossmann and Hart (1980) and (1981) and, especially, Stiglitz (1985)). Free-rider, “lemon” and signalling difficulties may render takeover threats ineffective. There is, in fact, a sizable volume of findings which are in principle consistent with some of the predictions of agency theory (see Jensen and Smith (1985) and Masulis (1988)). The theory suggests that the structure and type of ownership claim is a key factor in determining the significance of these costs. It is also a factor which varies significantly across countries.

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