

The commodity cycle: macroeconomic and financial stability implications. An introduction[#]

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02 June 2017

The sharp drop in oil and other commodity prices from mid-2014 proved particularly challenging for several commodity-exporting countries, as it was accompanied by large currency depreciations, higher inflation and sharp slowdowns or even recessions. Latin American countries were particularly affected. Hence the interest of central banks in the Americas region to better understand the real and financial implications of large commodity price swings. This interest was channelled through the BIS Representative Office for the Americas, whose mandate is to foster central bank cooperation in the region. A research network was set up in early 2015, comprising the eight BIS member central banks of the Americas region and Norway, a large oil producer that has developed mechanisms to deal with price swings. It benefited from the advisory role of Joshua Aizenman, of the University of Southern California. The work of the network culminated in a conference in Mexico City on 20–21 August 2016.¹ This special issue contains a selection of refereed papers from the conference, including the keynote lecture delivered by Frederick van der Ploeg of the University of Oxford.

I. The importance of commodity cycles in the Americas

The world seems to have left behind a long upward phase of the commodity price cycle. After a boom that started in the late 1990s, commodity prices peaked in 2011². Despite the modest rebound of recent months, commodity prices are unlikely to regain past strength in the near future, and that for several reasons. First, in advanced economies, adverse demographics, and high public and private debt, are likely

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¹ The Conference programme, with the list of discussants, can be accessed here: <https://www.bis.org/events/ccacloseconf2016/agenda.htm>

² Since the middle of the 19th century, the world has gone through four medium-run commodity cycles (Erten and Ocampo (2013), and Büyükşahin et al (2016)). The latest, which began in the late 1990s, has coincided with the rapid industrialisation and urbanisation of China.

to dampen growth for the foreseeable future. Second, growth in China – a major source of commodity demand – may continue to slow as its economy makes the transition from heavy industry to less commodity-intensive sectors, such as services. Growth is also expected to slow down in other emerging market economies (EMEs). Third, an excess supply of commodities may contribute to weak commodity prices going forward. Previous investment seems to have increased the production capacity of various commodities, such as oil and minerals. For example, in the United States, oil output doubled as a result of recent advances in extraction technologies, which apart from expanding global supply, have also reduced start-up costs and investment lead times (Bjørnland et al (2017)). As a result, global oil supply may have become more elastic, which barring policies seeking to limit production, could dampen the extent to which oil prices rise in response to future increases in demand.

These developments are likely to have important consequences for major economies in the Americas, many of which are heavily reliant on commodity exports. For example, commodities account for over 80% of total exports in Chile and Peru, over 70% in Colombia, over 60% in Argentina and Brazil, and close to 50% in Canada. Commodities are less important, but still a significant source of income to Mexico and the United States, accounting for about a quarter of total exports in both countries. Yet, the direct exposure of a country to commodity price fluctuations is not fully captured by the share of commodities in GDP or total exports.

For one, commodity upturns are often accompanied by other developments that can make the economy more vulnerable to a turn in the commodity cycle. Several channels may be at play. First, commodity price increases may lead consumers and producers to be overoptimistic about their permanent income. Borrowers and lenders alike may overestimate the persistence of commodity price increases and underestimate the potentially adverse consequences of future price drops. As a result, the country may face an upsurge in capital inflows, and a boom in domestic credit and asset prices, leading to levels of private and public debt that – at least with hindsight – turn out to be excessive. Such high levels of private and public debt may then exacerbate the contraction of activity when commodity prices fall or when global financial conditions tighten. High debt may also amplify the fall in commodity prices, to the extent that indebted commodity producers expand production to stabilise their cash flows and service their debts (Domanski et al (2015)).

Second, rising commodity prices are typically associated with an appreciation of the real exchange rate and changes in the structure of the economy. When commodity prices rise, the commodity producing sector, as well as non-tradable sectors, tend to expand, drawing resources away from the rest of the economy and pushing domestic prices up. As a result, the tradables sector – the manufacturing sector in particular – may become less competitive and shrink, pushing down average economic growth –

a phenomenon widely known as the “Dutch disease” (Corden and Neary (1982), and van der Ploeg (2011)). In financially open economies, capital inflows may further stimulate demand for non-tradables, thus exacerbating the crowding out of productive resources from the tradables sector (Alberola-Ila and Benigno (2017)).

Third, in countries with flexible exchange rate regimes, rising commodity prices also tend to be associated with nominal exchange rate appreciation. While this tendency may help stabilise domestic inflation, it could also mislead policymakers and investors into believing that the country is experiencing “good” or sustainable growth. In fact, an appreciation of the currency may amplify growth by contributing to a financial boom and exacerbating the reallocation of resources away from the most innovative and productive sectors. There is evidence, in particular, that nominal appreciation improves the balance sheets of domestic borrowers, reducing the perceived risk for lenders and, through this channel, increasing credit supply (Bruno and Shin (2014), and Hofmann et al (2016)). When the currency depreciates, the process goes into reverse. But, while a boom and a currency appreciation may be gradual, a bust and the associated depreciation can be sudden and sharp. When banks and non-banks hold significant foreign currency liabilities, such depreciation may lead to a severe tightening of credit supply, which could limit the expansionary impact of the depreciation on the exports of non-commodity firms as well as on the economy as a whole (Kearns and Patel (2016)). In addition to financial factors, the existence of sunk costs and other rigidities may significantly delay the recovery in non-commodity exports – a phenomenon known as trade hysteresis (Baldwin and Krugman (1989), and Tomlin and Fung (2015)). It follows that, at least in the short run, any current account adjustment may have to rely more heavily on a contraction of imports, thereby implying a stronger contraction of output growth than would otherwise be the case.

Fourth, commodity price booms tend to flatter fiscal balances, leading to a fiscal policy that, at least with hindsight, may turn out to be strongly procyclical. Policymakers may mistake some of the improvement in public finances as permanent, perhaps ascribing them to the success of reforms they implemented. Most importantly, the political pressures to spend any windfall may prove irresistible if institutions are not adequately designed to resist such pressures (Santos (2015)). The tendency to overestimate fiscal balances in the face of rising commodity or asset prices is by now well documented (Borio et (2017) and Alberola-Ila et al (2016)). In some cases, commodity-related income accounts for such a large proportion of government revenues that a sharp and persistent drop in commodity prices could severely dent sovereign creditworthiness.

Policymakers can reduce the vulnerabilities associated with the commodity cycle in a number of ways.

First, monetary policy can be tightened in an attempt to stem a boom in credit and asset prices, even if inflation remains subdued. However, in a financially open economy, monetary policy effectiveness may be significantly weaker, even with perfectly flexible exchange rates: indeed, while a central bank may in this case be able to control short-term interest rates and money market conditions, it may have much less control over other key asset prices, and credit, as these are strongly influenced by global financial conditions and the forces of international arbitrage (Rey (2013), Hofmann and Takats (2015), and Kharroubi and Zampolli (2016)). For this reason, authorities in EMEs have, over the past few years, increasingly adopted macroprudential measures along with measures to manage external capital flows (Bruno et al (2017) and Cerutti et al (2017)).

Second, countries can reduce the procyclicality of fiscal policy by adopting fiscal rules whereby spending or the fiscal balance is related to deviations of commodity prices from their long-run trend as well as the state of the business cycle, as is the case in Chile – one of the largest copper producers. These rules are more effective when their compliance or monitoring is delegated to independent authorities. This institutional arrangement helped Chile weather the 2008–09 global recession better than other countries (Frankel (2011)).

Third, countries may save some of the proceeds accruing to the government from commodity sales to create funds used to stabilise spending over the commodity cycle, to provide for an aging population or for the benefit of future generations. Norway and, again, Chile are good examples of this approach. Countries may also seek to mitigate the risks of commodity prices fluctuations on fiscal accounts through the use of financial derivatives, such as forward contracts, or the issuance of oil-linked bonds. To date Mexico has been one of the most active user of these instruments (Daniel (2002), and Devlin and Titman (2004)).

II. Overview of the papers in this issue

The research articles in this volume provide a better understanding of some of the phenomena just highlighted. They focus, in particular, on the effects of commodity price swings on the volatility of the real economy; the role of fiscal policy and financial market instruments in mitigating such volatility; and the predictability of commodity returns from changes in empirical measures of investors' risk aversion. These articles are briefly summarised below.

In his keynote lecture, Frederick van der Ploeg ("Macro policy responses to natural resources windfalls and the crash in commodity prices") illustrates, with the help of simple theoretical models, the main constraints faced by less developed countries in managing their natural resources, and what such

constraints imply for policy. Starting from the permanent income hypothesis, he shows that it is optimal to smooth consumption across generations and invest any savings abroad. If Dutch disease effects are potentially relevant, the optimal strategy also includes smoothing the real exchange rate as well as private and public consumption. Yet, when other realistic features are introduced into the analysis, these basic policy prescriptions change significantly. For example, in the face of commodity price volatility, it is also optimal to hold precautionary savings in the form of a stabilisation and an intergenerational fund. When a country faces high borrowing costs, a windfall should be used to reduce domestic debt, curtail risk premia and boost domestic investment. And when a country face absorption constraints, the real exchange rate should be allowed to temporarily appreciate so as to encourage investment in productive capacity. Van der Ploeg also shows the implications of real and nominal rigidities. In particular, nominal rigidities make a Taylor rule superior to a nominal exchange rate peg following a commodity price crash.

While simple models provide important insights into transmission channels and optimal policy, richer frameworks, such as DSGE models, are needed to evaluate the quantitative importance of commodity price shocks and how different policies influence macroeconomic fluctuations. Drago Bergholt, Vegard Larsen and Martin Seneca ("Business cycles in an oil economy") build one such model to study resource-rich economies, such as Norway. The novelty of their model is that it includes an oil-producing sector as well as an external sector (global economy) and a sovereign wealth fund. The model is then applied to the data, yielding the following conclusions. First, oil shocks are an important source of macroeconomic volatility in Norway. Second, the main channel of transmission is not through wealth effects but through increased demand for the intermediate inputs used by the oil industry. Third, fiscal policy implemented through a sovereign wealth fund has substantial stabilising effects.

Assessing macroeconomic volatility is also at the heart of the study on the Mexican economy by Bernabe Lopez-Martin, Julio Lean and Andre Martinez Fritscher ("Commodity price risk management and fiscal policy in a sovereign default model"). They use a model of sovereign default, which incorporates an endogenous feedback mechanism from the real economy, to evaluate the effects of various financial hedging instruments (eg forward and option sales, and oil price-linked bonds) on the volatility of macroeconomic variables and the degree of fiscal procyclicality. One potential advantage of using hedging instruments is that they reduce the need for precautionary savings and their associated opportunity costs. Another one is that they may also allow to sustain a higher level of debt, other things equal. The analysis shows that these instruments reduce macroeconomic volatility as expected, but – perhaps surprisingly – do not have an economically significant impact on average debt levels.

A key channel through which commodity prices and their uncertainty affect the real economy is through investment decisions. The study by Rocío Gondo and Marco Vega ("The dynamics of investment

projects: evidence from Peru”) uses a novel data set of more than a thousand announced investment projects in Peru over the period 2009–15 to quantify the effects of commodity price volatility. They find that volatility increases the probability of delaying a project in all sectors bar mining. In the latter, volatility has the opposite effect, improving the chance of project completion, consistent with the fact that this sector has much larger time to build lags than other sectors.

Financial market prices can provide important information regarding the future behaviour of commodity prices. So far the literature has focused on the predictive power of commodity currencies on the assumption that new information about commodity demand and supply tends to be incorporated more rapidly in currency markets. An interesting extension of this work is the paper by José Renato Haas Ornelas and Roberto Baltieri Mauad (“Volatility risk premia and future commodity returns”). They examine whether volatility risk premia for exchange rates and other assets are also useful in predicting future commodity prices. Volatility risk premia (ie the difference between implied and realised volatility) are believed to approximate investors’ risk aversion and have been found in recent studies of the equity market to be associated with future equity returns as well as having important effects on credit and the broader macroeconomy (see above). Their paper finds that volatility risk premia of commodity currencies are positively related to future commodity returns, but only post-crisis. They also find that gold volatility risk premia predict future returns on precious metals.

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