

Systemic Risk Centre public lecture

Credit, Commodities and Currencies

Jaime Caruana
General Manager, Bank for International Settlements

London School of Economics and Political Science

Friday 5 February 2016

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Lecture at the London School of Economics and Political Science

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Introduction

I am very happy to be back at the LSE. I was here in the same lecture theatre in 2005 when I was chairman of the Basel Committee on Banking Supervision to deliver an update on banking regulation. Then, as now, the LSE was at the forefront of the economic debates facing policymakers, and I remember some very illuminating discussions. The world is a rather different place now and policymakers are a more chastened bunch, but I am expecting equally stimulating discussions on a different topic. Today, I would like to lay out some broad themes that shed light on the current state of the global economy.

In December, the BIS highlighted the “uneasy calm” in financial markets in its *Quarterly Review*. As we entered 2016, the uneasy calm gave way to quite a turbulent start to the year in the financial markets. The global economy now finds itself at the centre of three major economic developments. The first is **disappointing growth and downward revisions of projections**, especially in emerging economies; the second is the **large shifts in exchange rates**, again especially for emerging market currencies against the US dollar; and the third is the **sharp fall in commodity prices**, hitting a number of commodity-exporting countries particularly hard, but at the same time providing a positive dividend to other economies.

These three developments may appear unconnected at first sight. Indeed, there has been a tendency in recent commentaries on the global economy to see them as exogenous “shocks” that have come out of the blue, and as external “headwinds” buffeting the domestic economy against which domestic monetary and fiscal policy have to lean.

However, when we take a step back and take in the larger picture, it becomes clear that these developments are connected; they share common factors. Rather than being separate exogenous “shocks”, they are **manifestations of a major realignment of economic and financial forces associated with the long-anticipated shift of global monetary forces**. As such, recent developments are a part of a longer movie, which requires a longer-term, global perspective to spot the vulnerabilities facing financial markets and the global economy. I would like to explore today some aspects of this long-term perspective that emphasise commonalities, in a stylised and therefore oversimplified way.

Taking a longer-term perspective allows us to grasp the importance of slow-moving phenomena and the cumulative evolution of stocks. We must keep at the front of our minds the adage that “stocks matter, not just flows”. Indeed, an alternative title of my lecture today could have been: **“It’s the stocks, not the shocks.”**

Arguably, financial markets have been so unsettled at the beginning of this year because we began the year with an already large overhang of the stock of vulnerabilities in the global economy. Policy interventions that address the symptoms without addressing the underlying vulnerabilities may succeed

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only in serving as a palliative that puts off the turbulence for another day, by which time the stock of vulnerabilities will have grown even larger.

A clear example is the stock of debt. Total debt in the global economy, including public debt, has increased significantly since the crisis (end of 2007). True, private debt has been reduced in some countries, namely Ireland, Spain, the United Kingdom, the United States and others. However, public debt has increased significantly in advanced economies, and private debt has increased in emerging economies and some advanced economies less affected by the 2008 financial crisis.

In spite of the challenging environment, I intend a positive message. These transitions and realignments inevitably bring short-term discomfort in the financial markets. They also raise significant risks. But depending on the policy responses, they could eventually allow renewed and, above all, more sustainable and resilient growth, both in advanced economies and key emerging economies. This would be so if they were taken as an opportunity to proceed on the path of the necessary and welcome rebalancing and normalisation of the global economy. There are therefore good reasons to remain positive about the long-run prospects for the global economy even if we should not underestimate the tasks ahead: a more balanced policy response will be critical, and the path will be bumpy.

I will come back to some policy conclusions at the end of my presentation, but now, let me start at the beginning and divide my comments into the following themes.

First, I would like to provide a brief synopsis of the evolution of debt in emerging economies, as part of a strong post-crisis upswing in their financial cycles,¹ and place this development in the context of global financial developments. I will mention, in particular, the role of dollar-denominated debt in emerging economies and give you an update by drawing on the latest readings from the BIS global liquidity indicators.

Second, I will connect the dots between the recent developments in the global economy by drawing on some recent research at the BIS. I will explain why apparently disparate developments in the global economy share some common factors – the shift in global financial conditions as domestic financial cycles mature. This time mainly in some emerging economies.

In particular, I will offer some thoughts on how the outsize movements in the currency market and the sharp decline in the price of oil can be better understood, at least in part, by reference to the turning of global liquidity conditions.

Finally, I will conclude with some implications for the appropriate policy response.

Debt in emerging markets

The growth of debt in the emerging economies has been dramatic, as shown in Graph 1. The left-hand panel shows the level of private credit as a proportion of GDP in the emerging economies compared with that in advanced economies. We see that although the level of private credit is higher in the advanced economies, the growth trajectory in the emerging economies has been very steep. Since 2009, the average level of private credit as a proportion of GDP has increased from around 75% to 125%.

The slightly declining line of the advanced economies' non-financial private sector debt hides significant differences among countries. Among the G20 economies, two have decreased private debt by

¹ For an explanation of the concept, measurement and policy implications of the financial cycle, as the term is understood at the BIS, see BIS, *84th Annual Report*, June 2014, and C Borio, "The financial cycle and macroeconomics: what have we learnt?", *Journal of Banking & Finance*, vol 45, pp 182–98, August 2014 (also available as *BIS Working Papers*, no 395, December 2012).

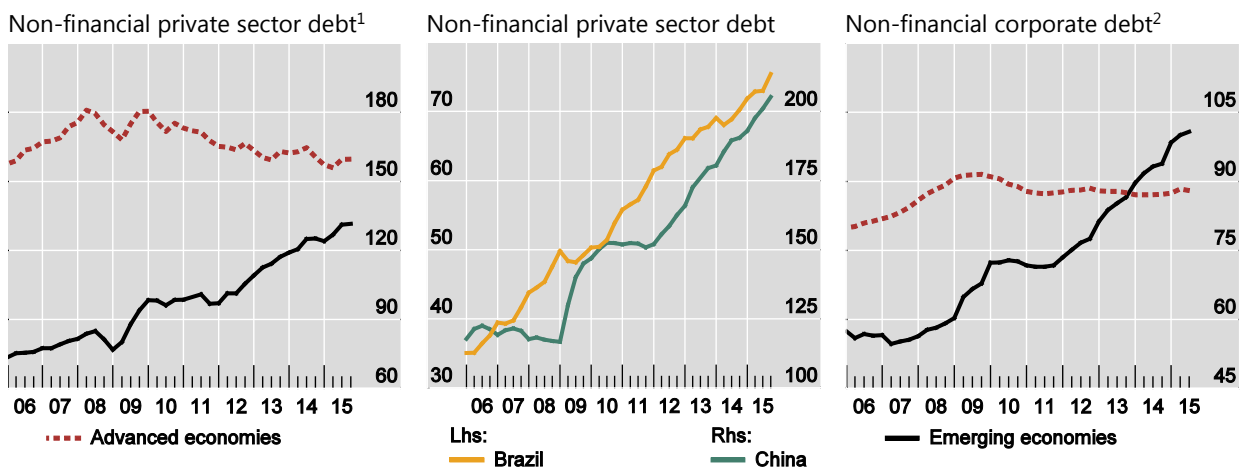
20 percentage points of GDP or more, while seven countries have increased debt by 20 percentage points of GDP or more.

The centre panel of Graph 1 plots the steep upward trajectory for the growth of private credit as a proportion of GDP for Brazil and China. The trend is especially striking for the debt taken on by non-financial companies (Graph 1, right-hand panel). The debt of non-financial companies in emerging market economies (EMEs) has grown so rapidly that in 2013 it overtook that of advanced economies, as a proportion of GDP. Since then, the corporate debt of EMEs as a proportion of GDP has pulled ahead of that in the advanced economies even further.

Private credit in emerging and advanced economies

As a percentage of nominal GDP

Graph 1



¹ Weighted average by GDP. Advanced economies: Australia, Canada, Denmark, the euro area, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States. Emerging economies: Argentina, Brazil, China, Hong Kong SAR, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Poland, Russia, Saudi Arabia, Singapore, South Africa, Thailand and Turkey. ² For advanced economies, nominal GDP-weighted average of Australia, Canada, the euro area, Japan, Sweden, Switzerland, the United Kingdom and the United States. For emerging economies, nominal GDP-weighted average of Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Poland, Russia, Saudi Arabia, South Africa and Turkey.

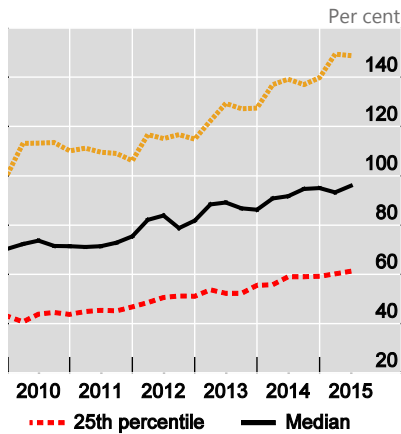
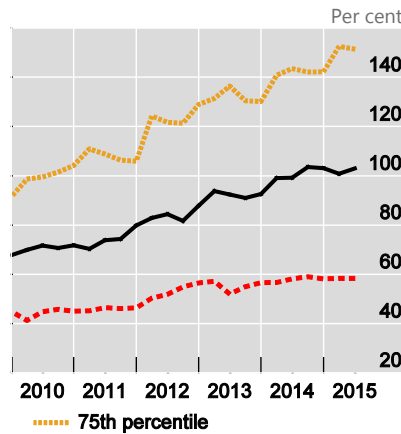
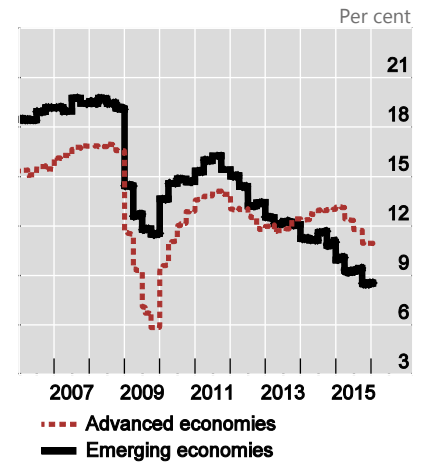
Sources: IMF, *World Economic Outlook*; BIS data on total credit to non-financial corporations and to the non-financial private sector.

What about the assets financed with this rapid EME corporate debt issuance? At the individual firm level, we recently examined the financial statements of about 280 EME companies that had issued bonds in international debt markets, and looked in more detail into their leverage. The results are shown in Graph 2.



Leverage and profitability of EME non-financial companies

Graph 2

Full sample, total debt to equity¹Non-tradable sectors, total debt to equity¹Profitability of non-financial companies²

¹ A sample of 250 companies which have issued international bonds. Tradables: diversified (conglomerates), industrial, metals & mining, oil & energy, pulp & paper, and transport (airlines); non-tradables: consumer, infrastructure, real estate, telecommunications, and utilities. ² Profitability is defined as the return-on-equity. The advanced economies index is the nominal GDP-weighted average of the euro area, Japan, the United Kingdom and the United States. The emerging economies index is provided by Datastream Worldscope.

Sources: Datastream; S&P Capital IQ.

As we see from Graph 2, corporate leverage in emerging economies has risen in general. This does not only reflect the increased debt of commodity producers, as seen by the fact that the leverage of companies producing non-tradable goods has risen even more than that of those producing tradables (centre panel). Moreover, the increase in leverage is most marked in the highly indebted segment – the 75th percentile in the graph. This is presumably the lower-rated segment.

Increased leverage would be less of a concern if debt is used to finance productive and profitable investments. However, the profitability of EME non-financial companies has fallen. Traditionally, EME firms have been more profitable than their advanced economy peers, but this is no longer the case, as we see in the right-hand panel of Graph 2. The profitability of EME corporates has fallen markedly in recent years, and has fallen below that of advanced economy firms. I will come back to this point in a minute when talking about the “illusion of sustainability”.

Should we be concerned by these developments?

We know that some debt can provide welfare benefits: it allows smoothing consumption and offsetting demand shocks by reallocating spending over time, and it permits firms to invest faster than their own cash flows would allow. However, reality is more complex; we have not seen that much real investment, and risk-taking activities have focused more on financial markets. Moreover, we have also learnt that rapid credit growth creates vulnerabilities and can culminate in costly defaults and crises.

Let me add three more arguments why we should not be complacent:

First, borrowing adds to the stock of debt; when the stock of debt becomes large, it can put a drag on growth. There is evidence that the increase in debt service ratios in advanced economies



has done so.² Recent research also indicates that financial booms go hand in hand with a misallocation of resources, depressing productivity on the way.³ This research illustrates at least one of the channels: the shift of factors of production (labour) to lower productivity growth sectors reduces productivity growth both during the credit boom and after the bust. To be sure, the data underlying these results come mainly from the advanced economies. But many of these elements are likely to hold for the emerging economies too as their financial cycles mature.

Second, the **turning of a financial cycle can be quite abrupt due to another feature of debt: its close link with risk-taking and the amplification of market dynamics**. During boom times, when asset prices are rising and financial markets are tranquil, borrowers may be lulled into a false sense of security. We could dub this the **“illusion of sustainability”** whereby even large debt levels appear sustainable when credit conditions are easy and asset prices soar. The illusion of sustainability blinds both borrowers and lenders. But as the cycle turns, the combination of falling asset prices and more turbulent markets means that what was viewed previously as sustainable levels of debt begins to look much more challenging. The decline of profitability, mentioned before, is particularly relevant here. This realisation may elicit deleveraging and outflows that amplify the downward cycle. Policymakers can try to stem the decline in asset prices by loosening monetary policy to turn back the tide, but the already large stock of debt means that monetary policy becomes less effective.

Third, **borrowing in foreign currency adds another dimension to the link with risk-taking and market dynamics**. The link between debt and risk-taking has an additional, global dimension in the case of emerging market economies. Analogously to domestic asset prices, the **exchange rate takes on a financial amplification role** in addition to its usual role in determining the trade balance. This is important because the expected mechanism through which currency devaluation may bring export benefits may be offset or even reversed by stock valuation effects that operate through balance sheets.

Given the importance of this last point, let us give the issue of debt in foreign currency some special attention at this stage.

Dollar debt in emerging economies

I would like to take advantage of my lecture today to report some highlights from the latest release of the BIS global liquidity indicators. “Global liquidity” is a catch-all term for the ease of financing in global financial markets, encompassing both credit and market liquidity conditions.⁴ Global liquidity thus depends on the actions of private investors, financial institutions and monetary authorities; it is a property of the financial system as a whole, and gauged using a variety of price and quantity indicators. The BIS publishes regular updates of these indicators.

Based on the most recent reading for the third quarter of 2015, global liquidity conditions may have begun to tighten for emerging economies. A key yardstick is the US dollar-denominated debt of non-bank borrowers outside the United States. It stood at \$9.8 trillion in September 2015, unchanged from the previous reading in June, and the dollar borrowing by non-banks in the emerging economies stood at \$3.3 trillion, again unchanged from June (Graph 3). This is the first time since 2009 that the latter has stopped increasing.

² M Drehmann and M Juselius, “Leverage dynamics and the real burden of debt”, *BIS Working Papers*, no 501, May 2015.

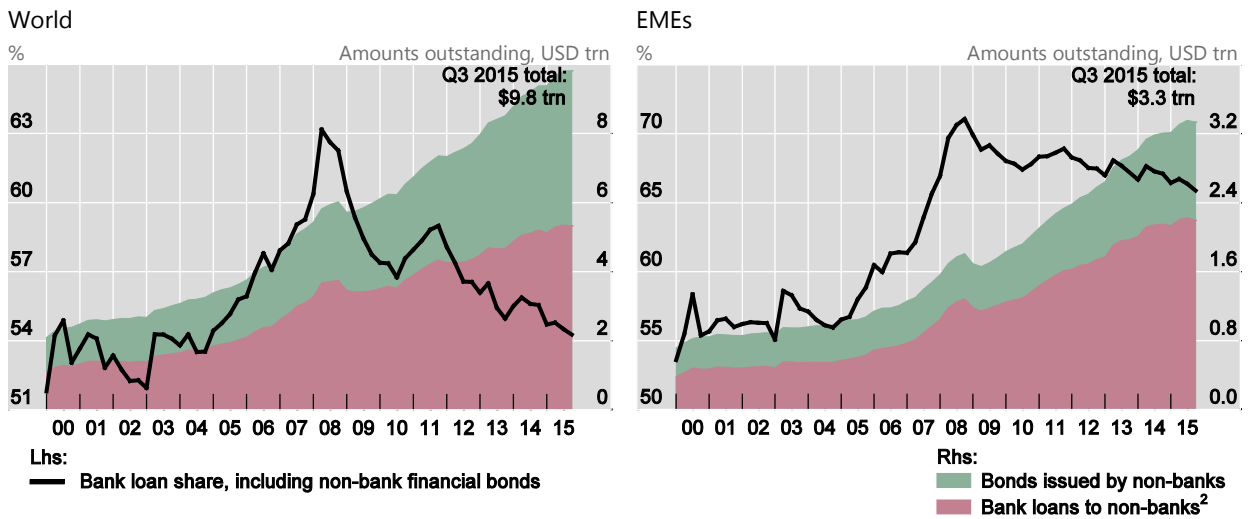
³ C Borio, E Kharroubi, C Upper and Fabrizio Zampolli, “Labour reallocation and productivity dynamics: financial causes, real consequences”, *BIS Working Papers*, no 534, January 2016.

⁴ BIS, “Global liquidity indicators: background and interpretation”, *BIS Quarterly Review*, March 2015, pp 20–1.



US dollar-denominated credit to non-banks outside the United States¹

Graph 3



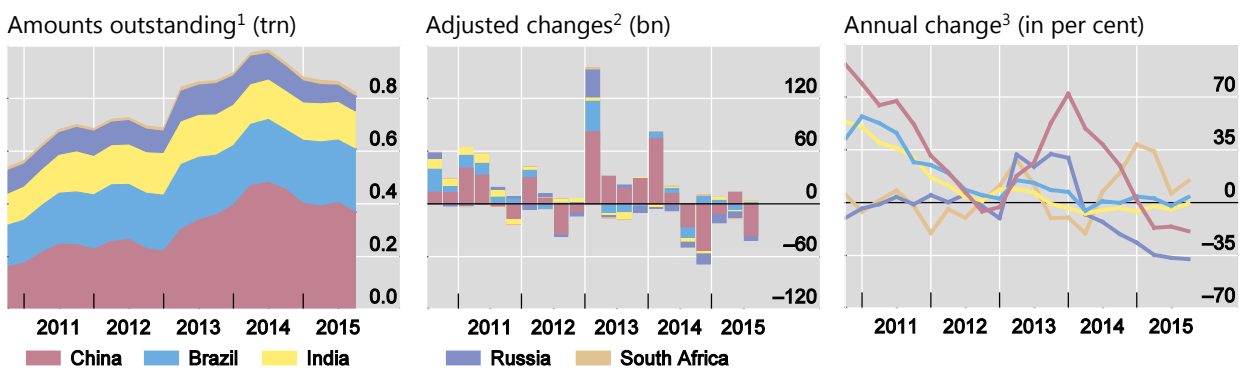
¹ Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. ² Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans. For countries that are not LBS-reporting countries, local loans in USD are estimated as follows: for China, local loans in foreign currencies are from national data and are assumed to be composed of 80% USD; for other non-reporting countries, local loans to non-banks are set equal to LBS-reporting banks' cross-border loans to banks in the country (denominated in USD), on the assumption that these funds are onlent to non-banks.

Sources: National data; BIS debt securities statistics; BIS locational banking statistics (LBS).

Cross-border bank lending shows even clearer signs that global liquidity conditions may have peaked for the time being in emerging economies. Cross-border bank lending to emerging economies has slowed considerably, especially to China (Graph 4). Cross-border lending in dollars to the five emerging market economies in Graph 4 shrank by \$38 billion during the third quarter of 2015, to stand at \$824 billion.

US dollar cross-border bank claims, by borrowing country

Graph 4



Further information on the BIS locational banking statistics is available at www.bis.org/statistics/bankstats.htm.

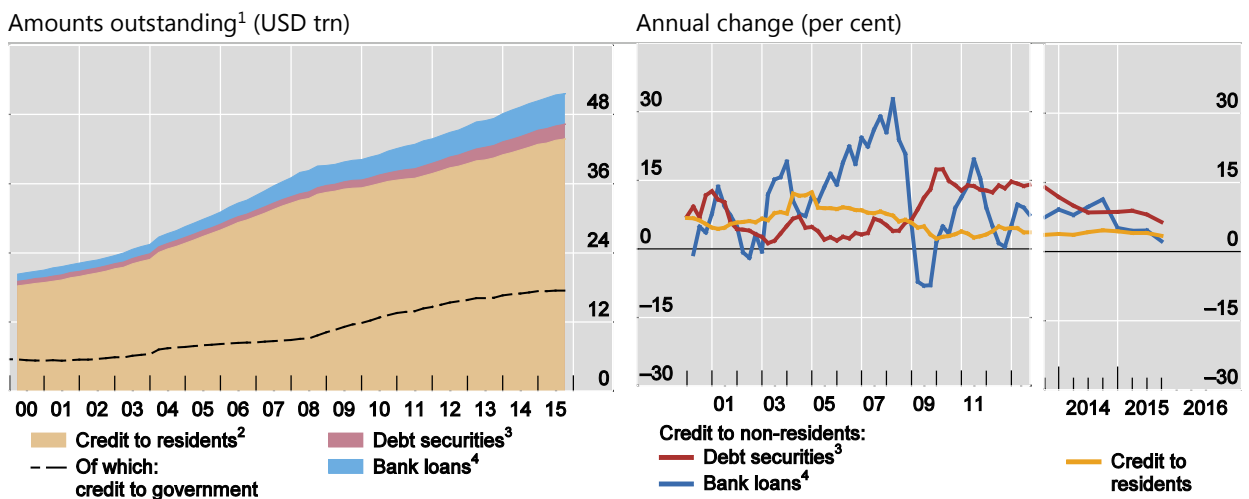
¹ Claims of BIS reporting banks, at quarter-end. ² Quarterly changes in amounts outstanding, adjusted for methodological breaks in the data. ³ Calculated from quarterly adjusted changes.



The dollar-denominated credit to borrowers outside the United States is, of course, a small fraction of the total dollar-denominated credit globally (Graph 5, left-hand panel), as most dollar debt is incurred by residents of the United States. What is notable, however, is the right-hand panel of Graph 5. The growth rate of dollar-denominated credit has been much higher to borrowers outside the United States than the growth of domestic dollar debt in the United States.

Global credit to the non-financial sector in US dollars

Graph 5



¹ Amounts outstanding at quarter-end. ² Credit to non-financial borrowers residing in the United States. National financial accounts are adjusted using BIS banking and securities statistics to exclude credit denominated in non-local currencies. ³ Excluding debt securities issued by special purpose vehicles and other financial entities controlled by non-financial parents. ⁴ Loans by LBS reporting banks to non-bank borrowers, including non-bank financial entities, comprises cross-border plus local loans. For countries that are not LBS reporting countries, local loans in USD are estimated as follows: for China, local loans in foreign currencies are from national data and assumed to be composed of 80% USD; for other non-reporting countries, local loans to non-banks are set equal to LBS reporting banks' cross-border loans to banks in the country (denominated in USD), on the assumption that these funds are onlent to non-banks.

Sources: IMF, *International Financial Statistics*; Datastream; BIS debt securities statistics; BIS locational banking statistics (LBS).

What kind of assets were funded by dollar debt issuance? Debt in foreign currency can be used to acquire foreign currency assets. However, firms have taken advantage of favourable financing conditions in foreign currencies to fund holdings of various assets at home. To the extent that these are in the traded goods sector, currency mismatches need not necessarily arise, although there may be an empirical association between a stronger dollar and weak cash flows, as in the case of oil firms. I will return to this issue shortly. The risks from currency mismatch are clearer when firms in the non-traded goods sector at home borrow dollars, especially in leveraged real estate. This type of dollar borrowing is often motivated not only by lower interest rates but also by the ability to borrow at longer maturities.

In addition, firms may borrow dollars to accumulate financial assets, including those in the domestic currency. The combination of debt in US dollars and a long position in domestic currency (a form of "carry trade") is difficult to document, given the lack of granularity in corporate reporting. Nevertheless, we can get some useful information by delving deeper into the firm-level micro data. A recent BIS working paper⁵ finds that dollar borrowing by emerging market corporates does have the attributes of a "carry trade". The evidence is that, for every dollar raised through a dollar bond issue, around 23 cents ends up

⁵ V Bruno and H S Shin, "Global dollar credit and carry trades: a firm-level analysis", *BIS Working Papers*, no 510, August 2015.

as cash on the firm’s balance sheet. Here, cash could mean a domestic currency bank deposit or a claim on the shadow banking system, or indeed a financial instrument issued by another firm. So, dollar borrowing will spill over into the rest of the economy in the form of easier credit conditions. When the dollar borrowing is reversed, these easier domestic financial conditions will tighten.⁶

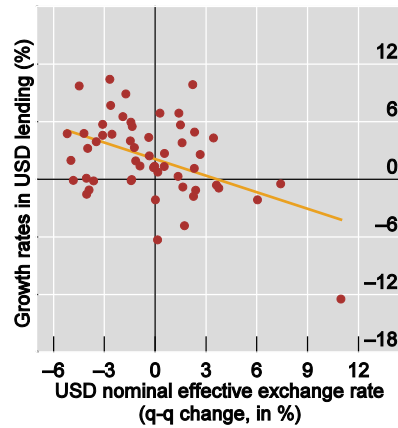
Debt and the exchange rate

One important aspect of this additional borrowing in dollars is the strong association between the strength of the dollar and dollar-denominated borrowing by EME borrowers. Graph 6 provides a snapshot of the link between the exchange rates and dollar-denominated debt of emerging economies.

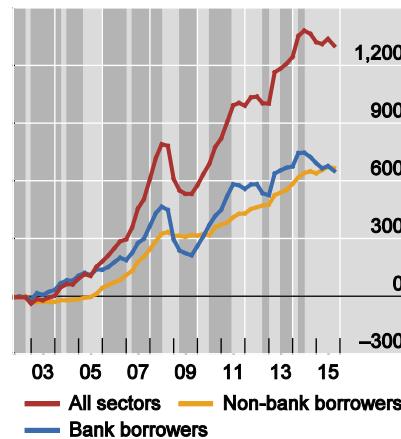
USD-denominated cross-border bank credit to EMEs

Graph 6

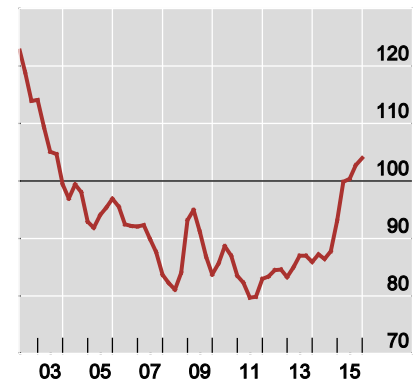
Cross-border bank credit to EMEs, all sectors (in per cent; coef = -0.574; p-val = 0.001)



Cumulative flows of cross-border bank credit to EMEs (USD bn)



USD nominal effective exchange rate (2000–09 = 100)



Positive changes in the exchange rate mean that the US dollar has appreciated. The shaded areas indicate a quarter-to-quarter depreciation of the nominal effective exchange rate of the US dollar. Cross-border bank credit is given by BIS reporting banks’ cross-border loans and holdings of debt securities.

Sources: National data; BIS locational banking statistics; BIS calculations.

The right-hand panel of Graph 6 plots the time path of the nominal effective exchange rate of the US dollar. The dollar weakened before the financial crisis, but has been strengthening unevenly since 2011. The centre panel plots the cumulative flows of cross-border lending denominated in US dollars to borrowers in emerging economies. The shaded areas indicate quarters when the dollar depreciated, and these are the periods when dollar borrowing increased sharply.

As a rule of thumb, a 1% depreciation of the US dollar is associated with a 0.6 percentage point increase in the quarterly growth rate of US dollar-denominated cross-border lending outside the United States (left-hand panel).

⁶ See R McCauley, “Capital flowed out of China through BIS reporting banks in Q1 2015”, *BIS Quarterly Review*, September 2015, pp 28–9.



These findings put the recent period of dollar strength into context. Just as a weakening dollar encourages greater borrowing in dollars, the stronger dollar recently has resulted in pressure to reduce debt in dollars.

The link between global leverage and the value of the dollar also puts the importance of global monetary conditions under the spotlight. The recent period of dollar strength should be understood in terms of the shifting stance of monetary policy in the United States and assessments of global market participants on risk-taking and leverage.⁷ Similarly, the growth in the dollar-denominated debt both in the run-up to the 2008 crisis and in the years immediately following the crisis represented times of a weaker dollar associated with accommodative monetary conditions in the United States. These were the times when dollar debts were growing rapidly. These findings add to the debates on monetary policy spillovers that H el ene Rey and others have contributed to recently.

I have mentioned already that contractions of leverage can be quite abrupt due to the close link between debt and risk-taking. The textbook model gives only marginal significance to a small shift in the interest rate. However, the close link between debt and risk-taking means that even a nudge on the tiller can elicit apparently disproportionate changes in risk-taking and the growth rate of debt.

Crucially, when there is a lot of borrowing in foreign currency, the link between debt and risk-taking has an added global dimension and exchange rates become financial amplifiers as well as playing their usual role in determining the trade balance. In this way, debt, risk-taking and exchange rates are all connected in global financial markets.⁸

To be sure, there are factors that mitigate concerns about dollar borrowing by EME firms:

- The first is that many of the EME firms have dollar cash flows, and so debt service is more manageable.
- The second is that a substantial portion of the dollar debt has been issued in the form of international debt securities, and that these debt securities have long maturity. Indeed, the average maturity of international debt securities issued by EME borrowers in 2015 is well over 10 years. This long maturity of the debt limits rollover risks and sudden flights of capital.
- The third is that the stock of foreign exchange reserves held by emerging market economies is substantial.

However, the feedback loop between deleveraging and EME currency depreciation presents challenges that should not be underestimated. That feedback loop has started to impact the broader economy in EMEs now that the dollar has started to appreciate.

First, as mentioned already, there is evidence that EME firms engaged in a form of "carry trade" by borrowing in US dollars and holding long positions in domestic currency. The financial assets could include bank deposits, a short-term claim on the shadow banking system, or a liability issued by another firm. The unwinding of these "carry trades" may create additional downward pressure in foreign exchange markets, as well as contribute to a general tightening of financial conditions at home.

Second, as already noted, the leverage of firms that have borrowed in dollars but have local currency assets is directly influenced by the exchange rate. In recent years, a weaker dollar has flattered the balance sheet of such firms as liabilities fell relative to assets. From the standpoint of creditors, the stronger credit position of the borrowers created spare capacity for credit extension even with a fixed

⁷ See eg H Rey, "International channels of transmission of monetary policy and the Mundellian trilemma", Mundell-Fleming Lecture, 13 November 2014, *IMF Review*, forthcoming.

⁸ See B Hofmann, I Shim and H S Shin, "Sovereign yields and the risk-taking channel of currency appreciation", *BIS Working Papers*, no 538, January 2016.

exposure limit for the lenders – for instance, through a value-at-risk (VaR) or economic capital (EC) constraint. The spare lending capacity was filled through an expansion in the supply of dollar credit. Now that the dollar has started to appreciate, the financial conditions of these firms have tightened, reducing investment, and curtailing operations as they seek to deleverage. Growth and employment will suffer as a consequence.

In this process, the large foreign exchange reserves in some emerging market economies may not necessarily prevent the slowdown in growth. Unlike in previous EME crises in the 1980s and 1990s that had the attributes of a sharp “sudden stop” in lending to EME sovereigns or a run on the banking system, the borrowing in dollars in recent years has been undertaken by private sector non-bank borrowers – mainly non-financial firms. Even if a firm operates in a country whose central bank holds large foreign exchange reserves, there is the question of how the dollars are transferred from the central bank to the firm itself. Unless there is some mechanism that transfers resources from the foreign exchange reserves to the firms themselves, the firms with dollar debts will need to curtail operations and reduce leverage, leading to a direct hit on overall economic growth. Some of these mechanisms have been put in place – for instance, through central bank facilities in some countries – but a consistent policy framework is required if they are to be effective. Thus, even a central bank that holds large foreign exchange reserves may find it difficult to head off a generalised slowdown in growth resulting from the recoiling from “carry trades” and the cutbacks in corporate investment.

Third, there is evidence that the depreciation of EME currencies has a knock-on effect on sovereign creditworthiness too. The role of the oil price here is especially important, as many of the EME governments have state-owned oil companies which contribute a substantial portion of their income to the general government budget. The importance of the oil price for EMEs is such that it deserves a separate, longer discussion, which follows below.

Exchange rate and sovereign risk

What is interesting is that, even for EMEs that are oil **importers**, there appears to be a knock-on effect of dollar appreciation on the creditworthiness of the sovereign. Given the tight links between sovereign yields and domestic lending rates to corporates and households, there is a relationship between exchange rates and domestic financial conditions more broadly.

We can illustrate this point with recent moves in EME sovereign credit default swap (CDS) spreads. Graph 7 shows how sovereign CDS spreads for a group of EMEs have moved with shifts in the bilateral exchange rate against the US dollar since the end of 2012. The horizontal axis in each panel is the percentage change in the bilateral exchange rate against the US dollar from the end of 2012. The vertical axis gives the change in the five-year sovereign CDS spread. The size of the bubbles indicates the total dollar-denominated debt owed by non-banks in the country.

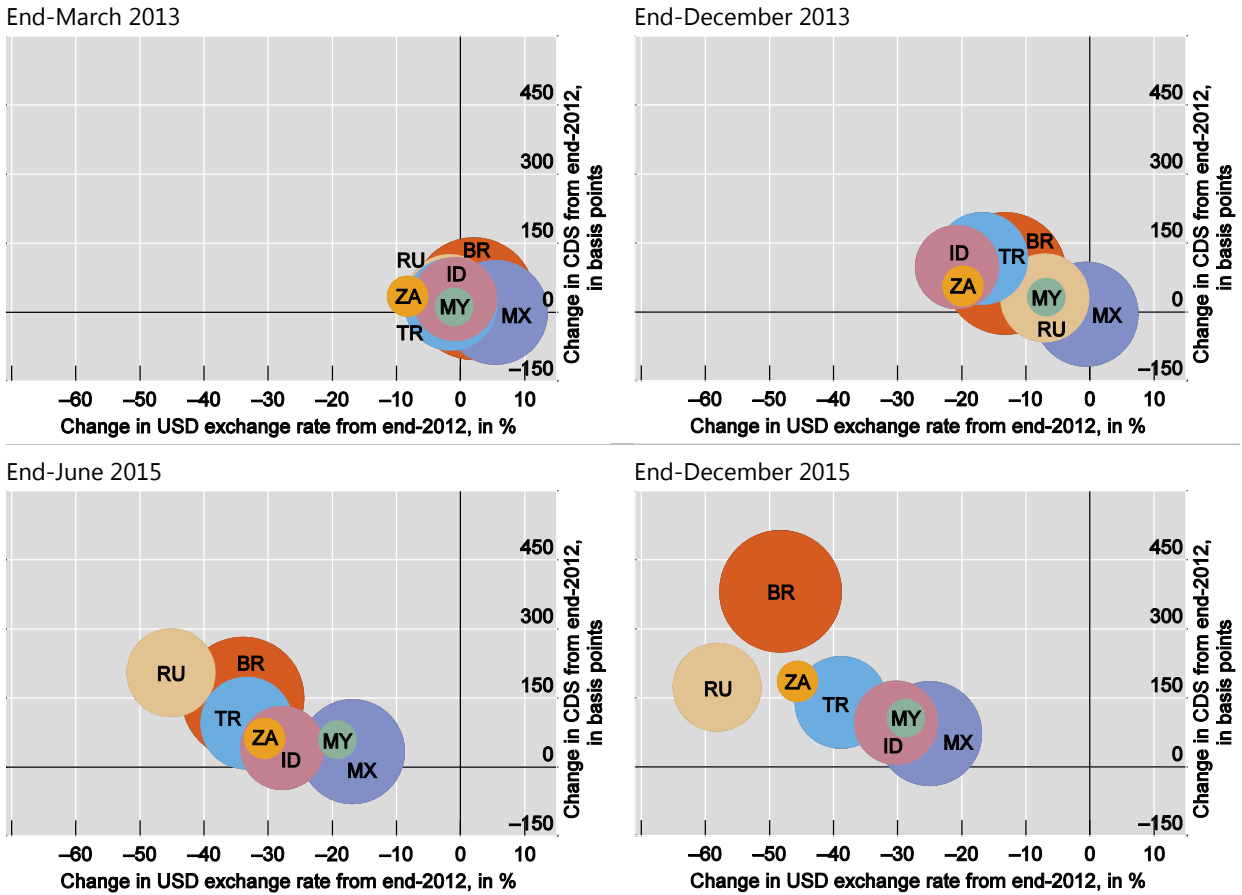
We see from the graph that there is both a time-series and a cross-section relationship between the CDS spread and the bilateral dollar exchange rate. In the cross section, the bubbles line up along a downward-sloping line, indicating that those countries that have depreciated more against the US dollar tend to have CDS spreads that are higher. Over time, as the US dollar appreciates, the bubbles migrate towards the top left-hand corner; in other words, as the domestic currency has weakened against the US dollar, EME sovereign CDS spreads have tended to rise.



Exchange rates and sovereign credit risk

Bilateral USD exchange rate and five-year sovereign CDS; change from end-2012

Graph 7



BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa. The size of the bubbles indicates the size of dollar debt in Q2 2015.

Sources: S Avdjiev, R McCauley and H S Shin, "Breaking free of the triple coincidence in international finance", *BIS Working Papers*, no 524, October 2015; Markit; national data; BIS.

In recent BIS research, we have found that these fluctuations in CDS spreads are also reflected in the yield spread between EME sovereign bonds and the corresponding spread in US Treasuries. Furthermore, these spread changes are found to be due to shifts in the risk premium, rather than in any deviations in interest rates already priced into forward rates.⁹ This evidence points to the interaction between investor risk appetite and the fiscal strength of EME governments.

⁹ Hofmann et al (2016), op cit.

Debt and oil

The impact of the fall in commodity prices for commodity-exporting countries has been far-reaching. The lessons are not limited to the oil firms in EMEs. US shale producers have also been an important element in the unfolding narrative. To be sure, the price of oil is determined by a complex set of factors, not least views about the evolution of production and consumption. And its fall over the past couple of years has clearly been influenced by major changes in supply conditions, such as the behaviour of OPEC. However, the common thread that ties together EME oil firms and US shale producers is the extent of leverage in the oil sector. The BIS did some early work on the role of debt in the oil sector at the beginning of last year, and we are continuing to look at these questions closely.¹⁰

The greater willingness of investors to lend against oil reserves and revenue had enabled oil firms to borrow large amounts in a period when debt levels have increased more. Companies in the oil sector borrowed both from banks and in bond markets. Issuance of debt securities by oil and other energy companies far outpaced the substantial overall issuance by other sectors. Oil and gas companies' bonds outstanding increased from \$455 billion in 2006 to \$1.4 trillion in 2014, an annual growth rate of 15%. Energy companies also borrowed heavily from banks. Syndicated loans to the oil and gas sector in 2014 amounted to an estimated \$1.6 trillion, an annual increase of 13% from \$600 billion in 2006.

A substantial portion of the increased borrowing was by state-owned oil companies from EMEs. From 2006 to 2014, the stock of total borrowing (syndicated loans and debt securities) of Russian companies grew at an annual rate of 13%, with that of Brazilian companies 25% and that of Chinese companies 31%. Borrowings of companies from other EMEs increased by 17% per annum. Graph 8 highlights the rapid growth of EME oil firm debt, especially through the bonds issued through offshore subsidiaries. The right-hand panel shows the total amount of bonds issued by the oil and gas sector of firms from a selected group of EMEs. The total debt outstanding can be measured in terms of either the debt of the borrowers located in a particular country (the locational series) or the total debt of the affiliated borrowers whose headquarters are located in the country concerned (the nationality series). We see that the difference between the two can be very large (Graph 8, right-hand panel), implying that EME oil firms were particularly active in issuing bonds through offshore subsidiaries.

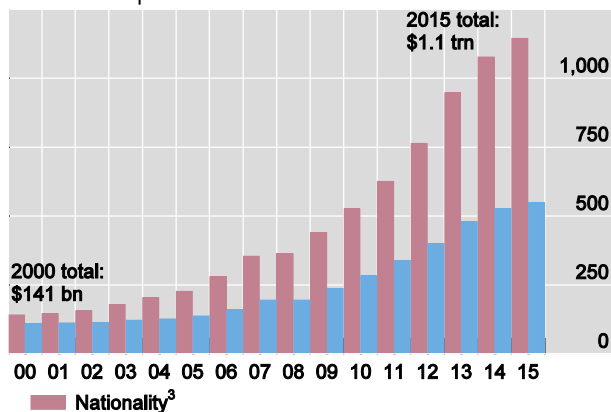
¹⁰ D Domanski, J Kearns, M Lombardi and H S Shin, "Oil and debt", *BIS Quarterly Review*, March 2015, pp 55–65. See also the recent discussion in S Dale, "New economics of oil", presentation at the Society of Business Economists Annual Conference, London, 13 October 2015.

Outstanding international debt securities

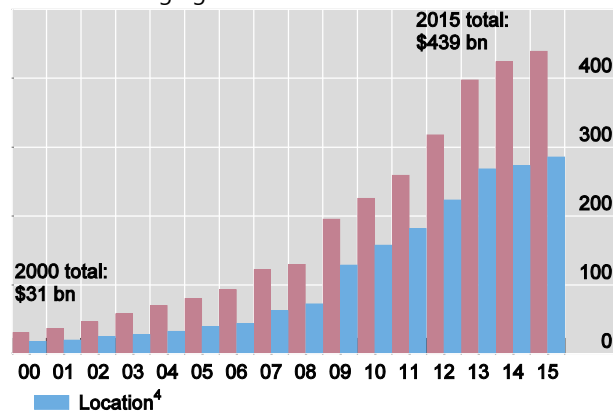
In billions of US dollars

Graph 8

Debt securities issued by developing country non-financial corporations¹



Debt securities issued by oil and gas sector firms in selected emerging economies²



¹ See *BIS Statistical Bulletin* for a list of countries. ² EMEs with oil production above 1 million barrels per day, namely: Brazil, China, Colombia, Indonesia, Kazakhstan, Kuwait, Malaysia, Mexico, Nigeria, Qatar, Russia, the United Arab Emirates and Venezuela. ³ Non-financial headquarters, by nationality of issuer. ⁴ Non-financial headquarters, by residence of issuer.

Sources: Dealogic; BIS international debt securities statistics; BIS calculations.

In many instances, the dollar borrowing by EME oil firms coincided with large dividend payments to their sovereign owners, directly contributing to the budget. As the price of oil declined, the amount remitted to the government also declined, which impacted the fiscal position of the governments that had grown increasingly reliant on the revenues from oil to finance government expenditure.

Some countries, such as Mexico, have hedged their oil revenues, but those governments that have not hedged such revenues have undergone fiscal retrenchment, which has reinforced the impact of decreased investment in lowering growth. Even if the government has hedged the oil revenue, the hedges are in place for short periods, such as one year, so that a prolonged period of low oil prices will eventually hurt government finances. EME governments have anticipated the eventual fiscal tightening and have front-loaded fiscal adjustments.

While it is true that EME oil firms do not have naked currency mismatches on their balance sheet, they are affected by the feedback loop generated by leverage. This loop operates even in the case of US oil producers that do not have currency mismatch, and highlights the feedback loop of deleveraging that takes place through the decline in the price of oil.

As with any leveraged sector, the combination of falling oil prices and higher leverage can lead to financial strains for oil-related firms.

First, the price of oil underpins the value of assets that back these firms' debts. Lower prices will tend to reduce profitability, increase the risk of default and lead to higher financing costs. Indeed, spreads on energy high-yield bonds have widened from a low of 330 basis points in June 2014 to over 1,600 basis points recently, much more than the increase for the yield on high-yield debt in general (Graph 9, right-hand panel). There has also been a sharp increase in the CDS spreads on debt instruments issued by EME oil firms (same panel).

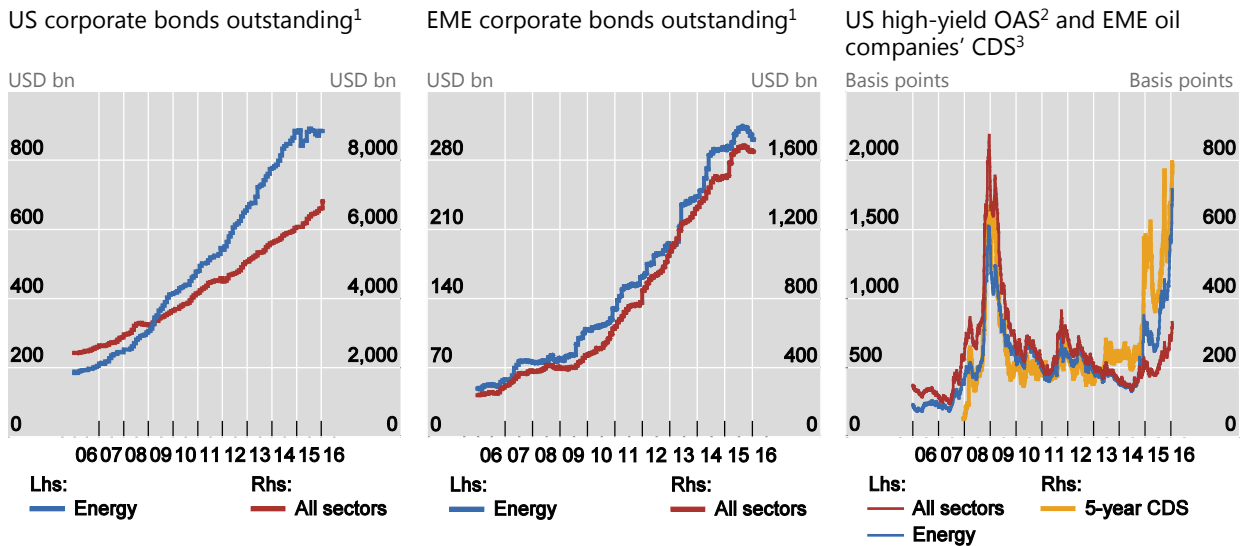
Second, a lower price of oil reduces the cash flows associated with current production and increases the risk of liquidity shortfalls in which firms are unable to meet interest payments. Such strains may affect the way firms respond to lower oil prices in two main ways. The first is by adjusting investment and production. Where a substantial portion of investment is debt-financed, higher costs and tighter



lending conditions may accelerate the reduction in capital spending. Highly indebted firms could even be forced to sell assets, including rights, plant and equipment.

Corporate bonds outstanding and credit spreads on energy company debt

Graph 9



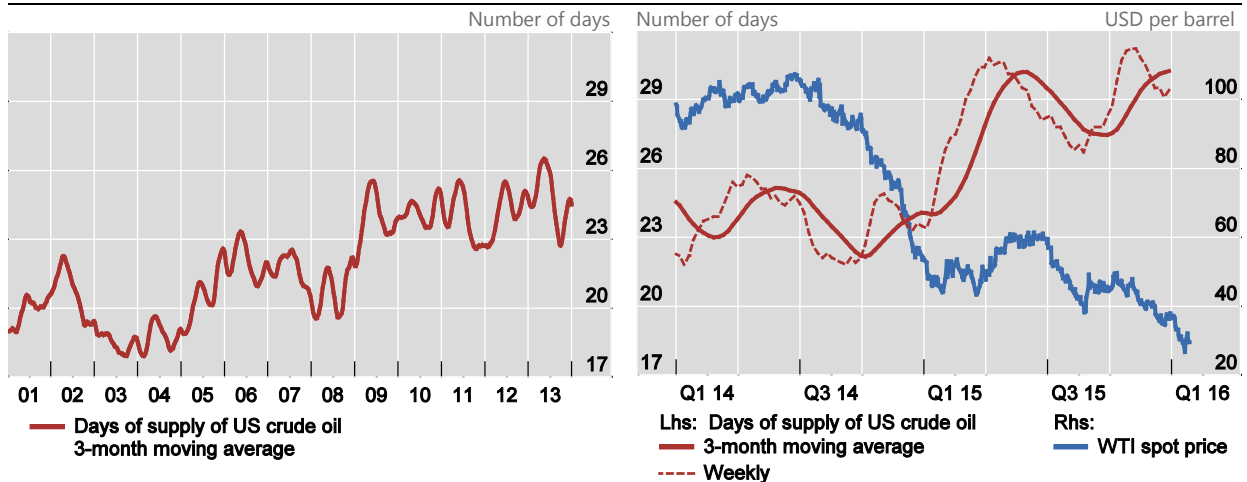
¹ Face value of Merrill Lynch high-yield and investment grade corporate bond indices. ² Option-adjusted spread vs treasury note. ³ Five-year CDS of Petróleos Mexicanos SA, Petróleo Brasileiro SA and Rosneft Oil Company weighted by total assets at the end of 2013.

Sources: Bloomberg; Datastream.

More pertinently for the price of oil, there is an impact on production. Highly leveraged producers may attempt to maintain, or even increase, output levels even as the oil price falls in order to remain liquid and to meet interest payments and tighter credit conditions. Second, firms with high debt levels face stronger imperatives to hedge their exposure to highly volatile revenues by selling futures or buying put options in derivatives markets, so as to avoid corporate distress or insolvency if the oil price falls further.

Days of supply of US crude oil and WTI spot price

Graph 10



Sources: US Energy Information Administration; Datastream.



If financial constraints contribute to keeping production levels high and result in increased hedging of future production, the addition to oil sales would magnify price declines. In the extreme, a downward-sloping supply response of increased current and future sales of oil could amplify the initial decline in the oil price and force further deleveraging. In addition to the other, well known factors that determine the oil price, this credit channel introduced by the financial structure of energy companies may be an amplification mechanism that has made this market so volatile.

The measure of outstanding stocks in Graph 10 is an indication that lower prices have not removed excess capacity from the market, but instead may have exacerbated it. The graph shows the outstanding stocks in the United States relative to the consumption of oil as measured by the input into refineries. We see that, since the end of 2014, the outstanding stock has outstripped previous years' levels, suggesting that production has been ramped up, rather than curtailed. The sharp increase in oil stocks has coincided with the decline in oil prices since June 2014.

Although the upward trend in Graph 10 pertains to US oil producers, these findings should be seen as holding lessons for the impact of leverage for oil firms in general. Highly leveraged EME oil firms will be faced with similar pressures. These findings are a good illustration of the amplification effects of leverage.

Conclusion

Eight years after the great financial crisis, the global economy is still finding it difficult to reach sustainable and balanced growth. Global recovery continues, albeit modestly by historical standards. Many uncertainties and downside risks remain. In the latest instalment of a movie that began before the crisis, emerging market economies have seen a significant growth slowdown, and commodity prices, exchange rates and asset prices have experienced a major realignment. EME firms that have borrowed in dollars have been especially hard hit by the sharp appreciation of the dollar in recent months, as they have reduced investment and curtailed their operations, contributing to the overall slowdown. The slowdown in China associated with the transformation of its economy has been an especially important factor for the global economy as a whole. It has weakened demand for commodities and has added further impetus to the downturn in commodity markets that has depressed the outlook for commodity exporters.

To be sure, there are important idiosyncratic factors, which complicate the stylised perspective that I have presented today. However, rather than being regarded as separate, exogenous "shocks", the combination of disappointing growth, large adjustments in exchange rates and falls in commodity prices is better seen as a set of outward manifestations of the combination of maturing financial cycles, this time in a number of emerging economies, and shifts in global financial conditions, which have influenced in particular exchange rates and the dollar component of debt. This perspective highlights the amplifying mechanisms and risks associated with the cumulative growth in the stock of debt.

To the extent that these transformations, realignments and adjustments in global conditions help to right financial imbalances and slow down the overall growth of debt globally, they can be seen as a necessary development in a welcome path towards normalisation. Unfortunately, these processes are not smooth and linear and pose significant challenges. These challenges need to be managed to avoid major financial distress and to reduce headwinds to growth. We should not be surprised if the feedback loops set in motion by the deleveraging and divergent conditions lead to financial market turbulence. The temptation may be to try to keep the financial booms going, or to give them a new lease of life, but this will be just a palliative unless the stock of debt is adjusted and vulnerabilities are reduced.

We have learnt from advanced economies that managing turning financial cycles, against the backdrop of high stocks of debt, modest growth and low inflation, is not easy. We also know that the world is more interconnected than ever and that there are challenges for emerging and advanced



economies alike. The spillbacks from EMEs can be significant. One consequence of turning financial cycles and of the impact of a dollar appreciation on their common US dollar component is that credit conditions have tightened due to the feedback loop generated by the deleveraging. Given the close connection between debt and risk-taking, the shift in sentiment accompanying the turning financial cycles and in conditions on dollar borrowing can be quite abrupt. Since a substantial amount of the debt was incurred in foreign currency, the pullback from risk-taking is closely intertwined with the exchange rate.

Hopefully, we are better prepared to deal with some of the problems. The regulatory reforms have strengthened the resilience of the banking system, new policy tools have been explored, including macroprudential policies, and emerging economies are better prepared, after years of improving policy frameworks and increasing cushions, such as higher foreign reserves. However, the challenges should not be underestimated, the policy room for manoeuvre has been shrinking and, most importantly, the global economy seems unable to avoid debt-fuelled growth patterns.

This leads me to my concluding remarks, from the long-term perspective that we at the BIS try to bring to the policy debates:

- The need to have a more balanced combination of policies. Monetary policy has been overburdened for too long. A longer-term perspective means paying more attention to the more entrenched impediments to growth – factors that may be slow-moving but whose effects accumulate over time. In particular, we can count impaired balance sheets, the build-up of financial imbalances and resource misallocations, which harm productivity growth. Bumpiness should be expected, but should not be a reason per se to delay normalisation.
- The need to recognise and internalise the importance of international spillovers and spillbacks. The principle of keeping one's house in order is necessary but is not enough. Policymakers will have to rely on sound judgment and possibly skilful intervention to mitigate the possible contagion effects that may accompany deleveraging. Central bank cooperation will become more important than ever.