



Monetary policy for financial stability

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Introduction

It is a great pleasure to be here in beautiful Myanmar. Thank you very much for inviting me to address this gathering of SEACEN Governors.

Collectively, you represent a region that came through the Great Financial Crisis (GFC) of 2007–09 quite well. As a European, I should be asking you how you did it. But I suspect part of the answer is that, because of the Asian financial crisis one decade earlier, many central banks in the region never lost sight of the importance of financial stability. Many of you were implementing macroprudential measures before the term “macroprudential” was widely known.

In fact, emerging market economies (EMEs) in general fared well during the GFC. But it would be a mistake to assume that EMEs are immune to the problems observed in advanced economies. In this era of unsatisfactory growth, central banks everywhere are being asked to carry most of the burden of macroeconomic stabilisation.

We at the BIS have long been arguing that central bank policy should not be the “only game in town”. In particular, it is not central banks’ role to assume functions more properly taken on by the fiscal or other authorities. Structural reforms to enhance productivity and growth potential – including changes to the tax system – are extremely important.

At the same time, there is one area where we think central banks in both advanced and emerging market economies might constructively broaden their horizons. And that is to explicitly and systematically incorporate financial stability considerations in monetary policy – what we at the BIS call a financial stability-oriented monetary policy.

We hold the view that present monetary policy frameworks do not give enough consideration to the build-up of financial imbalances and that they focus too narrowly on near-term price and output stabilisation. We do not think financial excesses can be tackled only with prudential measures. It would be rather elegant if some kind of “separation principle” allowed monetary policy to concentrate exclusively on the business cycle, while prudential and macroprudential policies dealt with the financial cycle. Unfortunately, we don’t think this describes the real world.

What is new, or has been further developed by recent research at the BIS, is the emphasis on being *systematic* about financial stability considerations. A financial bust is of course costly. But a financial boom – even if it does not end in crisis – can also have a long-lasting impact on the real economy through, for example, a misallocation of resources. Acting “systematically” implies that monetary policy acts against the early build-up of financial imbalances, even when the prospect of a crisis is remote.

Therefore, this research is not only about dealing with financial crisis. What it suggests is that enhancing monetary policy frameworks with financial stability variables can result in net benefits in terms of output and inflation more generally.



In my remarks, I will first discuss the importance of risk-taking in monetary policy transmission. Although this channel is usually ignored in today's money-macro textbooks, it is vitally important. I will next review how one might assess the role of financial stability considerations in monetary policy. I will then discuss potential issues that are especially relevant when pursuing a financial stability-oriented monetary policy in open economies that are prone to significant capital flows, notably the role of the exchange rate and the use of macroprudential tools.

The risk-taking channel of monetary policy

Monetary policy operates through many channels: perhaps the interest rate channel is the best known. Another that frequently attracts attention is the credit channel of collateral valuations and net worth emphasised in the famous work of Bernanke and Gertler in 1989.¹

Monetary policy, by setting the universal price of leverage in a given currency, will influence not only monetary stability but also financial stability. It may therefore be the most effective way to get into "all of the cracks" not reached by regulation and supervision.² Moreover, monetary policy also has the potential to increase the risk-taking of investors and financial institutions, thereby affecting economic activity. This again is a point that has been emphasised by economists at the BIS for some time.³ And this idea has gained recognition in recent years.⁴

This risk-taking can also involve excessive leverage and maturity transformation, as well as imprudent exposures to credit and exchange rate risk. In this respect, the very transmission mechanisms of monetary policy can increase vulnerabilities and reduce resilience. And so, the risk-taking channel generally ties monetary and financial stability together quite closely.

The empirical evidence is lending more and more support to the significance of this channel. Loose monetary policy, by increasing the ability to assume risk, fuels risk-taking by investors and financial intermediaries.⁵ This lowers the price of risk, which in turn can lead to more extreme spikes in volatility in crisis episodes: the so-called "volatility paradox" described by Brunnermeier and Sannikov in their recent work.⁶

¹ B Bernanke and M Gertler, "Agency costs, net worth and business fluctuations", *American Economic Review*, vol 79, no 1, March 1989, pp 14–31.

² See J Stein, "Overheating in credit markets: origins, measurement, and policy responses", speech at research symposium sponsored by the Federal Reserve Bank of St Louis, February 2013.

³ See eg C Borio and H Zhu, "Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism?", in *Journal of Financial Stability*, vol 8, no 4, December 2012, pp 236–51; first published as *BIS Working Papers*, no 268, December 2008.

⁴ See eg G Jiménez, S Ongena, J Peydró and J Saurina, "Hazardous times for monetary policy: what do twenty-three million bank loans say about the effects of monetary policy on credit risk-taking?", *Econometrica*, vol 82, no 2, March 2014, pp 463–505; and H Hau and S Lai, "Asset allocation and monetary policy: evidence from the eurozone", *Journal of Financial Economics*, vol 120, no 2, May 2016, pp 309–29.

⁵ See T Adrian and H S Shin, "Money, liquidity, and monetary policy", *American Economic Review*, vol 99, no 2, May 2009, pp 600–5.

⁶ M Brunnermeier and Y Sannikov, "A macroeconomic model with a financial sector", *American Economic Review*, vol 104, no 2, February 2014, pp 379–421. This conclusion echoes the "paradox of financial instability" in C Borio and M Drehmann, "Toward an operational framework for financial stability: 'fuzzy' measurement and its consequences", in *Financial Stability, Monetary*



The impact of monetary policy on risk-taking in the banking sector is especially important. In periods of easy monetary policy, banks may take on more risk on the asset side by reaching for yield on loans and investments of lower credit quality. With eased borrowing constraints, banks also take on more liability-side risk by borrowing short-term from less stable wholesale sources.

And the risk-taking channel can be even stronger for those jurisdictions that have an active shadow banking sector. Prudential regulation in this rapidly developing sector is frequently less equipped to monitor and rein in systemic risk.

In sum, although the risk-taking channel is not required to justify a financial stability-oriented monetary policy, it does tie monetary and financial stability together very closely. And it makes it hard to imagine monetary policy actions divorced from financial stability considerations.

Factoring in financial stability: understating the benefits⁷

It is perhaps natural, then, to consider how to incorporate financial stability concerns into monetary policy more generally. And yet, we think the benefits to economic welfare are being underestimated.

For instance, some experts have argued that tightening monetary policy to reduce the probability of future financial crises has near-term macro costs that exceed any longer-term output benefits. The arguments against such a “leaning against the wind” policy are consistent with the “separation principle” mentioned earlier: that monetary policy should concern itself exclusively with near-term output and inflation, and leave it to other policies to deal with financial stability risks.⁸

The models that underlie this view essentially compare the cost of lost output today from higher interest rates with the benefits of greater output in the future because of the lower probability of financial crises. While this is not the occasion to go into all the details of these models, let me review some assumptions that we believe may be leading to an underestimation of the benefits of a financial stability-oriented monetary policy.

For one, output losses from a financial crisis are usually assumed to be one-off, with growth eventually returning to trend. This view corresponds to the example in the left-hand panel of Graph 1. However, that’s not what the Basel Committee on Banking Supervision concluded shortly after the crisis, with the support of simulations and an extensive review of other research.⁹ The more realistic scenario is illustrated in the right-hand panel. Even if growth returns to its previous trend rate or even gets closer to the previous path, this is most likely to be along a lower output path, with potential output permanently lower. Even worse, there is increasing evidence that the growth of potential output too might be lower for a long time following financial crises.

Policy and Central Banking, vol 15, 2011, Central Bank of Chile, and Minsky’s earlier well known argument of how stability can be destabilising – see H Minsky, *Can “it” happen again?: Essays on instability and finance*, Armonk NY: M E Sharpe, 1982.

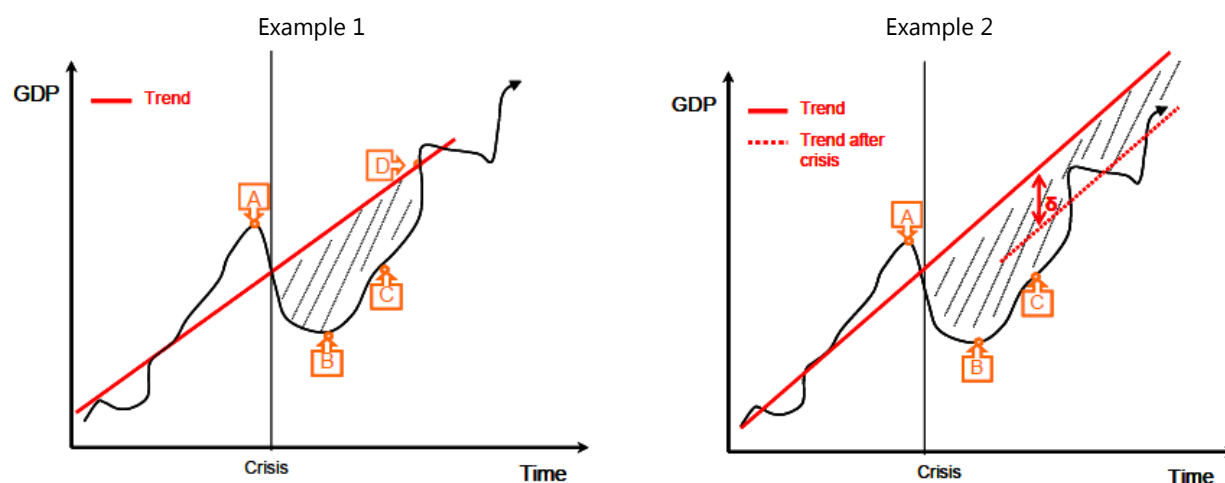
⁷ For a more detailed analysis of these issues, see C Borio, “Towards a financial stability-oriented monetary policy framework?”, speech at *Central banking in times of change – A conference on the occasion of the 200th anniversary of the Central Bank of the Republic of Austria*, Vienna, 13–14 September 2016.

⁸ See L Svensson, “Inflation targeting and ‘leaning against the wind’”, *International Journal of Central Banking*, vol 10, no 2, June 2014, pp 103–14.

⁹ See Basel Committee on Banking Supervision, *An assessment of the long-term economic impact of stronger capital and liquidity requirements*, August 2010. Reinhart and Rogoff document, with a sample spanning several centuries, that banking crises tend to lead to recessions that are much longer and deeper than recessions not coinciding with banking crisis – see C Reinhart and K Rogoff, *This time is different: eight centuries of financial folly*, Princeton University Press, 2009.

Measuring the costs of crises: a schematic overview

Graph 1



Point A: pre-crisis peak. Point B: post-crisis trough. Point C: GDP growth equals trend GDP growth for the first time after the crisis. Point D: the level of GDP returns to the pre-crisis level.

Source: Basel Committee on Banking Supervision, *An assessment of the long-term economic impact of stronger capital and liquidity requirements*, August 2010.

Another assumption is that the central bank can provide monetary policy easing to restore economic growth after the crisis, just as it does during a regular business cycle downturn. But cleaning up after a financial crisis – or what is often called a balance sheet recession – is very difficult and costly. Research at the BIS and elsewhere shows that monetary policy has a very hard time dealing with the aftermath of balance sheet recessions, when it is simply not as effective in raising growth.¹⁰

A third assumption is that a policy of “leaning against the wind” affects only the probability and not the cost of the crisis. But this view is not very plausible. The bigger the initial imbalance, the larger the hole in banks’ balance sheets in the downturn, and the higher the cost of the crisis. It follows that restraining the build-up ahead of time will reduce the extent of the damage.

Fourth, we at the BIS think of risks as building up over time. To a large extent, they are endogenous: there is inertia, they don’t just die away. Moreover, as they build up, they impact the real economy, for example by misallocating resources and reducing productivity growth. Thus, there is a cost to waiting until shortly before the crisis to act. Financial stability policy is not just something that should be applied once the warning lights of imminent financial crisis are flashing.

Fifth, neither do the standard models incorporate the risk-taking channel of monetary policy. This leads to an underestimation of how much monetary policy influences the probability and severity of financial crises. More broadly, and also more difficult to capture in models, analytical frameworks tend to underestimate the cross-border spillovers and the feedback effects of monetary policies, particularly those of the large economies.¹¹

¹⁰ See M Bech, L Gambacorta and E Kharroubi, “Monetary policy in a downturn: are financial crises special?”, *BIS Working Papers*, no 388, September 2012.

¹¹ For recent work on the spillovers to Asia, see K Miyajima, M S Mohanty and J Yetman, “Spillovers of US unconventional monetary policy to Asia: the role of long-term interest rates”, *BIS Working Papers*, no 478, December 2014.



Relaxing some assumptions

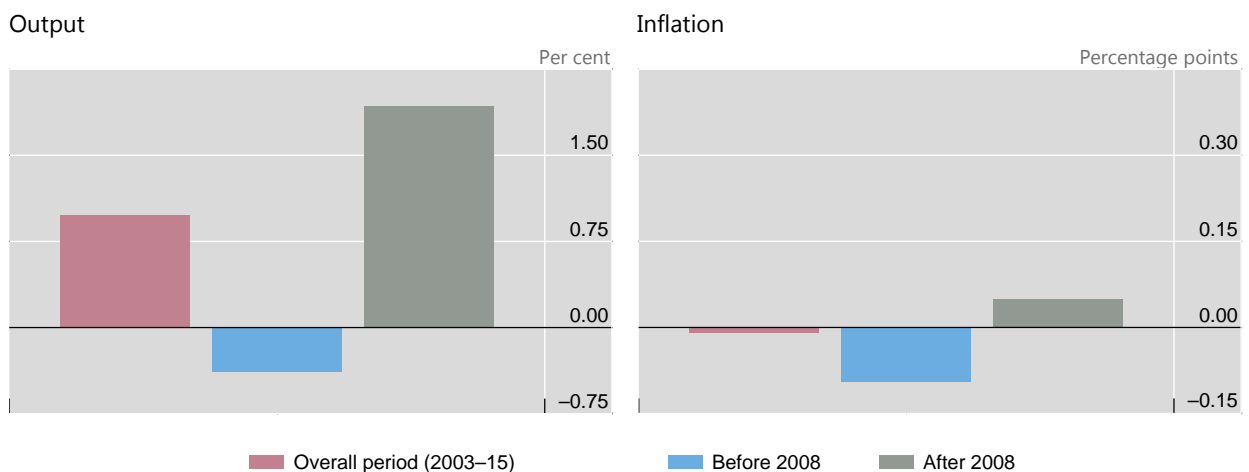
Properly integrating financial considerations into monetary policy frameworks requires an analytical framework that has yet to be fully developed. However, relaxing some of the above-mentioned assumptions can result in outcomes more in line with the intuition I have just described.¹² The details, of course, will depend on the specific models and calibration. But, as an example, researchers at the BIS have found that when one adds two financial cycle indicators to a standard macroeconomic model – one proxying for the debt service burden of the private sector and the other for leverage – these indicators can have a significant influence on private sector expenditure and output, and result in the model producing recessions with permanent output losses.

More ambitiously, what if we run a counterfactual exercise based on US data and ask how output and inflation might have evolved in the past decade and a half had monetary policy responded not *only* to output and inflation, as in a standard Taylor rule, but *also* to these indicators of the financial cycle? How might developments have unfolded in such a parallel universe?

This is a very tough question. That said, such an exercise suggests that the economy might have performed better. Graph 2 shows the results of the counterfactual exercise from 2003 to the present. As we can see in the left-hand panel, the economy would have grown about 1% more per year on average (red bar), with marginally lower growth before 2008 (blue bar) more than compensated for by significantly higher growth from 2008 (green bar). Any losses in the leaning phase during the boom would have been recouped and more than recouped later on, by helping to avoid really bad outcomes. At the same time, we see in the right-hand panel that inflation would have been effectively unchanged over the period.

An illustrative experiment: higher output and similar inflation

Graph 2



Source: M Juselius, C Borio, P Disyatat and M Drehmann, "Monetary policy, the financial cycle and ultra-low interest rates", *BIS Working Papers*, no 569, July 2016; based on US data.

Moreover, the same exercise suggests that it is important to lean early. The counterfactual policy interest rate (not shown in the graph) would have been some 1 percentage point higher than the actual rate until mid-2005, but then lowered considerably sooner than the actual interest rate was. Further, policy

¹² See M Juselius, C Borio, P Disyatat and M Drehmann, "Monetary policy, the financial cycle and ultra-low interest rates", *BIS Working Papers*, no 569, July 2016.



rates would have been normalised much more quickly after the recession, as the output decline would have been smaller and the recovery stronger. In sum, the observed gains to output over the period as a whole come from policy smoothing the financial cycle.¹³

Let me stress: this is just one exercise. And, like all exercises of this nature, it is subject to a number of analytical and empirical limitations. It is, however, indicative of the possible gains to leaning against the wind and how they might arise.

Complications and caveats

So far, my discussion has abstracted from the complications which international capital flows and exchange rates may present to the monetary authority looking to lean against the wind. Cross-border capital flows can exacerbate asset price booms and busts – even more so if there is significant foreign currency debt. H el ene Rey has famously characterised this phenomenon as a “global financial cycle”.¹⁴

Exchange rate regimes of course constrain how much monetary policy can do to incorporate financial stability implications and lean against the wind. In the case of an exchange rate peg, by construction the answer is *not at all*: you cannot use the interest rate proactively to contain financial stability risk, and can only maintain financial stability with prudential (and other policy) tools and a flexible economy.

But even in the case of floating rates, there are constraints. Traditionally, we have thought of exchange rate appreciation due to higher domestic rates as having a disinflationary impact domestically, and thus perhaps magnifying the contractionary impact of higher interest rates. However, recent BIS research shows that the impact of exchange rate appreciation on domestic financial stability can go in the other direction.

Specifically, this research finds that appreciating domestic exchange rates may increase incentives to bear currency risk. For instance, we observe that foreign currency bond issuance by domestic firms in EMEs tends to increase when the local currency appreciates. Non-financial firms thus take on carry trade-type risks when their balance sheets improve due to local currency appreciation, and in so doing encourage further appreciation.¹⁵ This tendency for increased currency risk-taking when the domestic currency rises has been referred to as “the risk-taking channel of currency appreciation”.

So this presents yet another potential dilemma when pursuing a financial stability-oriented monetary policy. Of course, how far such risk-taking constrains policies depends on the characteristics of

¹³ It is worth noting that this approach of incorporating financial stability considerations into monetary policy, unlike some others (eg J Stein, “Incorporating financial stability considerations into a monetary policy framework”, speech at the *International Research Forum on Monetary Policy*, Washington DC, 21 March 2014), does not rely heavily on financial market indicators to determine tipping points for intervention. Emerging markets often do not have the proper liquidity in credit markets that would allow a spread to be used as a signal of imbalances or overshooting. And even when markets do exist, they often have not been around long enough to allow proper inference about their relationship with subsequent macroeconomic performance.

¹⁴ See H Rey, “Dilemma not trilemma: the global financial cycle and monetary policy independence”, in *Global dimensions of unconventional monetary policy*, proceedings of the Federal Reserve of Kansas City Jackson Hole symposium, August 2013, pp 285–333.

¹⁵ See V Bruno and H S Shin, “Global dollar credit and carry trades: a firm-level analysis”, *Review of Financial Studies*, forthcoming; first published as *BIS Working Papers*, no 510, August 2015. When the dollar is weak, global investors perceive reduced risks and have credit capacity to extend credit, and global flows increase into emerging markets. Conversely, when the dollar strengthens, borrowers appear weaker, and creditors become more cautious and reduce exposures. The bilateral exchange rate with the US dollar is the main driver of this type of behaviour since international lending is most often denominated in US dollars.



the economy and broader circumstances. Capital flow management measures are also sometimes undertaken to resist the destabilising consequences of exchange rate appreciation, but these can have long-term distortionary effects.

Why macroprudential measures may need help

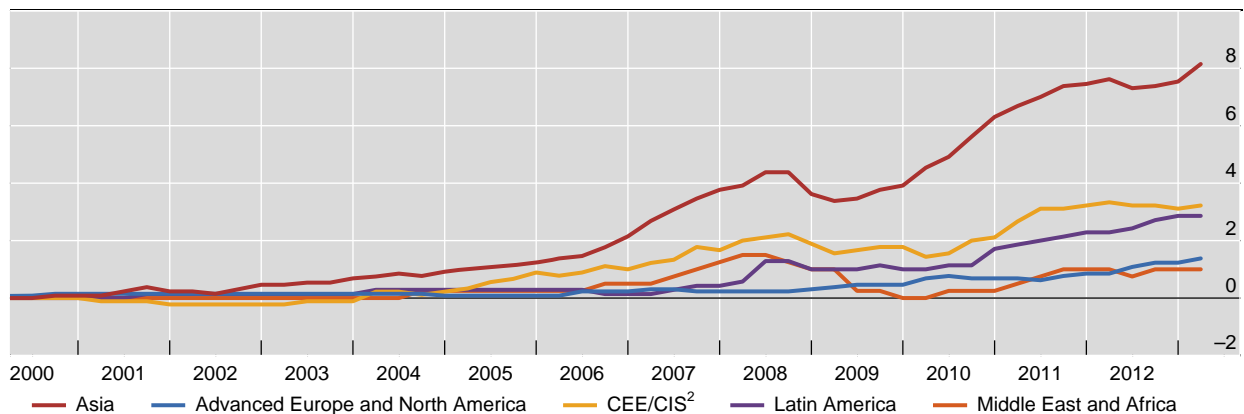
More generally, macroprudential measures can be taken independently of monetary policy to stabilise the financial system. Some would argue that relying on such tools could be viewed as an alternative to a financial stability-oriented monetary policy. As I noted at the outset, many of the economies in Asia already have a long experience with such measures. These instruments may target borrowers, such as maximum loan-to-value or debt-to-income ratios, or financial institutions, such as capital surcharges, leverage ratios for banks, foreign currency loan limits and so on.

Graph 3 cumulates the macroprudential measures adopted by various regions since 2000, and presents the average per country in each region. Authorities in EMEs are much more experienced with macroprudential measures than their counterparts in advanced economies. We also see from the red line that Asia stands out for its frequent use of the tools. Among the range of tools, policymakers in this region have been more likely to adopt those aimed at financial institutions.

Macroprudential policies: cumulative actions by region

Average per country in each region, Q1 2000–Q1 2013¹

Graph 3



¹ Index summing up housing-related measures, credit measures, reserve requirements, dynamic provisioning and core funding ratio. Simple average across countries within country groups. ² Central and eastern Europe and Commonwealth of Independent States.

Source: L Zhang and E Zoli, "Leaning against the wind: macroprudential policy in Asia", *IMF Working Papers*, no 14/22, February 2014.

There are many studies on the effectiveness of these tools, both in the region and in EMEs generally.¹⁶ By construction, macroprudential measures should be expected to make the financial system more resilient, since all of them build up buffers. But do they, in addition, help to constrain financial

¹⁶ See O Akinci and J Olmstead-Rumsey, "How effective are macroprudential policies? An empirical investigation", *International Finance Discussion Papers*, no 1136, 2015; V Bruno, I Shim and H S Shin, "Comparative assessment of macroprudential policies", *BIS Working Papers*, no 502, June 2015; E Cerutti, S Claessens and L Laeven, "The use and effectiveness of macroprudential policies: new evidence", *IMF Working Papers*, no 15/61, March 2015; M Lee, R Asuncion and J Kim, "Effectiveness of macroprudential policies in developing Asia: an empirical analysis", *Asian Development Bank Economics Working Paper Series*, no 439, July 2015; and L Zhang and E Zoli, "Leaning against the wind: macroprudential policy in Asia", *IMF Working Papers*, no 14/22, February 2014.



booms? The evidence does indeed indicate that they have helped to constrain credit growth, albeit with a lag. In Asia, this finding particularly holds for housing-related measures. On the other hand, evidence of an impact on housing prices is visible in only a few jurisdictions.

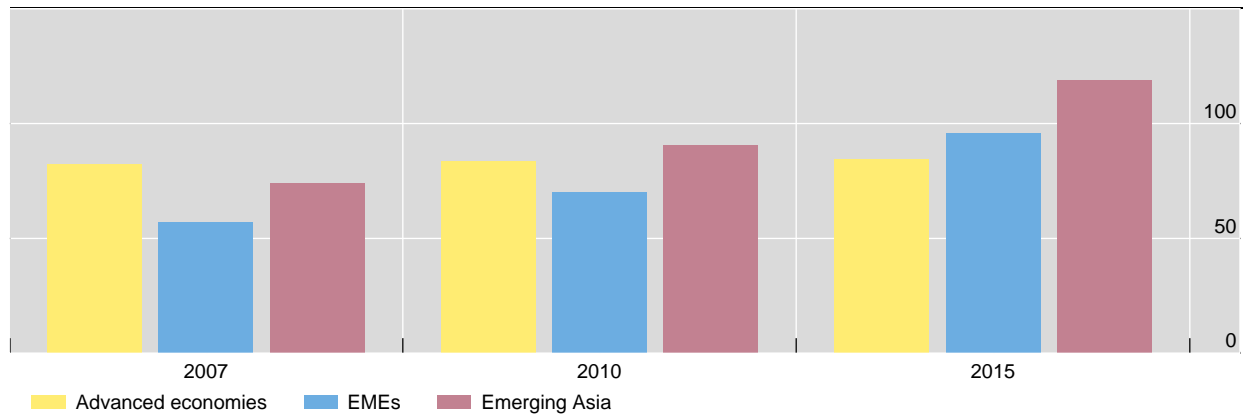
Despite the apparent success in reducing credit growth in some sectors, and partial success in affecting asset prices, macroprudential tools do not appear to have sufficed to prevent the emergence of the usual signs of financial imbalances. This year's BIS Annual Report looks into this in more detail; here let me just mention a few salient developments.

Take corporate credit, shown in Graph 4 as a percentage of GDP for both advanced and emerging market economies between 2007 and 2015. While the ratio of corporate debt to GDP for advanced economies (yellow bar) on the whole has been range-bound around 80%, the same ratio for EMEs (blue bar) has risen. In particular, between 2007 and 2010 it increased from 60% to 70%, and by 2015 to 95%, at which level it had surpassed even that of advanced economies. And if we look at just Asia (red bar), the rise is even more marked.

Corporate debt

As a percentage of GDP

Graph 4



Averages across jurisdictions weighted by GDP. Advanced economies: Australia, Canada, Denmark, Germany, France, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, the United Kingdom and the United States. Emerging market economies: Argentina, Brazil, China, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Poland, Russia, Saudi Arabia, Singapore, South Africa and Turkey. Emerging Asia: China, Hong Kong SAR, India, Indonesia, Korea, Malaysia and Singapore.

Sources: National data; BIS, *86th Annual Report*, June 2016, Graph I.3; BIS calculations.

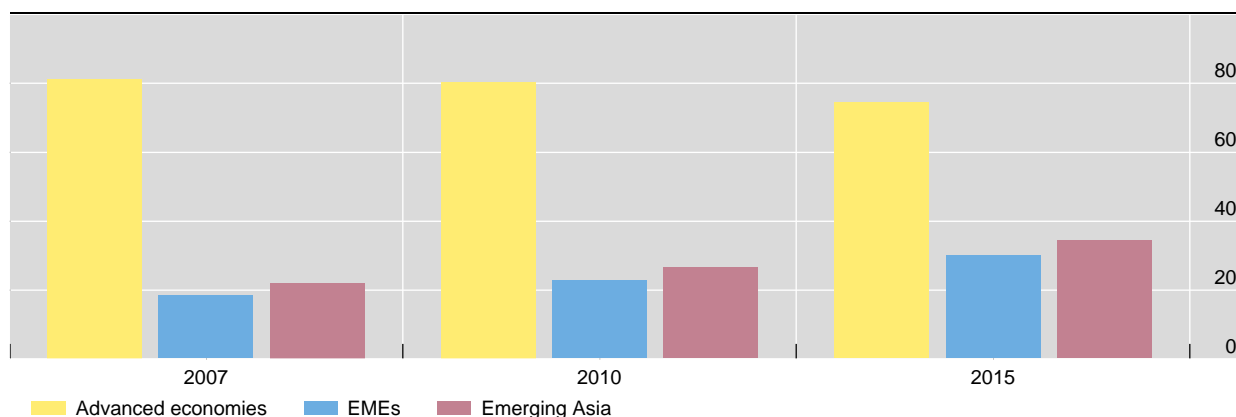
The picture is not much different if we consider household credit, as shown in Graph 5. We see extraordinary growth of household debt in the red bars representing the Asian EMEs, although as a percentage of GDP it has not yet risen to the levels of advanced economies.

What is causing the outsize growth in corporate and household credit in Asia, despite the adoption of the macroprudential measures? Have the tools worked as effectively as one had hoped? And have these measures become less potent over time as economies have become more open and financially integrated? Or has the global trend of greater reliance on capital markets – in particular, for the financing of corporations – which is outside the realm of traditional financial intermediary-based measures, played a role? These are questions that warrant further discussion and research.

Household debt

As a percentage of GDP

Graph 5



See Graph 4 for the lists of countries in the underlying sample.

Sources: National data; BIS, *86th Annual Report*, June 2016, Graph I.3; BIS calculations.

In any event, the message here for emerging market economies generally, it seems to me, is that while the use of macroprudential tools is helpful, it is not a cure-all. Those who argue there is no need to put financial stability into monetary policy because one can always use macroprudential measures to correct imbalances may have an overly optimistic view of their effectiveness. Indeed, a financial stability-oriented monetary policy might in fact ease the burden on macroprudential tools and make them more effective.

Summing up

Allow me to sum up briefly and then conclude.

Monetary and financial stability are closely linked. The impact of monetary policy on risk-taking highlights just how tight this link can be. The link makes it natural to take financial stability into consideration when setting monetary policy.

Some of the models that find no long-term net benefits in a “leaning against the wind” policy adopt assumptions that tend to underestimate the benefits. They tend to neglect the risk-taking channel, to assume that the costs of financial crises are one-off, to assume that monetary policy works just as well in the aftermath of a crisis as in a normal recession, to assume that leaning against the wind lowers only the probability of crisis but not its cost, and to neglect the cumulative nature of financial imbalances. They also imply that there are no benefits to such a policy unless crises occur and that waiting before acting as financial booms develop has no cost.

Relaxing these assumptions suggests that leaning early as part of a systematic response of monetary policy over the whole financial cycle can yield significant economic benefits. In particular, pre-emptive action can improve the performance of output in the medium term.

Exchange rates are a critical complication to the analysis when leaning against the wind, in part because stronger currency appreciation during a financial boom can be a side effect of a financial stability-oriented monetary policy. This is particularly the case for small open economies, where tightening measures can exacerbate imprudent foreign exchange risk-taking on the part of global lenders and investors as well as domestic borrowers.



While we acknowledge that macroprudential measures are essential to improving possible trade-offs between price and financial stability, we argue that the evidence suggests they do not suffice on their own to forestall the emergence of financial imbalances. There still remains a role for financial stability-oriented monetary policy.

Whether it be monetary policy, exchange rate policies or the use of macroprudential tools, we would do well in the long term to avoid policies that pull in opposite directions. Research has found that macroprudential tools work best when they are used as complements to the monetary policy stance.¹⁷

I look forward to discussing your reactions and your experiences. Thank you again for inviting me.

¹⁷ See BIS, *86th Annual Report*, June 2016, Chapter IV.