BANK FOR INTERNATIONAL SETTLEMENTS

The banking industry: struggling to move on[1]

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"Competition in banking: implications for financial regulation and supervision", Fifth EBA Research Workshop, London, 28–29 November 2016

The question of competition in banking – the subject of this event – has been hotly debated for a very long time. There is a consensus that in other sectors unrestrained competition is best. But in banking there has always been a nagging feeling that it might not be, because given the specificities of the industry it could encourage too much risk-taking and engender costly instability (eg Berger et al (2004), Vives (2016)).

The answer, of course, is not to artificially curtail competitive forces, but to make sure that they play out on solid foundations. We want strong and agile institutions to compete with each other. The task of prudential regulation and supervision in combination with competition authorities is to provide the right framework for this to happen. To be sure, the devil is always in the detail: tensions can and do arise. But the direction of travel is clear.

This explains the three questions I would like to address today. The answers hold the key to how well the industry will fare in the years ahead. So, at the cost of spoiling the suspense, here they are.

Is the banking industry stronger than before the Great Financial Crisis (GFC)? In some important respects, no doubt; even so, some troubling questions remain, including those raised by widespread market scepticism (eg Caruana (2016)).

Why such scepticism? It arguably results from a poisonous mix of legacy problems and an unfavourable economic environment. Legacy problems reflect, in part, an inadequate policy response to the banking strains the crisis caused. A key feature of the unfavourable economic environment, which no one anticipated even in the aftermath of the crisis, has been persistently and extraordinarily low interest rates – their recent pickup notwithstanding.

What could banks, prudential authorities and policymakers more generally do about it? Banks need to work out the right business models without repeating pre-crisis mistakes. In essence, this means pursuing sustainable – and the key word here is "sustainable" – profitability. Given the limited choices available, cost cutting and, in a number of jurisdictions, reductions of excess capacity will be an inevitable part of the solution. For their part, prudential authorities should complete the financial reforms without delay, notably Basel III. And in the process, they should not succumb to the pressure to dilute standards and should redouble efforts to repair balance sheets. Finally, policymakers more generally should work in concert with prudential supervisors to facilitate the needed adjustment, not least by addressing the "exit problem" that characterises the industry and tends to induce, or exacerbate, excess capacity.

As I elaborate on these points, I will review some recent BIS research and highlight some analytical questions that deserve further attention.

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[1] I would like to thank Dietrich Domanski, Ingo Fender, Leonardo Gambacorta, Enisse Kharroubi, Ulf Lewrick, Dubravko Mihaljek, Hyun Song Shin, Nikola Tarashev, Kostas Tsatsaronis and Christian Upper for their helpful comments as well as Alan Villegas for excellent research assistance.

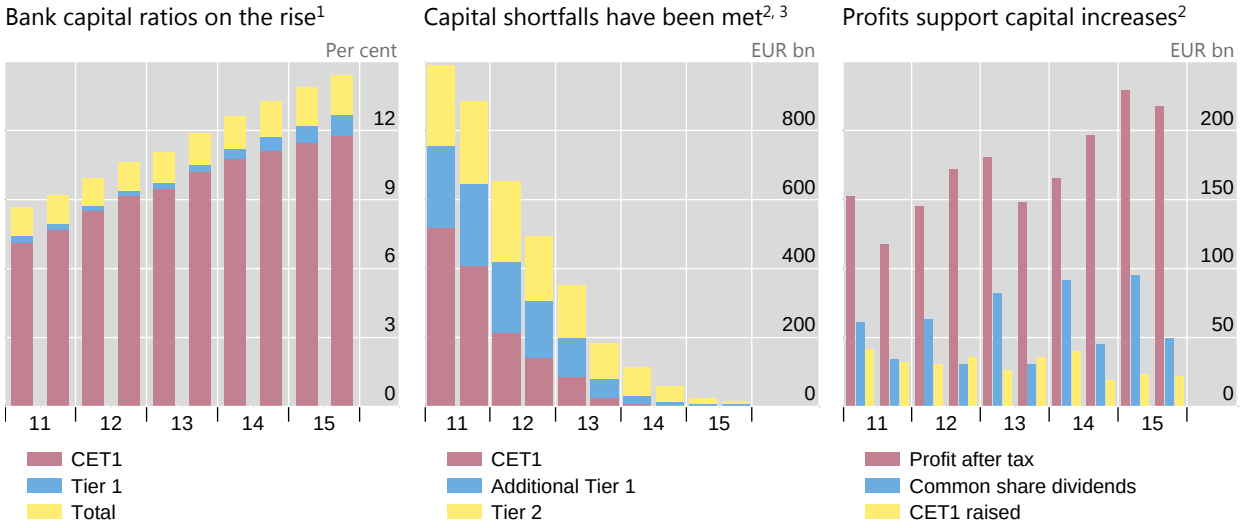
I – Is the banking industry stronger than pre-crisis?

Let me start with the good news. In crisis-hit economies,[2] profits have recovered, albeit at an uneven pace. And where banks have incurred losses over the last couple of years, this has in part reflected the healthy cleaning-up of loan portfolios.

Likewise, banks have been rebuilding their capital cushions at a brisk pace – the best news of all (Graph 1). Large banks steadily increased their Core Equity Tier (CET) 1 capital between 2011 and end-2015 (left-hand panel). According to the latest Basel III monitoring figures, under fully loaded Basel III definitions, average CET 1 ratios increased from 7% to around 12%. Thus, CET 1 shortfalls have been effectively eliminated (just €0.2 billion at the target level – that is, including the capital conservation buffer and surcharges for global systemically important banks (G-SIBs), as applicable; centre panel)). This has been done mostly via retained earnings and without much sign of an adverse short-term impact on bank lending – the ratio of bank lending to the private sector to GDP has been stable or has risen in many jurisdictions (Cohen and Scatigna (2014), BIS (2016a); Graph 1, right-hand panel).

Banks have strengthened their balance sheets

Graph 1



[1] Group 1 banks. [2] Group 1 and Group 2 banks. [3] The height of each bar shows the aggregated capital shortfall considering requirements for each tier (ie CET1, Tier 1 and total) of capital.

Sources: Basel Committee on Banking Supervision; BIS calculations.

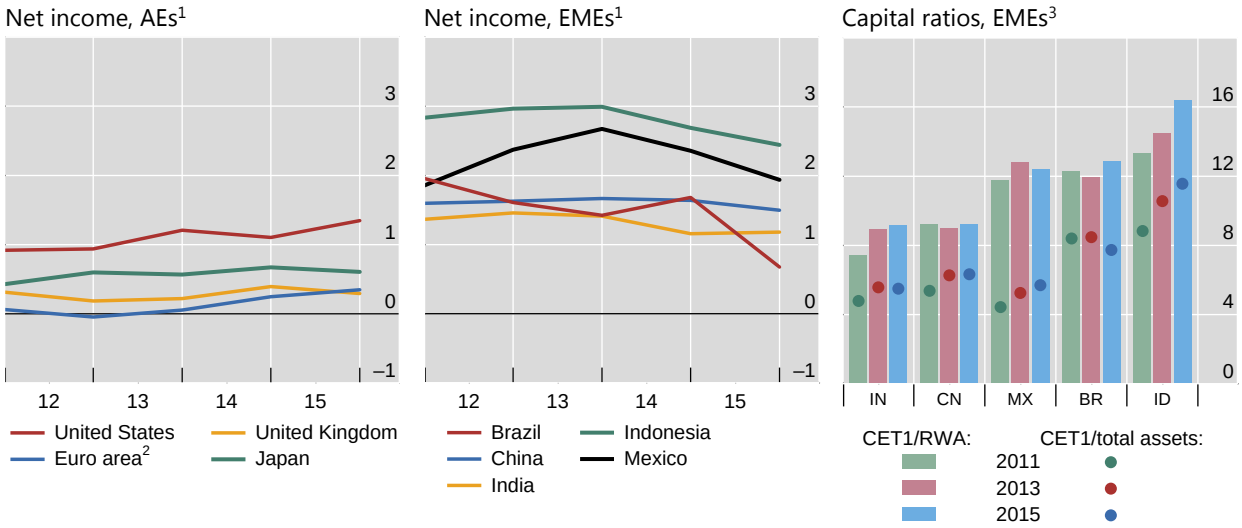
In non-crisis-hit economies, especially emerging market economies (EMEs), indicators of profitability and balance sheet strength have generally looked good (Graph 2). Until recently, banks in a number of major EMEs had posted high pre-tax profits (well above 1% of total assets, ahead of their most profitable advanced economy peers). And they had steadily increased their equity-to-total assets ratios, which averaged 7% at end-2015. That said, there have been exceptions of late in those economies where the financial cycle has turned and banks' net income has come down substantially, such as Brazil. Still, even there, a full blown crisis has not erupted so far.

[2] By crisis-hit economies, I mean those where banks suffered large losses on their assets, especially on their domestic portfolios, coming under stress as a result.

Profits and capitalisation: EME banks outperform their advanced economy peers

In per cent

Graph 2



BR = Brazil; CN = China; ID = Indonesia; IN = India; MX = Mexico.

[1] Net income as a percentage of total assets. The calculation of total assets may differ across banks due to different accounting rules (eg on netting of derivative positions). [2] France, Germany, Italy and Spain. [3] Median ratios.

Sources: SNL; BIS calculations.

But there is also some more worrying news. For one, there is widespread scepticism about banks' health. Price-to-book ratios have remained below 1 for many advanced economy banking systems (Graph 3, left-hand panel), typically faring worse than those in EMEs (centre and right-hand panels). Bank shares have been recovering only slowly after the crisis and have taken yet another beating recently, despite a generally buoyant stock market. And they have suffered from successive bouts of anxiety, most notably in February this year and then again following Brexit (BIS (2016a,b)).[3]

Credit ratings tell a similar story (Graph 4). Even the credit ratings that abstract from official support – which we know has been cut – have not improved post-crisis, while those in EMEs have tended to improve (left-hand panel). Fitch's stand-alone ratings for euro area banks were on average one notch lower in August 2015 than at end-2010, even as the end-2010 ratings reflect substantial crisis-driven downgrades. And for Moody's, they were three notches lower. Moody's assessment, in fact, is similar for other European and US banks.

Within this general picture, at least one banking system in Europe, Italy's, has been facing serious strains, handicapped by a crippling pile of bad debt. Bank of Italy numbers for the second quarter of 2016 place the size of non-performing ("problem") loans (NPLs) in the sector at around €330 billion, with the narrowest category (bad debts or defaulted loans) at some €197 billion in the first quarter of 2016 (around 20% and 12% of GDP, respectively). Despite recent steps, the problems persist, weighing on profitability.[4]

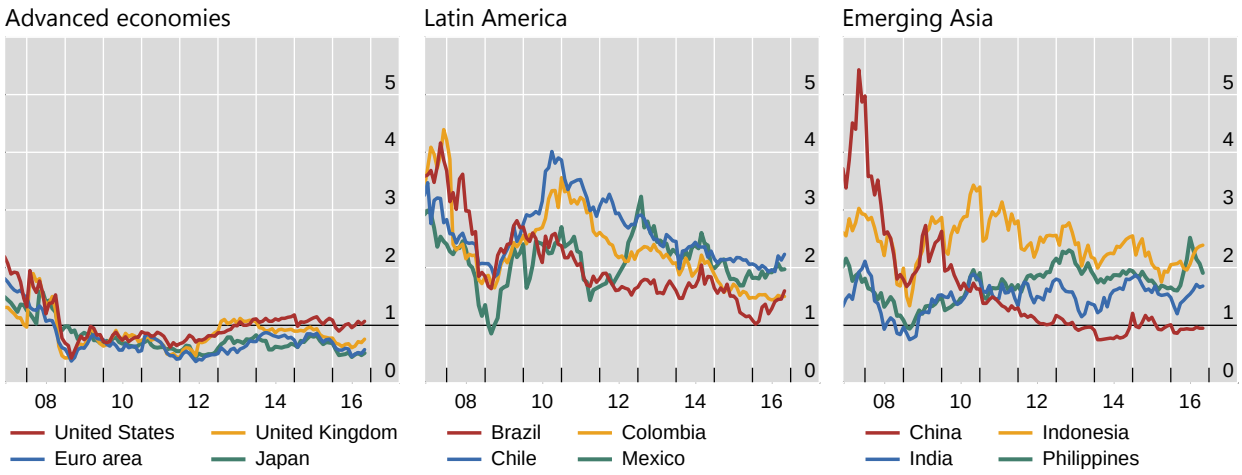
[3] See also Sarin and Summers (2016) for a recent analysis highlighting the sober assessment of creditworthiness that emerges from market prices. Their benchmark, however, is pre-crisis experience, when market exuberance infected those assessments. Market prices typically point to unusually low risk in the run-up to crises – the paradox of financial instability (Borio and Drehmann (2010)).

[4] Similarly, the ratios of NPLs are quite high in several southern and eastern European economies that were in recession during the financial crisis; see EBA (2016a), Klein (2013) and Raiffeisen Research (2016).

Bank price-to-book ratios struggling to recover[1]

Ratio

Graph 3

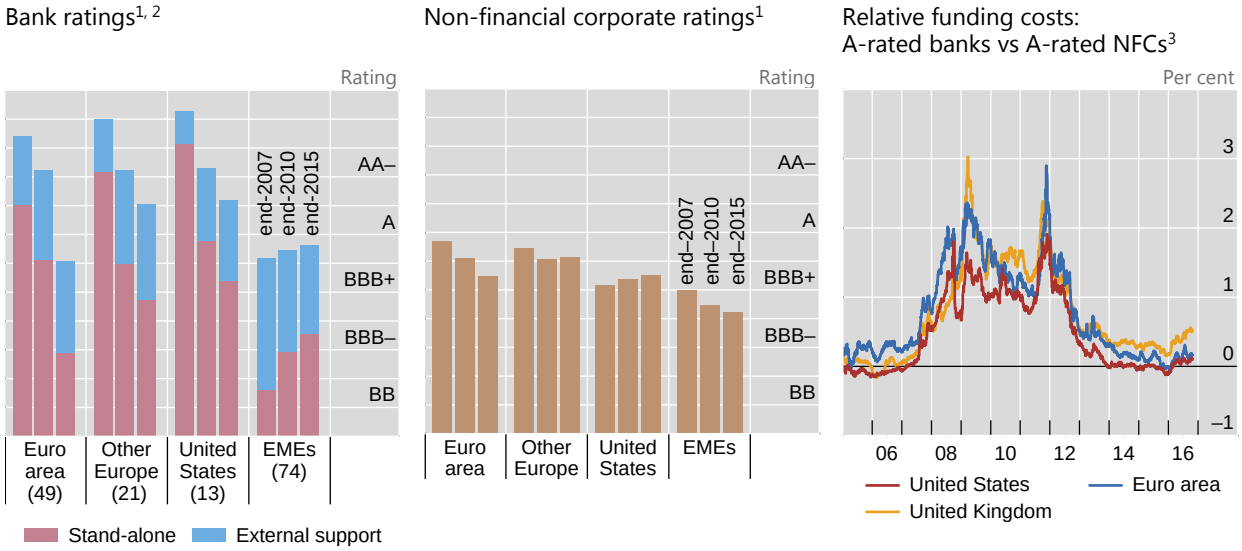


[1] End-of-month data.

Sources: Datastream; S&P Capital IQ; BIS calculations.

Weak ratings erode banks' funding advantage

Graph 4



[1] Asset-weighted averages. [2] Numbers of banks in parentheses. [3] Option-adjusted spread on a bank sub-index minus that on a non-financial corporate sub-index, divided by the spread on the non-financial corporate sub-index. Sub-indices comprise local currency assets.

Sources: Bank of America Merrill Lynch; Moody's; BIS calculations.

The general scepticism about the sector has translated into a loss of competiveness vis-à-vis market-based finance. Advanced economy banks are struggling to regain their pre-crisis funding advantage vis-à-vis non-financial corporates. Banks' all-in ratings,[5] which should be closely related to their

[5] All-in ratings combine measures of inherent strength and external support, notably from the government; stand-alone ratings exclude external support. For a discussion, including post-crisis changes in methodology, see Packer and Tarashev (2011).

funding costs, have deteriorated in the wake of the crisis and failed to recover even as those of non-financial companies have changed little (Graph 4, centre panel). And even banks with a similar rating tend to be at a cost disadvantage, arguably reflecting perceived uncertainty about their relative creditworthiness (right-hand panel). Partly as a result, as non-financial companies have directly tapped markets with gusto, the asset management industry has grown in leaps and bounds post-crisis (BIS (2016a).

Finally, where more optimism is present, it need not be always well founded. There are good grounds for mistrusting rosy financial statements in those countries that have been experiencing strong financial booms. By their nature, financial statements tend to be lagging indicators of trouble (Borio and Drehmann (2010)). Just recall the pre-crisis experience in mature economies. The refrain "banks have never been so well capitalised" still distinctly echoes in my ears. And the recent experience in Brazil is just the latest reminder of this old story: in the previous five years, banks there had enjoyed some of the best results.

II – Why such scepticism?

So much for the general picture. Time will tell whether in countries that have been experiencing strong financial booms the story will follow previous plots or not. That is an important question, but not one I would like to address today. Rather, let me ask: why so much scepticism about so many advanced economy banks so many years after the GFC?[6]

I would highlight two issues, both related to the long shadow cast by the crisis. The first has to do mainly with *stocks*, and involves the asset quality problems brought to light by the crisis and its prolonged aftershocks. Evidence of banks underreporting risk weights has not helped (Behn et al (2016), Plosser and Santos (2014)). Such evidence, together with the serious misconduct problems,[7] is likely to have undermined the trust markets had in banks, thus increasing the perceived uncertainty about asset quality. The second issue has to do mainly with *flows*, and involves doubts about banks' earnings capacity going forward.[8] These doubts reflect many factors (eg Constâncio (2016)); here I will focus only on one: the prospect of persistent ultra-low interest rates. Both issues are related to policy, but in very different ways: the first is a kind of sin of omission; the second, a sin of commission. Let me elaborate.

It may seem odd to talk about asset quality problems a full nine years after the crisis broke out. Still, in some jurisdictions banks are not out of the woods yet. There are many reasons for this. The crisis morphed as time passed, from a standard financial boom gone wrong in 2007–09 – albeit one turbocharged by less standard financial innovations – to a sovereign crisis in the euro area in 2010–11, in which a doom loop developed between banks and the sovereign (CGFS (2011), BIS (2016a)). The recession has been unusually deep and prolonged and the recovery unusually shallow – the typical pattern of financial booms gone wrong (Reinhart and Rogoff (2009), Borio (2014), Bech et al (2014)). That said, probably the most important reason for the current woes has been a policy response that has failed to induce sufficient adjustment.

In some respects, this is surprising. For those, like myself, who had witnessed previous banking crises, the rule book was clear. Before the GFC, the international community had reached a consensus:

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[6] For an analysis of the challenges the banking industry is facing, see also IMF (2016).

[7] Recent ECB data suggest that legal costs from misconduct in 2008–15 were worth about 50% of major European banks' net income (ECB (2016)).

[8] For the United States, the detailed empirical analysis by Huizinga and Laeven (2012) highlights the role of the under-recording of losses, while the more recent analysis of Calomiris and Nissim (2014) stresses the decline in the value of intangibles. US bank price-to-book ratios have performed considerably better than those of their European or Japanese counterparts.

intervene early; clean up the balance sheets; recapitalise, possibly through temporary public ownership; and restore the basis for the sector's sustained profitability, including by encouraging the elimination of excess capacity (Borio et al (2010)). To put it bluntly, follow what the Nordic countries did when tackling their crises in the early 1990s and not what Japan did, or rather did not do, roughly at the same time. This was the consistent message EMEs received when their crises broke out later in that decade. The contrasting economic performance of their advanced economy peers was there to confirm the recipe's soundness: the Nordic countries had recovered comparatively quickly; Japan was suffering a lost decade.

Why such a gap between what the consensus recommended and the actual policy response? Yes, initially, the crisis was interpreted as merely a liquidity, rather than a solvency, problem and treated as such. Yes, some of the securitised instruments were harder to deal with. And yes, the international nature of the challenges greatly complicated things, especially in the euro area, owing to the institutional idiosyncrasies involved. These factors should not be underestimated.

But I would suggest that another, possibly deeper, factor has also played a role: countries thought they *could buy time*. The sense of crisis was only short-lived. And so, unless the window of opportunity was taken, the temptation to wait for better days was overwhelming. This helps explain, too, the difference in response between the Nordic countries and Japan: the external crisis Nordic countries faced meant they really had no choice; Japan, by contrast, faced no such crisis and thought it could afford to let time heal things. As the saying goes, if you want to kill a frog, you don't throw it into boiling water; you gently place it in cold water and turn up the temperature gradually. Of course, we now know that time, far from healing the wounds, made them worse. The incentives in place entrenched the misallocation of resources and weakened the real economy (eg Borio et al (2016a)). Theory tells us as much. Gambles sometimes pay off, but most of the time they don't.

To be sure, country experiences have differed considerably this time around too. The United States and the United Kingdom, for instance, acted more swiftly and in greater depth than most countries in the euro area. And in the euro area itself, those that experienced the most severe problems, such as Spain, faced them head-on more effectively. But despite the valiant efforts of the European Banking Authority (EBA), the first comprehensive assessment, involving both an asset quality review and a stress test, took place only in 2013/14.[9] Looking back, I suspect that this differential response has been a key factor in explaining differences in economic performance – arguably a more important factor than differences in monetary and fiscal policies, which have received much more attention. But then, our macroeconomic models have no role for these effects. What you don't see, you can't measure.

This brings me to the second issue underlying markets' scepticism: the prospect of persistent ultra-low interest rates, their recent pickup notwithstanding. Here I am not referring to the historically low *inflation-adjusted* (*real*) rates which have been negative for even longer than during the Great Inflation of the 1970s. Rather, I am thinking of *nominal* interest rates. In the main jurisdictions, policy rates have been languishing close to zero ever since the crisis, if not earlier, as in Japan. Moreover, over the last couple of years no fewer than five central banks have adopted *negative* policy rates, including the ECB and the Bank of Japan (Bech and Malakhov (2016)). As interest rates reached their trough in July, over $10 trillion of sovereign paper was trading at negative yields, including at maturities of 20 years or more for some countries, such as Switzerland. Such low rates are unprecedented and completely beyond the boundaries of the imaginable pre-crisis.

The focus here is on nominal interest rates because banking is a spread business. Banks make profits through the difference between what they earn on their assets and what they pay on their liabilities. In principle, if they could charge any negative rate on their liabilities, they could also live with negative rates. But that is clearly not the case, as their customers can always shift into cash. More generally, low

[9] See eg Enria (2012) on the importance of loss recognition and recapitalisation following busts.

interest rates erode their net interest margins, by eating into any market power banks may have over their deposits. Likewise, a compressed yield curve (strictly speaking, term premium) undermines the profits from maturity transformation – a banking business staple. And, last but not least, very low interest rates increase the incentive for banks to "extend and pretend" and not dispose of any NPLs, weakening their performance further – another obstacle to an in-depth response to the asset quality problem mentioned before.[10]

Admittedly, there are offsetting effects (Cœuré (2016), Fischer (2016)). A reduction in interest rates boosts asset prices and hence produces capital gains. And to the extent that it spurs economic activity, it lifts volumes and profits too. But these effects are either one-off or less durable.[11] That is why *persistent* ultra-low interest rates tend to undermine bank profitability as time unfolds. As a Japanese banker once told me, "very low interest rates threaten banks with a slow death". Clearly, the point is exaggerated, but the basic message is not.

Seeing the looming problem ahead, with colleagues we examined this issue in some depth (Borio et al (2015)). We considered 109 large international banks headquartered in 14 major advanced economies for the period 1995–2012. Because banks operated in more than one currency and had exposures to more than one country, we had to make approximate adjustments to the data, based on the BIS international banking statistics. We then considered the impact of the short-term interest rate and the slope of the yield curve (term spread) on banks' return on assets, controlling for various aggregate demand effects and bank-specific factors, and also allowing for the possibility, consistent with theory, that the strength of the effect depends on the levels of the rates and the spread, ie allowing for non-linearities.

We reached two conclusions. Lower short-term rates and a less steep yield curve do weaken bank profitability. And the effect becomes stronger as the short-term interest rate falls and the slope flattens and becomes negative, ie non-linearities are present. The orders of magnitude are significant. Taking the results at face value, we found that in our sample the combined impact of changes in the level and slope of the yield curve was, on balance, positive in the first two years post-crisis (2009–10), by an estimated cumulative 0.3 percentage points, but turned negative in the following four years (2011–14), by 0.6 percentage points, equivalent to one year of profits. Subsequent econometric work on US banks has found similar results (eg Claessens et al (2016)).

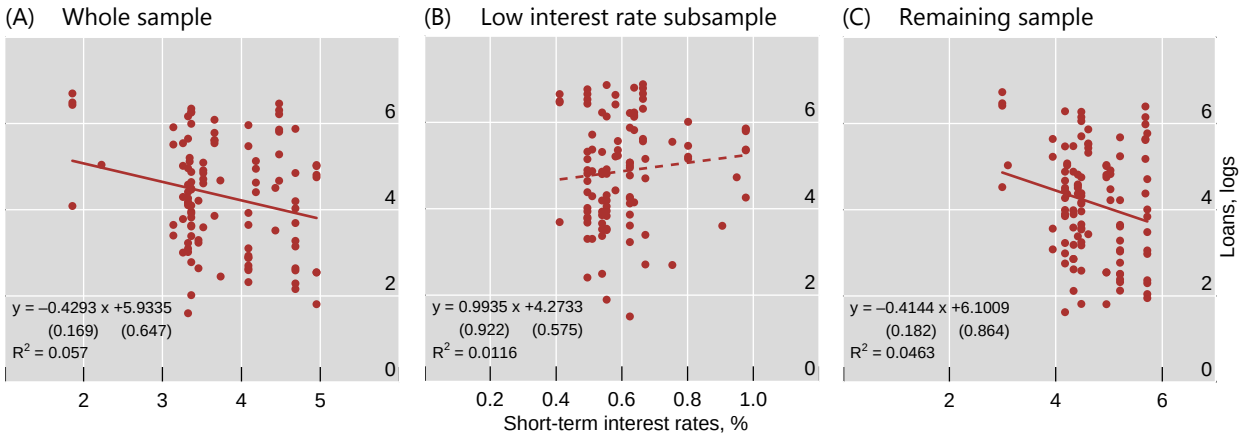
Now, if unusually low interest rates sap the lending business's profitability, might they not, paradoxically, also inhibit lending? After all, if banks treat capital as scarce and allocate it to higher-return activities, this may indeed be possible. More recent empirical work that we have done is consistent with this hypothesis (Borio and Gambacorta (2016)). Based on a similar sample of 108 large international banks, our empirical analysis suggests that monetary policy is not really that effective in stimulating bank lending growth when interest rates reach a very low level. This result holds after controlling for business and financial cycle conditions and different bank-specific characteristics such as liquidity, capitalisation and funding costs as well as bank risk and income diversification. As indicated in Graph 5, which shows just raw data, at very low rates the typical relationship between interest rates and lending disappears (compare the left-hand and centre panels with the right-hand panel). And through further analysis we find that one

[10] A growing empirical literature confirms the existence and significance of this effect. See eg Caballero et al (2008) for Japan and Acharya et al (2016) for the European experience; Albertazzi and Marchetti (2010) for that of Italy; and Adalet McGowan et al (2016) for that of OECD countries more generally.

[11] The impact of capital gains is one-off and actually reverses in the case of bonds held to maturity. And by and large, the literature sees monetary policy as having only a temporary impact on economic activity (eg Christiano et al (1999)), except perhaps to the extent that it may contribute to the build-up of financial imbalances that then cause serious recessions and financial crises (eg Borio (2016)). For euro area banks, Altavilla et al (2016) find that non-standard measures have strengthened the pass-through to lending rates while at the same time compressing banks' lending margins significantly; Rostagno et al (2016) argue that, on balance, the introduction of negative interest rates has so far not weakened profitability, especially once its overall impact on aggregate demand is taken into account (general equilibrium effects).

third of the slower loan growth in the period 2010–14 is due to low rates cutting the profits banks make from their traditional intermediation role.

At very low rates, easing loses effectiveness in boosting lending[1] Graph 5



[1] The panels are summary plots of the raw data from the empirical database of 108 advanced economy banks (standard errors in brackets). The figure plots the average log level of lending to the non-financial sector against the average short-term interest rate that each bank has faced in the jurisdictions in which it operates. (Thus, each dot represents a bank-specific semi-elasticity of lending with respect to the short-term interest rate). The three panels represent different samples: all data (left-hand panel); periods in which short interest rates were at very low levels (below 1.25%, centre panel); and remaining sample (right-hand panel). The scatter plots overstate the noise in the slope relationships, as the plots are from the raw data without controls; the panel regressions that control for bank-specific characteristics and macro variables will reveal an even clearer pattern. The panels show that the standard negative relationship between policy rates and lending is not visible in a low interest rate environment: in fact, the relationship has the opposite sign, although it is not statically significant (dashed line).

Sources: Borio and Gambacorta (2016).

All this raises serious challenges for banks struggling to find successful business models post-crisis. Work by BIS colleagues based on a large sample of international banks found that institutions engaging mainly in commercial banking activities had lower costs and more stable profits than those more heavily involved in capital market activities, mainly trading (Roengpitya et al (2014)). Moreover, and critically, this research also found that the attractiveness of retail banking increased post-crisis, reversing a pre-crisis trend (Table 1). Indeed, the superiority of a retail banking model was a common lesson drawn from the crisis experience. And yet, this is precisely the model most threatened by the persistence of ultra-low interest rates. One can sympathise with bank managements, who may be wondering where to turn next! I will return to this point in a minute.

III – What can be done?

What conclusions could one draw from this analysis? There are implications for banks, prudential authorities and policymakers more generally. Let me take each group in turn.

Just as for policymakers, the key to banks' success is to get the big strategic choices right. The key concepts here are "sustainability" and "long term". For banks, this means sustainable profits, a strong capital base and top-notch risk management.

Analysis in the BIS Annual Report suggests that this was definitely not the case pre-crisis (BIS (2010)). Compared with other sectors, banks typically produced somewhat lower but more volatile equity returns: the slight overperformance during booms was more than offset by losses during stress. Moreover,

Business models: traditional banking regains popularity

Number of banks — Table 1

		Business model in 2007			
		Retail-funded	Wholesale-funded	Trading	*Total*
Business model in 2005	Retail-funded	53	10	0	*63*
	Wholesale-funded	3	25	2	*30*
	Trading	2	0	13	*15*
	Total	*58*	*35*	*15*	*108*
		Business model in 2013			
		Retail-funded	Wholesale-funded	Trading	*Total*
Business model in 2007	Retail-funded	57	1	0	*58*
	Wholesale-funded	16	16	3	*35*
	Trading	3	1	11	*15*
	Total	*76*	*18*	*14*	*108*

[1] Based on a sample of 108 banks from advanced and emerging market economies.

The table summarises banks' shifts across different business models before the crisis (top part of the table) and after the crisis (bottom part of the table). Each cell reports the number of banks that started the period in the model identified by the row heading and finished it in the model named in the column heading. The numbers along the diagonal indicate the number of institutions that preserved their business model over the particular period. Off-diagonal entries indicate transitions, eg 16 banks transitioned from the wholesale-funded model to the retail-funded model between 2007 and 2013. The rows/columns "total" indicates the total number of banks in a particular model in particular year, eg there were 63 banks in the retail-funded model in 2005. Overall, there are the same 108 banks in each year, from advanced and emerging market economies.

A key message is that about 40% of the institutions that entered the crisis as wholesale- or retail-funded banks (ie 19 out of 50 institutions) ended up with a retail-funded model in 2013. Over the same period, only one bank switched from retail-funded to another business model.

Sources: Roengpitya et al (2014).

in a sample of 40 large banks, those that had a higher return on equity pre-crisis ended up receiving more, not less, emergency support. And those that had higher capital (Tier 1) required less support. This is the picture of a sector that relies too much on leverage and generates unsustainable returns.

Raising profitability in a sustainable way requires tackling successfully the business model challenge. This is not easy, given the limited room for manoeuvre that ultra-low interest rates imply – and precisely at a time when new regulations are coming on stream and digital innovations risk squeezing banks saddled with antiquated IT infrastructures, especially in the retail segment.[12] I am not a banker: providing advice here is not my comparative advantage. But an obvious avenue, regardless of the chosen product mix, is to cut the cost base further. By and large, costs have proved quite stubborn, at least if we

[12] On banks' challenges and opportunities related to fintech, see Peters and Efstathios (2015) and Philippon (2016). On those related to low interest rates and high risk premia, see eg Taylor (2016)).

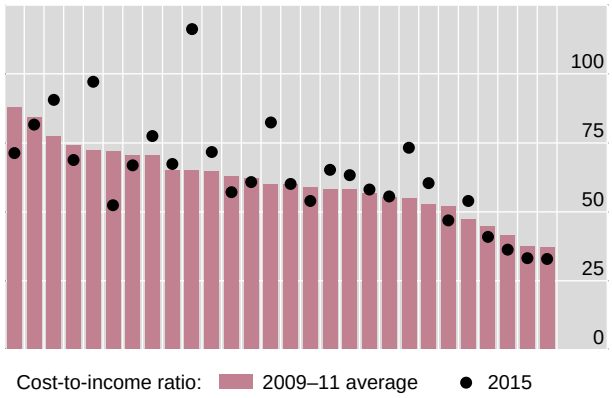
compare the recent experience with previous and more successful post-crisis adjustments, such as the one in the Nordic countries in the 1990s (Graph 6).[13]

Uneven progress in banks' costs adjustments

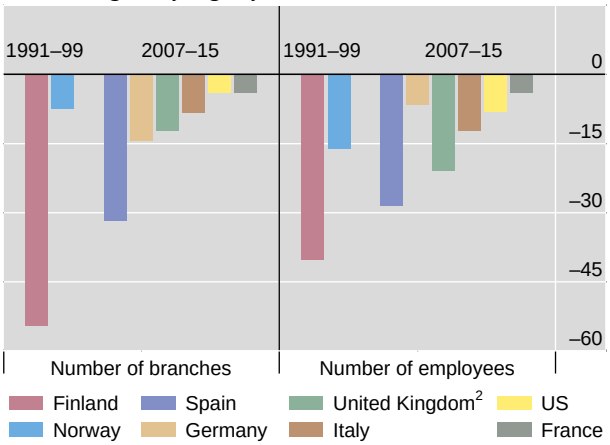
Graph 6

In per cent

Cost-to-income remains stubbornly high for G-SIBs[1]



Cost savings vary eight years after the onset of the crisis



[1] Based on 2015 list of G-SIBs for which cost-to-income ratios were available. [2] For the change in the number of branches, 2007–14.

Sources: OECD; SNL; national data; BIS calculations.

A priority for prudential authorities is to finalise the reforms, notably Basel III, and, in the process, not to dilute the standards. Finalising the reforms should provide much needed clarity for the sector, helping to dispel any uncertainty that could hold back planning. Not diluting the standards is equally important. It should be recalled, in particular, that even based on *very conservative assumptions* there appears to be room to raise capital further while generating net benefits for the economy. This is the message of the recent update by colleagues of the work done when calibrating Basel II (BCBS (2010)).[14] The update, published in the latest BIS Annual Report, indicates that the benefits in terms of lower expected output losses due to banking crises exceed any output costs of higher lending rates (BIS (2016), Fender and Lewrick (2016); Graph 7). The message is strengthened if one adjusts for the estimated effects of Total Loss-Absorbing Capacity (TLAC) on both crisis costs and probabilities while allowing for a partial reduction in borrowing costs.[15] Against this backdrop, this year's announcement by the Governors and Heads of Supervision that the Basel Committee would focus on "not significantly increasing overall capital requirements" points to a conservative approach (GHOS (2016)).

Still, two types of argument have been put forward to support a softening of the standards. One is that the timing is not quite right: higher standards risk reducing the supply of lending and inhibit what

[13] Addressing legacy issues is a sometimes underappreciated part of this cost cutting. Bank of Italy data suggest that, in 2014, the management of NPLs alone accounted for almost 3% of banks' operating costs – a sizeable percentage (Carpinelli et al (2016)). The sooner NPLs are dealt with, the quicker these costs disappear. The recent EBA stress test, in turn, indicates that progress has been very uneven across countries (EBA (2016b)). While Spanish banks have done relatively well, those in Italy and Ireland seemingly have not.

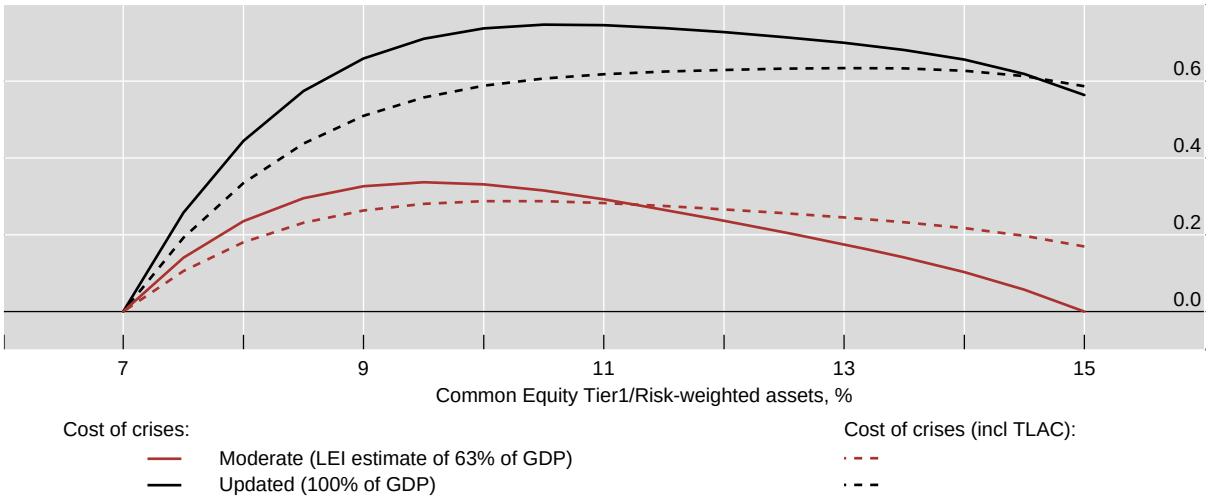
[14] See Elliott et al (2012), Brooke et al (2015) and Dagher et al (2016) for similar analyses.

[15] This is a Modigliani-Miller "offset" of 50%, as suggested by the academic literature

is already sub-par growth. The other is that the tougher post-crisis standards have had the unintended consequence of impairing market and possibly even funding liquidity.

Capital regulation is expected to yield sizeable economic benefits[1]

Expected marginal net benefits (as a percentage of GDP) Graph 7



Cost of crises:
Moderate (LEI estimate of 63% of GDP)
Updated (100% of GDP)
Cost of crises (incl TLAC):

[1] The graph depicts two sets of marginal net benefit schedules indicating the estimated macroeconomic impact (in terms of output) from rising minimum CET1/RWA requirements. They combine (i) alternative estimates of the *benefits* from higher capital in the form of lower (expected) crisis costs (ie the reduction in the crisis probability times costs in terms of output losses for a given increase in bank capital); and (ii) the *expected output loss* from any increase in lending spreads that might result from the same increase in bank capital. The starting point is 7% CET1/RWA (minimum requirement plus 2.5% capital conservation buffer). The first schedule (solid red line) reports the baseline results from the original LEI (BCBS (2010)) study, which are based on moderate crisis costs of 63% of GDP in net present value terms. The second schedule (solid black line) uses a higher cost estimate of 100% of GDP, which also takes into account the more recent and very costly crisis episodes. The dashed lines adjust for the effects of introducing total loss-absorbing capacity (TLAC) standards. In addition, they relax the assumption made in the LEI study that higher capital fails to reduce banks' borrowing costs by assuming a 50% reduction in the expected output loss per percentage point increase in CET1/RWA (a "Modigliani-Miller offset"). Even for the moderate crisis cost estimate, the benefits of considerable additional minimum regulatory requirements would outweigh the costs

Source: BIS (2016a), partly based on Fender and Lewrick (2015) and BCBS (2010).

It is not possible to do full justice to these arguments in the limited space available. But let me sketch why, upon reflection, I do not find them convincing.

It is of course possible that, faced with higher capital requirements and left to decide, banks may choose to shrink their balance sheets. This is more likely if they need to raise external equity, which for a number of reasons is more expensive than internal equity, such as the well known informational costs highlighted in the theoretical literature.[16] That said, the concern can easily be overdone.

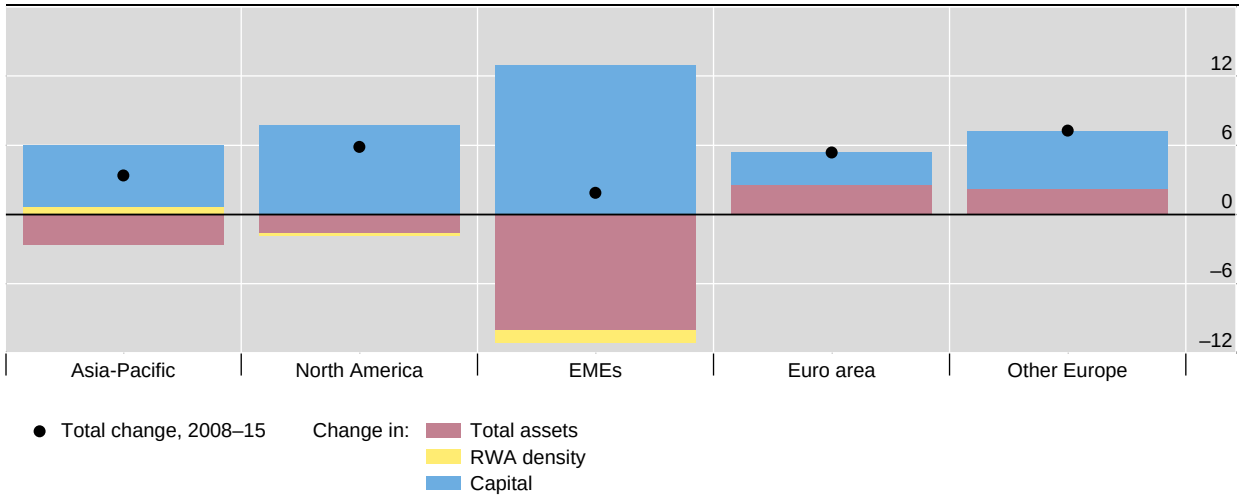
First, as already noted, the evidence indicates that banks have adjusted relatively easily to the higher capital requirements post-crisis, limiting the impact on lending. For instance, my colleagues (Cohen (2013), Cohen and Scatigna (2014)) have found that, for a sample of 94 large banks from advanced and emerging market economies, retained earnings account for the bulk of their higher risk-weighted capital ratios, with reductions in risk-weighted assets playing a lesser role (Graph 8). On average, banks continued to expand their lending, and banks that came out of the crisis with higher capital ratios and stronger profitability were able to expand lending more. A gradual phasing-in of the new regulations has helped.

[16] A seminal article here is Myers and Majluf (1984). See Kashyap et al (2010) for a recent discussion.

Second, recent empirical evidence by BIS researchers indicates that lending growth is higher for banks with higher capital ratios (lower leverage), as their cost of non-equity funding is lower and their borrowing increases faster (Gambacorta and Shin (2016)). Qualitatively similar findings have been reached by others, including EBA (2015). This suggests that, as stressed by my colleague Hyun Shin (2016a), capital is the foundation of all lending.[17] Anyone who has worked in a bank understands this: that is what capital planning is all about.[18]

Sources of changes in bank capital ratios, end-2008 to end-2015

Normalised to percentage points of end-2008 risk-weighted assets — Graph 8



The graph shows the change in the ratios of common equity to risk-weighted assets at the (fiscal-year) end of 2008 and 2015, respectively, in percentage points. The overall change is shown by the red diamonds. The components of this change are the terms on the right-hand side of equation (2) in the text, normalised by the ratio (b-a)/(ln(b) – ln(a)). All figures are weighted averages, using end-2015 assets as weights.

Sources: updated based on Cohen and Scatigna (2014); SNL; BIS calculations.

Turning to the second argument, the evidence on the reduction in market liquidity is far from conclusive. True, there are some signs of reduced liquidity, including smaller market depth (the ability to transact in size), reduced broker-dealer inventories and some episodes of outsize price changes. But as discussed in detail in the latest BIS Annual Report and related research, indicators like bid-ask spreads and aggregate transaction volumes generally suggest no such decline. Moreover, to the extent that a reduction has taken place, it has been confined to specific sectors (eg corporate bonds) and been smaller than sometimes claimed (BIS (2016a)).

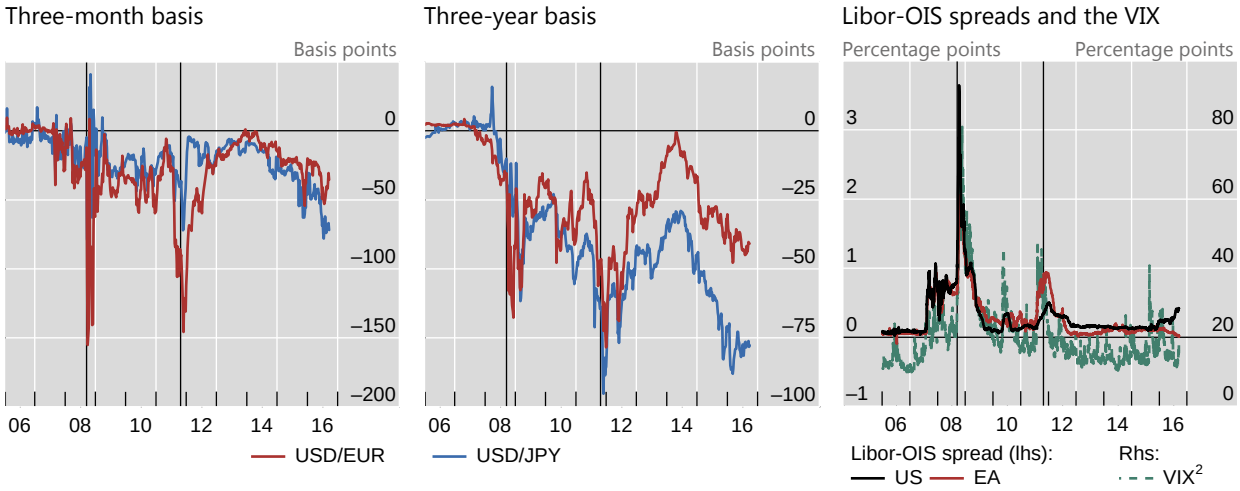
What is undisputed is the emergence of some market anomalies. Probably the most spectacular is the breakdown of covered interest parity (CIP) – regarded as the closest thing to an ironclad law in international finance. In essence, CIP is the condition that in any given currency the interest rate on borrowing/lending in money markets should be the same as that on foreign exchange markets, through swaps or a combination of spot and forward transactions. The breakdown is illustrated in Graph 9, which

[17] Interestingly, this contrasts with the focus of much of the literature on monetary transmission mechanisms, which has assumed that it is bank liquidity reserves, rather than capital, that constrains lending (eg Borio and Disyatat (2010)).

[18] This also suggests that, given that raising equity is costlier than building it up internally, restrictions on dividend payments can be an especially useful tool to strengthen bank soundness while preserving lending capacity. The tool deserves close consideration. Banks have paid generous dividends since the crisis (Shin (2016)); on this, see also Caruana (2016)).

plots the gap between the implied interest rates for the yen/dollar and euro/dollar pairs (or "currency basis"): post-crisis, dollar borrowing in the FX markets has become much more expensive.

Cross-currency basis against the US dollar, interbank credit risk and market risk[1] Graph 9



[1] The vertical lines indicate 15 September 2008 (Lehman Brothers file for Chapter 11 bankruptcy protection) and 26 October 2011 (euro area authorities agree on debt relief for Greece, leveraging of the European Financial Stability Facility and the recapitalisation of banks). [2] Chicago Board Options Exchange S&P 500 implied volatility index; standard deviation, in percentage points per annum.

Sources: Bloomberg; author's calculations.

Still, regulation can at best be only one of the factors behind these developments, and hardly the most important.[19] For example, in the case of market liquidity, the spread of electronic and high-frequency trading in fixed income markets has been a major influence, not least on the reduction of trade size and occurrence of short-lived outsize price changes (Bech et al (2016)). Likewise, in the case of CIP, recent research with colleagues indicates that post-crisis the behaviour of the basis, which has widened even when markets have been calm,[20] can be explained remarkably well by changing FX hedging demand from banks, institutional investors and corporates (Borio et al (2016b)). Graph 10 illustrates this for the yen/dollar pair: it is clear that an index of hedging demand closely tracks the evolution of the basis. This hedging demand helps explain why the basis opens up; tighter management of balance sheet capacity and risks arguably helps explain why it does not close.[21]

Thus, if regulation has played a role, it has been in reinforcing the influence of other factors, by supporting a more realistic management of risks and by adding to the costs of putting the balance sheet to work (Andersen et al (2016)). This was *intended*. The objective has been to hard-wire a more realistic assessment of risks – something that was clearly lacking pre-crisis. For instance, market liquidity was badly underpriced then, abating the illusion that markets would remain liquid even once the tide changed, and thus encouraging further risk-taking. Sailing close to the wind was a matter of pride among intermediaries.

[19] Moreover, the impact of regulation differs, depending on the specific measure. For instance, Bao et al (2016) find that dealers subject to the Volcker rule have reduced their liquidity provision to "forced" sellers of corporate bonds, while those not covered by the rule have stepped in to fill at least part of the gap. Interestingly, the authors also find that these results are unlikely to be driven by Basel III regulation and Comprehensive Capital Analysis and Review (CCAR) requirements.

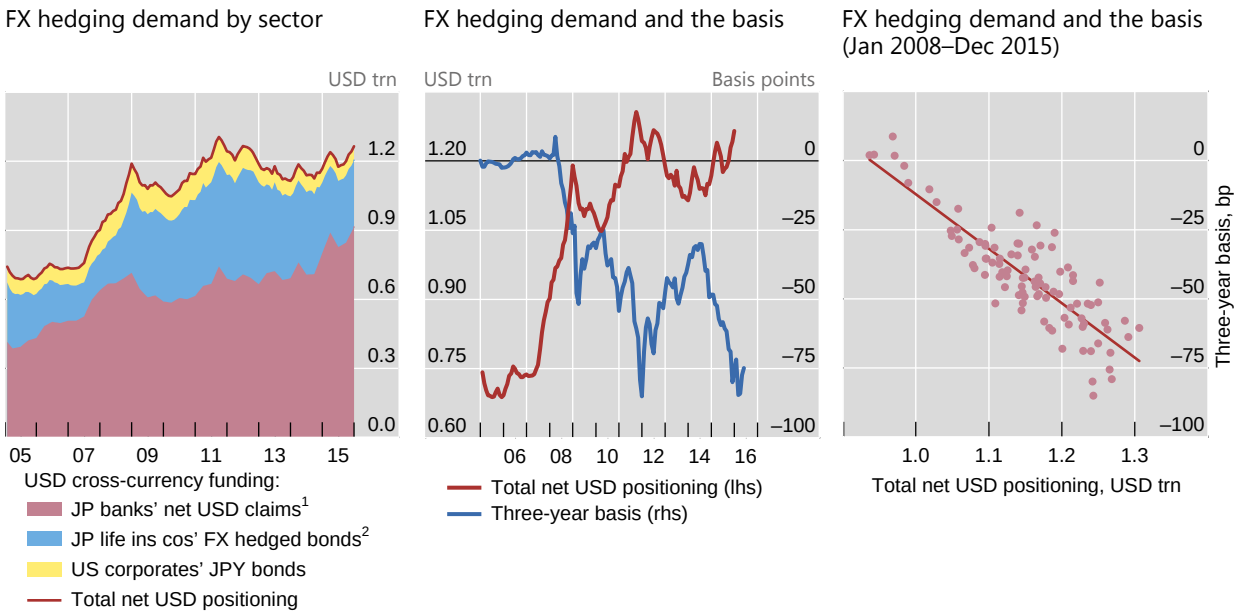
[20] The widening of the basis during periods of serious stress, such as the GFC, was largely attributed to heightened counterparty risk (eg Baba et al (2008)). The recent research indicates that hedging demand was at work even at the time.

[21] For a complementary treatment, stressing the role of the dollar, see Shin (2016b) and Avdjiev et al (2016).

Likewise, the arbitrage needed to exploit the basis is not riskless: there are credit, counterparty, market and liquidity risks involved. It is riskless only under the assumption that there is just foreign exchange risk, and that expanding balance sheets is riskless. Before the crisis, this is exactly the assumption banks would work on. Recall, for instance, the huge increase in broker-dealers' leverage (Shin (2016)).

Sources of currency hedging demand and the JPY/USD basis

Graph 10



The left-hand panel indicates three proxies for dollar hedging demand by Japanese banks, Japanese insurance companies and US non-financial corporations, respectively. It indicates that the main increase has resulted from banks' hedging needs. The centre and right-hand panels show that the sum of these three proxies tracks closely the cross-currency basis: the basis widens (becomes more negative) when the aggregate hedging demand increases.

[1] Difference between gross US dollar assets and liabilities of Japanese banks; quarterly data linear-interpolated to monthly frequency. [2] Japan life insurance companies' currency-hedged US dollar bond holdings estimated by multiplying the stock of the insurance companies' FX bond holdings by their time-varying currency hedge ratios; monthly frequency.

Source: Borio et al (2016b).

If so, we – by which I mean market participants and regulators – have definitely moved in the right direction. Better capitalised institutions are the source of more robust, as opposed to artificial, market liquidity and are better placed to exploit real, as opposed to imaginary, arbitrage opportunities.

Finally, what about the role of policymakers more generally, including acting in concert with prudential authorities? The priority here is to facilitate the adjustment towards pristine balance sheets and sound profitability.

A key challenge is the "exit problem". Exit in banking is hard, much harder than in other sectors. It is harder because bankruptcies are especially costly for the economy. As a result, the explicit or implicit forms of protection designed to limit those costs ("safety nets") weaken market discipline ex ante. The problem is exacerbated wherever appropriate mechanisms for orderly resolution are not in place.

Arguably, this can bias the industry towards a permanent state of excess capacity even in the absence of technological pressures.[22] It can thereby also heighten the potential for financial strains.[23]

One way of addressing this issue is to improve the resolution mechanisms to ensure orderly exit. Major efforts have been made in this direction at both national and international level. And significant progress has been made. Think, for instance, of the work of the Financial Stability Board to develop international guidelines for the orderly resolution of institutions and TLAC (FSB (2014, 2015)). Similar steps have been taken in Europe. Mechanisms of this kind, when credible, are also essential to helping supervisors induce banks to recognise losses and clean up balance sheets. For instance, it is unrealistic to expect stress tests to be stringent enough unless they are backed up by mechanisms to allow an orderly resolution of a bank in trouble (Borio et al (2014)).

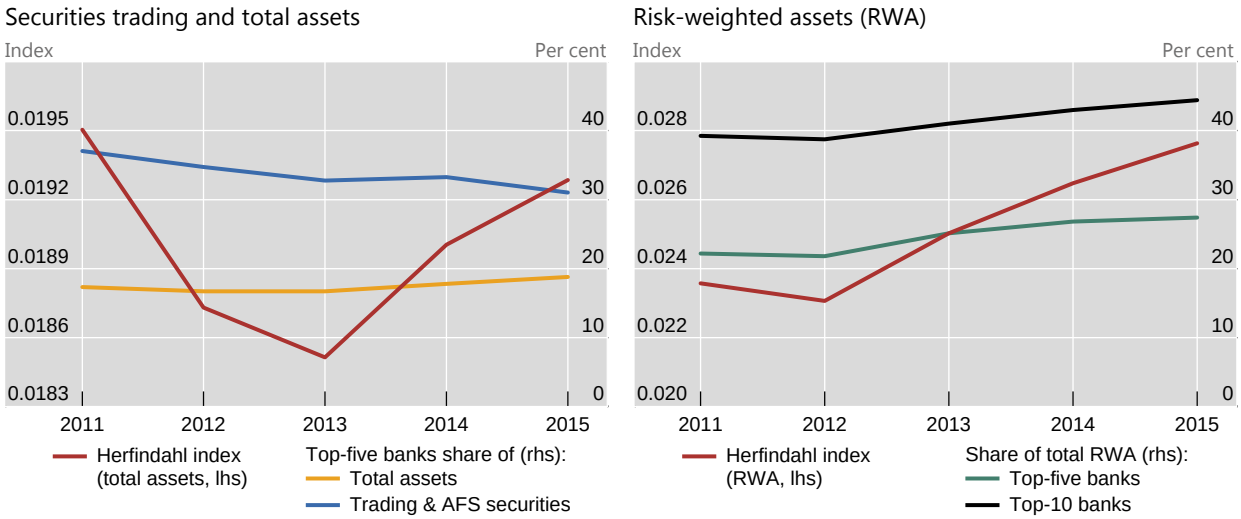
A complementary way is to adopt broader supportive policies. One example is legal steps to shorten drawn-out workout processes, where appropriate (eg Italy). Another is not to hinder cross-border mergers, sometimes because of the temptation to promote "national champions". Yet another is assessing critically the merits of public sector ownership, or just close ties, which can distort competition. A more general one is to promote the flexibility of labour markets, critical for cost cutting.

The challenges involved should not be underestimated. In particular, the jury is still out on the effectiveness of current efforts to address the orderly exit, "too big to fail" problem: it would be imprudent to assume that a foolproof solution will be found. And when establishing a balance between private sector and public sector involvement in addressing systemic crises, it is essential to bear in mind that public sector support may be necessary: the risk is that, otherwise, pressures to sweep problems under the carpet could be overwhelming. If so, the solution could be worse than the problem. Another tricky balance is between encouraging the reduction of excess capacity and higher concentration in the sector. In fact, post-crisis, the degree of concentration in global banking remains high and has even risen on some measures (Graph 11). The risk here is that consolidation may not result in cost cutting but may simply allow the incumbent to reap monopoly rents to cover inefficiencies and open up pockets of systemic risk. Competition policy can play a supportive role.

[22] For an elaboration of this issue, with particular reference to Europe and "overbanking", see ESRB (2014).

[23] Another specific feature that makes the banking industry, and financial sector more generally, more prone to excess capacity is of a more cyclical nature (Borio and Tsatsaronis (1999)): excess capacity in banking is not always self-correcting, as it does not immediately reduce profitability. Rather, it tends to raise it for a time, exacerbating financial booms. Specifically, credit expansion facilitates economic activity and booms in asset prices that, for a while, generate strong positive feedback on the financial condition of participants. The experience ahead of the GFC is but the latest such example. The true extent of excess capacity may thus not become fully apparent.

Concentration in global banking activity persists[1] Graph 11



[1] Sample of major internationally active banks that are included in the G-SIB calculation exercises.

Sources: SNL; BIS calculations.

Conclusion

The GFC, its aftershocks and the policy response have altered beyond recognition the landscape in which banks operate. How banks and authorities tackle the corresponding challenges will largely determine the industry's future shape and its success or failure.

In this presentation, I have addressed three questions and provided three tentative answers. I have argued that while the banking industry may be stronger than it was pre-crisis, troubling questions remain, as most concretely reflected in widespread market scepticism. I have suggested that such scepticism results from a poisonous mix of legacy problems and an unfavourable economic environment, most notably persistently and extraordinarily low interest rates. And I have pointed to possible responses. Banks need to work out the right business models without repeating the mistakes made pre-crisis – in essence, stay clear of the allure of short-term profits and focus on sustainable profitability based on a sound capital base and risk management as well as on lean cost structures. Prudential authorities need to complete the regulatory reforms without delay, notably Basel III, without diluting the standards, and need to encourage the clean-up of banks' balance sheets. Policymakers more generally, acting in concert with prudential authorities, need to facilitate the necessary adjustment, not least by addressing the "exit problem" that characterises the industry and tends to induce, or exacerbate, excess capacity.

For researchers, this represents a rich area of study. Some questions are better suited for macroeconomists, notably the reasons for such extraordinarily and persistently low interest rates – their recent pickup notwithstanding. As we have argued at the BIS and in contrast to prevailing orthodoxy, such low rates need not represent "equilibrium" rates, conducive to *lasting* financial and macroeconomic stability (BIS (2016a), Borio (2016)). Other questions fall squarely into the lap of prudential experts. One example is the impact of low rates and of the regulatory reforms on the banking industry, on banks' business models and on the financial system and economy more generally. Another is the nexus between exit barriers, excess capacity and risk-taking. Yet another is the equally important nexus between regulation, internal capital allocation and pricing decisions. I very much look forward to your progress in these areas.

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