BANK FOR INTERNATIONAL SETTLEMENTS

Bank capital and monetary policy transmission

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It is a privilege to share the platform with such a distinguished panel. The title of the session mentions inflation, but I would like to broaden the discussion somewhat and offer some thoughts on the role of the banking sector in the transmission of monetary policy.

Although banks figure very prominently in policy discussions and in popular commentary, the macroeconomics profession still has a rather uneasy relationship with banking. Some progress has been made in incorporating banks into theoretical models, but the standard workhorse macro models have little room for banks. Introductory textbooks in macroeconomics do not say much about banks, and for that matter, more sophisticated macro models used in central banks seldom mention banks, either.

I remember a long discussion over coffee with a distinguished macroeconomist in early 2008. At issue was whether bank failures can be expected to have any adverse impact on the economy. His argument was simple, and in some ways compelling. Banks are intermediaries; lenders give funds to banks who then lend on to ultimate borrowers. If banks are not there to be the middle men, lenders will surely find other ways to lend to ultimate borrowers. Market instruments could take the place of banks; new intermediaries will spring up to take their place. There may be short-term disruptions, but as long as there are willing lenders and willing borrowers, the market will find a way to match them. What was all the fuss about?

We argued about the severity of the possible feedback effects to the real economy but we did not manage to agree that morning, in spite of many cups of coffee.

I was reminded of this conversation recently by all the press commentary on monetary policy transmission and how it may have changed with the introduction of negative policy rates by some central banks. Many of the arguments that we hear today in the commentaries and speeches are quite reminiscent of the arguments that my distinguished interlocutor was offering in 2008. Preparing my remarks for this panel has given me a chance to mull over the arguments again. Based on these reflections, I would like to offer two main points today.

The first is on the way we view banks as actors in the economy. Banks are sometimes seen as passive actors who merely enable the decisions taken by lenders and borrowers. For this reason, they are seen as background detail that can be airbrushed out of our economic models for the sake of simplicity, much as my interlocutor was doing back in 2008. However, I would argue that this is a mistake. It turns out to be important to take account of banks as actors in their own right, managing their balance sheets actively, pursing their own objectives and reacting to the constraints that other actors place on them. This

[1] I thank Stefan Avdjiev, Claudio Borio, Jaime Caruana, Dietrich Domanski, Ingo Fender, Leonardo Gambacorta, Krista Hughes, Catherine Koch and Philip Turner for comments on earlier drafts and Kristina Bektyakova, Sebastian Deininger, and Anamaria Illes for excellent research assistance. The views expressed here are my own, and not necessarily those of the Bank for International Settlements.

will sound very abstract for now, but let me come back to this and make it more concrete when discussing the impact of negative interest rates.

My second point is about bank capital. For most central banks, discussions of bank capital crop up most often in connection with their financial stability mandate or perhaps with their financial supervision mandate, if they have a role there. But having soundly capitalised banks turns out to be vital for the transmission of monetary policy, also. In this sense, bank capitalisation ought to be a key concern for central banks in fulfilling their *monetary policy mandate*, as well as for their financial stability mandate.

Bank capital as the foundation for lending

Banks are intermediaries; they borrow from other lenders, combine the borrowed funds with their own funds, and then lend the combined total to ultimate borrowers. Bank capital refers to the bank's own funds. The more capital a bank has, the more own funds it has to lend out. But bank capital plays a more important role than this for overall lending. As well as lending out its own funds, a bank with plentiful own funds is able to borrow *more* from its creditors, and on much better terms than if the bank is poorly capitalised. So, if the objective of monetary policy is to unlock bank lending to the real economy, ensuring that banks have enough capital to support their lending activity is vital.

It is also true that bank capital is a loss-absorbing buffer in the sense that the bank's own funds can absorb losses from lending activity without imposing losses on the creditors to the banks. But solvent banks can sometimes be reluctant to lend, and weakly capitalised banks may seek to improve solvency metrics such as their ratio of capital to risk-weighted assets by cutting back on lending. If a bank's solvency metric is expressed as a ratio, there may even be some apparent tension between the monetary policy objective of unlocking bank lending (which entails expanding credit) and the supervisory imperative of ensuring the soundness of individual banks (which can be achieved by cutting back credit). This is why we sometimes hear calls for the relaxation of bank capital rules.

But this tension between the monetary policy objective and the supervisory imperative is more apparent than real; both the macro objective of unlocking bank lending and the supervisory objective of sound banks are better served if banks have more capital. In general, sound banks lend more, and do so in a sustainable way over the cycle.

The bank's own funds come from several sources, but the most important source is the bank's *retained earnings*. This portion of the bank's own funds refers to the accumulated stock of all of the bank's profits since its inception that have not been paid out as dividends to shareholders. This is probably not something that many of you follow closely, and so let me show you some numbers for the retained earnings of euro area banks.

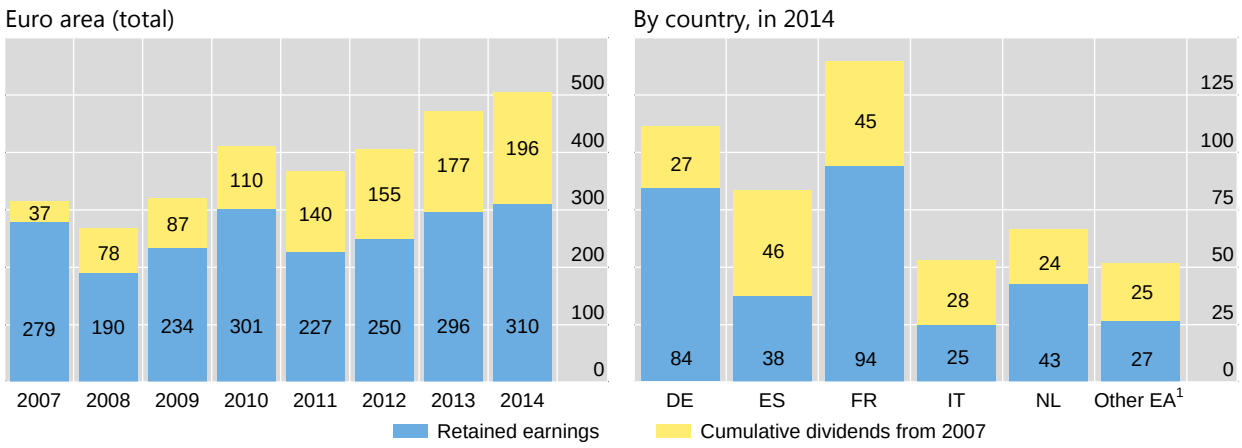
Graph 1 shows the total amount of retained earnings for a group of 90 euro area banks as well as the cumulative amounts paid out as dividends since 2007.[2] I chose 2007 for this illustration, as 2007 was the beginning of the global financial crisis, and policymakers could see that all was not well for the world economy. The left-hand panel shows the total accumulated dividends for this group of banks, while the right-hand panel gives a snapshot of the same categories broken out by country of residence at the end of 2014. The accounting numbers for 2015 are still trickling in, and so end-2014 is the latest complete snapshot.

[2] The list of banks follows in the appendix. The banks in the sample are locally incorporated banks in the euro area, not the consolidated global banking groups.

Total retained earnings and accumulated dividends of a group of 90 euro area banks

In billions of euros

Graph 1



DE = Germany; ES = Spain; FR = France; IT = Italy; NL = Netherlands; Other EA = Other euro area.

[1] Austria, Belgium, Finland, Greece, Ireland and Portugal.

Sources: S&P Capital IQ; BIS calculations.

The blue bars indicate the total euro amount of retained earnings of the 90 banks in the sample. Notice that retained earnings can decline sometimes; this happens when the bank makes losses and has to dip into its retained earnings to make up for those losses.

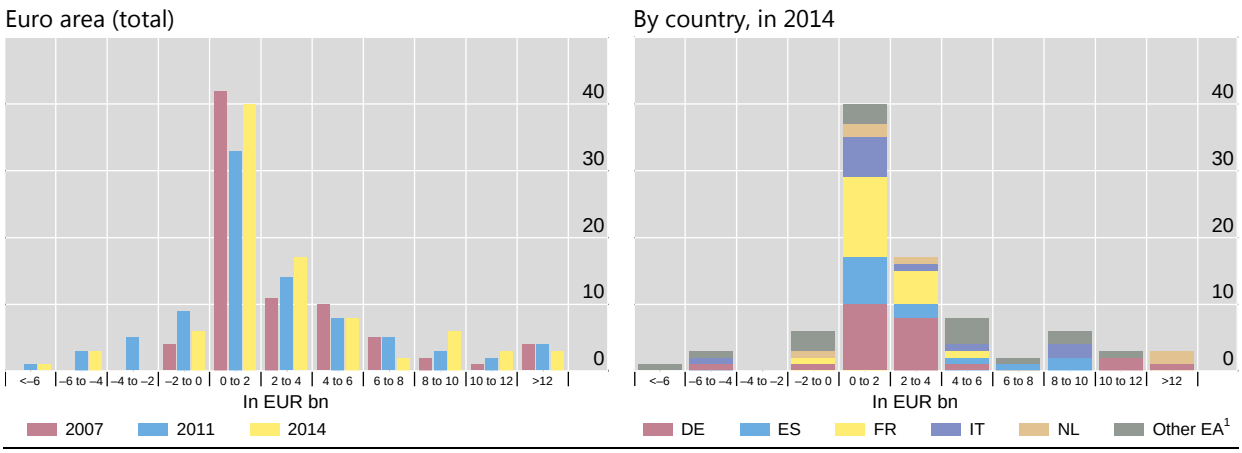
By the end of 2014, the total retained earnings of this group of banks stood at 310 billion euros. Meanwhile, the accumulated dividends for this group of banks since 2007 amounted to 196 billion euros. This means that the retained earnings of these banks would have been 63% higher in 2014, had the banks chosen to plough back the profits into their own funds rather than paying them out as dividends. If greater retained earnings had supported a virtuous circle of greater lending and higher profits, the hypothetical increase in retained earnings might have been larger still. In the case of some countries, the accumulated dividends exceeded the retained earnings of the banks; for the subsample of banks from Spain and Italy, retained earnings would have been more than double what it was at the end of 2014, had profits been ploughed back into the bank.

Graph 2 presents more detailed cross-section information on retained earnings across banks. The left-hand panel shows the cross-section distribution of retained earnings. I have plotted the distribution at three snapshots in time: at the beginning of the crisis in 2007, during the euro area crisis in 2011 and more recently, at the end of 2014.

We see that retained earnings can actually turn negative; this happens when accumulated losses exceed the accumulated stock of past profits ploughed back into the bank. We also see that the number of banks with negative retained earnings jumped in 2011, but the distribution shifted to the right in 2014. Yet, there remain many more banks with negative retained earnings than at the start of the crisis in 2007.

Frequency distribution of retained earnings by country

Number of banks in the range, sample of 90 euro area banks — Graph 2



DE = Germany; ES = Spain; FR = France; IT = Italy; NL = Netherlands; Other EA = Other euro area.

[1] Austria, Belgium, Finland, Greece, Ireland and Portugal.

Sources: S&P Capital IQ; BIS calculations.

Why do banks choose to erode their capital in such large amounts? This is more than just an idle question, because banks' capital – their own funds – has important implications for bank lending in support of the real economy. I will come back to the question later but, for now, let me illustrate the role of bank capital in lending with some charts from a working paper with my BIS colleague Leonardo Gambacorta that we released this morning. The paper studies a sample of 105 advanced economy banks to shed further light on their lending decisions.[3] Graph 3 is from that working paper.

The left-hand panel of Graph 3 shows a summary scatter chart that plots the relationship between the cost of the bank's borrowed funds and its overall leverage. Here, leverage is defined as the ratio of a bank's total assets to its equity. You can see that the scatter chart is quite dispersed, but the scatter chart overstates the noise in the relationship as it is just the simple scatter for the mean values for each bank, without controlling for bank characteristics or macro variables. In our more detailed empirical analysis, we find that a 1 percentage point increase in the equity-to-total-assets ratio is associated with a 4 basis point reduction in the cost of borrowed funds for the bank.

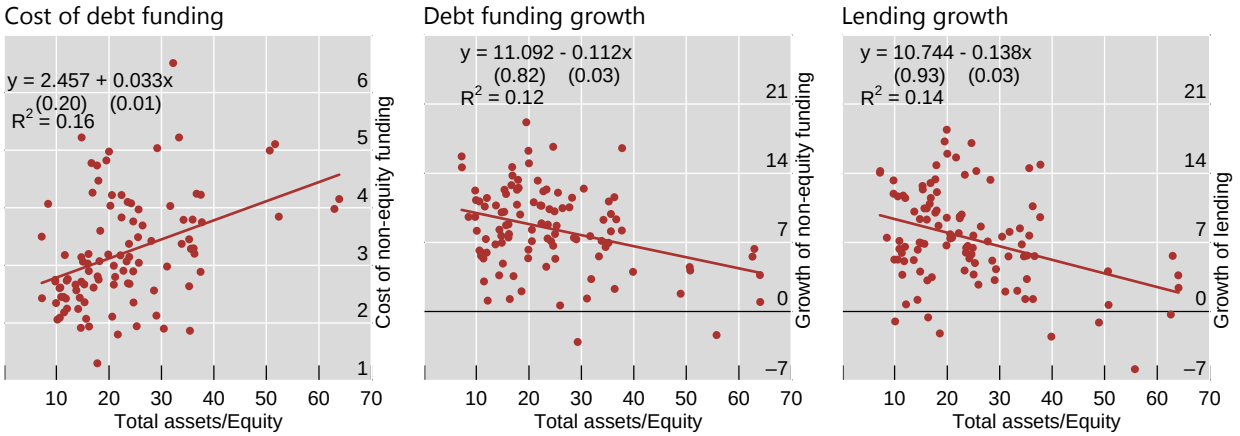
This finding sets an important benchmark when considering the benefits of higher bank capital for bank funding cost. For typical levels of bank leverage, it would appear that banks could go a long way towards mitigating their supposedly higher cost of equity funding by keeping back more of their profits for retained earnings (and, hence, capital).[4]

[3] L Gambacorta and H S Shin, "Why bank capital matters for monetary policy", *BIS Working Papers*, no 558, April 2016.

[4] Consider a balance sheet of size 100, with equity of 10. If equity is raised to 11, a 4 basis point reduction in the cost of borrowed funds results in cost saving of $0.0004 \times 89 = 0.0356$. If the cost of equity is assumed to be 10%, the cost of equity funding is 1 when equity is 10 and 1.1 when equity is 11. The additional cost of equity is 0.1. The reduction in the cost of borrowed funds is 36% of the supposed incremental cost of equity.

Bank capital and loan growth[1]

Graph 3



[1] The panels present scatter plots between the leverage of 105 advanced economy banks and cost of funding in percent (left-hand panel), annual growth rate of debt financing in percent (centre) and annual growth rate of lending in percent (right-hand panel). Standard errors are in brackets.

Source: L Gambacorta and H S Shin, "Why bank capital matters for monetary policy", *BIS Working Papers*, no 558, April 2016.

The lower funding cost translates into greater intermediation activity by the bank. The centre panel of Graph 3 shows that banks that have more own funds, and hence lower funding costs, raise borrowed funds at a faster pace. The upshot is that banks with lower leverage expand their lending at a faster rate, too – this is the "sound banks lend more" line I mentioned earlier. The right-hand panel of Graph 3 shows this for the summary data. In the detailed analysis, we find that a 1 percentage point increase in the equity to total assets ratio is associated with a 0.6 percentage point uptick in the subsequent growth in lending.

To drive home the point, let me reach back to the analogy I used in my Sintra presentation two years ago at the ECB Annual Symposium. That is, a bank's lending is to its capital as a building is to its foundations. If the bank's capital forms the foundations, its leverage corresponds to the height of the building that stands on the foundations. The size of the building is the total lending done by the bank. The bank can expand lending by using more borrowed funds and increasing its leverage. But it turns out that this kind of lending is not very resilient. It is "fair weather lending", to coin a phrase. As soon as economic conditions turn less favourable for leverage, the bank shrinks its lending with very bad consequences for the real economy.

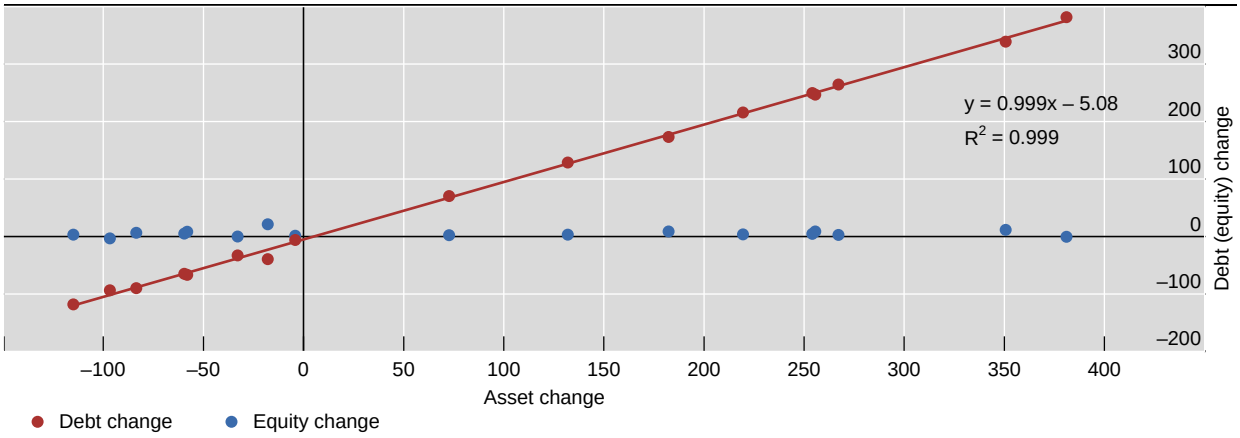
Graph 4 illustrates how the cyclical variation of lending plays out for a typical bank. It shows a scatter chart that plots the relationship between the annual change in total assets on the horizontal axis and how the assets are financed as between its own funds (in blue) and in borrowed funds (in red) on the vertical axis.[5]

[5] The slopes of the two lines add up to 1 due to the balance sheet identity. See T Adrian and H S Shin, "Procyclical leverage and value-at-risk", *Review of Financial Studies*, vol 27, no 2, 2014, pp 373–403.

Annual changes in assets, equity and debt for a large European bank

1999–2015, in billions of euros

Graph 4



Scatter plot showing how much of the change in assets is accounted for by changes in debt and equity, respectively. Annual changes in billions of euros are shown for large European bank (1999–2015).

Sources: S&P Capital IQ; BIS calculations.

The fitted line through the scatter plot between the change in assets and change in borrowed funds has a slope that is essentially equal to 1, meaning that the change in assets in the short term, over horizons of around one year, are almost all accounted for by the change in debt. The blue scatter for equity is flat, meaning that the bank's own funds do not vary much over the cycle.

This scatter chart reinforces the analogy between equity and the foundations of the building. It suggests that the foundations of the building are pretty much fixed, and what changes is the size of the building that stands on those foundations. The taller is the building, the higher is the leverage and the greater is the amount of lending done by the bank. During boom times, the height of the building increases as the bank adds new floors to the existing structure. In other words, the bank increases its total assets by increasing its leverage atop the same equity base. The boom is associated with greater availability of credit and lower risk weights for the bank's assets. The problems arrive when financial conditions turn for the worse and the bank is no longer able to secure borrowed funds. Then, the lending too grinds to a halt.

Graph 5 shows the famous Sutyagin House in Archangel in Russia, reputed to have been the tallest wooden structure in the world when it was completed. The photo on the left is from its heyday from around 2007, while the right-hand photo is from 2008, after the building was condemned as a fire risk and its upper floors were dismantled.[6] The building's multilayered architecture in its heyday suggests that the builder added new floors to the existing structure as the construction progressed. The turret at the top seems to be the builder's final flourish, added on top of an already precarious structure. The analogy would be with the subprime mortgage securitisations that came late in the credit boom. More lending atop a fixed equity base is like piling a taller building onto the same foundation.

The eventual fate of the Sutyagin house is something of a parable for undercapitalised banks. After having its upper floors dismantled in 2008, it eventually burned down in a fire in 2012. That the dates coincide with the banking crisis is fortuitous, but the analogy gains added poignancy, nevertheless.

[6] https://en.wikipedia.org/wiki/Sutyagin_House.

Graph 5 – Sutyagin house in Archangel, Russia

(left, circa 2007; right circa 2008)

I would argue that there is an important lesson for monetary policymakers from the Sutyagin house analogy. If the aim of monetary policy is to induce banks to lend and do so in a way that is sustainable over the cycle, securing a strong enough foundation is a vital first step. The foundation for lending is the bank's own funds – its capital. Otherwise, any additional lending may end up being fair weather lending that will vanish at the first sign of trouble.

Let me now come back to the question posed earlier as to why banks have been so reluctant to plough back their profits into their own funds. We need to better understand the reasons for this reluctance, but we may ask whether there are possible tensions between the private interests of some bank stakeholders versus the wider public interest of maintaining a soundly functioning banking system that can supply credit in support of economic activity.[7]

When the bank's share price is substantially below the book value of the bank's equity, shareholders may feel they can unlock some value from their shareholding by paying themselves a cash dividend, even at the expense of eroding the bank's lending base. As many of the shareholders are asset managers who place great weight on short-term relative performance in competition against their peers, the temptation to raid the bank's seed corn may become too strong to resist. The bank's management, for their part, may see the lower capital base as unobjectionable if it means that they can meet their return-on-equity target more easily by reducing the base for the calculation of return-on-equity.

These private motives are reasonable and readily understandable, but if the outcome is to erode capital that serves as the bank's foundation for lending for the real economy, then a gap may open up between the private interests of some bank stakeholders and the broader public interest. To the extent that undercapitalised banks perpetuate a weak economy and thereby keep bank stock prices under pressure, it may even be the case that paying out large dividends also fails to promote the collective interests of the bank's shareholders, let alone the wider public interest. One thing is clear. Banks have paid

[7] For further development of this point, see A Admati, P DeMarzo, M Hellwig and P Pfleiderer, "Fallacies, irrelevant facts and myths in the discussion of capital regulation: Why bank equity is not expensive", *Stanford GSB Research Paper*, no 2065, 2010, and A Admati and M Hellwig, *The bankers' new clothes: what's wrong with banking and what to do about it*, Princeton University Press, 2010.

out substantial cash dividends, even in those regions where bank lending may not be sufficient to support recovery of economic activity after the crisis. This should be of concern to central bankers in pursuit of their monetary policy, as well as their financial stability mandates.

Negative interest rates and credit growth

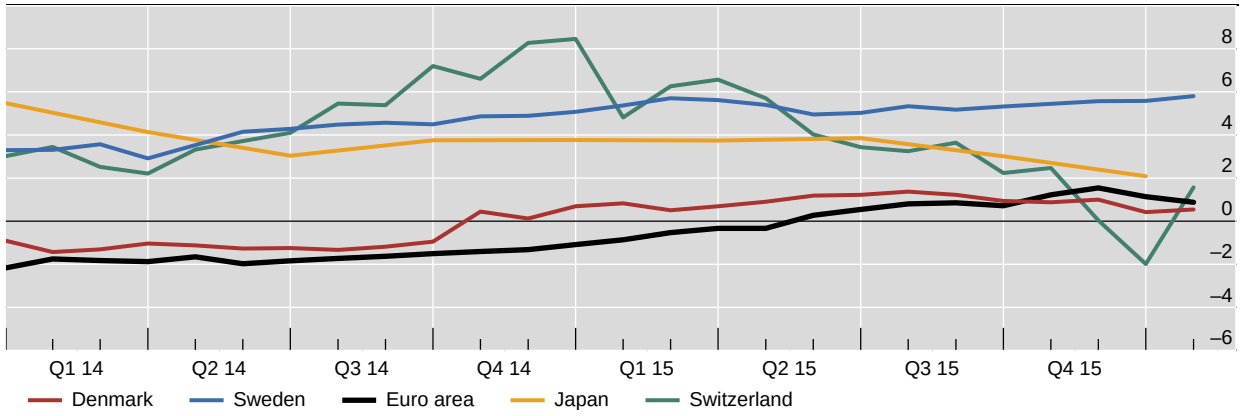
We have focused so far on bank capital as the basis for lending. What about interest rates? How does the central bank policy rate affect lending? This question has been gaining more attention recently in connection with the discussions on how negative central bank policy rates affect lending growth.

Let me start with a quick overview of what has been happening to credit growth in jurisdictions where the central bank policy rate is negative. Graph 6 plots the annual growth rate of bank lending to households and firms in Denmark, the euro area, Japan, Sweden and Switzerland.

The first thing to note is how diverse the experience with credit growth has been. Credit growth to firms and households turned positive in the euro area last year, and is running at around 1% per year, while in Switzerland the growth rate has fallen from an annual rate of 8% at the end of 2014. But the case that stands out is Sweden, where lending has been growing at close to 6% annually. The contrast between Sweden and Switzerland is especially noteworthy.

Annual growth in loans to household and non-financial firms by resident banks[1]

In per cent — Graph 6



[1] All outstanding loans; all maturities. Data are at a monthly frequency except for Japan, which is quarterly. The latest observation for the Japan credit series is for Q4 2015. For all other series, the latest observation is January 2016.

Sources: Bank of Japan; ECB; Datastream.

How do these developments tie in with the textbook mechanisms that connect interest rates with credit growth? Graph 7 illustrates the standard discussion in introductory textbooks on why a cut in the interest rate will stimulate economic activity. Although these diagrams are in some respects a gross oversimplification, they do capture the essential elements of standard macro models used in central banks around the world. I would say that these charts also capture well what my distinguished interlocutor was arguing back in 2008.

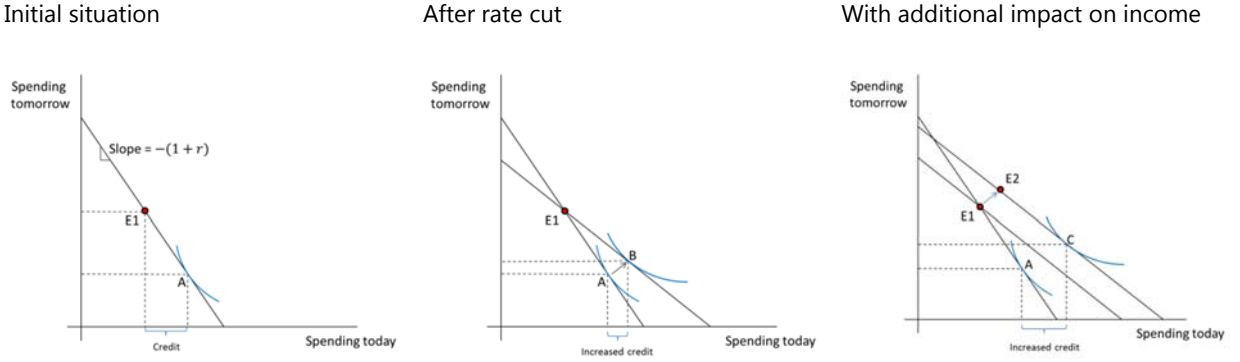
The left-hand panel of Graph 7 shows the saving and spending decision for an individual whose income today and tomorrow is represented by point E1, and who can borrow or lend at the interest rate *r*. As the diagram is drawn, this individual settles on point A, choosing to borrow today and repay tomorrow.

The centre panel shows what happens after a cut in the interest rate. The borrower takes advantage of the lower interest rate and spends more today by borrowing more, settling at point B. Of

course, to complete the story, we would need to introduce savers who lend to the borrowers, and the interest rate *r* will then be determined by setting lending equal to borrowing. I will dispense with that step today for brevity, but had we built the full economic model, we would also have the so-called general equilibrium effects, meaning that the additional spending will feed into the rest of the economy and raise activity levels more generally. So, we could go one step further from the centre panel to arrive at the right-hand panel of Graph 7. If the economy was operating below full capacity to begin with, the additional spending generated by the cut in interest rates will raise overall incomes in the economy; we would then have a shift in endowments from E1 to E2, giving further impetus to overall spending and the demand for credit, moving to point C.

Note one important point. There is nothing in the argument that relies on the interest rate being positive. A negative *r* just means that the budget line is shallower, but nothing special happens at zero, and the qualitative features of the argument are unaffected. So, when you read commentators who say that negative rates are nothing special, this is the picture you should have in mind.

Textbook description of impact of an interest rate cut — Graph 7



How would banks fit into the picture? How would lower interest rates stimulate greater bank lending? In normal times, when interest rates are positive, there is actually a lot in common between the textbook model above and how bank lending would respond to lower policy rates. Lower central bank policy rates can be expected to boost bank lending, too. In normal times, changes in the policy rate have a virtually one-for-one relationship with the change in the term spread, the difference between long-term and short-term rates. This is because the long-term rate moves by much less than the policy rate itself. Graph 8 illustrates this feature for the United States.

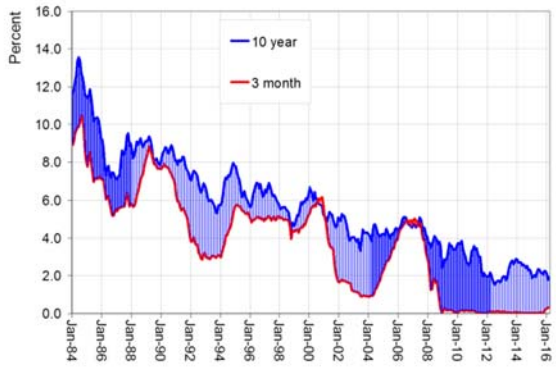
The left-hand panel of Graph 8 plots the 10-year and three-month US treasury rate, with the gap in blue indicating the term spread – the difference between the 10-year rate and the three-month rate. Before the crisis, we see that the blue region widens when the short rate goes down. But after the crisis, once we hit the zero lower bound, the term spread is driven by fluctuations in the long rate.

The right-hand panel of Graph 8 plots the scatter chart between the 12-month change in the 10-year rate and the 12-month change in the three-month rate. Before the crisis, the dots line up quite well along the diagonal line of slope minus 1. But as the red dots show, this feature breaks down after the crisis. We see that the three-month rate is immobile, and the term spread is driven entirely by the long rate.

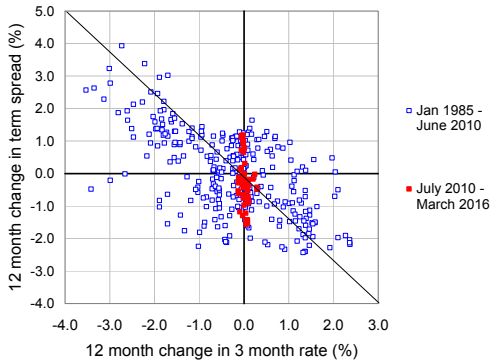
Change in US 10-year – three-month treasury term spread and change in three-month rate

In percent Graph 8

US three-month and 10 year treasury rate



Change in term spread



Source: Federal Reserve.

For a bank whose funding cost is tied to the short-term rate, but whose lending rate is closer to the long-term rate, a higher term spread makes lending more profitable, which induces banks to lend more. A steeper yield curve driven by a low short rate is therefore favourable to bank lending, and this is why bank profitability tends to rise with an increase in the term spread.[8]

The introduction of negative policy rates has led to an active debate about bank profitability, but bank profitability should be discussed in connection with its impact on the real economy. If banks were to diversify into other business areas, such as asset management, but abandon lending, this may help their profitability but may do less for lending in support of the real economy. The issue is not only banks' profitability, as such, but the profitability of their lending activity.

The bank-driven lending mechanism described above is quite different from the one sketched in Graph 7, which follows the textbook account, but the outcome of an interest rate cut happens to be the same in a normal environment. When the central bank cuts its policy rate, the short rate falls and bank lending expands. During normal times, the textbook model is an acceptable abstraction of what happens to lending, since the outcome is the same. When you drive a car, you don't need to know how the controls are wired; pressing on the accelerator pedal makes the car go. That's all you need to know.

The problem comes when you push the model beyond breaking point, and the abstraction is no longer acceptable. Then, the details start to matter, and airbrushing banks out of your macro model can lead to misleading conclusions. What if the car's wiring is now switched, and pressing the accelerator pedal actually activates the brakes?

The bank-driven credit story and the textbook story have similar predictions during normal times, but they start to diverge when the policy rate becomes negative. As we saw above, in the textbook explanation, there is nothing special about zero. However, for a bank, its overall funding cost may not fall much below zero. That is especially true if the bank is reliant on deposit funding from retail customers. It is rare for retail deposit rates to fall below zero, even when the central bank policy rates turns negative.

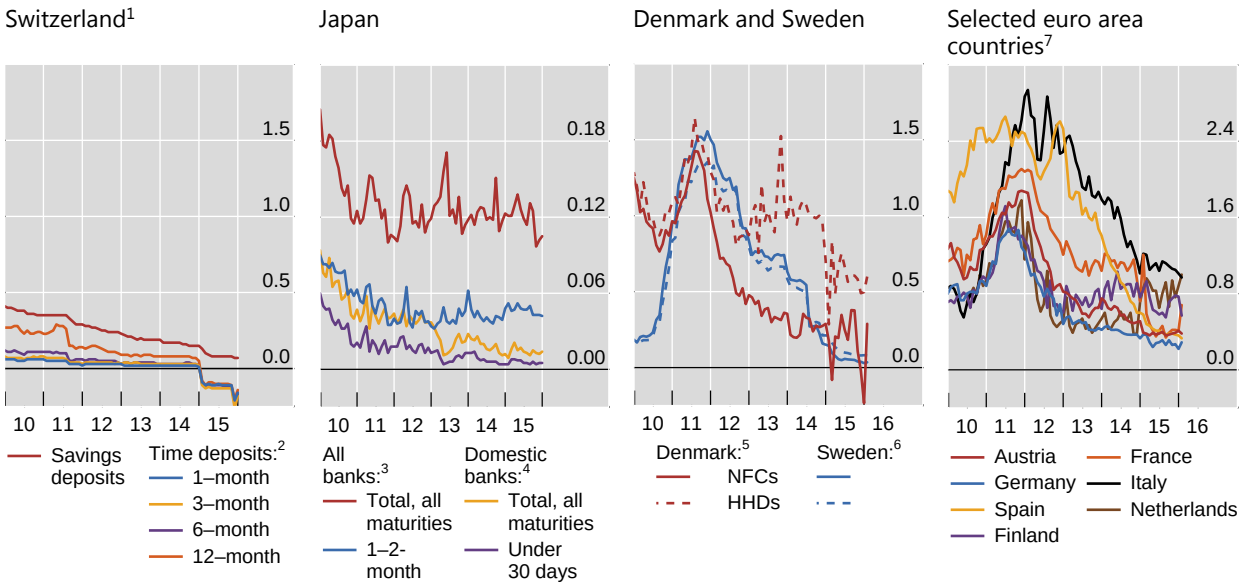
[8] For more detailed evidence on this point, see C Borio, L Gambacorta and B Hofmann, "The influence of monetary policy on bank profitability", *BIS Working Papers*, no 514, October 2015.

Meanwhile, lending rates may fall nevertheless, especially if the central bank also pursues asset purchase programmes that push down long-term rates. This means that banks' lending rates will decline even if deposit rates do not, squeezing lending margins and dissuading banks from lending.

Graph 9 plots deposit rates in those jurisdictions where the central bank has adopted negative policy rates. The first panel, for Switzerland, shows that wholesale deposit rates to large depositors went negative at the beginning of 2015, following the central bank policy rate into negative territory, but that household deposit rates have stayed above zero. The same is true of deposit rates in Denmark, Japan, Sweden and in the euro area.

Deposit rates of banks

In per cent — Graph 9



HHDs = households; NFCs = non-financial corporations.

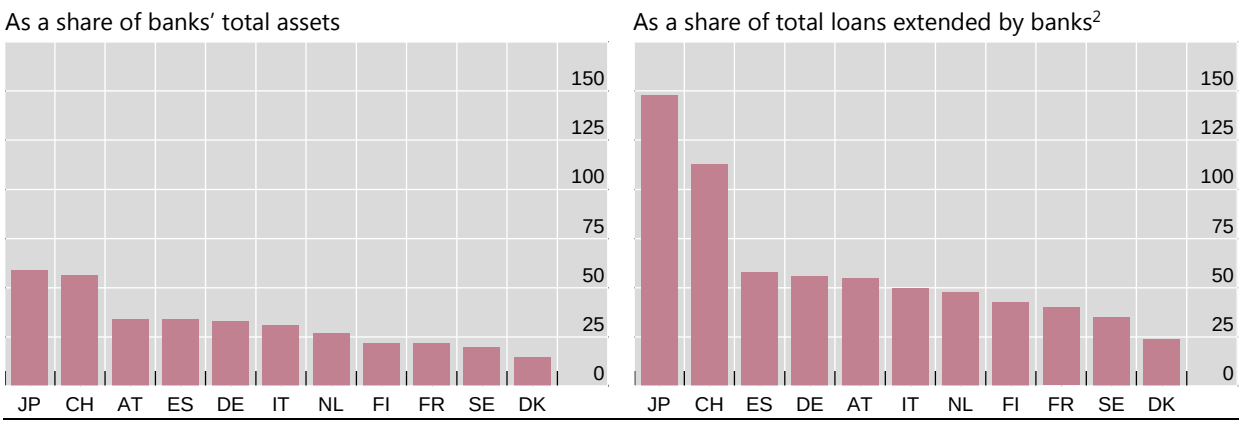
[1] Interest rates on new deposits. [2] Median value of deposits of at least CHF 100,000. [3] New time deposits. [4] Certificates of deposit. [5] New domestic deposit rates for deposits with agreed maturity; excluding pooling scheme. [6] New domestic deposit rates of banks on all accounts. [7] Annualised agreed rate on new deposits with agreed maturity to non-financial corporations and households, all maturities.

Sources: Bank of Japan; Danmarks Nationalbank; ECB; Sveriges Riksbank; Swiss National Bank.

The evidence is that banks have been reluctant to bring retail deposit interest rates down below zero, even if deposit rates to corporate and institutional clients can dip below zero. How important the zero lower bound turns out to be for retail deposit rates depends on how easily non-rate terms can be adjusted for retail clients, for instance, through fees. Another important element is how much of the banks' overall borrowed funds comes from retail depositors. In this respect, there is a wide range across different economies, as seen in Graph 10.

Deposits of households and non-financial corporations[1]

In per cent, data up to December 2015 Graph 10



AT = Austria; CH = Switzerland; DE = Germany; DK = Denmark; ES = Spain; FI = Finland; FR = France; IT = Italy; JP = Japan; NL = the Netherlands; SE = Sweden.

[1] Total outstanding deposits; for euro area MFIs excluding ESCB; for Switzerland amounts due in respect of customer deposits. [2] For Switzerland loans are the sum of amounts due from customers and mortgage loans.

Sources: Bank of Japan; ECB; SNB; Datastream.

Graph 10 illustrates the diversity in the bank funding model across countries. Japanese banks have a high reliance on deposit funding, both as a proportion of banks' total assets and as a proportion of total loans. At the other end of the spectrum come Sweden and Denmark. In the case of Denmark, its unique system of covered bonds sets it apart from the other cases listed in Graph 10.

This brings us to Sweden. We saw earlier how bank credit growth has been buoyant in Sweden, in spite of negative policy rates. One possible reason for this is that Swedish banks are not so reliant on deposit funding.

There is also perhaps an even more important point. Swedish banks are sensitive to monetary developments in the euro area, and especially to the slope of the euro yield curve. In recent months, Swedish banks have taken advantage of low long-term borrowing rates in euros, and have been issuing euro-denominated bonds of longer maturity. The banks then swap the euros for Swedish krona in the capital market, meaning that they borrow Swedish krona by pledging the borrowed euro funds as collateral. Having borrowed the Swedish krona, they lend it out to domestic borrowers in Sweden.[9]

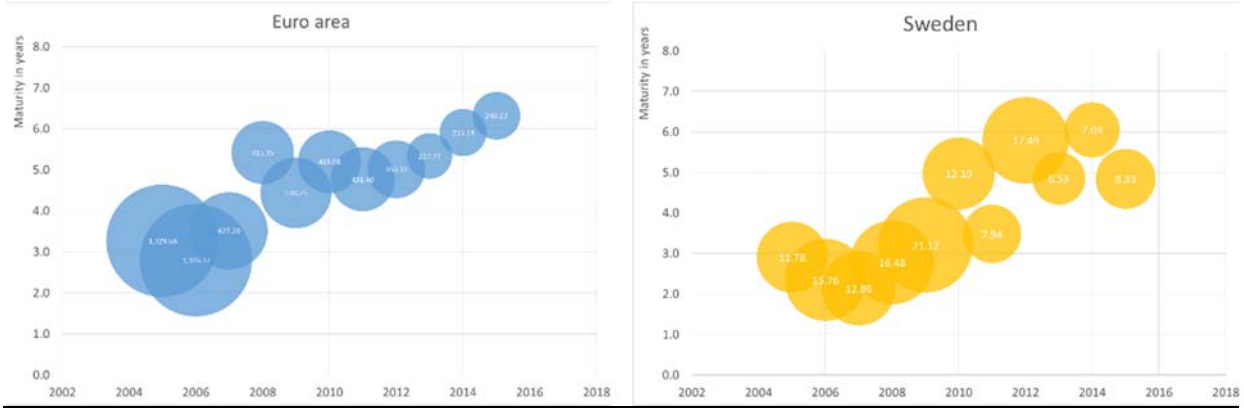
Graph 11 shows the gross issuance of euro-denominated bonds by banks. The size of the bubble indicates the relative size of gross issuance amounts over time, while the height of the bubbles indicates the average maturity of the gross issuance. The left-hand panel shows the issuance activity of euro area banks, and the right-hand panel shows the issuance activity of Swedish banks. Euro area banks have been issuing far less in notional amounts after the crisis than before, although the maturity is higher than before the crisis. For Swedish banks, their issuance activity is not much smaller now compared to before the crisis, and the maturity has also increased.

[9] I Hilander, "Short-term funding in foreign currency by major Swedish banks and their use of the short-term currency swap market", *Sveriges Riksbank Economic Review*, no 1, 2014, pp 1–23.

Gross issuance of euro-denominated debt securities

Sum of domestic and international debt securities (in billions of euros) Graph 11

Euro area (Total) Sweden



Size of the bubble indicates the relative gross issuance amount in billions of euros. Height of the bubble indicates weighted average maturity in years.

Sources: BIS debt securities statistics.

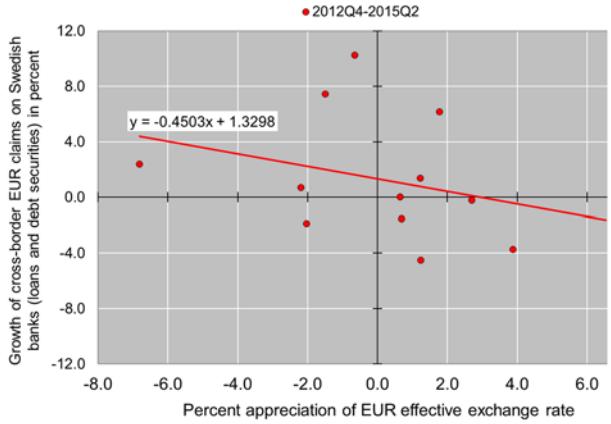
One indication of the banks' currency swap activity is the so-called cross-currency basis between the Swedish krona and the euro. This refers to the difference between the interest rate on the euro implied by the cross-currency swap versus what banks have to pay to borrow euros in the open market. The cross-currency basis for the Swedish krona versus the euro has been positive, meaning that the euro interest rate implied by the cross-currency swap is *lower* than the euro interbank rate. Another way of saying this is that there is an "abundance" of euros in Sweden from sellers who wish to borrow Swedish krona by pledging euros as collateral. Only a few other currencies have this feature, and most of them are countries where the banks issue long-term bonds in international currencies to fund domestic lending. Australia is a good example, and Norway is another.

If we take in the bigger picture by zooming out and seeing the international dimension of bank lending, we get a better view of recent events. Graph 12 shows how the euro exchange rate affects cross-border lending to banks in Sweden. The left-hand panel shows the relationship between the euro-denominated cross-border borrowing of banks in Sweden and the euro exchange rate. It shows that banks in Sweden tend to draw on more euro-denominated funding from outside Sweden when the euro is weak. . This negative relationship between the euro exchange rate and cross-border flows is a fairly recent phenomenon, as is shown by the coefficients on the 20-quarter rolling regressions in the right-hand panel. In this sense, Sweden's buoyant credit growth may be related as much to monetary developments in the euro area as to domestic circumstances.

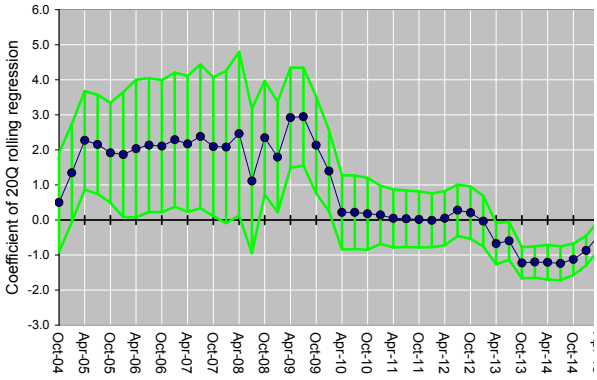
Cross-border lending in euros to banks in Sweden

Graph 12

Growth in EUR cross-border lending to banks in Sweden vs changes in EUR effective exchange rate[1]



Rolling window regression coefficient[2]



[1] The line is a fitted regression line. Positive changes in FX rate denote euro appreciation; percentage changes refer to EUR cross-border claims (loans and debt securities) on banks in Sweden. [2] The dark circles indicate the regression coefficient from a 20-quarter rolling regression. Green lines indicate one standard error bands.

Sources: BIS effective exchange rate statistics; BIS locational banking statistics by residence.

Concluding remarks

I have made two points today. The first is that banks deserve attention as actors in their own right. By paying attention to essential details, we will be better equipped to recognise when the predictions of the standard textbook model will adequately serve in describing more realistic outcomes with banks. This is especially true when central bank policy rates are negative.

Second, having soundly capitalised banks is a public good, but the interests of some bank stakeholders and the broader public may diverge. My colleague Bill Coen of the Basel Committee on Banking Supervision gave a speech earlier this week[10] taking stock of the discussions on the Basel III standards. We should all be taking an interest in the work of the Basel Committee and supporting its efforts to ensure that banks have sufficient capital. As I have argued today, soundly capitalised banks should be a central concern of central banks in fulfilment of their mandates for both monetary policy and financial stability.

[10] W Coen, "The global policy reform agenda: completing the job", Keynote speech at the AFR Banking and Wealth Summit, Sydney, 5 April 2016.

Appendix: the 90 banks used in the sample for Graphs 1 and 2:

Abanca Corporación Bancaria S.A., ABN AMRO Group N.V., Allied Irish Banks p.l.c., Alpha Bank A.E., Banca IMI S.p.A., Banca Monte dei Paschi di Siena S.p.A., Banca Nazionale del Lavoro SpA, Banca popolare dell'Emilia Romagna Società cooperativa, Banco Bilbao Vizcaya Argentaria S.A., Banco Comercial Português S.A., Banco de Sabadell S.A., Banco Popolare Societa Cooperativa Scarl, Banco Popular Espanol S.A., Banco Santander S.A., Bankia S.A., Bankinter S.A., Banque Fédérative du Crédit Mutuel S.A., Bausparkasse Schwäbisch Hall AG, Bayerische Landesbank, Belfius Banque SA/NV, BNP Paribas Fortis SA/NV, BNP Paribas Personal Finance SA, BNP Paribas SA, BNP Paribas Securities Services S.C.A., BRED Banque Populaire S.A., Caisse des dépôts et consignations, Caisse Française de Financement Local SA, CaixaBank S.A., Cassa di Risparmio di Parma e Piacenza S.p.A., Catalunya Banc S.A., Commerzbank AG, Confédération Nationale du Crédit Mutuel, Coöperatieve Rabobank U.A., Crédit Agricole Corporate and Investment Bank S.A., Credit Agricole S.A., Crédit du Nord Société Anonyme, Crédit Foncier de France, Crédit Industriel et Commercial, Crédit Mutuel Arkéa, Dekabank Deutsche Girozentrale, Deutsche Bank AG, Deutsche Boerse AG, Deutsche Kreditbank AG, Deutsche Pfandbriefbank AG, Deutsche Postbank AG, Dexia Crédit Local Société Anonyme, Dexia SA, DZ Bank AG, Erste Group Bank AG, Eurobank Ergasias S.A., HSBC France S.A., HSH Nordbank AG, Hypo Real Estate Holding AG, Hypothekenbank Frankfurt Aktiengesellschaft, Ibercaja Banco S.A., Iccrea Holding S.p.A., ING Bank N.V., ING Belgium SA/NV, ING-DiBa AG, Instituto de Crédito Oficial, Intesa Sanpaolo S.p.A., KfW, Kutxabank S.A., Landesbank Baden-Württemberg, Landesbank Berlin AG, Landesbank Hessen-Thüringen Girozentrale, Landeskreditbank Baden-Württemberg - Förderbank, Landwirtschaftliche Rentenbank, LCL, Mediobanca Banca di Credito Finanziario S.p.A., N.V. Bank Nederlandse Gemeenten, National Bank of Greece S.A., Natixis, Nederlandse Waterschapsbank N.V., Norddeutsche Landesbank Girozentrale, NRW.BANK, Piraeus Bank S.A., Pohjola Bank plc, Raiffeisen Bank International AG, Raiffeisen Zentralbank Österreich Aktiengesellschaft, Santander Consumer Finance S.A., SNS Bank N.V., Societe Generale Group, The Governor and Company of the Bank of Ireland, UniCredit Bank AG, UniCredit Bank Austria AG, UniCredit S.p.A., Unione di Banche Italiane S.p.A., WGZ BANK AG Westdeutsche Genossenschafts-Zentralbank, Wüstenrot & Württembergische AG.