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European Bank Strategy

## Negative rates and euro area banks: the problem and the solutions

We show how negative interest rates have affected euro area banks and expose the emerging supply-side risks to credit creation. Regulators need to find a way to lower the cost of bank liabilities, otherwise the ECB will have to take controversial steps to support bank lending.

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## EXECUTIVE SUMMARY

The ECB has long argued against the notion that its negative interest rates policy harms euro area banks; yet bank analysts, and the banks themselves, cry foul. We use system-level balance sheets to analyse how negative interest rates have affected euro area banks and to expose the emerging supply-side risks to credit growth.

The “reversal rate” hasn’t been reached, yet. Euro area lending data show that banks continue to lend in greater volumes and at lower rates. This supports the calm response of policy-makers when discussing the side effects of negative rates and quantitative easing. But we argue that the “reversal rate” – ie. the level of interest rates at which accommodative monetary policy becomes contractionary for the real economy – is not just a *level* in yields, it is also the *time* when banks can no longer grow lending by reducing other activities or costs.

**Bank loan growth has been mostly supply driven.** Negative rates have compressed the yield on all bank assets, which has made lending a relatively more attractive use of capital. But banks are supporting lending volumes by reducing the balance sheet made available for financial market activity such as market making, repo and OTC derivatives. This approach to credit creation is doomed to slow once banks exhaust their capacity to shrink other activities, unless there is an increase in loan demand that leads to higher margins on lending. At the limit, the low RoTE that banks generate threatens to keep credit growth constrained at relatively low levels in the euro area (<5%/y).

**Unless regulators are willing to accept lower rates of loan growth, extreme solutions will be required.** To re-establish bank profitability, regulators need to lower the cost of bank liabilities. One potential solution would be to allow banks to charge negative rates on household deposits, in part or full. But this would be controversial and not without risks for the banking system; we believe that regulators/law-makers would need to step in to make this approach broadly applicable. Other possible solutions include increased non-bank lending or greater wholesale funding of bank balance sheets. The most bank-negative outcome would be if policy-makers accept low credit growth as a “fact of life”, which could increase the risk of a low growth/inflation outcome for the euro area.

If regulators do not act, the ECB may have to take controversial steps. Should banks hit a wall in lending, as balance-sheet constraints bite or demand weakens, the ECB could be forced to further relax TLTRO conditions or even consider extreme policy actions, such as adding bank securities to its asset purchase programmes.

## Assessing the net effect of negative rates

*"Whenever [banks] have negative rates they don't like it, but I wouldn't go as far as saying that negative rates would cause the collapse of the financial system"*

Mario Draghi, 13 September 2019

*President Draghi argues that easy monetary policy has been positive for banks....*

At the September 2019 ECB press conference, President Draghi reiterated his long standing view that extraordinary monetary policy by the ECB, in the form of negative rates and asset purchases (QE), has not harmed the European financial system and that the euro area has not reached the so-called "reversal rate". But our bank credit and equity analysts, as well the banks themselves, have a different perspective. For example, Barclays European bank equity analysts estimate that the recent 10bp cut in the ECB's deposit rate will directly cost the 15 banks in their coverage €685mn (c.1% of 2020E pre-tax profit), before any benefit from ECB deposit tiering or a potentially stronger growth outlook (see [Initial thoughts on ECB Tiering announcement for banks](#), 12 September 2019). The ECB argues that policy cuts will support growth and lower NPLs, offsetting the first-order effect on bank profitability.

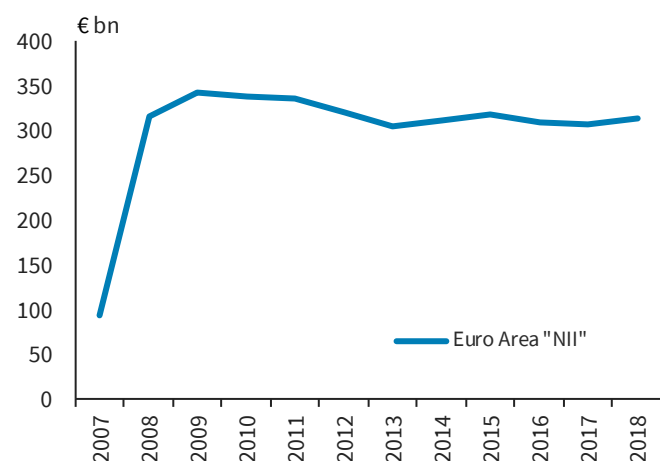
*...reflecting ECB data at the system level...*

President Draghi's comments most likely reflect the aggregated balance sheet and income statement data collated by the ECB, covering the whole euro area banking system. The data show that "Net Interest Income" (ECB definition) has been steady since 2010, supporting Draghi's view that negative rates, introduced in 2014, and EGB purchases, from 2015 onwards, have not compressed net interest income (Figure 1). Further, the Total Operating Income (net) and Total Operating Expenses of the euro area banking system as a whole have hardly changed over the last 10 years, while bank profits have risen steadily since 2012 as provisions on loans have fallen (Figure 2). In aggregate, the ECB data support Draghi's view that monetary policy has helped banks more than it has hindered.

*...but we argue that this glosses over important details that reveal underlying stress in the banking system*

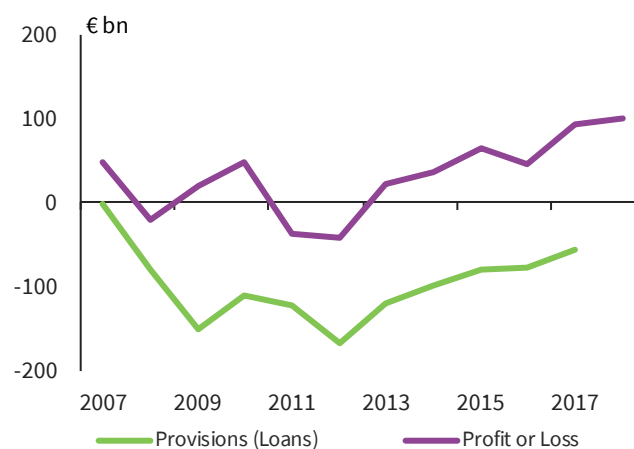
However, we think that high-level data conflate two different questions: whether the ECB's extraordinary policies negatively affect bank profitability, assuming a static balance sheet; and whether banks have been able to offset this headwind through management of their balance sheets and/or income statements. The negative impact of monetary policy will not be apparent in system-wide income statements if banks are actively working to mitigate them. In that scenario, bank profitability would still be *constrained* (but not necessarily put on a declining path) by ECB policy. To use an awkward analogy: just because someone with an umbrella is dry, does not prove that it hasn't been raining outside.

FIGURE 1  
Euro area bank Net Interest Income (ECB definition)



Source: ECB, Barclays Research

FIGURE 2  
Euro area bank PnL has risen, driven by falling impairments



Source: ECB, Barclays Research

## On the surface: no signs of policy reversal

*Negative policy rates: good or bad for the EA economy? The jury is still out*

In the debate about the potentially negative side-effects of extraordinary monetary policy, the risk that a prolonged period of negative rates could become detrimental for the banking system, and by extension the real economy, features prominently. At the reversal rate - ie. the level of interest rates at which accommodative monetary policy becomes contractionary for the real economy – the economics of bank lending are thought to go into reverse, with banks pulling back as rates drop further into negative territory.

There is no unequivocal answer to how bank profitability is affected by a negative interest rate policy (NIRP). Critics of the ECB's policy settings warn that its NIRP hurts bank profits, ultimately leading to higher lending rates and lower credit supply. Against this, advocates argue that low rates support real activity and increase private sector demand for loans, thus favouring the improvement in earnings via higher lending volumes and lower NPLs. The magnitude of the various effects of negative interest rates on aggregate bank profitability is uncertain and the intensity of the debate has increased, as the ECB's monetary policy stance has shifted towards further monetary accommodation.

### Not there, at least not yet

Has a prolonged period of negative rates destabilized the financial system to the extent that the detrimental effects on the banking sector outweigh the benefits of negative policy rates?

To address this issue, we look at how supply/demand conditions and the cost of bank loans have evolved since the ECB cut the Depo Rate (DFR) into negative territory in April 2014. Empirical evidence supports the view that policy rates have not hit their effective lower bound in the euro area; lending rates have stabilized at very low level, while there are no indications that negative rates have impaired credit supply/demand *a priori*. This evidence, therefore, supports the advocates of policy easing.

*No indication that cost of credit for the real economy is about to reverse...*

For example, financial institutions seem to have found ways to deal with the prolonged period of negative policy rates without needing to increase funding costs for the economy. Final lending rates charged by banks to the private sector started to decline in 2012 and continued to fall after negative rates were introduced in 2014, bottoming at the beginning of 2016. Even after the ECB lowered the DFR to -40bp in March 2016, the cost of credit for non-financial corporations (NFCs) and consumers has remained steady, around their all-time low levels of 1.4% and 5.7%, respectively (Figure 3).

*...or that negative rates have impaired banks' credit supply capacity*

Despite this decline in the price of loans, banks remain willing to support the real economy. The stock of loans to euro area Non-Financial Corporations (NFCs) bottomed in 2014, and has been rising since (though it has only just retuned to 2008 levels, Figure 4). Indeed, since the DFR was cut to -40bp loan growth has accelerated. Still, in a long-term context, the pace of NFC loan creation remains low and well below pre-crisis levels. The growth in consumer loans has been more unequivocally strong since 2014. Continued growth in loan volumes and no signs of a rise in loan interest rates both support the view that the reversal rate has not been reached in the euro area, at least not thus far.

And yet, the combination of strong loan growth and falling loan pricing should cause some concern for policy-makers, as this has all the hallmarks of a supply-led credit expansion rather than a demand-led period of credit growth. A demand-led expansion in credit would be characterised by a rise in pricing power (ie. expanding loan margins) for banks. As we discuss later in this report, an expansion in supply that is not met by offsetting demand is not indefinitely sustainable: the fall in the profitability of lending that must inevitably result from competitive pressures as supply outpaces demand will eventually lead to a contraction in lending, via weakness in capital generation.



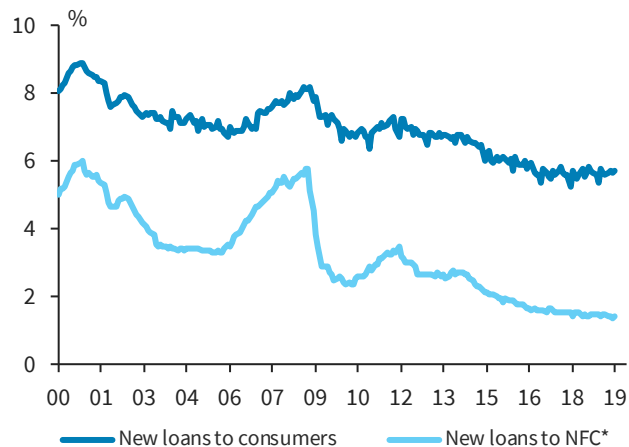
*We think there has been a stronger supply response than demand response, which has negative long-term implications*

That is not to say that ECB policy has not supported loan demand at all. Strong demand for credit for investment and consumption was evident during the expansionary phase of the economic recovery from 2014-2017 (Figure 5). Peering into the ECB lending survey, we find that the “General level of interest rates” was a strong support for loan demand in 2017/18 (Figure 6). However, we argue that the ECB elicited a stronger response from supply than credit demand, at least based on the fall in the price of credit (interest rates).

More worryingly, there are signs that credit demand from the private sector has weakened lately, most likely due to slowing economic activity. This creates more downside economic risks, but again, no sign that the “reversal rate” is imminent. In particular, in recent quarters, the positive effect on demand for credit due to low interest rates appears to have weakened (though, interestingly, this is less evident in the demand for mortgage loans). This should be a concern for the ECB and other policy-makers as a *decline* in demand would exacerbate the downward pressure on bank lending margins and accelerate the issues that we highlight in the following sections.

FIGURE 3

**Lending rates to the private sector have not increased since the ECB lowered the DFR to -40bp in March 2016**

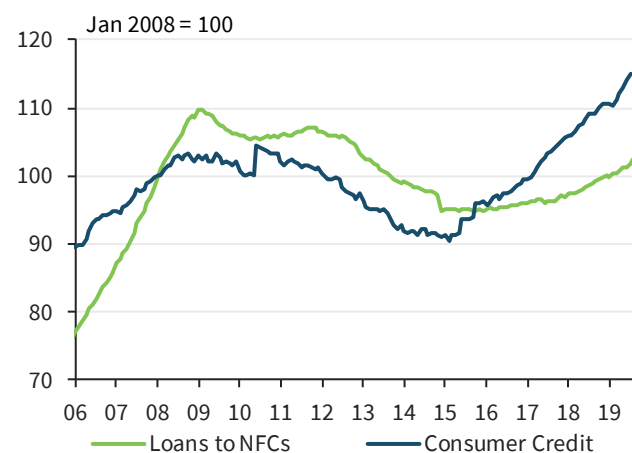


Note: Excludes revolving loans

Source: Barclays Research, Haver Analytics

FIGURE 4

**Lending to PNFCs and for consumer credit has picked up sharply since the ECB introduced negative rates in 2014**

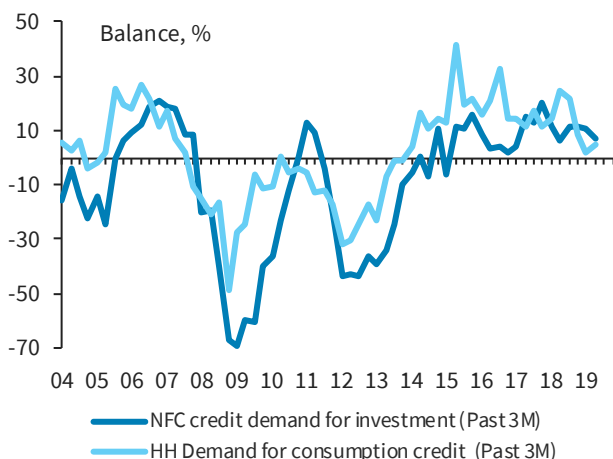


Note: Q1 2008 = 100 / Adjusted for sales and securitisations

Source: Barclays Research, Haver Analytics

FIGURE 5

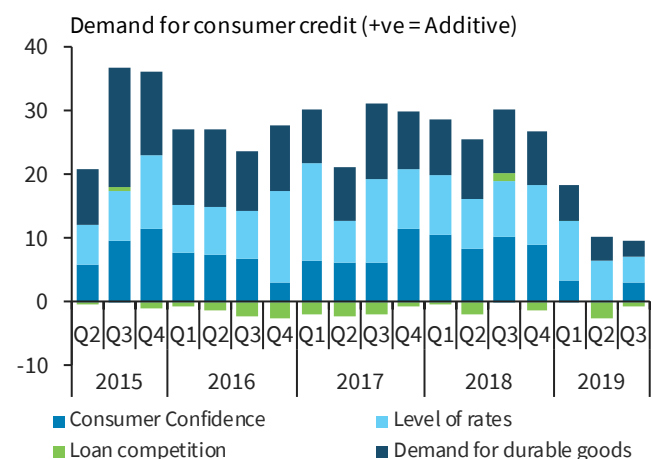
**Private sector's credit demand has strengthened since 2013**



Note: Q1 2008 = 100; Source: Barclays Research, Haver Analytics

FIGURE 6

**The benefits of low rates on demand are waning**



Source: Barclays Research, Haver Analytics

## Under the surface, all is not well

So far the ECB's arguments appear to hold sway: macro level lending data show no signs of a decline in lending volumes or an increase in lending rates. And yet banking analysts of every hue have argued, convincingly in our view, that negative rates squeeze bank earnings. Bank equity valuations speak volumes about the market's view of negative interest rates.

*To bridge the gap between policy-makers and bank analysts, we have built country level banking system models*

To take a more equity-like look at how ECB policy rates interact with the income statements of euro area banks, we have constructed model balance sheets for the banking systems of Germany, France, Spain and Italy. In particular, we model how cuts in the ECB's main policy rates pass through to both the asset and liability side of balance sheets. The line-item data, along with our assumptions on the pass-through of policy rates cuts, are all presented in Appendix 1. The conclusions are presented in Figure 7.

At the core of our analysis are the detailed assumptions of how cuts in the ECB policy rates propagate through euro area fixed income yields over a 12-18 month horizon. We think it is critical to expand analysis beyond securities tied to the ECB policy rates and to include the impact of policy rates on interest rates at longer tenors, for both the asset and the liability side of bank balance sheets. This gives us a deeper insight into how banks are affected and which particular line items are causing them headaches. We are also able to parse the data at the country level to see any differences across member states.

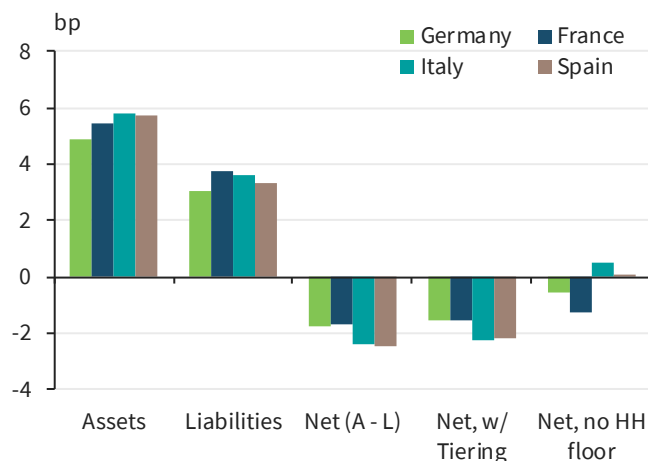
*Our models show that negative rates compress the spread between asset yields and the cost of bank liabilities...*

Based on our models, we estimate that the (10bp) September cut in the ECB deposit rate will lower the weighted average cost of bank liabilities by 3-4bp, while the average yield of assets will fall 4-6bp. Hence, across all four jurisdictions, the 'balance sheet margin' of banks contracts by c.2bp for each 10bp cut in ECB policy rates. Further, we can simulate deposit tiering by adjusting the assumed pass-through to excess liquidity. While the sensitivity of bank balance sheets to the ECB's deposit rate will be lower with tiering, with German and French banks the largest beneficiaries, our modelling indicates that the margin that banks can generate from their balance sheets will continue to fall as the ECB cuts its policy rates further. Our economists expect 10bp cuts in December and March 2020.

*...because of the zero floor on household deposits*

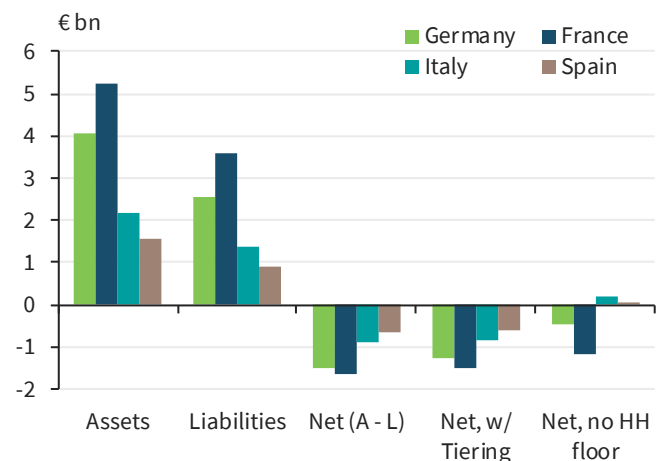
Based on our models, the key problem for banks is that household current account deposits are at a "zero bound". For reputational (in some cases legal) reasons, banks do not charge negative interest rates on household current account deposits. This is reflected in our assumption of 0% pass-through of policy rate cuts to these liabilities from current levels.

FIGURE 7  
Estimated pass-through of a 10bp rate cut in policy rates



Note "HH" = Household deposits. Source: Barclays Research

FIGURE 8  
Each 10bp cut cost banks several billion euros, per year



Note "HH" = Household deposits. Source: Barclays Research

*Banks have started flagging the asymmetric pass-through of negative rates to their assets and to household deposits that our model highlights*

*Because the problem is the lack of pass-through to bank liabilities, ECB deposit tiering can only help so much*

*Instead, assuming that the ECB plans to keep asset yields low in the euro area, banks need relief on their liabilities*

As a thought experiment, we run our sensitivity analysis under the assumption that banks are able to pass 100% of policy rate cuts through to household current account deposits: modelling “life without a zero bound”. If euro area banks were to pass on policy cuts in full, their interest income would show almost no sensitivity to the ECB’s policy rate (Figure 7).

This cuts to the crux of the issue, negative policy rates are a headwind for banks because they result in a decline in the yield on interest bearing assets that (currently) is not matched by an offsetting decline in the cost of household overnight deposits, due to the “zero floor”. Support for this conclusion comes directly from the banks. At our recent Global Financial Services Conference, European banks’ management representatives indicated that a change in approach may be needed if the current rate environment persists; for example, the CFO of Societe Generale indicated that the French banking industry might reconsider its approach to passing negative rates on to retail clients if negative rates are here for the long term. Similarly, the management of Spanish banks Sabadell and Bankia said that they would explore charging fees on retail deposits, with Bankia’s CFO more specifically wishing to assess more closely the profitability of retail depositors on a per client basis.

**Our modelling supports the view of banks and bank analysts that ECB policy rate cuts have hurt the return that banks can generate on their balance sheet, *ceteris paribus*,** due to the 0% floor on overnight household deposits. This has been a particular headwind for the Italian and Spanish banking systems, due to their higher reliance on retail overnight deposits (in particular Spanish banks) and the high pass-through of policy rate cuts to their mortgage books (most Spanish mortgages are linked to Euribor).

A second point evident in our analysis is that, while it has generated extensive discussion, the cost of holding the excess liquidity injected into the banking system by asset purchases is a relatively minor issue for bank profitability. As noted already, our European bank equity analysts estimate that the recent 10bp cut in the ECB’s deposit rate will directly cost the 15 banks in their coverage €685mn (c.1% of 2020E pre-tax profit).

But the true headwind for euro area banks is the resulting compression in margins as the policy cut filters through to interest rates for *all* segments of the euro area, and the failure of the average cost of bank liabilities to fall by an offsetting amount. If we expand the horizon of our analysis from the cost of holding excess liquidity to a 2bp fall in the yield on *all* bank assets, then the impact of cuts rises sharply. We estimate that a 10bp cut in ECB policy rates reduces the interest income from bank assets by €13.2bn for the banking systems we have modelled (€24trn out of €33trn total banking system assets) after 12-18 months. In contrast, the cost of bank liabilities falls by only €8.5bn, resulting in net drag of €4.7bn on operating earnings. This is c.5% of 2018 euro area bank net profits (ECB definition).

Hence, the current form of ECB deposit tiering can only offer limited relief and with uneven regional benefits. Italian banks see the least benefit from deposit tiering, as they hold little excess liquidity, while the French and German banking systems enjoy the greatest relief as, together, they account for nearly 60% of the total overnight liquidity placed at the ECB.

Assuming that the ECB will try to keep policy supportive (ie. the yield on assets low) for the foreseeable future, any long-term solutions to the profitability squeeze on euro area banks is most likely to be successful if it addresses constraints on the liability side of bank balance sheets. Specifically, the cost of bank liabilities, in aggregate, needs to fall in line with the yield of their assets if banks are to preserve their Return on Tangible Equity (RoTE). Looking at our models, the key issues on the liability side are the limited use of wholesale funding (<15% of liabilities) by euro area banks (versus, for example, Nordic banks) and the failure of interest on household current accounts to fall in line with policy rates. Hence, the floor on household deposits needs to be addressed or offset in some other way.



## Why isn't this seen in the aggregate level data?

Our analysis shows how five years of negative rates should have significantly lowered the return that euro area banks can earn on their balance sheets. Yet, there does not appear to be strong evidence of this constraining profitability or lending volumes, according to the data collated by the ECB. We identify three factors at work here:

- Bank hedging of falling interest rates;
- Changes in the mix of interest-bearing assets on bank balance sheets;
- A decline in Non-Performing Assets (NPAs) and cost of risk.

### *The effectiveness of hedging is falling*

*Deposit hedging has turned from a benefit to a cost as term rates move negative*

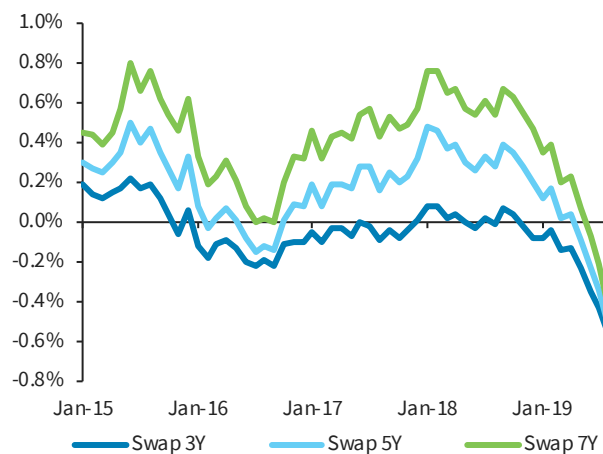
Perhaps the most pertinent example of banks hedging their exposure to falling interest rates is the 'Frenelux' banks, who use swap portfolios to synthetically hedge the gap between the statutory and the behavioural duration of household current account deposits. As detailed by our equity research team (*Frenelux Banks: The deposit race to the bottom*, 13 September 2019), broad use of "replication portfolios" means that the cost of their deposits effectively evolves with Euribor. Until now, this has allowed them to step around the issues of the "zero floor". While we cannot know exactly how much banks have benefitted from this, a rough estimate based on the 3m-5y Euribor spread implies that they saw an uplift of 15bp in 2016. Now we estimate that portfolio replication is a 3bp cost on more than €1trn of deposits.

More generally, now that term (3-7y) EUR swap rates have turned negative, bank replication portfolios are starting to become a drag on profitability (Figure 9). As a result, our equity analysts forecast significant declines in net interest income for these banks as the ECB continues to lower its main policy rates (Figure 10). This makes sense, because hedges can only buffer the pain of falling interest rates for the duration of the hedge. As swaps that were entered into 3-5 years ago roll off, banks will see their NII come under pressure.

*Hedging benefits are set to roll off in the coming years*

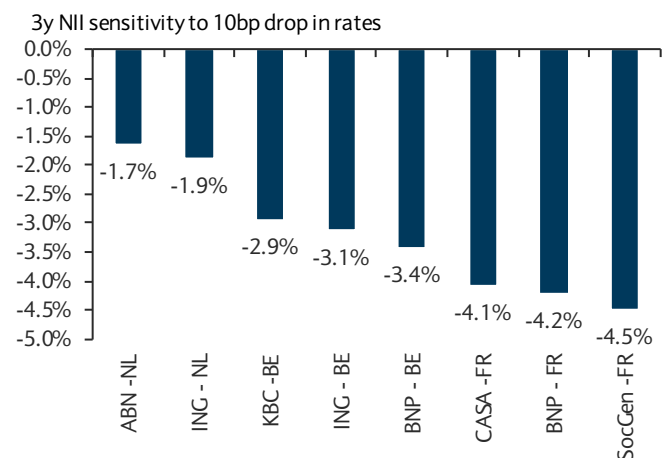
Put another way, there is a large difference between temporary declines in policy rates and persistently negative rates. When policy cuts are temporary, hedges dampen the ups and downs until interest rates return to a normal level. However, if rates remain low (negative) beyond the point at which hedges have expired, then the pain was only deferred. This is analogous to the experience of oil producers in 2014-15: the industry practices of forward hedging the price of oil provided temporary relief, but did not avert a crash in earnings as hedges rolled off with oil prices still well below the full-cycle cost of production.

FIGURE 9  
EUR term swap-rates continue to decline...



Source: Bloomberg

FIGURE 10  
...causing NII to fall as banks reset swaps at lower yields



Source: Barclays Research estimates

*Banks have replaced low margin activity with greater household and corporate lending*

Hence, we expect the negative effects of the ECB's extraordinarily policy settings to be felt ever more acutely over the next two years, particularly by banks that have heavily engaged in interest rate hedging, such as the 'Frenelux' banks.

#### *Banks have offset falling margins with rising volumes*

A key part of our balance sheet sensitivity analysis is the assumption of a "static" balance sheet; effectively we have analysed the impact of policy cuts on the back book. In reality, banks have continued to engage in new business and their balance sheets have undergone considerable re-balancing, not just due to low interest rates but also due to regulatory and supervisory overhaul since the global financial crisis. As we show, this has been a key factor in maintaining bank net interest income (ECB definition) over the period.

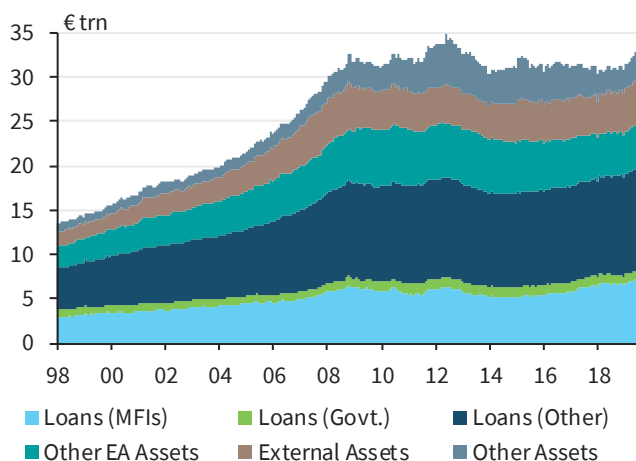
The size of the European banking system, currently at €32.7trn, is effectively unchanged since 2008 (Figure 11). However, the mix of assets has evolved materially, at both the micro and the macro level (Figure 12). Since December 2012, just before the ECB embarked on asset purchases and NIRP, holdings of bonds and equities (including government bonds) have fallen by €1.2trn, offset by increased "Loans to MFIs". This is not an increase in inter-bank lending, but a rise in deposits at the ECB/NCBs, ie. excess liquidity.

On top of this involuntary shift, there has also been a rotation out of "Other assets" (mostly investment bank balance sheet, including derivatives), into loans to Households and Private Non-Financial Corporates (PNFCs) and "External assets" (exposures to overseas borrowers). Overall, the period of extraordinary policy has seen banks reduce their holdings of ECBs and "Other" assets, and increase their liquidity and lending to the euro area economy. This more "Barbelled" approach to balance sheet use appears to be the (currently) preferred way for euro area banks to optimise their capital use.

While the swap of government bonds for central banks' deposits is the mechanical result of asset purchases, the rotation out of Other Assets and into loans to euro area Households and PNFCs (and overseas exposure) has been discretionary. The motivation for this shift has been regulatory and economic: loans have become one of the most profitable ways for banks to deploy capital. Mortgage lending, in particular, remains attractive despite a clear downward trend in the yields on new lending (Figure 13). Indeed, the rise in mortgage lending, and the correlated rise in house prices across the euro area, was the focus of a recent ECB report on financial stability in the context of excess liquidity.

FIGURE 11

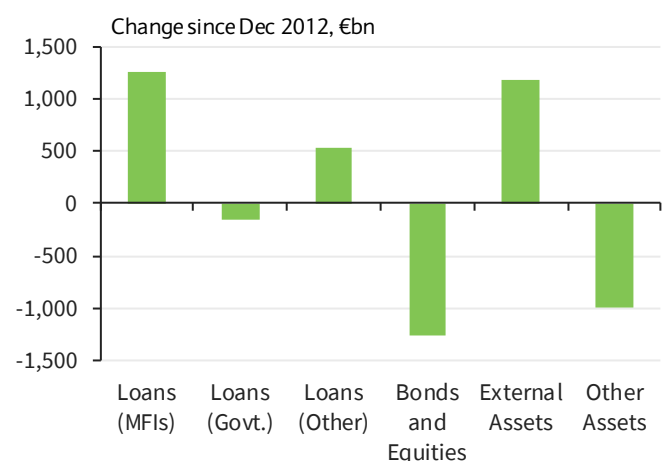
The size of the euro area banking system has been steady since the Global Financial Crisis



Source: ECB

FIGURE 12

Banks have replaced government bonds with excess liquidity, loans and external assets



Loans (Other) = Euro area Household and PNFCs. Source: ECB, Barclays Research

As a result of this behavioural shift, the volume of loans to euro area households and PNFCs on bank balance sheets has risen sharply. Indeed, from a low of 49% of gross assets, these loans now take up almost 57% of European bank balance sheets (Figure 14). If we strip out non-financial assets and external assets, the share is even higher: loans to euro area PNFCs and households account for 75% of bank exposure to the euro area, the highest in over 20 years. Of particular interest, we note that the inflection point higher in bank lending was after the ECB introduced negative policy rates in H2 2014.

Indeed, the ECB's own data show that banks have offset a decline in margins by increasing loan volumes (Figure 15). This supports our argument that lending growth has been supply driven. Banks have offset the decline in asset yields, driven by the ECB's monetary policies, with greater loan growth, specifically loans to households and PNFCs. In this way, they have kept Net Interest Income steady, giving the appearance that the effect of monetary policy on bank NII has been negligible. If loan growth had been demand driven, then banks should have been able to charge flat or higher margins despite rising loan volumes. Instead, what we have seen looks to us like a supply-driven expansion in lending that pushed down on margins. Based on our preceding analysis, this most likely reflects the falling yield on other bank assets, which makes lending still a relatively attractive use of bank capital.

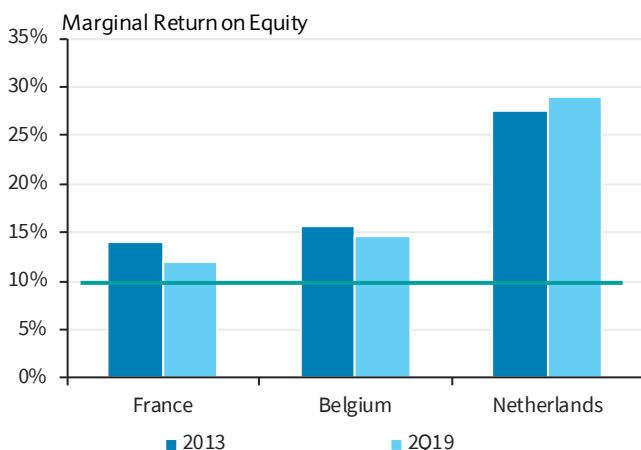
*Increased lending with lower pricing implies that the expansion in credit has been a “race to the bottom”*

Given the high-level data on the evolution of bank balance sheets, and the timing of shifts in bank asset mix, we can understand why the ECB has concluded that its policy mix has not harmed bank net interest income. Indeed, from a regulatory perspective, ECB policies have had the desired effect of driving up lending and pushing down on banks' “other” activities. However, we perceive increased lending volumes as a “race to the bottom” by euro area banks: as long as loans offer a net increase in yield versus other assets, then banks will continue to grow their lending despite the fall in loan margins. This implies that loan growth remains a “rational” strategy for euro area banks and there is no reason to expect greater discipline in pricing or volumes, at least until they hit capital constraints.

Yet this strategy relies on at least some level of demand from creditworthy borrowers. If that begins to falter, there is the risk that, in reaching to grow the size of their loan books, banks increase the riskiness of their lending to offset continued pressure on other forms of asset income, although risk-weighted asset reform and macro-prudential buffers (specifically the countercyclical buffer) are expected to help contain any re-risking of loan books.

FIGURE 13

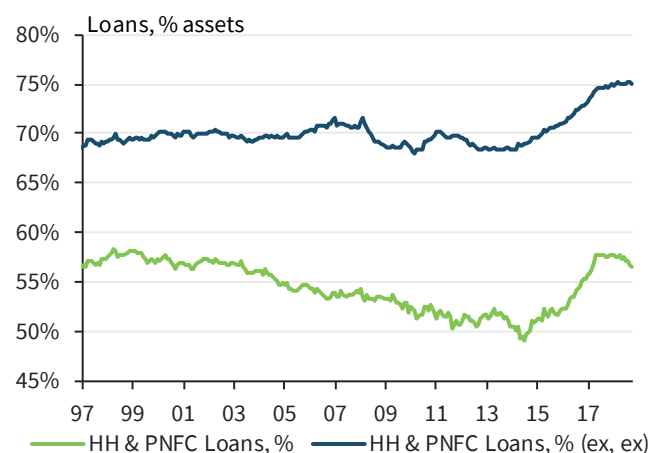
Euro area banks have shifted to mortgage lending as this still offers a relatively attractive return on equity



Source: Barclays Research Estimates

FIGURE 14

Euro area banks have dedicated more balance sheet than ever to lending to the “real economy”

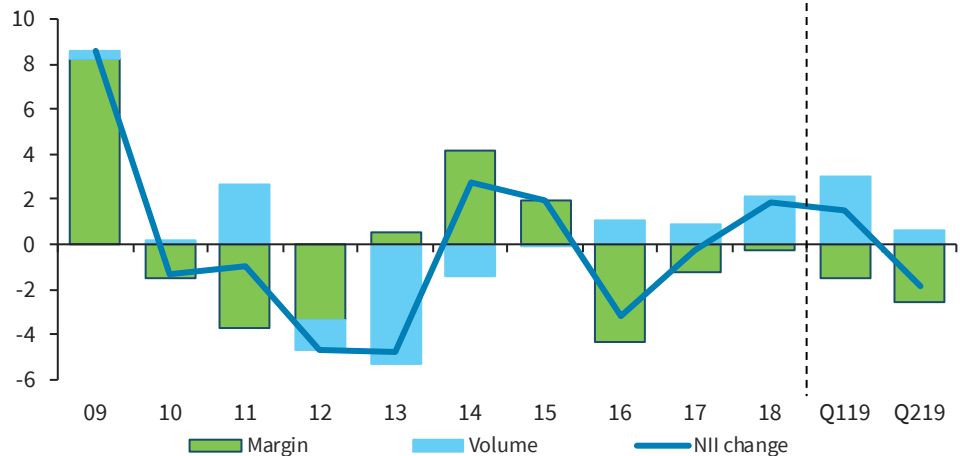


Note “Ex. Ex.” excludes External Assets, and Remaining Assets (ECB definition).  
Source: ECB, Barclays Research

In sum, euro area banks have supported earnings by shifting out of lower return businesses (market making, repo activity) and into relatively higher margin lending. For policy-makers it is agreeable that the decline in yields on other assets has driven a rotation into loans to the “real economy”, but this is a supply-side response. On the positive side, it has also increased bank positive leverage to NPLs, which have been falling in recent years.

FIGURE 15

Interest margins have been falling for several years, now loan volumes are weakening too



Note: \* Consolidated banking statistics, EA 11-19, Domestic banks only; \*\*Barclays estimate, assuming for Q2 19 same annual increase in NII recorded between Q1 18 and Q1 19.

Source: Barclays Research

*Bank profitability has been supported by a decline in loan write offs...*

#### *A falling cost of risk has driven up profitability*

By increasing lending and reducing their exposure to “Other Assets”, euro area banks have been able to maintain Net Interest Income despite the downward pressure on their “balance sheet margin”. This has been achieved despite negative ECB policy rates lowering the yield on banks’ assets by more than the cost of their liabilities. However, that does not explain the upward shift seen in their profitability since 2012.

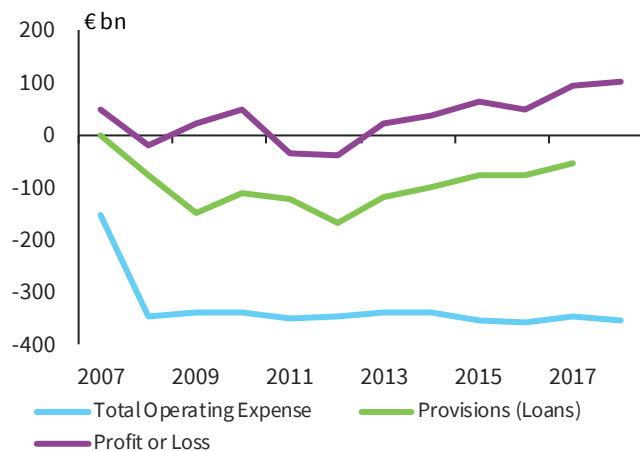
Increased profitability has not come from a fall in costs either, despite several rounds of cost cutting over many years. Almost the entire rise in the profitability of euro area banks has been driven by a decline in provisions on loans (Figure 16). Here too, President Draghi’s position that ECB monetary policy has benefited euro area banks by supporting growth and household incomes, thereby pushing down on the formation of non-performing assets, seems well supported. Combined with the work out of legacy NPAs, this has been the single most important driver of the recovery in European bank earnings.

*... but NPLs are already at very low levels and unlikely to decline much further*

The implied “cost of risk” for euro area banks fell from €238bn in 2011 to €75bn in 2018, more than offsetting the pressure on revenues due to monetary policy, though the benefits have been felt unevenly. The worst banks have benefited the most from the work out of NPLs; in contrast, healthier banks have seen less upside from the decline in NPLs but have still faced the full downside of negative yields. At 14% of Total Operating Income, the cost of risk is now at its all-time low and would need to fall €15bn (to 11% of TOI) to offset the model-implied impact of the three 10bp cuts that our economists forecast by March 2020 (including the 10bp cut in September). This seems challenging: Figure 17 shows euro area bank NPL ratios average just 3.1% (€636bn) and would need to fall further to generate incremental upside to bank profits. Against this, we note that many euro area banks have been guiding towards more normalized (ie. higher) provisions from next year.

FIGURE 16

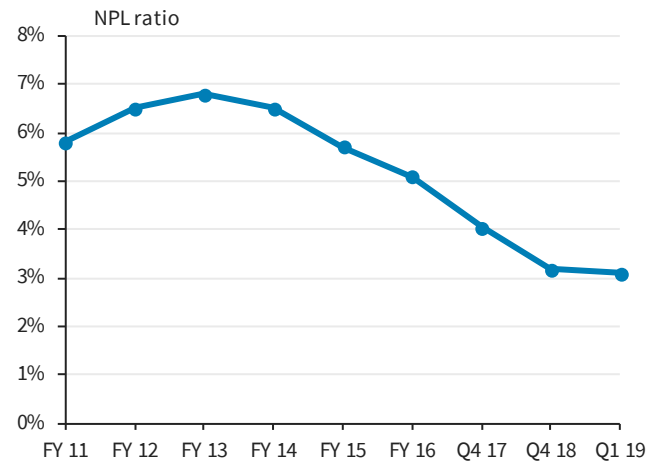
Rising bank profitability driven by falling NPA provisions...



Source: ECB, Barclays Research

FIGURE 17

...but NPLs are already at a historical and cyclical low



Source: EBA, Barclays Research

In that sense, the positive effect of monetary policy on NPLs appears to have largely played out and this is unlikely to drive bank earnings materially higher from current levels, with the possible exception of Italian banks where NPL stocks are still relatively high.

*Euro area bank expense ratios are elevated...*

### Cutting costs has been hard in practise

So far we have focused on the return that euro area banks earn from the spread between their assets and liabilities. But earnings are not just revenues; there is also a cost component that banks can, at least in theory, flex to support capital generation. During the September ECB meeting, Mario Draghi responded to criticism raised by Deutsche Bank's CEO, Christian Sewing, that negative interest rates were "ruining the financial system", by asserting that banks should focus on cutting costs and digitising their business models rather than "being angry about negative rates".

ECB data support the view that euro area banks have not meaningfully tackled costs since the financial crisis: operating expenses are essentially flat for the last decade. This wouldn't necessarily be a problem if banks had been able to generate "positive jaws" by growing revenues but, because they haven't been able to do that in aggregate either (bank operating income is also broadly unchanged over the past decade), the cost to income ratio for the euro area banks has remained at an elevated level of c65%. Compared to US banks (and also Nordic banks), which operate at an average of 55% cost to income ratio, it is clear that euro area banks are relatively inefficient (Figure 18).

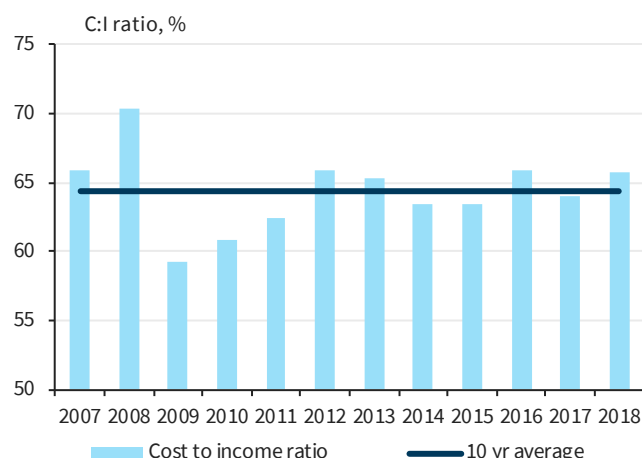
*...but ten years of failed cost cutting implies structural impediments*

But euro area banks have been targeting lower costs for nearly a decade. This suggests that this option is not as simple as Mr Draghi may hope. We do expect banks to address their cost structures, given the realisation that negative interest rates will be in place for several more years, via new or revised strategic plans that have cost cutting measures at their heart. However, these are not free or easy: banks will need to accept restructuring and severance costs, as well as an increase in investment spending to bring their digital capabilities up to standard. Both of these will have upfront costs (operating and non-operating) that will push down on as-reported net profits, while any medium-to-long term increase in profitability is uncertain. Further, the speed of progress towards improved efficiency and the relative success rate is likely to be constrained by a number of factors, in particular: banks' capacity to absorb upfront hits to their P&L; as well as external factors such as strictness of labour laws; and the overall level of digitalisation in the country of operation.



FIGURE 18

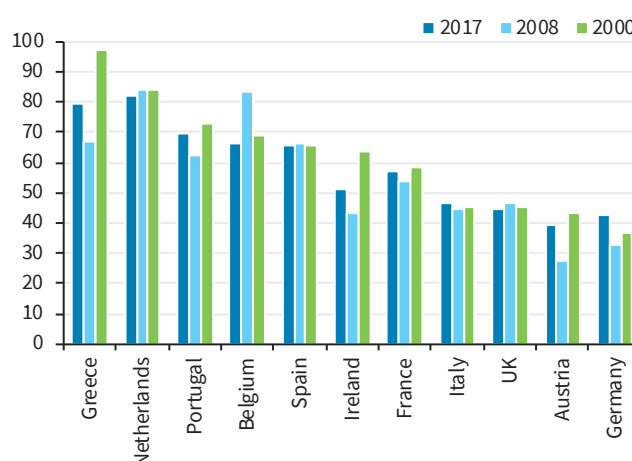
Euro area bank cost to income ratios are elevated



Source: ECB, Barclays Research

FIGURE 19

Share of total assets of the five largest credit institutions



Source: ECB, Barclays Research

M&A/consolidation in the banking industry could help bring greater efficiency through cost synergies. In Figure 19 we show the share of total assets of the five largest credit institutions in each of the major euro area countries (and the UK). We believe that there is greater potential for domestic consolidation in those countries where the share of total assets is low across the top-five banks: Germany and Austria stand out on this metric, along with Italy. However, *cross border* M&A remains riddled with impediments, such as a lack of common frameworks for bankruptcy, collateral and taxation to name but a few. The much discussed Capital Markets Union (CMU) and Banking Union for which the European Deposit Insurance Scheme (EDIS) is a key pillar, has not seen meaningful progress for several years and faces significant political opposition that appears to be unlikely to decline given the apparent rise of nationalistic politics in some member states.

In sum, while we agree with the ECB that cost/income ratios for euro area banks appear high, the lack of progress after more than 10 years is strong evidence that there are structural impediments to cost cutting, including the rising cost of regulation and continued barriers to consolidation across the banking sector. If policy-makers wish to see progress on this front, completion of the CMU would be a significant step forward, in our view.

## Subsidized loan growth is not a sustainable solution

*Loan growth has been supported by ECB policy actions...*

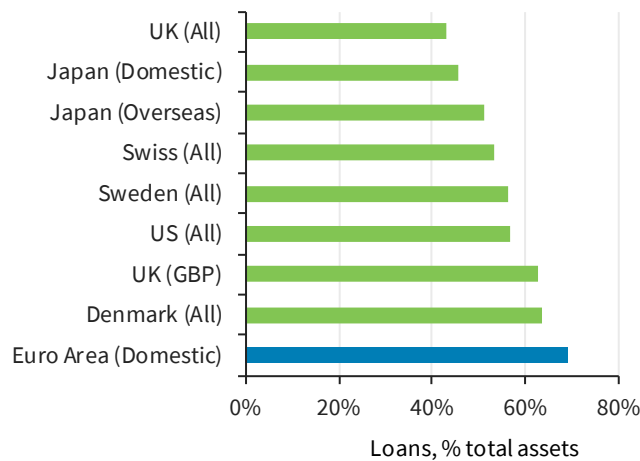
*...but in an unsustainable way*

Even if ECB policy settings have compressed balance sheet margins, as our models imply, because banks have been able to offset this pressure by shifting their asset mix to one that is more loan-heavy, policy-makers are unlikely to feel much concern. Hence they are unlikely to “come to the rescue” any time soon, given that regulators and the ECB are focused on loan growth and not bank profitability. Indeed, if banks continue to shift their mix of assets towards more loans then this is likely to be viewed positively.

However, we do not believe that the balance of positive and negative factors will remain net supportive to credit growth over the long term. Loan growth is being driven by a rotation out of other banking activities, but there are limits to the extent that this can continue. As shown in Figure 14, loans as a percentage of bank assets are historically high for euro area banks. Our fundamental analysts believe that this shift will continue for now, given that domestic lending remains one of the most effective ways for banks to deploy capital. But eventually banks’ ability to lend will hit a wall unless they can either grow their balance sheets, or in some way off-load their loans to non-bank investors.

FIGURE 20

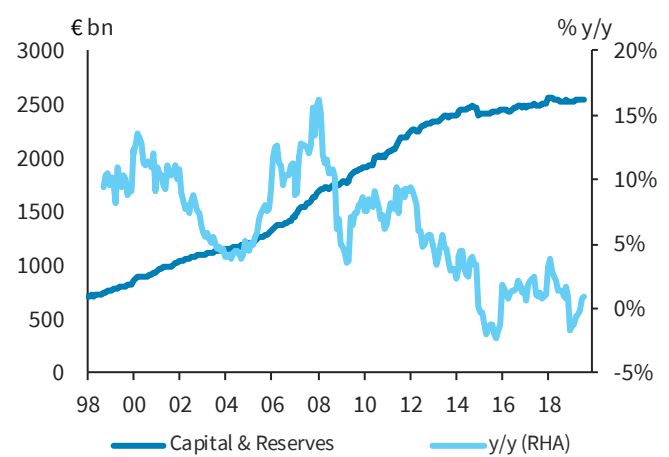
Euro area banks' balance sheets are already loan heavy



Source: Haver, Central banks, Barclays Research

FIGURE 21

Bank capital generation remains structurally low



Source: ECB, Barclays Research

Looking across regions, loans as a percentage of balance sheet already looks elevated in the euro area (Figure 20). Indeed, based on country-level financial accounts, we cannot find another DM banking system with greater on balance sheet exposure to loans.

*Eventually loan growth will be capped by balance sheet growth...*

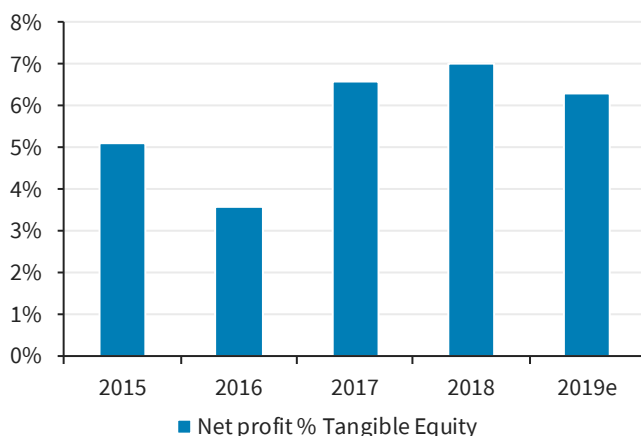
This is not to say that loan growth cannot continue to outpace balance sheet growth for a while, but with on balance sheet lending already elevated it's impossible to say how much longer (or not) euro area banks can subsidize loan growth by shrinking other uses of their balance sheets. Once that is exhausted, banks will need to offload their loans somehow, or (by definition) bank lending will need to grow in line with their bank balance sheets, which will need to match the organic growth of capital (ie. RoTE).

*...in turn capped by capital generation...*

While most euro area banks currently meet their regulatory capital requirements, in general there is limited scope for euro area banks to grow balance sheets without raising capital. The natural way to do this would be through retained earnings but, as shown in Figure 21, the growth rate of bank capital and reserves has been in low-single digits since 2014 and is currently barely above zero. This implies that loan growth would not exceed 2-4% once banks reach a steady state, net of returns to shareholders.

FIGURE 22

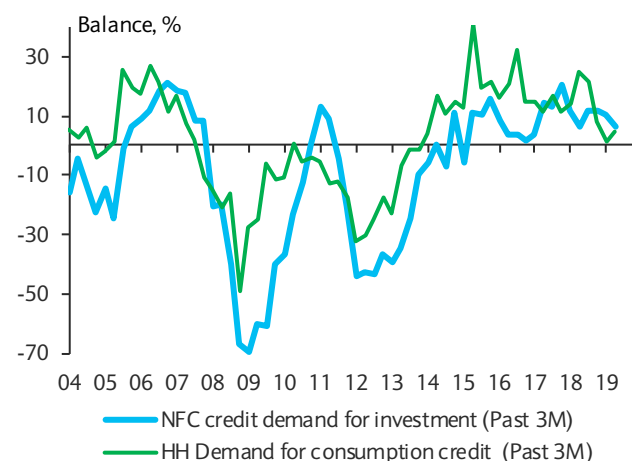
Even with a zero pay-out ratio, capital growth would be low



Source: SSM, Barclays Research

FIGURE 23

Household and corporate demand for credit has weekend



Source: ECB, Barclays Research

In theory loan growth could be higher if banks were to retain all of their earnings, though we find it unlikely that shareholders would tolerate this for a long period of time. Still, even in the most “credit growth positive” scenario, credit growth would be capped at a relatively low level. Organic capital generation has averaged c.6.6% over the past three years and is unlikely to move higher given our analysis (Figure 22).

*...which is low because of negative rates*

This is because, bringing the argument full circle, negative interest rates in the euro area will continue to compress the return on the balance sheet for euro area banks due to the “zero floor” on household current deposits. Bringing it all together, our analysis implies that the point at which monetary policy inhibits loan growth is the point at which banks can no longer replace non-loan assets with loans. Once banks hit the “lending wall”, we would expect to see a sharp decline in the pace of bank lending, a rise in the cost of lending, or both, ie. the “reversal rate” would have been reached. This is likely to be a sudden event rather than a gradual one, in our view.

Finally, we note that loan growth is not just a matter for supply, but also demand. Given the recent slowdown in activity, euro area loan demand has started to fall (Figure 23), which suggests that loan growth will slow. A decline in loan demand is likely to result in a further compression in loan margins, possibly to the point where it becomes impossible to offset this with increased lending volume (at least to credit worthy borrowers). Thus, the bite of negative yields could quickly turn into a near-term problem in an economic downturn.

## Policy implications: Banks will need radical help

In the past, President Draghi has answered questions on the negative impact of ECB policy on euro area banks by noting that, at the system level, euro area bank Net Interest Income has been stable, and that bank profitability has risen consistently since 2012. At the same time, the ECB has been of the view that the euro area has not yet reached the reversal rate, suggesting it does not see imminent risks that a protracted period of negative rates could become detrimental for banking systems and the real economy.

*We agree that ECB policy has supported bank lending so far, but it has largely been a “supply-side” phenomena*

We agree that the ECB’s policies have supported banks via these channels until this point, by supporting loan demand and pushing down on impairment rates by supporting growth. But we believe the bigger effect has been on the supply side: pushing down the yield of all bank assets presses banks to lend more in order to maintain their net interest income. Since 2014, banks have offset the squeeze on asset yields by increasing loan volumes at the expense of government bonds and “other assets”. In that sense, QE has worked, motivating banks to replace their government bonds with loans. However, the ability of banks to shuffle assets around a fixed balance sheet is finite. While we believe that banks can continue lending for now, eventually this strategy must reach a limit.

*Eventually banks will run out of balance sheet and lending will hit a wall due to low bank profitability...*

Beyond that point, we expect loan growth to be stymied by the lack of capital generation at euro area banks (ie. their low profitability) and the risk that economic momentum slows further. Lack of capital generation directly results from the impact of negative rates on bank “balance sheet margins”, in our view, and once banks reach the limits of asset rotation, ECB policy will be constraining, not supporting, loan growth. That, to us, is the true “reversal rate”: not just a level in interest rates, but also the moment when banks have exhausted all avenues to offset the drag on profitability from the decline in yields on financial assets.

*...this is the true reversal rate*

Our analysis argues that negative policy rates are a structural drag on bank profitability due to the “zero bound” on what banks charge household deposits. As long as the lower bound holds (and it is legally required in some member states), then lower ECB policy rates *will* increasingly hurt euro area bank profitability, according to our analysis. Further, because tiering provides only partial relief, primarily for banks in Germany and France, it cannot fully offset the negative side effects of the ECB’s current policy mix.

*Policy-makers will need to accept lower credit growth...*

Hence, euro area policy-makers will eventually face a dilemma: do they accept lower credit growth in the euro area resulting from constrained balance sheet growth that, ultimately, reflects the negative side effects of monetary policy, or will regulators and governments provide policy relief to banks?

Schematically we see three plausible outcomes. The most negative for banks would be that policy-makers simply accept lower credit creation as a “fact of life” and banks are forced to struggle on in a world of limited growth and constrained RoTE. In this scenario, we see credit growth as capped at 5% over the medium- to long-term, which increases the risk of the euro area becoming trapped in a low growth, low inflation equilibrium.

*...or lower the cost of bank liabilities...*

Alternative outcomes will require an effective policy shift, for example: to lower the cost of bank liabilities in line with the decline in yields on euro assets. This would push up banks’ RoTE and allow them to generate capital that could, ultimately, be used to grow balance sheets and lending. A simple solution and, as noted earlier, one that is being talked about by euro area banks already, would be if banks were able to pass on negative interest rates to household depositors, in part or in full. This would meaningfully reduce the cost of banks’ liabilities and increase their RoTE and capital generation. Of course, this option is politically controversial and risks increasing voter resistance to negative interest rates: the sort of “political” constraint on negative yields that we first explored in *Negative Ascent: Life amid negative nominal interest rates* (3 March 2016).

*...or increase non-bank lending...*

Another approach would be increased non-bank lending. For example, investment vehicles that bought performing loans, either outright or via some form of securitisation vehicle. One way to accelerate this could be the creation of euro area “GSEs” that could support the creation of household (mortgage) credit without consuming bank balance sheet. However, this is another extreme and controversial solution.

*...but there are no easy solutions and the ECB may have to step in to support bank*

As there are no easy solutions, there is also the risk that credit supply hits a wall, and that the ECB is forced into action because banks are no longer able to manage the pain inflicted by negative policy rates, either due to worsening economic conditions or a chronic inability to expand balance sheets. Then the ECB may have to consider expanding or modifying its policy tools, such as more aggressive adjustments to TLTRO conditions, although this could be contentious within the governing council due to financial stability concerns. Should the ECB’s existing policy tools not prove enough, more extreme options could include adding bank securities to its asset purchase programmes (we discussed some of these potential options in *QE options: the devil is in the detail*, 19 July 2019).

*Until we see progress on policy solutions, the outlook for euro area banks remains challenged*

In sum, we believe a radical move is required to address the structurally low RoTE of euro area banks; however, given the high political costs involved, this is unlikely to happen unless the economic or bank lending situation deteriorates materially further. Our analysis argues for proactive work by policy-makers so that they are ready for the “lending wall”, whenever it may arrive. But until we see regulators and policy-makers start to move in that direction, the outlook for euro area banks will remain downbeat, in our view.

## Appendix: Assessing the impact of policy rate cuts

Conceptually, bank revenues derive from the spread between the yield on their assets and the cost of their liabilities. As the yield on assets falls, so will bank earnings unless this is offset by an equal fall in the cost of liabilities. Of course this is not the whole story; there are other sources of revenue such as fee income and there are also the costs deducted from revenues to generate earnings, including the cost of risk. Still, we consider it to be a solid starting point for discussing the impact of monetary policy on euro area banks.

In our experience, discussions on this topic tend to focus on specific parts of bank balance sheets, for example, the excess central bank liquidity they hold or the cost of funding raised in bond markets. We think this is a clear case of “missing the bigger picture”. For example, it is simply not correct that euro area banks fund their loans to the private sector using bonds or inter-bank lending. Bank loans are, by definition, funded with deposits at creation. Under the current regulatory regime most bonds are, *de facto*, capital instruments. Because of this, bonds are only small (10%) of bank liabilities and hence movements in bond spreads are a poor proxy for the cost of funding a bank’s balance sheet.

More importantly, a “one line” discussion of how monetary policy influences bank funding or asset yields ignores the correlation between assets. When the ECB cuts its policy rate, all interest rates in the euro area adjust. The pass-through of policy cuts to floating rate assets is trivial to assess, as these price off Euribor or a similar benchmark that tightly follows ECB rates, but the pass-through to other assets, such as government bonds or longer-term loans, is more complex. And the pass-through to liabilities is even more unclear.

In order to take a holistic approach to evaluating the impact of monetary policy on bank revenue generation, we have built country-level balance sheets for the banking systems of France, Germany, Italy and Spain. Using ECB data, we lay out the balance sheet line-items for euro area MFIs excluding the eurosystem (the ECB and member state central banks). For some of these items we have added further detail from other sources, for example we have estimated of the split of deposits between households (HH) and Private Non-Financial Corporations (PNFCs) and the split of mortgages between fixed and float.

As a second step, we make analyst assumptions on the pass-through of cuts in the ECB policy rates to each line item, over a 12-18 month horizon. Key to this analysis, we assume a static balance sheet; for example, any fixed interest asset or liability with a maturity greater than two years would see no change in its yield/interest cost, as it would still have not matured, while short-dated instruments would be refinanced at a new (lower) rate.

### Limited pass-through to liabilities

In Figure 24 we lay out the liability side of our model balance sheets, the key line items are taken directly from the ECBs statistical data warehouse. ECB data combine deposits from euro area PNFCs and euro area Households, so we have used NCB data to estimate the split of deposits with a maturity of less than two years. Further, we have used NCB data on the tenor split of deposits to estimate what fraction of household deposits are in savings accounts versus current accounts.

To assess the effect of policy cuts, we assume that 100% of a policy rate cut is passed through to MFI deposit liabilities, as well as deposits from corporates (based on qualitative feedback from banks). We assume the interest paid on term deposits does not change over the 12-18 month time horizon that we are estimating; we also assume zero pass-through to government and overnight household deposits, simulating a “lower bound” for these items. For retail savings accounts, we base our assumptions on observations of movements of interest rates on savings accounts since 2014. Finally, we assume ECB policy rates have no influence on the cost of equity or liabilities denominated in other currencies.



As shown in our analysis, by far the largest liability of euro area banks is their deposit base, supporting our assertion that evolutions in corporate bond markets are a poor indicator of the cost at which banks fund their balance sheets. Further, the largest source of deposits is from euro area households and these liabilities do not (under our assumptions) fall in cost in response to the recent ECB cut *because they are already at their lower bound*.

As a result, the next pass-through of an ECB policy rate cut to the weighted average cost of bank liabilities is low, we estimate it is just 3-4bp in the 12-18 months following a 10bp cut in ECB policy rates.

FIGURE 24

Liabilities of Member State banking systems, and the assumed pass-through of ECB policy rate cuts.

	Amount (ECB)				12m pass through of 10bp policy cut			
	Germany	France	Italy	Spain	Germany	France	Italy	Spain
Deposits - MFI	1,292	2,413	869	412	100%	100%	100%	100%
Deposits - Govt	17	28	36	16	0%	0%	0%	0%
Other Deposits (> 2y)	673	612	157	195	0%	0%	0%	0%
Other Deposits (<2y)								
of which Retail	2,089	1,385	1,201	808	13%	0%	4%	0%
[Overnight]	1,011	447	1,106	679	0%	0%	0%	0%
[Retail Savings]	1,078	939	94	130	25%	0%	50%	0%
of which Corporate	949	558	320	435	100%	100%	100%	100%
Repo	13	94	127	20	100%	100%	100%	100%
Debt (<2y)	35	527	7	30	100%	100%	100%	100%
Debt (>2y)	1,038	882	293	205	0%	0%	0%	0%
Equity	601	639	371	267	0%	0%	0%	0%
External	780	1,482	89	106	0%	0%	0%	0%
Other	833	944	299	206	0%	0%	0%	0%
Total	8,320	9,563	3,768	2,700	31%	38%	36%	33%

Source: ECB, Banque de France, Bundesbank, Banco de España, Banca d'Italia, Barclays Research

### Assets: A higher beta to policy rates

In Figure 25 we repeat the same exercise using ECB data on bank *assets*. Here, we need to make fewer assumptions on asset mix beyond the basic ECB data, but more assumptions on how the yield on assets evolves over the following 12-18 months.

For loans, we assume that (due to the competitive pressure in markets) there is 100% pass-through of policy rates to loans to corporates and MFIs – either because they are linked to Euribor or a similar benchmark, or because this is liquidity being deposited at the ECB/NCBs. We make the conservative assumption that cuts are not passed through to governments, but this is a small line item and changing this assumption has little impact on the conclusions of our analysis. We assume 100% pass-through on loans to PNFCs and non-monetary financial institutions, except for Spain where the BDE provides data on the fixed/float split of the current stock of such loans.

For household credit, we use NCB data on the stock of fixed versus float mortgage and credit loans, except in the case of Italy where we have used the trailing 15y average of new mortgage volumes to estimate the split in the stock of mortgages.

For non-loan debt securities (ie. bonds) we have taken ECB data on the split between long- and short-term debt, and assumed that anything less than two years is floating rate or refinanced, while anything greater than two years is fixed and held at amortized cost. For other bonds we have assumed that around a quarter are either floating rate or are short enough in tenor that they are refinanced at a lower rate. These items are small enough that different assumptions on the pass-through do not materially alter our conclusions. As with the liability side of the balance sheet, we assume that ECB policy rates have no influence on equity returns or on the cash flows from assets denominated in other currencies.

After making this exhaustive list of assumptions, we calculate the weighted average impact on the yield of bank assets 12-18 months after and ECB policy cut. We estimate that a 10bp cut in ECB policy rates lowers the weighted average yield on bank assets by 4-6bp after 12-18 months. Relative to the, lower, 3-4bp pass-through on the liability side, this implies that each 10bp cut in ECB policy rates lowers the margin on bank balance sheets by c.2bp.

Note that in our analysis of the asset side of the balance sheet, we have ignored the positive impact of mark-to-market on assets as interest rates fall. While this generates a one-time accounting gain, we are focused on the long-term profitability of banks' balance sheet.

FIGURE 25

Assets of Member State banking systems, and the assumed pass-through of ECB policy rate cuts.

	Amount (ECB)				12m pass through of 10bp policy cut			
	Germany	France	Italy	Spain	Germany	France	Italy	Spain
Loans to MFIs	1,922	2,664	628	336	100%	100%	100%	100%
o/w Actual Loans	1,485	2,385	573	254	100%	100%	100%	100%
o/w Excess liquidity	437	279	55	82	100%	100%	100%	100%
Loans to Govt	287	212	266	75	0%	0%	0%	0%
Loans to PNFCs	1,091	1,112	669	464	100%	100%	100%	100%
Loans to Non-Monetary FI	208	342	238	51	100%	100%	100%	74%
Household - Credit	455	257	249	193	95%	65%	100%	65%
Household - Mortgages	1,263	1,066	383	515	5%	20%	60%	90%
Debt Securities (MFI)	368	283	73	11	2%	58%	1%	17%
Debt Securities (Govt)	256	198	442	247	25%	25%	25%	25%
Debt securities (Other)	150	377	139	169	25%	25%	25%	25%
Money Markets	0	27	0	0	100%	100%	100%	100%
Shares	304	425	154	107	0%	0%	0%	0%
External Assets	1,104	1,578	151	223	20%	25%	10%	10%
Fixed Assets	28	39	74	44	0%	0%	0%	0%
Remaining Assets	883	982	303	265	0%	0%	0%	0%
Total	8,320	9,563	3,768	2,700	49%	55%	58%	58%
Liabilities					31%	38%	36%	33%
Net passthrough (10bp cut)					-1.8	-1.7	-2.1	-2.4
Net passthrough w/ Tiering					-1.5	-1.6	-2.0	-2.2
Net passthrough, no floor					0.4	-0.3	0.9	0.6

Source: Banque de France, Bundesbank, Banco de Espania, Banca d'Italia, Barclays Research

## Modelling conclusions

While there is necessarily a high degree of subjectivity on the assumed pass-through rates, we are comfortable with the approach we have taken and find that it is relatively robust. We admit that some of the line items are opaque, but this analysis also shows that the key items are those where we have the most visibility: the cost of deposits, and the yield on loans. We have the greatest confidence in our assumptions of policy-rate pass-through for those bank assets and liabilities that have the greatest weight.

While we have not explicitly addressed positive or negative interest levels, the key issue is asymmetric pass-through of policy cuts to household deposits and to the loan book. This entirely results from negative interest rates in combination with the “zero floor” on deposits that currently is in place. At higher nominal rates we are confident that banks would be able to pass on policy rate cuts to depositors in full, albeit with a lag in most circumstances.

## How much can tiering help?

A detailed discussion of the ECB’s tiering and its implications for euro area money markets can be found in research by our Barclays Fixed Income Research team:

- *Swiss tiering has not convinced the market*, 12 September 2019
- *ECB Tiering and Italian repo: Fears but not tears*, 2 October 2019

Based on our models, however, a simple way to gauge the effectiveness of ECB deposit tiering in supporting banks is to change the pass-through assumption on excess liquidity (an asset) from 100%. Based on a system exemption of six times required reserves, roughly €792bn (60%) of excess liquidity will be put on at the preferential rate of 0% with a broad range across countries. This is unlikely to move lower if the ECB cuts again in the future, so only the remaining 40% of excess liquidity would be subject to a lower yield.

Making this change lowers the weighted average pass-through of policy rates to bank assets, shown in Figure 26. We note that the largest benefit accrues to the German banking system, while the sensitivity of Spanish and Italian banks is barely lowered as they have little excess liquidity that can benefit from the preferential rate.

FIGURE 26

Tiering can reduce the pass-through of cuts on the liability side of the balance sheet, but only by a marginal amount

		Amount (ECB)				12m pass through of 10bp policy cut			
		Germany	France	Italy	Spain	Germany	France	Italy	Spain
Today	Loans to MFIs	1,922	2,664	628	336	100%	100%	100%	100%
	Excess liquidity	437	279	55	82	100%	100%	100%	100%
	Asset passthrough					49%	55%	58%	58%
Current Tiering	Excess liquidity	437	279	55	82	49%	46%	0%	20%
	Asset passthrough					46%	53%	56%	55%
100% tiering	Excess liquidity	437	279	55	82	0%	0%	0%	0%
	Asset passthrough					43%	52%	56%	55%
Tiering benefit						-3%	-2%	-1%	-2%
Maximum benefit						-5%	-3%	-1%	-3%

Source: ECB, Barclays Research

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We, Zoso Davies, Charlotte Edwards, CFA, Omar Fall, Fabio Fois, Koen Gheeraert, Amit Goel, Christy Hajiloizou, Chris Manners, Grace Dargan, Fernando Gil De Santivanes, Lorenzo Gren, Aman Rakkar, CFA, Paulina Sokolova and Jun Yang, hereby certify (1) that the views expressed in this research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this research report and (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report.

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