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Monetary policy, credit institutions
and the bank lending channel in the
euro area

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Abstract

As the euro area has a predominantly bank-based financial system, changes in the composition and strength of banks' balance sheets can have very sizeable implications for the transmission of monetary policy. This paper provides an overview of developments in banks' balance sheets, profitability and risk-bearing capacity and analyses their relevance for monetary policy. We show that, while the transmission of standard policy interest rate cuts to firms and households was diminished during the crisis, in a context of financial market stress and weak bank balance sheets, unconventional monetary policy measures have helped to restore monetary policy transmission and pass-through to interest rates. We also document the extent to which these non-standard measures were successful in stimulating lending and which bank business models were more strongly affected. Finally, we show that the estimated impact of recent monetary policy measures on bank profitability does not appear to be particularly strong when all the effects on the macroeconomy and asset quality are taken into account.

JEL codes: E4, E43, E5, E52, G20, G21

Keywords: monetary policy, interest rates, banks, credit

Executive summary

This paper provides an overview of developments in the euro area banking sector and of how monetary policy – both standard and non-standard – has been transmitted through banks to the non-financial private sector. The euro area private sector relies predominantly on banks for its external financing, and because changes in bank capital, profitability, funding and asset quality can alter banks' credit intermediation capacity, it is essential to monitor developments in these variables.

Since the inception of the euro, banks' assets and liabilities have not only reflected, but also affected, developments in the macroeconomy. In the run-up to the financial crisis, banks' asset growth was driven by credit to the private sector and expansion of external assets. Subsequently, there were two distinct waves of active balance sheet deleveraging during the financial crisis. External assets decreased strongly in the early stages, and then almost all asset components contracted as the sovereign bond crisis intensified towards the end of 2011. On the liabilities side, outflows during the crisis were mainly in debt securities and interbank and external funding, and banks increasingly relied on central bank funding. The share of more stable funding sources, such as euro area residents' deposits, has increased since the crisis. We also show that there is heterogeneity across banks' balance sheets according to their business models and strategies, which are also relevant for how banks transmit monetary policy through to firms and households.

The banking sector's primary function of channelling funds from savers to productive firms and households is essential to ensuring investment and growth, but it can be an opaque and risky activity. For this reason, it is essential to monitor banks' risk-bearing capacity to ensure a healthy flow of lending to the real economy. Shocks to banks' risk-bearing capacity can curtail credit supply and therefore may require a monetary policy response. We provide an overview of the main indicators of banks' capacity to intermediate and to absorb shocks. Since the onset of the financial crisis, euro area banks have increased their regulatory capital ratios, making them more resilient to shocks. Moreover, we show that credit risk in banks' balance sheets is decreasing as macroeconomic conditions steadily brighten. This is manifested by the reduction in the stock of non-performing loans (NPLs), meaning that their adverse effect on credit conditions is diminishing.

Bank profitability affects their ability to generate capital and therefore may impact their capacity to provide adequate funding to the economy. We show that euro area banks' profitability has been gradually recovering from the significant decline that followed the crisis, though it remains low by historical standards. In recent years, net interest income has remained broadly unchanged, with lower interest income fully offset by lower interest expense. Overall, universal banks seem to have fared better, perhaps reflecting benefits in terms of their diversification.

Finally, we analyse the transmission of monetary policy through to interest rates, credit volumes and bank profits. At the onset of the crisis, the transmission of monetary policy was fragmented across countries, banks and sectors. Cross-country

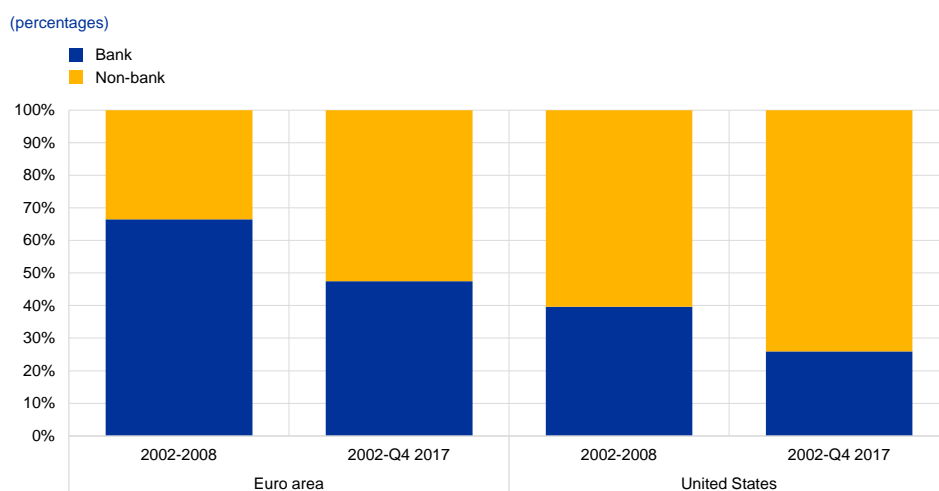
divergence in lending rates reflected structural differences and variation in the characteristics of borrowers and lenders, while banks' weak balance sheets also hampered the pass-through of cuts in the standard policy rate. We show how non-standard monetary policy measures helped to improve the pass-through of interest rate reductions, in particular for banks with weaker balance sheets. They also helped to stimulate lending volumes to firms and households, albeit with varying intensity across different bank business models. Moreover, while the low interest rate environment exerts downward pressure on banks' net interest margins, monetary policy measures have had a positive impact overall on lending volumes and credit quality and induced capital gains, which together have offset the decrease in net interest margins.

1 Introduction

Financial intermediaries play a prominent role in financing investment and consumption by firms and households in the euro area. Therefore, bank lending conditions are crucial to economic activity and welfare, especially in the euro area, where bank loans constitute almost 50% of the external financing of non-financial corporations (NFCs). By comparison, they account for only around 25% in the United States (see Chart 1). While the share of bank financing in total has declined somewhat in the euro area in recent years, owing in part to the financial crisis, banking sector developments continue to have important implications for both monetary policy and financial stability (Langfield and Pagano, 2016).

Chart 1

Share of bank and non-bank financing in NFCs' financing in the euro area and the United States



Sources: ECB, Federal Reserve System.
Notes: The latest observation is for 2017.

The smooth transmission of monetary policy to the real economy depends on a well-functioning “credit channel”. Theoretically, changes in the policy rate can affect the cost and availability of credit in a way that reinforces and amplifies the impact of monetary policy actions on the real economy. This amplification mechanism is called the credit channel of monetary policy transmission (Bernanke and Gertler, 1995). The channel is usually further decomposed into two parts: the balance sheet channel and the bank lending channel.¹ The balance sheet channel amplifies the impact of monetary policy measures via changes in the net worth and liquidity of borrowers. Due to information asymmetries (or agency costs), these ultimately lead to

¹ Following the seminal contributions by Bernanke and Blinder (1988), Bernanke and Gertler (1989) and Bernanke, Gertler and Gilchrist (1996), there has been extensive literature on both the bank lending channel and the balance sheet channel. The evidence for the bank lending channel is based primarily on differences among banks (e.g. Kashyap and Stein, 1995, 2000; Gambacorta, 2005, 2008; Jayaratne and Morgan, 2000; Ashcraft, 2006; Ciccarelli et al. 2015; Altavilla, Canova and Ciccarelli, 2016).

changes in borrowing and investment. The bank lending channel focuses on the financial frictions associated with the balance sheet strength of financial intermediaries. Following monetary policy easing, for example, lower interest rates improve banks' funding conditions, in turn inducing an increase in the supply of loans.

Empirical studies generally show that the strength of monetary policy transmission is influenced by the balance sheet characteristics of financial intermediaries. Following monetary policy tightening, for example, banks with weak balance sheets tend to reduce their loan supply more than other banks. The transmission of monetary policy is found to be stronger for small (Kashyap and Stein, 1995), illiquid (Stein, 1998; Kashyap and Stein, 2000) and poorly capitalised banks (Peek and Rosengren, 1995; Kishan and Opiela, 2000; Van den Heuvel, 2002). These findings indicate that larger, better capitalised and more liquid banks are more resilient to monetary contractions, as they can easily substitute deposits with other sources of financing, absorb expected future losses and divert liquidity to satisfy increases in loan demand.

In periods of financial stress, economic and regulatory constraints might alter the effectiveness of monetary policy. Recent work analysing the pass-through of interest rates to household and NFC lending rates in the euro area over the last decade has produced contradictory conclusions (see Altavilla, Canova and Ciccarelli, 2019). For example, Hristov et al. (2014) document a significant fall in average pass-through rates relative to the pre-crisis period, while Von Borstel et al. (2015) and Illes et al. (2015) only find a mild decline that is statistically similar in core and periphery countries, once banks' effective cost of funding is taken into account. Jimenez et al. (2012), Acharya et al. (2015) and Holton and Rodriguez d'Acari (2015) find that variations in bank characteristics impact the transmission of monetary policy. Their findings are consistent with studies by Acharya and Steffen (2015), Altavilla, Pagano and Simonelli (2017) and Acharya et al. (2017), while Andreeva and Vlassopoulos (2016) highlight that a pre-existing link between the creditworthiness of domestic banks and sovereigns biases banks' portfolio choices. Overall, the main consistent finding is that periods of financial stress and associated balance sheet impairments can alter banks' behaviour and their response to changes in policies.

Since the onset of the financial crisis, the ECB and all other major central banks have complemented their operational frameworks with an array of non-standard monetary policy measures. In general, the aim of the non-standard measures introduced by the ECB before June 2014 was to remedy impairments in various stages of the transmission mechanism. From June 2014, a series of new measures were gradually introduced that constituted a package of credit-easing policies – notably the targeted longer-term refinancing operations (TLTROs). The aim of these measures was to enhance the transmission of monetary policy but also to reinforce the accommodative monetary policy stance in view of the persistently weak inflation outlook, slowing growth momentum, and subdued monetary and credit dynamics at the time. Finally, in January 2015 the ECB announced the introduction of the expanded asset purchase programme (APP) to further ease the monetary policy

stance. This measure was deemed necessary as the inflation outlook had deteriorated further since the credit-easing package was introduced.²

The evolution of bank balance sheet characteristics influences the strength of the bank lending channel in the euro area. Financial intermediaries are not passive players that neutrally channel monetary policy, but rather a key sector in the transmission mechanism that can drive the financial cycle (Adrian and Shin, 2010). For instance, changes in banks' profitability can impact their capital position and risk-bearing capacity, which can in turn alter the supply of credit to the real economy. As bank balance sheet characteristics play such a crucial role in the transmission of monetary policy, the following sections will focus on their evolution and the driving forces that have influenced them in the euro area banking system. The rest of the paper is structured as follows. Section 2 describes the balance sheet developments in the euro area banking sector. Section 3 concentrates on bank risk-bearing capacity. Section 4 focuses on recent developments in bank profitability. Section 5 analyses the impact of monetary policy actions on bank intermediation and profitability. Section 6 concludes.

² The transmission of unconventional monetary policy to bank lending in the euro area has been investigated by Altavilla, Canova and Ciccarelli (2016), Albertazzi, Nobili and Signoretti (2016), Boeckx, De Sola Perea and Peersman (2017), Altavilla, Pagano and Simonelli (2017) and Albertazzi, Becker and Boucinha (2018).

2 Bank balance sheet developments

2.1 Developments in main assets

Given banks' crucial role in financing investments by the euro area private sector, an analysis of credit institutions' assets and liabilities is vital in assessing the transmission and impact of monetary policy. This section provides an overview of the main developments in bank assets and liabilities, including credit and funding conditions. It also describes differences across different types of banks.

Euro area banks went through two distinct waves of active balance sheet deleveraging during the financial crisis (see Chart 2). The growth in banks' assets, which had increased from around 6% in annual terms at the end of 2003 to around 14% by the end of 2007, was driven primarily by credit to the private sector and, to a lesser extent, to other monetary financial institutions (MFIs), while external assets also built up over this period. At the onset of the crisis, all these components decreased precipitously, leading to an overall contraction in main assets. In the early stages of the crisis, external assets experienced a more pronounced decline, as banks' deleveraging efforts focused initially on cross-border activities that were less central to their operations.³ The main countervailing force during this period was credit to the general government, reflecting both an increase in demand for safer assets (so called "flight to safety") and the increase in sovereign indebtedness due to the automatic stabilisers that kick in when unemployment increases and activity declines. Deposits with the Eurosystem also increased, reflecting the rising uncertainty in the interbank market and the increasing intermediation role played by the central bank. While money market flows improved somewhat in 2011, their composition shifted towards domestic activity, while cross-border activity fell (see Chart 3). As tensions in the banking sector grew towards the end of 2011, almost all asset components began a renewed contraction.

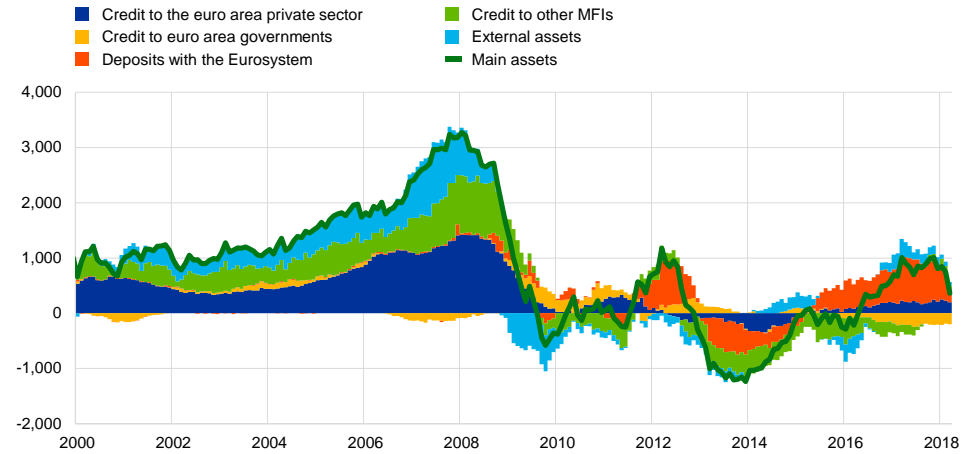
Monetary policy actions and the subsidence of risks in financial markets stabilised conditions in the banking sector and led to an eventual revival in banks' asset growth. While banks' assets started to stabilise towards the end of 2013, their balance sheets only began growing again in 2016, following a wide range of standard and non-standard monetary policy measures. As can be seen in Chart 2, the recent expansion in banks' balance sheets has been driven by growth in credit to the private sector and external assets, but mostly by deposits with the Eurosystem. These largely reflect the accumulation of reserves injected via the expanded APP, with banks selling own eligible bonds and settling transactions on behalf of customers. The contraction in flows in early 2018 partly reflects the reduction in asset purchases by central banks, but is also due to the waning effect of the TLTROs, the last of which were allotted in 2017.

³ For more details see the box entitled "The Role of MFI External Assets and Liabilities in the Recent Deleveraging Process" in the November 2009 ECB Monthly Bulletin.

Chart 2

Main assets of euro area MFIs other than the Eurosystem

(12-month flows in EUR billions, not seasonally adjusted)



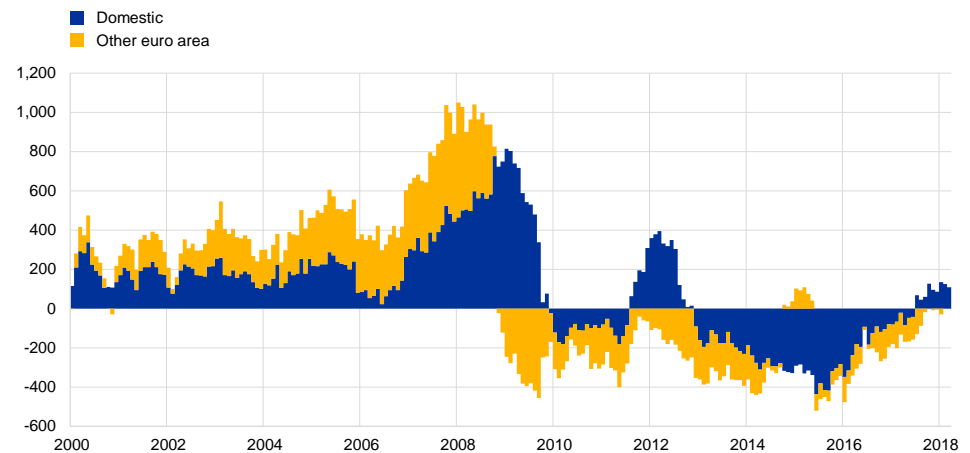
Source: ECB.

Note: The latest observation is for March 2018.

Chart 3

MFI loans to domestic MFIs and MFIs resident in other euro area countries

(12-month flows in EUR billions; adjusted for seasonal effects)



Source: ECB.

Note: The latest observation is for March 2018.

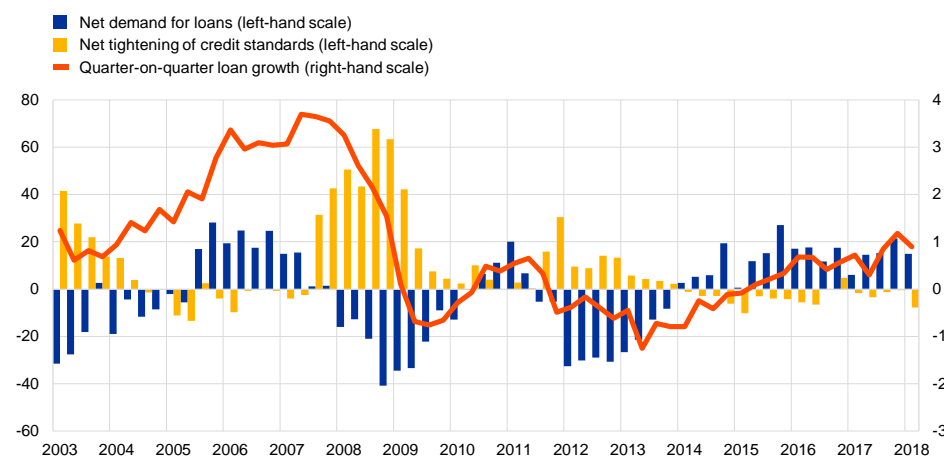
From a monetary policy perspective, it is important to analyse not only the broad flows in credit to the private sector, but also the supply and demand factors that drive the developments in different sectors. For instance, weak credit developments owing to a decline in demand from an exogenous macroeconomic shock would imply a different policy response as compared to weak lending flows driven by a liquidity crisis in the banking system. Disentangling supply and demand effects can be very difficult in practice, given the endogenous nature of the variables and the confounding factors that affect both. For this reason, the euro area bank lending survey (BLS), which provides qualitative information on credit demand and

supply pressures, is a crucial complement to quantitative information on credit developments.⁴ Chart 4 and Chart 5 show loan developments with the main demand and supply measures for NFCs and households respectively. In the five years preceding the crisis, high credit demand and broadly neutral credit supply conditions drove an expansion in credit. The crisis was associated with decreasing credit demand and tighter credit standards, which prevailed for over two years. Towards the end of 2010, credit flows improved as loan demand increased and the tightening in credit standards abated. However, as macroeconomic conditions deteriorated and sovereign and financial market tensions escalated around 2010, both supply and demand conditions deteriorated again and lending weakened. Since the introduction of the credit-easing package in mid-2014, and in particular since the start of the expanded APP at the beginning of 2015, credit demand conditions have supported loan flows; more recently an easing in credit standards has also bolstered credit flows, albeit to a lesser extent.

Chart 4

Credit standards and demand for loans to NFCs and growth in MFI loans to NFCs in the euro areas

(net percentages of tightening; net increase in demand; quarterly percentage changes, seasonally adjusted)



Sources: ECB, euro area bank lending survey.

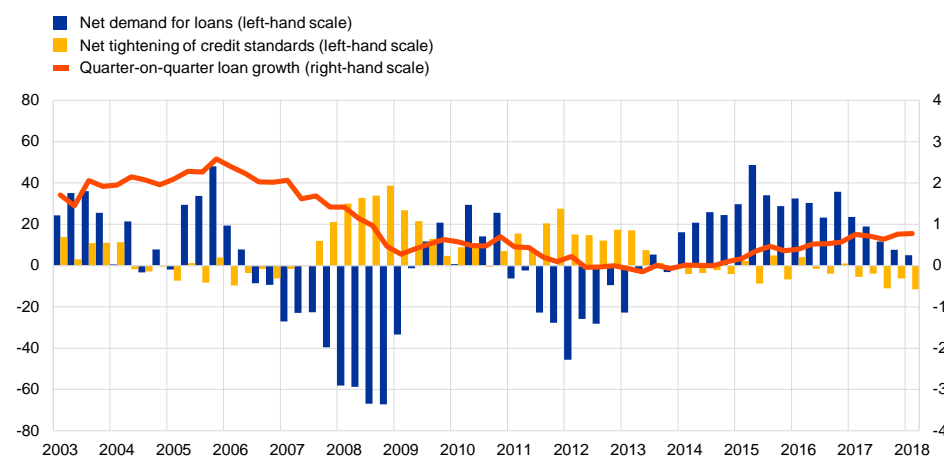
Notes: Net tightening of credit standards is the percentage of banks reporting that credit standards tightened minus the percentage that reported they eased. Net demand is the percentage of banks reporting that demand increased minus the percentage that reported they eased. The latest observation is for the first quarter of 2018.

⁴ See the [Euro area bank lending survey](#).

Chart 5

Credit standards and demand for loans to households for house purchase and growth in MFI loans to households in the euro area

(net percentages of tightening; net increase in demand; quarterly percentage changes, seasonally adjusted)



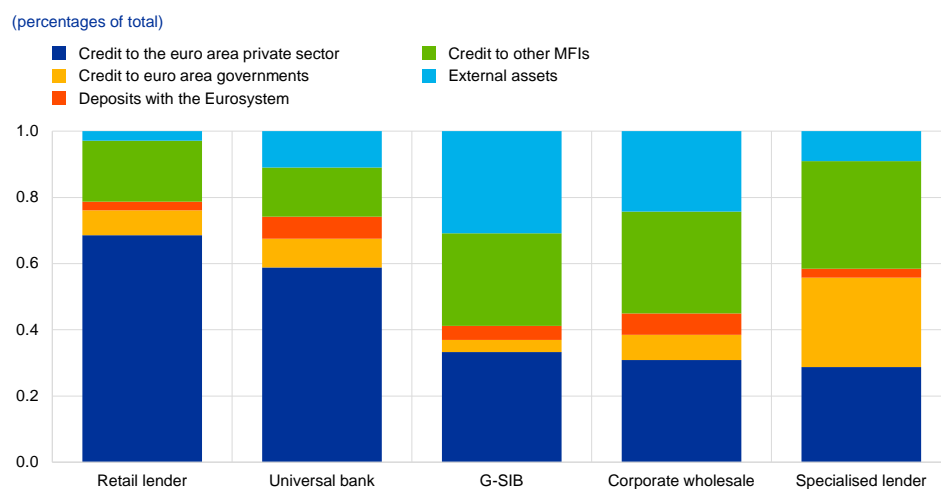
Sources: ECB, euro area bank lending survey.

Notes: Net tightening of credit standards is the percentage of banks reporting that credit standards tightened minus the percentage that reported they eased. Net demand is the percentage of banks reporting that demand increased minus the percentage that reported they eased. The latest observation is for the first quarter of 2018.

While on average credit to the private sector accounts for the largest share of euro area banks' assets, the composition of assets can vary widely across business models. Box 1 outlines how banks can be grouped in five business model categories depending on their activities and funding. Chart 6 illustrates a number of stylised facts concerning banks' asset composition by business model. First, the share of credit to the private sector is highest for retail lenders and lowest for specialised lenders, as would be expected. Specialised lenders are the group for which credit to the private sector is least important, with credit to other MFIs constituting the largest share of total assets. Unsurprisingly, global systemically important banks (G-SIBs) have the highest share of external assets, while retail banks, which tend to focus more on domestic markets, have the lowest.

Chart 6

Structure of main bank assets by business model



Source: ECB.
Notes: Data for March 2018.

Box 1

Bank business model classification

Maturity transformation and credit intermediation are the main purposes of banking, but there can be considerable heterogeneity across banks, for example in terms of their funding, activities, size and geographical spread. Banks' business models depend on their objectives and strategic goals, and therefore determine the extent to which these characteristics vary. Classifying banks according to their business models provides a useful framework for assessing the likely outcome of a change in monetary policy, as their ultimate strategies can determine how they will respond to an increase in liquidity or to a change in the yield curve configuration. This box outlines a business model classification used to assess developments across a sample that primarily covers the largest MFIs in each euro area country.

The business model classification starts with the classification of significant institutions, which considers: (i) risk mix/complexity, (ii) activities and sources of income, (iii) geographical orientation, (iv) funding, (v) size, and (vi) ownership. The classification is then applied to a wider group of banks, using information from the Orbis Bank Focus database on bank specialisation augmented by balance sheet information. The classification is finally cross-checked and confirmed by national banking experts. The classification applies at the individual institution level, meaning that branches and subsidiaries do not automatically take the classification of the head institution, but rather reflect the business and activities of the individual entity. When consolidated group data are used, however, the business model selected is that which most accurately applies to the group.

The five resulting business models can be described as follows:

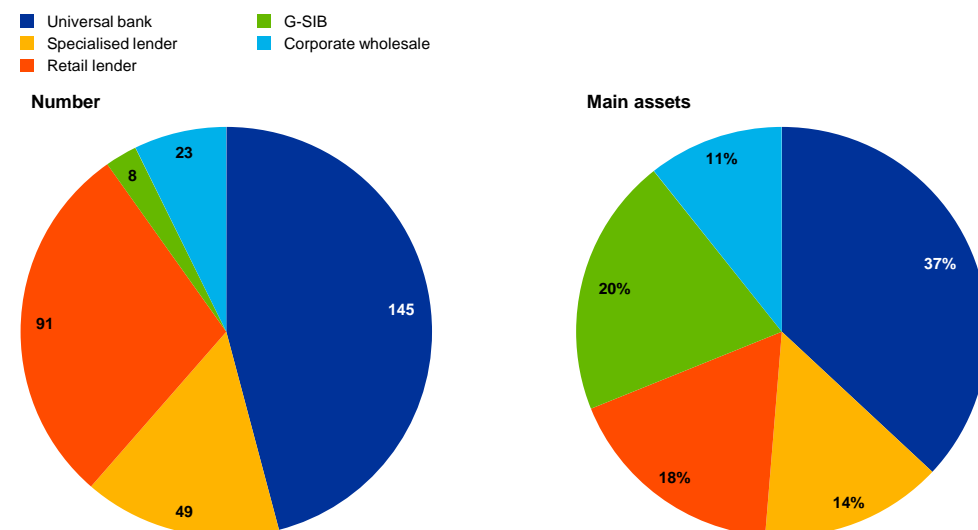
- **G-SIBs:** banks that are identified by the Basel Committee on Banking Supervision/Financial Stability Board as globally systemically important. These banks have many similarities: they are very large, are all conglomerates, have an international geographical orientation and tend to be diversified. Given their importance they have additional capital requirements and higher supervisory expectations, but tend to be viewed with more confidence by market participants

- **Universal banks:** banks that engage in lending activities but also have significant non-lending business. This group includes banks that are mainly active in a combination of retail banking (servicing individuals and small and medium-sized enterprises (SMEs)), wholesale banking (servicing large corporates) and private banking, not belonging to groups of savings banks or cooperative banks.
- **Retail lenders:** cooperative banks and savings banks that are mainly active in retail banking (servicing individuals and SMEs) and mortgage banks. These banks tend to be funded by their retail clients through deposits.
- **Corporate wholesale banks:** banks with a customer base consisting predominantly of large corporations and corporate SMEs.
- **Specialised lenders:** banks that are custodians and asset managers, sectoral lenders, clearing and custody institutions, investment and trust corporations, finance companies, investment banks, asset management companies, specialised governmental credit institutions, securities firms and real estate financing banks.

Using this business model classification, the breakdown of banks across the 19 euro area countries is shown in Chart A. Universal banks constitute the largest group and, while the smallest group in terms of number of banks is G-SIBs, this is the second-largest group in terms of main assets.

Chart A

Euro area banks by business model



Source: ECB.
Notes: Data for March 2018.

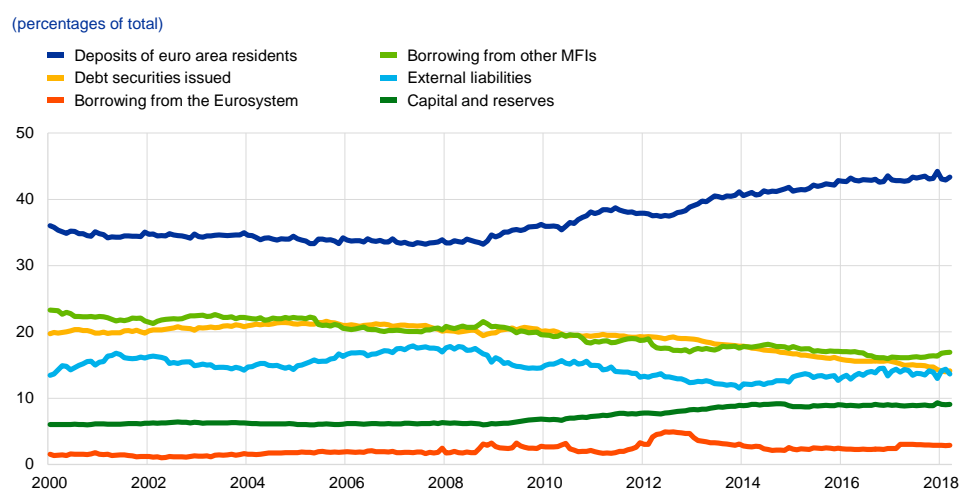
2.2 Developments in main liabilities

As a result of changes in market risk, regulatory pressure and the economic environment, the funding structure of euro area banks has shifted towards more stable deposit funding over the past decade (Chart 7). In the run-up to the financial crisis, the expansion of banks' balance sheets was accompanied by an

increase across all main liability components (Chart 8). As the financial crisis escalated, liability outflows were mainly in debt securities, interbank and external funding. When financial market tensions then intensified towards the end of 2011, banks' balance sheets were increasingly supported by central bank funding, particularly in countries acutely affected by sovereign market tensions.⁵ Since the crisis, the share of euro area residents' deposits in banks' total funding has increased and reliance on more volatile market sources, such as debt securities and external liabilities, has decreased (see Chart 7). The share of capital in total funding has also increased from around 6% of main liabilities in 2005 to around 9% in 2017.⁶

Chart 7

Structure of main liabilities of euro area MFIs other than the Eurosystem



Source: ECB.

Note: The latest observation is for March 2018.

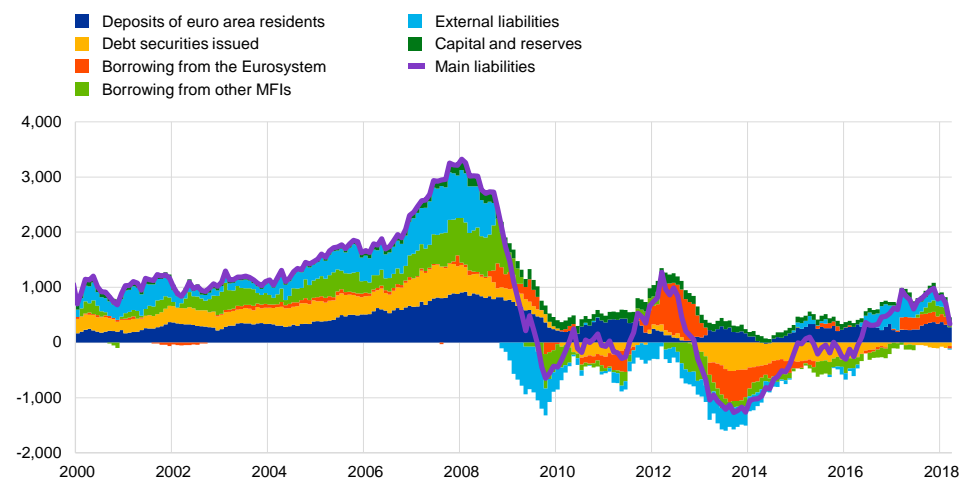
⁵ For more details on funding in vulnerable and other countries, please see the Article entitled "Recent developments in the composition and cost of bank funding in the euro area" in the ECB Economic Bulletin, Issue 1/2016.

⁶ This measure of capital differs from the regulatory measure. Its statistical definition includes equity capital, non-distributed benefits or funds and specific and general provisions against loans, securities and other types of assets. However, its trend follows a general improvement in solvency and leverage ratios.

Chart 8

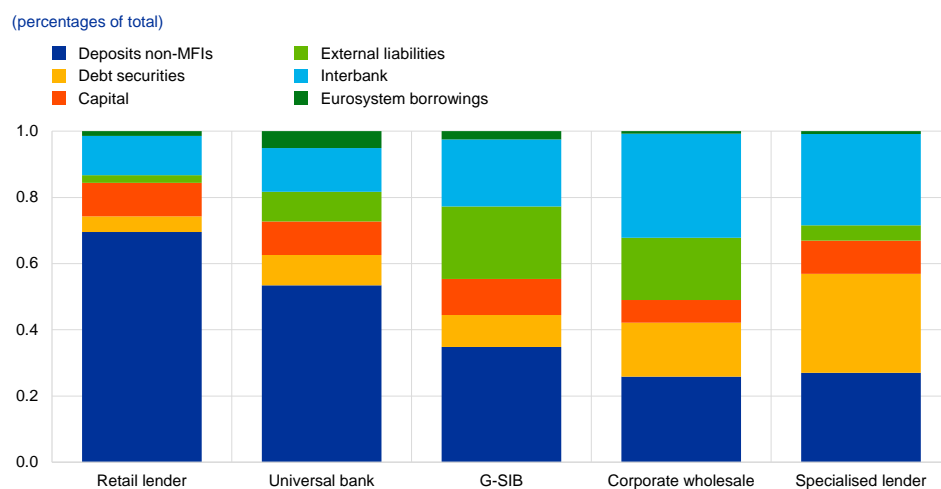
Developments in main liabilities of euro area MFIs other than the Eurosystem

(EUR billions, 12-month flows)



Source: ECB.
The latest observation is for March 2018.

While in general banks' funding structures have become more focused on stable sources, there are still substantial differences across business models (see Chart 9). Retail banks, which constitute almost 20% of the sample in terms of main assets, are heavily reliant on deposits, and this category's share of their total funding has grown by over ten percentage points since the start of the crisis, replacing more volatile sources of funding. Universal banks have also shown increased reliance on non-MFI deposits and central bank liquidity, the former constituting around half of their current liabilities. G-SIBs and specialised lenders, conversely, have a much more diffuse funding base and lower reliance on non-MFI deposits overall. G-SIBs, the most international banks, have by far the highest share of external liabilities, while specialised lenders have the greatest reliance on market funding. As the balance sheet measure of capital shown in Chart 9 diverges from the regulatory measure (for instance, it is not risk-weighted), we will explore developments in the latter in Section 3.

Chart 9**Structure of main liabilities by bank business model**

Source: ECB.
Notes: Data for March 2018.

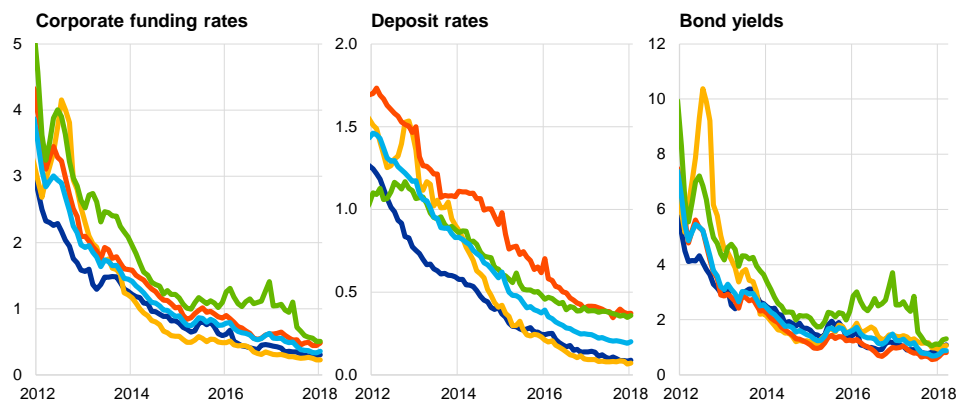
2.3 Developments in funding costs

While the level and dispersion of bank funding costs were elevated during the crisis, they have both decreased as financial market tensions have subsided.

Banks' overall funding costs have declined substantially since the height of the financial market tensions, and funding cost measures across the largest economies have converged in line with the lessening in risk perceptions and the recovery in the transmission of monetary policy (See Chart 10). During 2012, at the height of the sovereign debt crisis, banks' composite funding costs (defined as a weighted average cost of deposits and debt securities) increased, largely owing to high bond yields. During this period, adverse spillovers from sovereign market funding into bank funding intensified and parts of the banking system lost access to wholesale funding markets on the back of perceived redenomination risk. In general, funding costs have converged since 2012, following large-scale monetary policy intervention; however, concerns over pending bank resolution operations and high levels of non-performing assets have contributed to increased funding costs in some countries. Over the course of 2017, funding costs decreased in all large euro area countries, most notably in Italy. This was mainly driven by bond yields, as deposit rates had largely flattened out at low levels. While bond yields increased slightly in early 2018, they remain at historical lows.

Chart 10 Funding costs

(percentages of total)

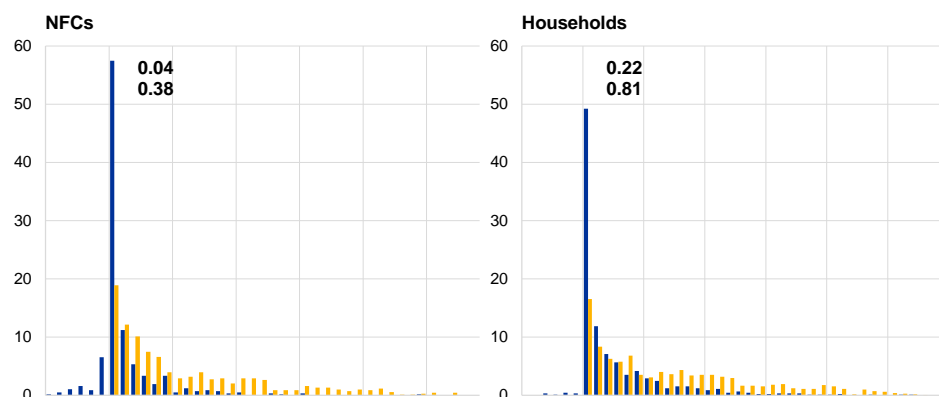
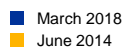


Sources: Markit Iboxx, ECB.
Notes: Bond yields until May 2018, deposit rates and composite rates until March 2018.

Cuts in key monetary policy rates into negative territory eased the cost of certain funding sources more than others. In general, deposits tend to be more resistant to negative rates than market financing, and this is particularly true of household deposits (Chart 11). The deposit facility rate (DFR) was brought below zero for the first time in June 2014, and since then average deposit rates have decreased and become increasingly stacked at zero. However, for NFC deposits a non-trivial share are on average remunerated below zero. In March 2018, over 10% of the outstanding amounts of euro area deposits were at negative rates. For this reason, banks with lower reliance on deposits (in particular retail deposits) benefited more from the easing that originated from the negative DFR.

Chart 11 Distribution of deposit rates on outstanding amounts across individual MFIs

(x-axis: deposit rates in percentages per annum, y-axis: frequencies in percentages, weighted by volumes)

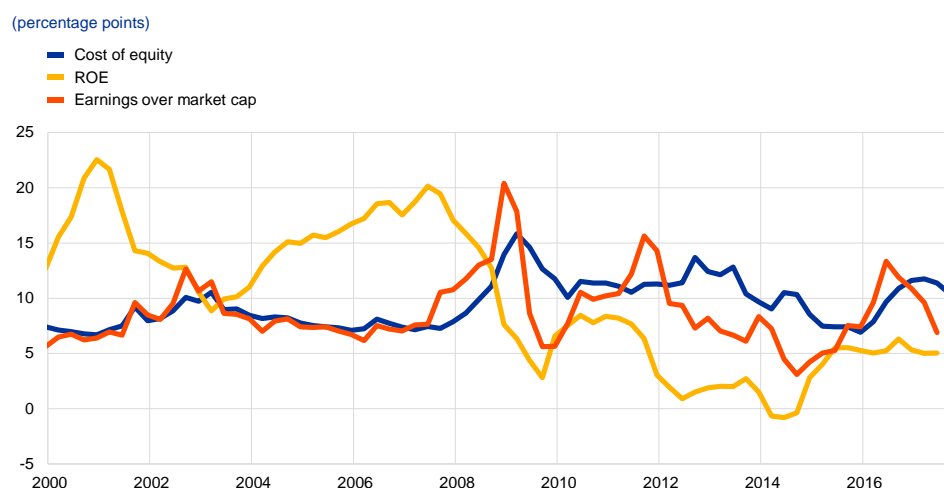


Source: ECB.
Notes: Deposit rates on outstanding amounts as reported by individual banks, weighted by outstanding amounts. The numbers displayed show the weighted average deposit rates in June 2014 and March 2018.

The cost of equity increased for euro area banks during the financial crisis and has since remained above the return on equity, although the gap between the measures has narrowed recently (Chart 12). Until summer 2007, euro area banks had been able to raise equity offering an expected rate of return of approximately 7% to investors. As the crisis broke out, their cost of bank equity rose significantly, while the return on equity declined versus pre-crisis levels. In this environment, the cost of equity increased to above the return on equity, indicating that the profits generated by banks were insufficient to cover the rate of return required by investors. The cost of equity then decreased in line with the positive developments observed in financial markets against the background of the ECB's monetary policy action and, in particular, the APP. This positive trend was interrupted in December 2015 amid equity market turbulence, reflecting an increase in the equity premium and in banks' sensitivity to market fluctuations. In addition, euro area banks' valuations remained hampered by concerns about their asset quality and by uncertainty over the new regulatory and supervisory requirements and banks' ability to meet them in an environment of low growth and low interest rates. More recently, the cost of equity for euro area banks has decreased, reflecting brighter longer-term prospects for bank profitability and progress on the clean-up of banks' balance sheets. It is worth noting that while the ratio between earnings and market capitalisation has remained aligned with the cost of equity overall, this has to a large extent been driven by low price to book ratios. Therefore, even if the return on investment that prospective investors in bank shares expect to earn remains adequate, banks are likely to avoid raising capital externally if not under market or regulatory pressure to do so, as this could lead to significant dilution of existing shareholders.

Chart 12

Return on equity, cost of equity and earnings over market capitalisation of euro area banks



Sources: Bloomberg, Datastream, Consensus Economics, ECB calculations.

Notes: Quarterly data. Cost of equity is the expected return on the EuroSTOXX Banks index, estimated by applying the CAPM to the EuroSTOXX weekly market index with one-year rolling betas. Estimates of the equity premium are based on I/B/E/S earnings forecasts and consensus estimates of long-term real GDP growth. For details of the calculation, see "Measuring the cost of bank equity in the euro area", ECB Financial Stability Review, May 2015. The latest observations are for the first quarter of 2018.

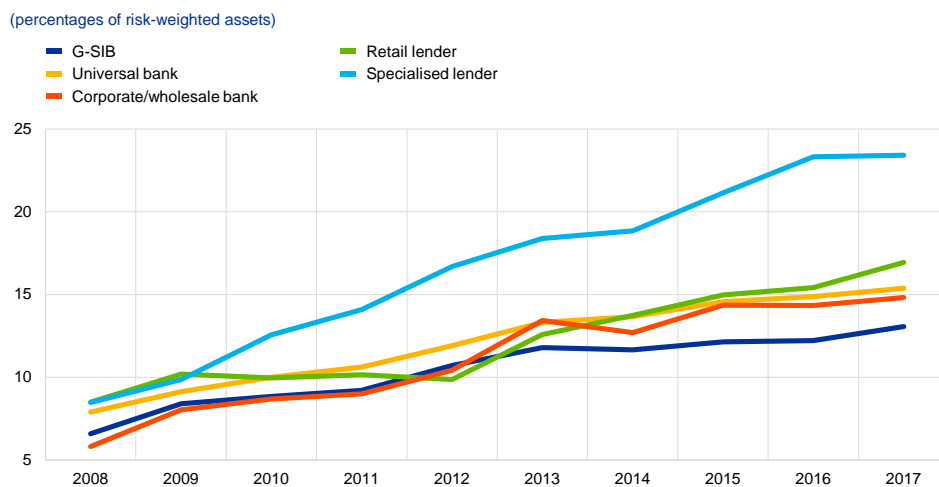
3 Bank risk-bearing capacity

Banks' core function is to collect savings from the non-financial private sector and channel them to productive but risky credit to firms and households. An adequate capacity to bear risk is therefore an essential prerequisite for a healthy flow of bank lending. Shocks to banks' risk-bearing capacity can curtail credit supply, with negative implications for investment and consumption, and may therefore require a monetary policy response to dampen the negative impact on output and inflation (Gilchrist and Zakrajšek, 2011). Important metrics of bank risk-bearing capacity are regulatory capital ratios and measures of credit risk in banks' loan and security portfolios. We therefore review their recent evolution in this section.

Euro area banks have increased their regulatory capital ratios since the onset of the financial crisis. This trend was observed in response to higher regulatory requirements and stronger market scrutiny in the aftermath of the financial crisis of 2007/08. Improvements were registered for banks across business models (see Chart 13). The markedly higher capital ratio for specialised lenders reflects the fact that these banks tend to be focused on specific activities that often have lower risk weights (e.g. sovereign assets). While the capital ratio of G-SIBs has recently fallen behind that of the other business models, owing to significant one-off costs that have eroded capital at some large institutions, it overall remains close to levels at universal and retail banks. The trend in G-SIBs' capital ratio reflects two opposing effects on capital. On the one hand, G-SIBs have greater capacity to diversify, can reap economies of scale in screening and monitoring, and are generally perceived as being too big to fail, all of which would imply a need for lower capital. On the other hand, these banks have recently been subject to increasing capital surcharges, in view of the potentially severely disruptive consequences of the collapse of such a large institution for the economy. Overall, while outright deleveraging in assets with above-average risk weights explained a significant part of the observed improvements up to 2013, more recently the evolution has by and large been driven by an expanding holding of capital (see Chart 14).

Chart 13

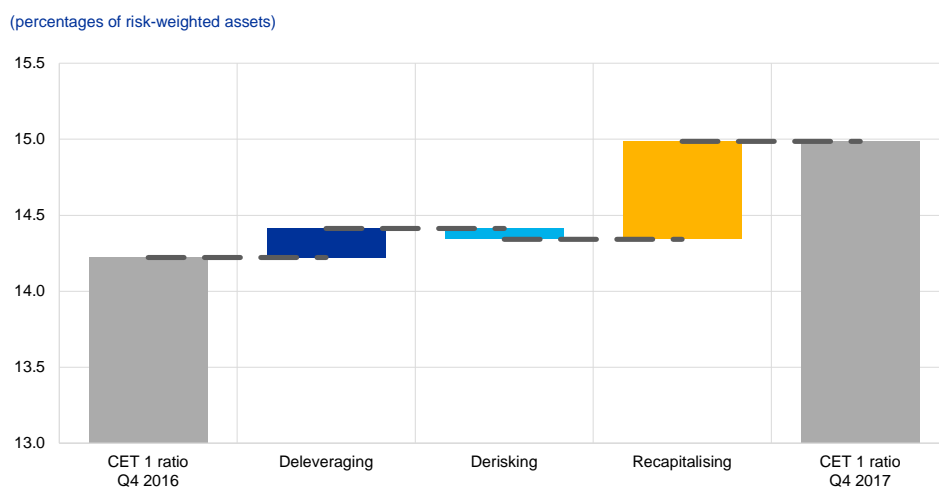
Evolution of euro area banks' regulatory Tier 1 capital ratios since 2008



Sources: SNL Financial, ECB and ECB calculations.
 Notes: Sample means weighted by total assets. The latest observation is for the fourth quarter of 2017.

Chart 14

Factors contributing to the change in banks' regulatory CET1 ratios between the fourth quarter of 2016 and the fourth quarter of 2017



Sources: Sources: ECB and ECB calculations.
 Notes: Sample means weighted by total assets. Deleveraging refers to changes in total assets. Derisking refers to changes in average risk weights. Recapitalising refers to changes in the amount of bank capital. The latest observation is for the fourth quarter of 2017.

The large quantity of reserves injected since the APP does not seem to have led to tight regulatory leverage ratio constraints with adverse repercussions for bank intermediation capacity.⁷ Euro area banks – selling own eligible bonds in the context of the APP and settling transactions on behalf of customers – have accumulated a large volume of reserves (see also the discussion in Section 2.1 and Chart 2). The excess liquidity tends to be concentrated in less vulnerable countries,

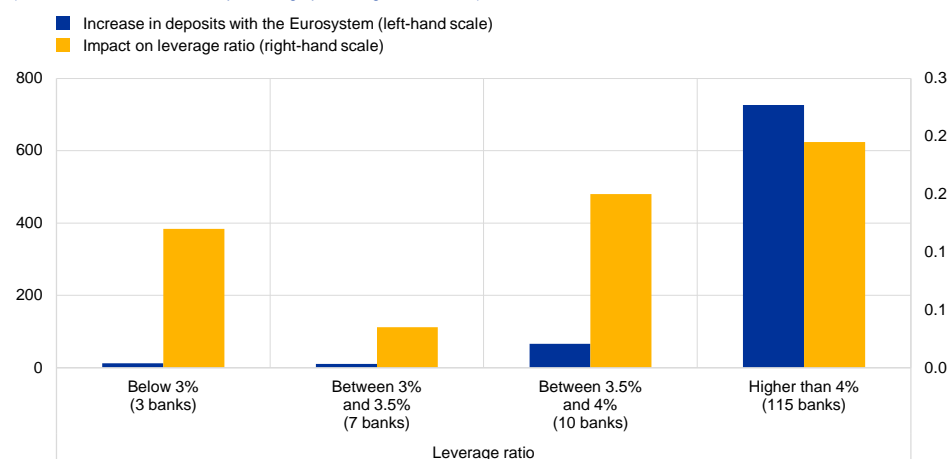
⁷ The regulatory leverage ratio is defined as Tier 1 capital divided by a broad measure of exposure which encompasses both on and off-balance-sheet items.

and the bulk of it is accumulated by banks with regulatory leverage ratios of 3.5% or higher (see Chart 15). So far it has had a limited impact on banks' regulatory leverage ratios and thus does not seem to be consuming scarce balance sheet capacity that would otherwise back loan origination.⁸ In fact credit to the private sector has been gradually increasing in parallel with the surge in excess reserves.

Chart 15

Increases in deposits with the Eurosystem since the start of the APP, by ranges of leverage ratios

(EUR billions, left-hand scale; percentage points, right-hand scale)



Sources: ECB and ECB calculations.

Notes: Changes in deposits between March 2015 and April 2018 for a sub-sample of 230 banks. Leverage ratios (transitional definition) as of the fourth quarter of 2017. Only banks with positive changes in Eurosystem deposits are shown. The impact on banks' leverage ratios is estimated as the difference between banks' observed leverage ratio in the fourth quarter of 2017 and a counterfactual leverage ratio in the absence of Eurosystem deposit increases. The counterfactual leverage ratio is calculated by subtracting the observed change in reserves since March 2015 from the leverage ratio exposure measure.

The composition of banks' sovereign bond portfolios across domestic bonds, bonds issued by other euro area governments and non-euro area governments shows less evidence of home bias compared with the peak of the sovereign crisis (see Chart 16a).

In the course of the sovereign debt crisis, euro area banks significantly increased the share of domestic sovereign bonds in their sovereign bond portfolios while cutting down on debt issued by other euro area sovereigns. This exacerbated the spillovers from sovereign funding stress into the funding costs of domestic banks (as banks' direct exposures to the sovereign had expanded) with adverse effects for bank intermediation capacity and the transmission of monetary policy. The process started reverting at the turn of 2013/14. Across all countries, the share of domestic debt seems to be converging to a level significantly below that reached at the peak of the sovereign debt crisis but still above the level observed in earlier, more tranquil periods. While the portfolio composition has remained fairly stable over the last two years in countries less exposed to the financial and sovereign market tensions, the share of domestic debt held by banks in countries more exposed to stress continues to decline, albeit at a slower pace.

⁸ While the regulatory leverage ratio only became a binding regulatory requirement in 2018, banks were required to calculate and disclose their leverage ratios as of 2015 and therefore probably started monitoring the metric intensively ahead of the migration to the Pillar 1 requirement. G-SIBs will also be subject to a leverage ratio surcharge from January 2022.

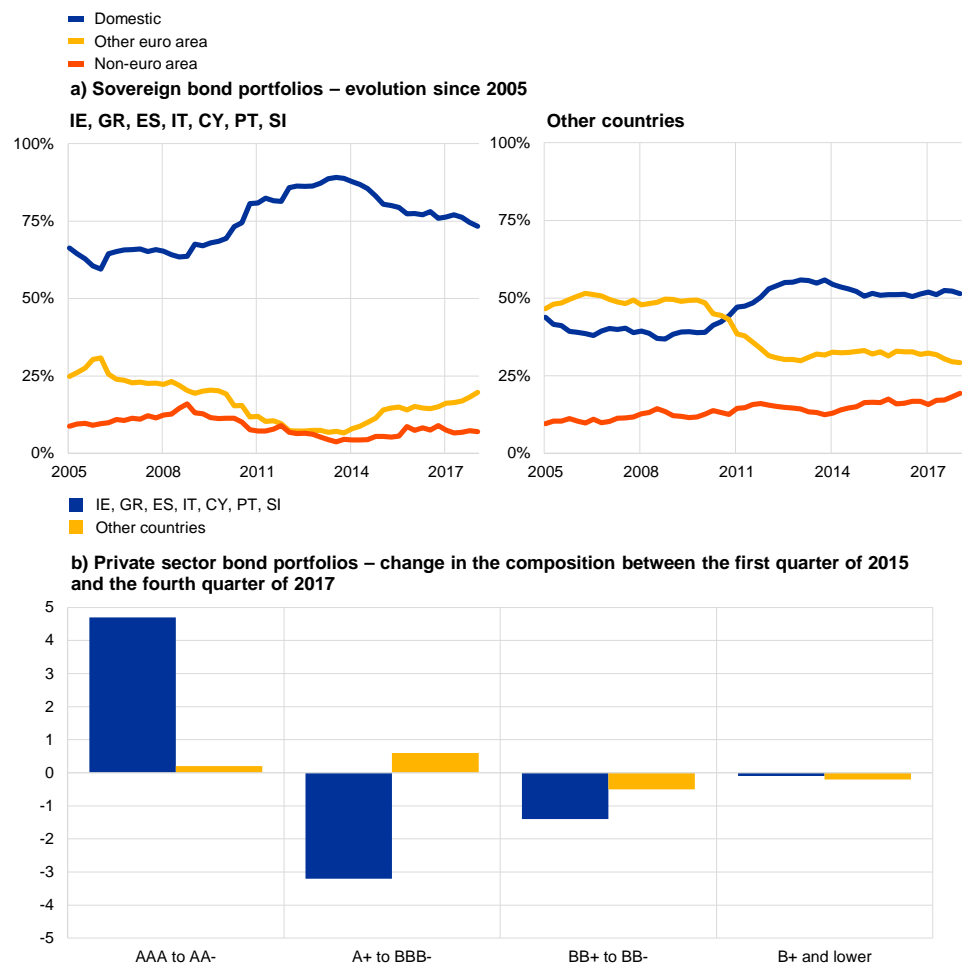
Credit risk in euro area banks' private sector bond portfolios is gradually declining. Chart 16b shows the change in the shares of private sector bonds held by euro area banks by rating category between the first quarter of 2015 and the fourth quarter of 2017.

Overall the share of securities rated AAA to AA- increased during the period covered in both vulnerable and less vulnerable countries. The increases were particularly strong in more vulnerable euro area countries. This development was partly driven by rating migration and does not necessarily reflect active management of banks' securities portfolios. Better macroeconomic conditions and low borrowing costs are supporting borrowers' debt servicing capacity and resulting in improved credit ratings for private sector issuers. Holding ratings constant reveals a reduction in the share of securities rated AAA to AA- and an increase in the A+ to BBB- category for both country groups. Overall, no evidence of widespread risk-taking since the APP was introduced in early 2015 is visible in the data.

Chart 16

Risk in banks' securities portfolios: change in the composition of euro area credit institutions' bond portfolios

(y-axis: percentage points)



Source: ECB and ECB calculations.

Notes: The latest observation in the left-hand panel is for March 2018. The right-hand panel is based on debt securities with a residual maturity above one year held by euro area credit institutions.

Credit risk in banks' balance sheets is decreasing as macroeconomic conditions steadily brighten. Chart 17a depicts the evolution of credit risk in banks' held-to-maturity portfolios (largely consisting of loans) using three complementary measures. The probability of default on performing exposures is a forward-looking estimate of credit risk reported by banks and estimated using internal risk models. The measure has declined in both vulnerable and other countries. The observed reduction was stronger in the former group of countries, although starting from a considerably higher level. A similar pattern is discernible for expected losses and default rates. The first of these two indicators captures – in addition to the probability of default – estimates of the losses to be born if defaults were to materialise. The second is a backward-looking measure of already realised credit risk.

Chart 17
Risk in banks' loan books

(y-axis: percentage points)

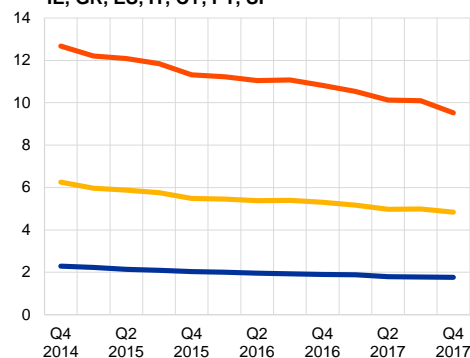
■ Probability of default on performing exposures

■ Expected losses

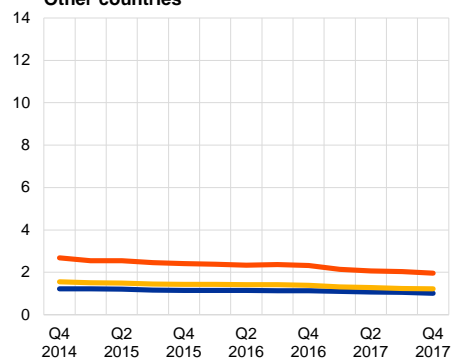
■ Default rates

a) Measures of credit risk in banks' held-to-maturity portfolios

IE, GR, ES, IT, CY, PT, SI



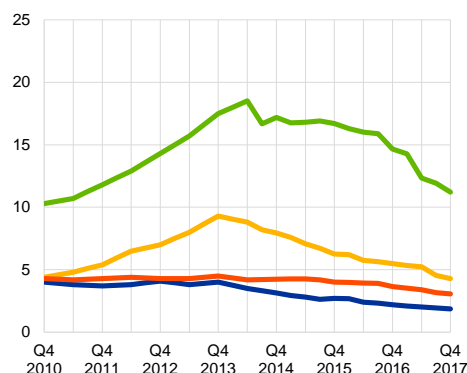
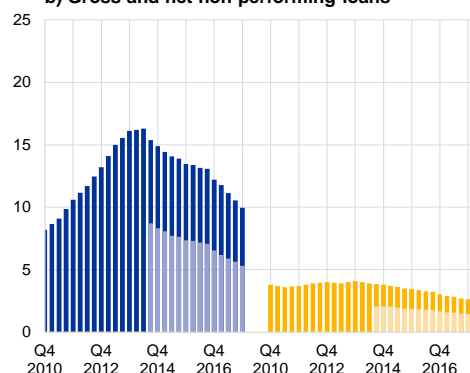
Other countries



■ IE, GR, ES, IT, CY, PT, SI

■ Other countries

b) Gross and net non-performing loans



Notes: The left-hand charts are based on a balanced panel of credit institutions which use internal ratings-based models to quantify risk and are subject to direct supervision by the ECB. These account for around 70% of total exposures reported by significant institutions under the direct supervision of the ECB. One large outlier is excluded from the sample. The right-hand charts show total NPLs as a ratio of total loans for vulnerable and other countries. NPLs net of impairments are shown in white bars. The country-level time series show gross NPLs as a ratio of loans for the four largest euro area countries. The latest observation is for the fourth quarter of 2017.

The stock of non-performing loans (NPLs) remains high in some euro area countries but is on a steady downward trajectory (see Chart 17b). Euro area banks – in particular those located in countries that were subject to financial market

stress – accumulated a large stock of NPLs in the aftermath of the sovereign debt crisis. NPL ratios continued to increase up until late 2014. The stock of NPLs has been declining steadily since then but remains elevated in vulnerable countries. Recently, the downward trajectory has gained momentum. Across the large euro area countries, NPL ratios have declined in Italy in particular, where individual institutions have sold a substantial share of their NPL portfolios. Despite these improvements, the NPL workout process remains gradual and the stock of non-performing legacy assets is weighing on bank intermediation capacity.

The adverse effect of banks' NPLs on their credit conditions is diminishing, and most have adequate loss-absorption capacity to deal with the problem.

Chart 18a shows that banks reported that their NPLs contributed to a tightening in their credit standards and terms and conditions across all categories of loans from 2014, but that this impact has diminished more recently. Banks reported that NPL ratios affected their lending policies via their impact on risk perceptions, risk tolerance and the cost of cleaning up the balance sheet. However, NPL levels exceeded the loss-absorption capacity only for a very small, and shrinking, set of credit institutions located in more vulnerable euro area countries. Chart 18b shows the ratio of non-performing loans to the sum of CET1 capital and loan loss allowances, a measure of the relationship between NPLs and available loss-absorption capacity (known as the “Texas ratio”). On average, the Texas ratios of euro area banks decreased in both vulnerable and less vulnerable countries between the fourth quarter of 2015 and the fourth quarter of 2017. The evolution reflects the declining stock of NPLs in both country groups and an increase in CET1 capital in less vulnerable countries. Nevertheless, the stock of NPLs exceeded loss-absorption capacity for a set of banks in vulnerable countries in the fourth quarter of 2017.

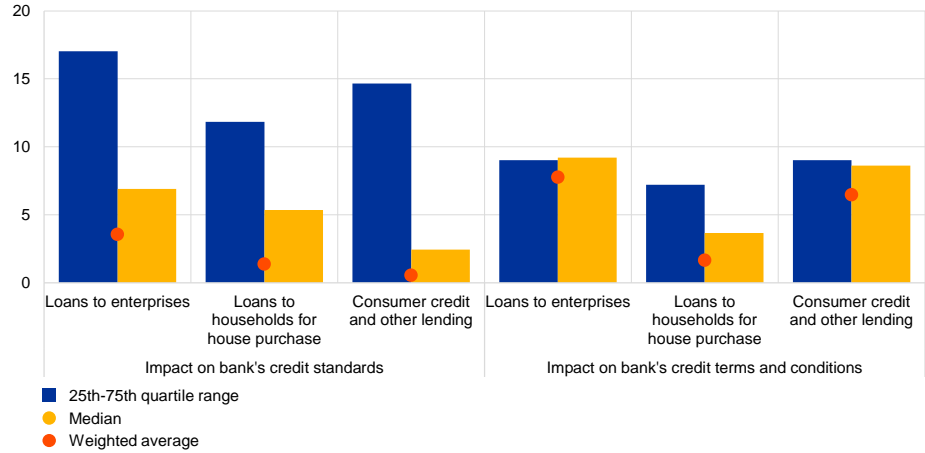
Chart 18

NPLs, credit provision and loss-absorption capacity

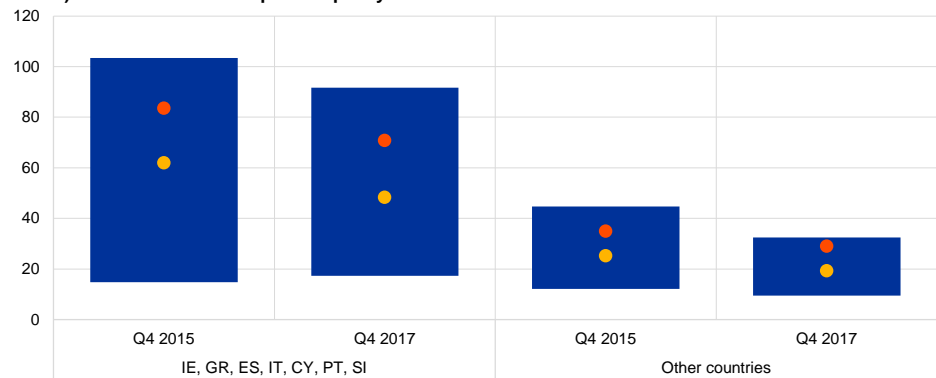
(y-axis: a) net percentages of banks; b) percentage points)

- From 2014 to 2017
- Over the past six months
- Over the next six months

a) Impact of NPL ratios on credit conditions



b) NPLs and loss-absorption capacity



Sources: ECB, euro area bank lending survey and ECB calculations.

Notes: The left-hand panel shows the net percentages of banks reporting that their NPL ratio (defined as the stock of gross NPLs on a bank's balance sheet as a percentage of the gross carrying amount of loans) had a tightening impact on their credit standards and terms and conditions. The right-hand panel is based on COREP and FINREP data for the fourth quarter of 2014 for all institutions under the supervision of the ECB that report accounting data on a consolidated basis (111 SIs and 137 LSIs).

4 Bank profitability

Bank profitability affects banks' ability to generate capital internally, with potential implications for their ability to provide adequate funding to the economy.

Profitable banks are able to attract capital from market investors at lower cost and to generate capital through retained earnings. In turn, well-capitalised banks can adequately intermediate between savers and investors and absorb (rather than amplify) economic shocks. Robust bank profitability therefore contributes towards adequate transmission of monetary policy, as well as towards bank soundness and financial stability. Moreover, as monetary policy can affect bank profitability, which could possibly lead to unintended credit supply effects, it is vital to monitor the relationship between the policy stance and banks' profit-generating capacity (Altavilla, Boucinha and Peydró, 2018, Brunnermeier and Koby, 2017). This section discusses recent developments in bank profitability, while Section 5 provides an assessment of the causal impact of monetary action on bank profits.

Euro area bank profitability has been gradually recovering from the significant decline that followed the crisis but remains low by historical standards.

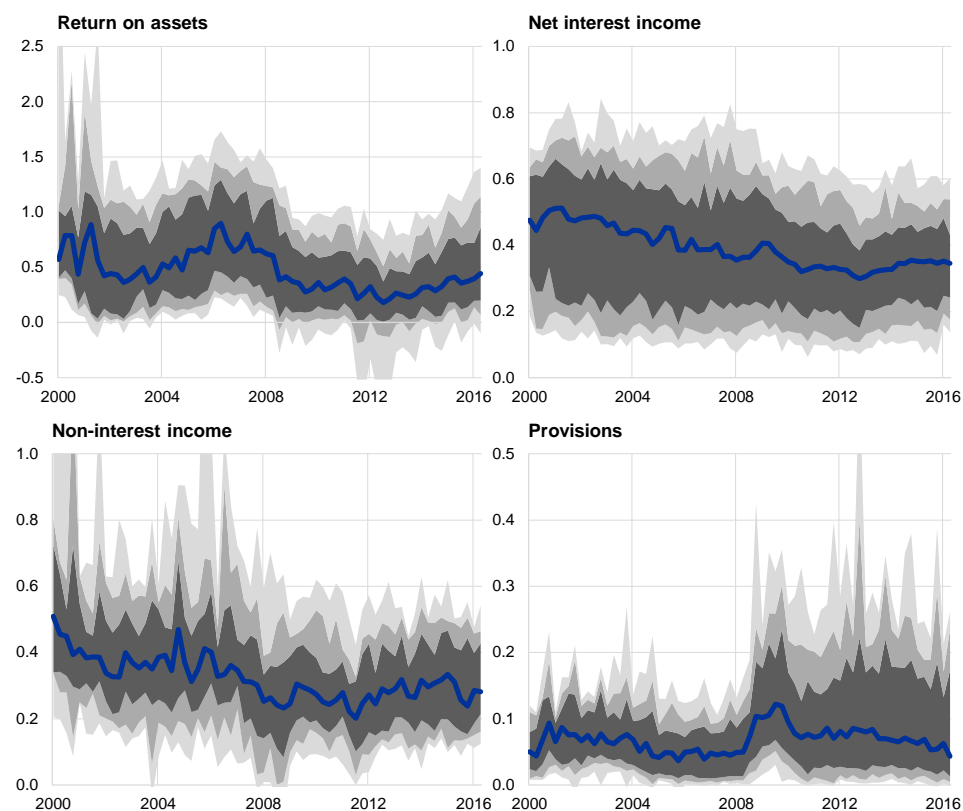
Chart 19 illustrates the developments over time and the cross-sectional dispersion of bank profitability (as measured by the return on assets) and its main components: net interest income, non-interest income and provisions. Bank profitability showed an upward trend in the run-up to the financial crisis, followed by a decline which was largely driven by a sharp increase in loan loss provisions. More recently, on the back of the improving macroeconomic outlook, bank profitability has gradually recovered, supported by increasing net interest income and a reduction in loan loss provisions. Nonetheless, the lower level of net interest income and non-interest income compared with those observed before the crisis may reflect higher risk-taking in the past, as well as financial innovation in the more recent period. The increase in supervisory and regulatory standards contributed to reducing bank risk, and this might translate into a lower equilibrium level of bank profitability than observed in the past. At the same time, new technologies can increase competition and require higher up-front fixed costs, while the benefits in the form of lower marginal costs tend to materialise only in the medium to long term. The resilience of net interest income in the recent low interest rate environment reflected savings in funding costs, which more than offset lower interest income. Interest income itself was supported by increasing intermediation volumes. See Section 5 for a discussion of the relationship between these developments and the monetary policy stance.

Chart 19

Bank profitability and its main components

(percentages of total assets)

- 95th-5th percentile
- 84th-16th percentile
- 75th-25th percentile
- Median



Source: Altavilla, Boucinha and Peydró (2018).

Notes: The blue line represents (for each quarter) the median figure across banks; the shaded areas show the cross-sectional distribution of banks.

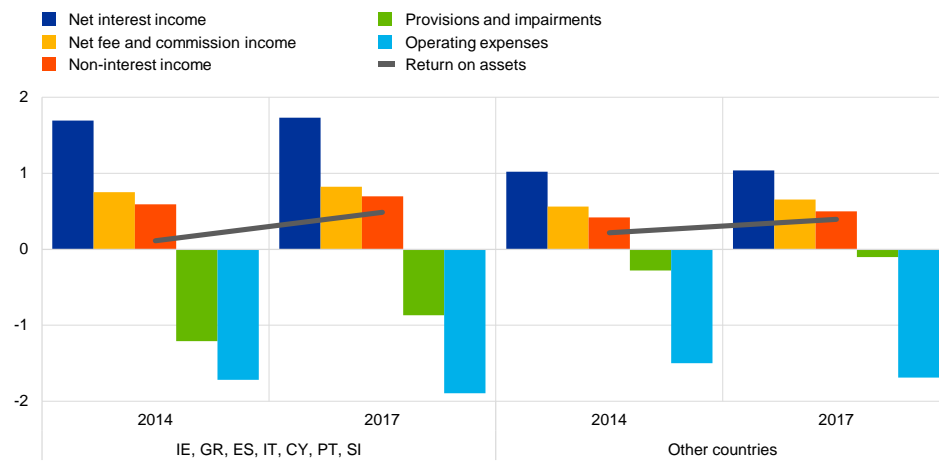
An analysis of the recent developments in bank profitability and the respective drivers reveals significant differences across country groups.

While the level of net interest income scaled by total assets (a proxy for the net interest margin) is clearly higher in countries which were more affected by the sovereign debt crisis, this likely reflects higher credit risk premia in bank lending rates and is largely counterbalanced by higher provisions for loan losses (Chart 20). In terms of changes in profitability, lower costs associated with provisions were the main supporting factor across both groups of countries, as borrowers' creditworthiness improved against the background of the macroeconomic benefits of the ECB's monetary policy. Non-interest income was boosted by capital gains in banks' securities portfolios, reflecting the compression in yields driven by the APP. Net fee and commission income also increased, possibly reflecting adjustments in banks' pricing structure as the low interest rate environment curbed net interest margins. Operating expenses increased despite anecdotal evidence of restructuring plans aimed at increasing operational efficiency. This could reflect short-term costs required to achieve higher efficiency in the medium term.

Chart 20

Bank profitability and contributing factors

(percentages of total assets)



Sources: ECB and ECB calculations.

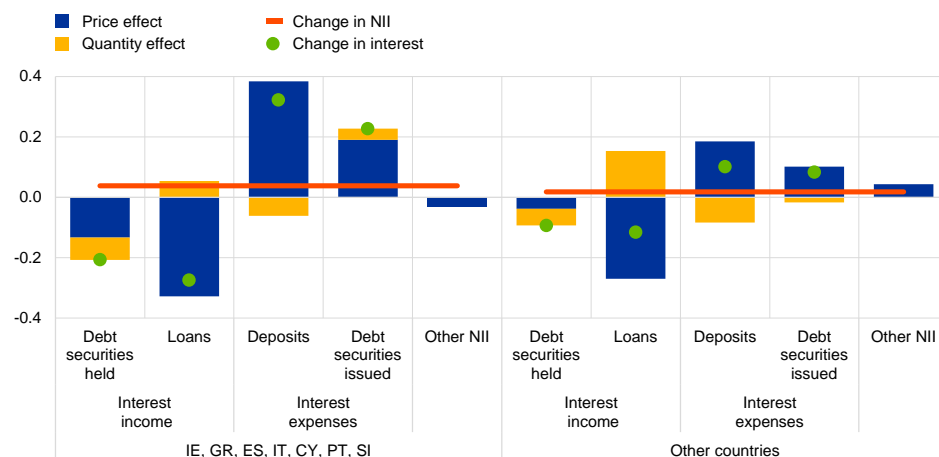
Notes: Based on data for a balanced panel of institutions under the supervision of the ECB that report accounting data on a consolidated basis (91 significant institutions and 134 less significant institutions).

Net interest income remained broadly unchanged, as lower interest income was fully offset by lower interest expenses (Chart 21). While lower interest rates contributed to a decline in interest income (price effect in Chart 21), higher lending volumes supported interest income (quantity effect in the chart) as banks' balance sheets strengthened and the economic outlook improved, most notably in less vulnerable countries. At the same time, funding costs declined, reflecting the pass-through of expansionary monetary policy, and this more than offset the decline in interest income. The compression in funding costs was more significant in vulnerable countries, as risk premia converged from higher starting levels.

Chart 21

Contributions to the change in net interest income between the fourth quarter of 2014 and the fourth quarter of 2017

(percentages of total assets)

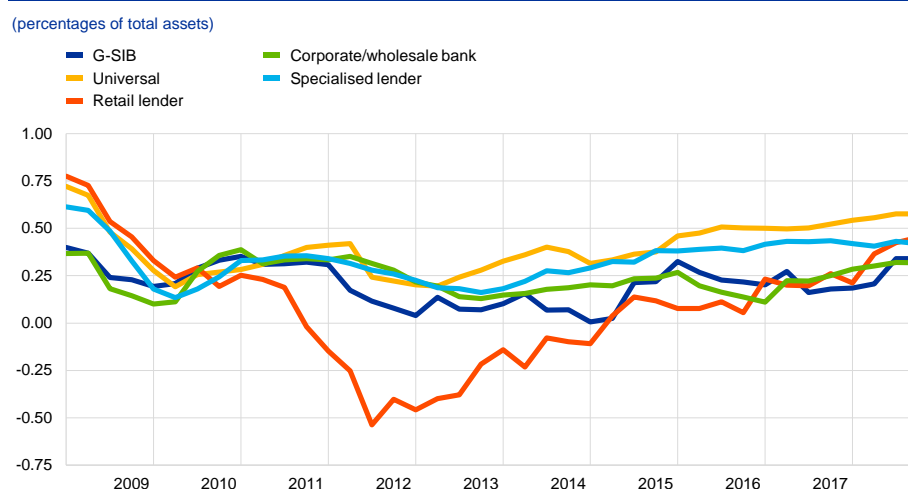


Sources: ECB and ECB calculations.

Notes: Based on data for a balanced panel of institutions under the supervision of the ECB that report accounting data on a consolidated basis (91 significant institutions and 134 less significant institutions). Interest expenses are inverted, so that a decrease in costs is shown as a positive contribution to net interest income. NII stands for net interest income.

Across bank business models, universal banks seem to be faring better, possibly reflecting benefits in terms of diversification (Chart 22). After being hit particularly hard by the crisis, the profitability of retail banks has been steadily recovering. It is important to note that recent figures for bank profitability, most notably for G-SIBs, have been negatively affected by one-off losses associated with restructuring and balance sheet adjustment by some banks. Over the medium term, this should improve banks' ability to generate profits and to attract capital from external investors.

Chart 22
Bank profitability across business models



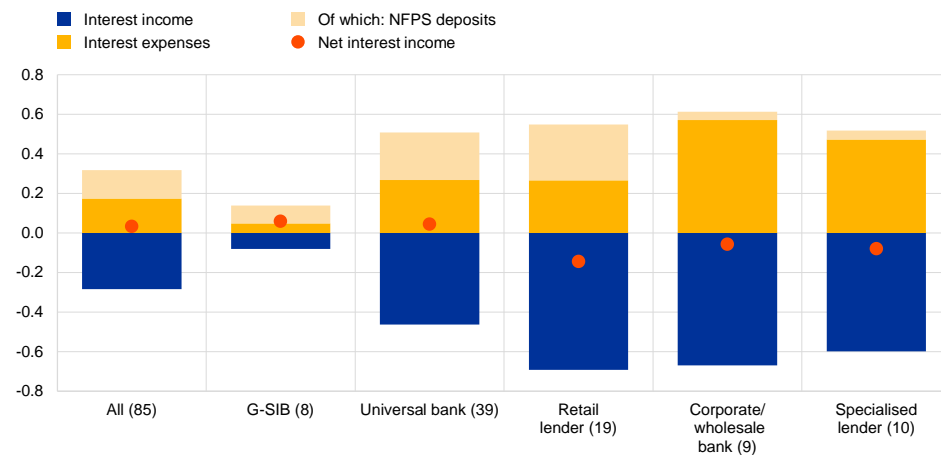
Sources: ECB and ECB calculations.
Notes: Based on S&P Global Market Intelligence data for an unbalanced sample of 310 euro area banks.

Developments in net interest income vary across banks depending on their business models (Chart 23). On aggregate, net interest income for euro area banks has remained broadly stable since the fourth quarter of 2014. G-SIBs, the group comprising the largest institutions, showed a contained decrease in interest income, which was fully offset by lower funding costs. This probably reflects their greater diversification, with a significant share of activity outside the euro area. Other groups of banks had more pronounced decreases in both interest income and expenses, which largely offset each other, except for retail banks. This is in line with their higher reliance on retail deposits, on which the zero lower bound is likely to be particularly binding. At the same time, while the increase observed in net fee and commission income was broad-based across bank business models, it was particularly significant for retail banks – the group whose net interest income was more compressed.

Chart 23

Developments in interest income and expenses as a percentage of total assets

(percentage point changes, Q4 2014-Q4 2017)



Sources: ECB and ECB calculations.

Notes: Based on data for a balanced panel of significant institutions under the supervision of the ECB that report accounting data on a consolidated basis. NFPS denotes the non-financial private sector. Number of banks in brackets. Interest expenses are inverted.

5 The impact of monetary policy on bank intermediation and profitability

Since the onset of the financial crisis, central banks have used both standard and non-standard monetary policy measures to stabilise economic developments and achieve their inflation objectives. The effectiveness of standard interest rate policy was diminished during the crisis, as financial market stress and weak bank balance sheets hampered its transmission through to firms and households. Moreover, the acute and persistent nature of the downturn meant that interest rates reached their effective lower bound and further monetary stimulus required additional non-standard measures. This section analyses the impact of these measures on bank lending volumes, rates and profitability. The first subsection illustrates how the ECB's non-conventional monetary policy measures have helped to restore monetary policy transmission and pass-through to interest rates. The second section focuses on the effects on loan volumes. The final section considers the effects of these policies on bank profitability.

5.1 Impact on interest rate pass-through

During the crisis period, bank lending rates to euro area households and firms were elevated and exhibited significant heterogeneity across countries. After the first recession in 2008-09, when global demand and uncertainty were common contractionary factors for all euro area economies, the sovereign debt crisis engendered acute financial stress in certain countries, which led to high cross-country heterogeneity in retail bank lending rates. As can be seen in Chart 24, the aggregate cost of borrowing indicator for both NFCs and households increased in the largest euro area countries between 2010 and 2012. Between 2012 and the end of 2013, the indicator declined in Germany and France but remained at an elevated level in Italy and Spain. As a result, the dispersion of lending rates across countries in the euro area widened significantly.

Cross-country divergences in lending rates can reflect structural factors as well as differences in the characteristics of borrowers and lenders.⁹ The structural factors include cross-country heterogeneity in bank products and institutional differences, such as fiscal and regulatory framework, enforcement procedures and collateral practices. In addition, lending rates for loans assigned to the same maturity bucket may differ, as bank products are heterogeneous (e.g. non-interest rate charges, collateral and contractual options embedded in the loans).¹⁰ The additional

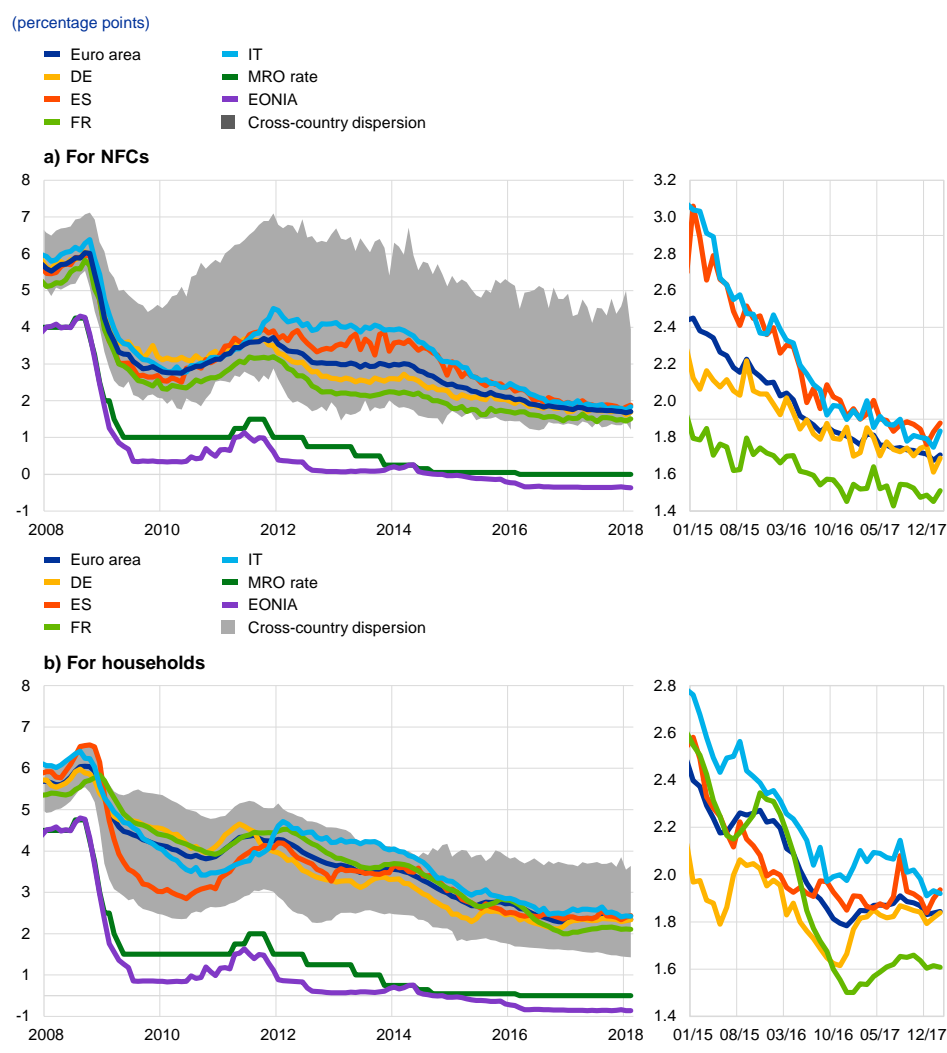
⁹ Structural differences in how lenders set rates have been analysed extensively in previous publications. See, among others, Kok Sørensen and Lichtenberger (2007).

¹⁰ For example, non-interest rate charges (such as fees and commissions) will not be shown in the lending rates component of the overall costs paid by borrowers. Consumer credit comprises loans for car purchases, with solid collateral and relatively low interest rates, and credit card charges. Floating-rate loans may give borrowers the opportunity to reset the loan, choosing to adjust either the instalment or the term of the loan.

factors that explain observed differences in cross-country lending rates can be classified into two groups: demand-side determinants, comprising factors related to borrower characteristics, and supply-side determinants, comprising factors related to the characteristics of the banking system.¹¹

Chart 24

Composite indicator of the cost of borrowing for NFCs and for households



Sources: ECB and ECB calculations.

Notes: The indicator for the total cost of lending is calculated by aggregating short and long-term rates using a 24-month moving average of new business volumes. The cross-country dispersion displays the minimum-maximum range over a fixed sample of 12 euro area countries. The latest observation is for March 2018.

After the credit-easing package was introduced in June 2014, the cost of borrowing indicators for both NFCs and households declined to historical lows.

Chart 25 compares the change in lending rates to NFCs since 2008 with the change in the main refinancing operations (MRO) rate over the same period, distinguishing

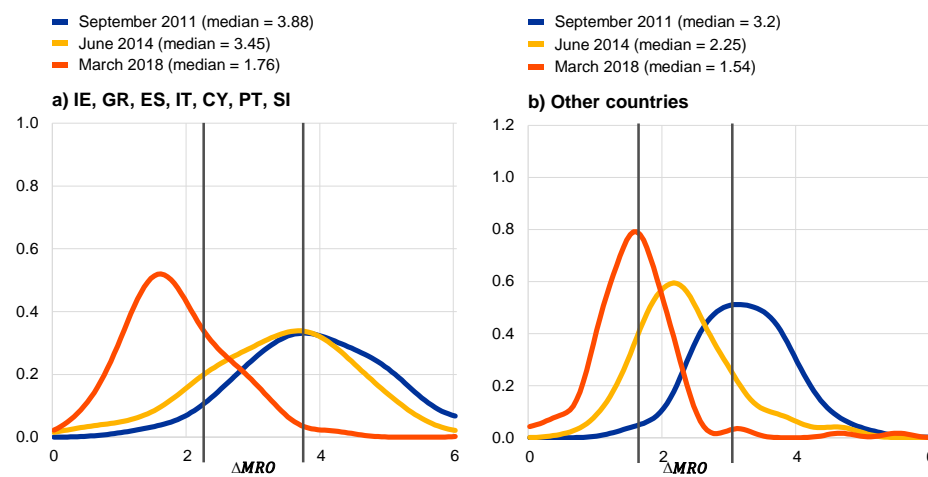
¹¹ Demand-side indicators cover, for example, the creditworthiness of the borrowers, demand for credit, the availability of alternative market-based sources of financing for corporations, and the disposable income of households and residential property prices in the case of mortgage loans. Supply-side indicators cover bank balance sheet characteristics, other measures of bank soundness, prevailing bank business models, loan securitisation and the degree of bank competition.

between countries that were more acutely affected by the crisis and the rest of the euro area. It is evident that (i) until June 2014 lower policy rates translated into lower lending rates only in countries less affected by the crisis and (ii) following the introduction of non-standard measures, the interest rate pass-through has also been quite effective in countries that were more severely affected by the crisis.

Chart 25

Changes in composite lending rates to NFCs across individual MFIs in country groups

(percentages per annum)



Source: ECB.

Notes: The chart shows the density approximation of the lending rate distributions (new business) in three different periods (September 2011, June 2014 and March 2018) and the change in the MRO rate (Δ MRO). The chart also shows what the lending rates would have been had the reduction in the MRO rate between September 2011 and March 2018 (i.e. 150 basis points) been fully passed on to the median lending rate of that period (i.e. 3.88% and 3.2% in vulnerable and other countries respectively).

Cross-country dispersion in lending rates also narrowed considerably across the euro area but remains elevated. The overall decline in lending rates to NFCs in the period between June 2014 and March 2018 was 120 basis points for the euro area. Italy and Spain registered stronger falls (−197 basis points and −169 basis points respectively) than Germany and France (−84 basis points and −65 basis points respectively). Therefore, lending rates have become gradually less heterogeneous across the largest euro area countries since the introduction of the credit-easing package in 2014. Nevertheless, the cross-country dispersion of bank lending rates remains relatively high from a historical perspective.

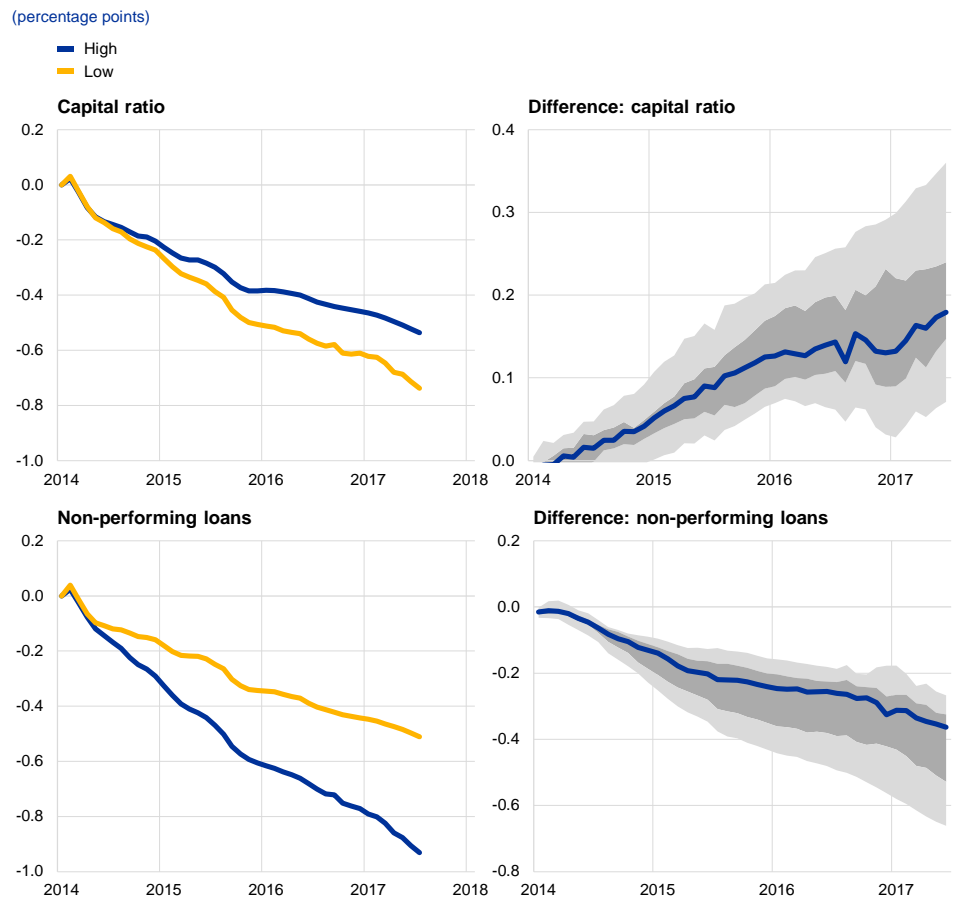
The pass-through of the ECB’s non-standard measures introduced since June 2014 to bank lending rates has been stronger for banks with weaker balance sheets. According to the conventional view, in normal times, larger, better capitalised and more liquid banks are more resilient to monetary contractions and thus cut their loan supply less strongly when monetary policy is tightened. The finding that banks with weak balance sheets react more to changes in the monetary policy stance is found to apply also for the non-standard measures introduced since the credit-easing package of 2014. A recent study by Altavilla et al. (2016) suggests that non-standard measures were particularly effective in lowering lending rates for banks with a high share of NPLs and low capital. The median difference between the upper and lower quartiles of the distribution sorted by these characteristics is up to 40 basis points, and

differences become highly significant after about 18 months (see **Error! Reference source not found.**).

The improved credit conditions in the euro area have meant that monetary policy accommodation is increasingly being transmitted to households and firms. According to the above-mentioned study, non-standard measures have helped to normalise lending conditions, reduce the cross-sectional dispersion of lending rates and produce a larger pass-through in the medium run. Better lending conditions for NFCs materialised because of the improved pass-through from dynamic funding cost relief and signalling effects. The positive impact on banks' funding costs has incentivised them to pass on the cost relief to final borrowers by granting more credit at better conditions.

Chart 26

Decline in bank lending rates due to the ECB's non-standard monetary policy measures by bank characteristics



Source: Altavilla, Canova and Ciccarelli (2019).

Notes: The charts show the average responses in the top and bottom quartiles of the lending rate distribution sorted by bank characteristics. Shaded areas in the third column are the interquartile (dark grey) and the 95% (light grey) ranges. Posterior distributions are obtained using a VAR for each bank with the bank bond yield variable.

5.2 Impact on bank intermediation volumes

This section presents some descriptive statistics on the extent to which lending volumes were affected by unconventional monetary policy measures, using information from the euro area BLS and individual bank lending survey responses (iBLS).¹²

Negative deposit facility rate

By increasing the opportunity cost of holding excess liquidity, the negative DFR incentivises banks to lend. The negative DFR, i.e. the interest rate that banks pay for depositing money with the central bank overnight, was introduced for the first time by the ECB Governing Council in June 2014 as part of the credit-easing package. Since then, the rate has been cut on three more occasions, reaching a low of –40 basis points. The negative DFR encourages lending and accentuates the effect of the APP on credit supply by increasing the cost of holding the reserves injected via the APP, thus incentivising banks to rebalance towards other assets, notably bank loans.

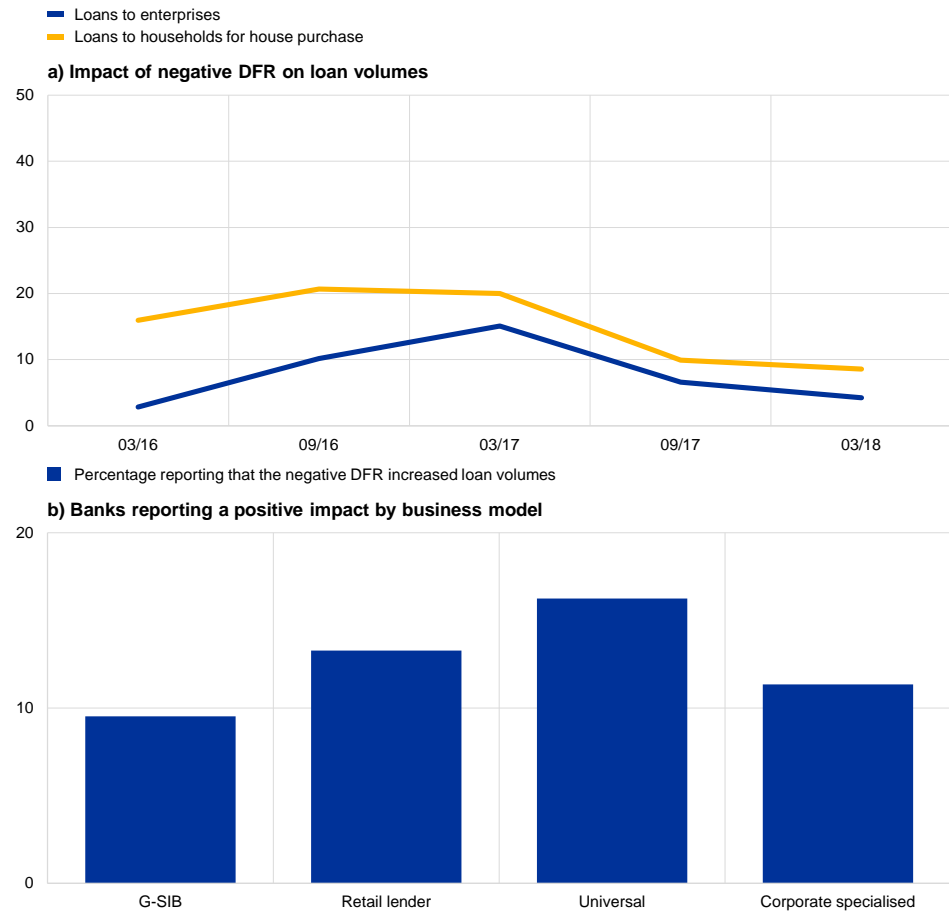
A positive net percentage of euro area banks reported that the negative DFR led to higher loan volumes, and the reported effect was highest for universal banks (see Chart 27). The left-hand panel of the chart shows that on average, 8% of banks in net percentage terms reported that the negative DFR led to an increase in loan volumes to enterprises, while the share was 15% for house purchase loans. As the negative DFR essentially acts as a tax on banks' cash holdings with the central bank, its impact should increase with the share of excess liquidity in banks' assets. Moreover, as deposits (in particular by households) tend to be more resistant to negative rates, one would expect the impact of the policy to be greater on banks with higher deposit liabilities. Indeed, the right-hand panel of Chart 27 shows that universal banks – which have one of the highest shares of deposits with the central bank and the second-highest share of deposits in their liabilities – were more inclined to report a positive effect on loan volumes. Conversely, G-SIBs, which have relatively less excess liquidity and a lower share of deposits within their liabilities, report a lower impact in general.

¹² For a more in-depth analysis of the effects of the negative deposit facility and the APP on bank lending, see Altavilla, Boucinha, Holton and Ongena (2018).

Chart 27

Impact of negative DFR on loan volumes

(y-axis: a) net percentage reporting a positive impact; b) percentages)



Sources: ECB, euro area bank lending survey and iBLS.

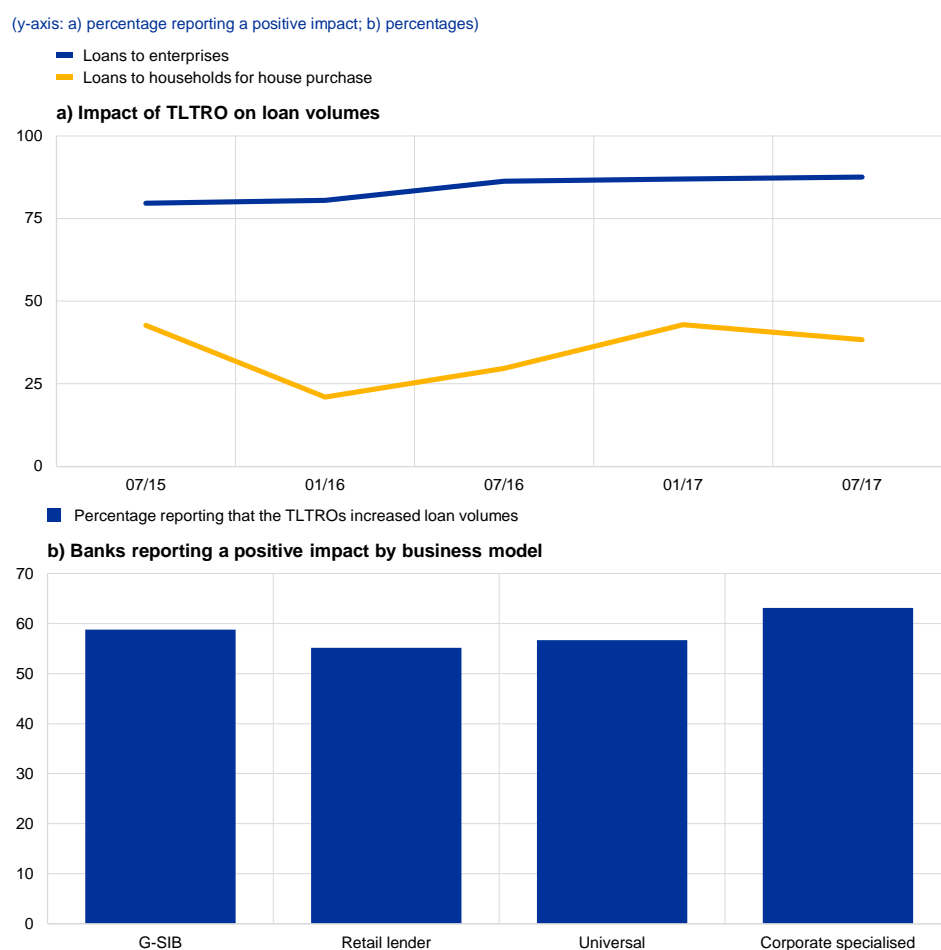
Notes: Left-hand panel uses aggregate euro area BLS data. Responses refer to a question on the impact of the negative DFR on lending volumes and to the six months ending with the date on the x-axis; right-hand panel uses iBLS data for individual banks matched to business model classification. iBLS data are for a sub-sample of banks from 13 euro area countries: Belgium, Germany, Estonia, Ireland, Spain, France, Italy, Lithuania, Luxembourg, Netherlands, Austria, Portugal and Slovakia. The latest observation is for the first quarter of 2018.

Targeted longer-term refinancing operations

As part of the same credit-easing package announced in June 2014, the ECB Governing Council decided to launch a series of TLTROs. These operations provided financing to credit institutions for up to four years at attractive conditions, with the amounts that banks could borrow being linked to an eligible part of their loan portfolios (loans to non-financial corporations and households, excluding house purchase loans). In a second round of operations introduced in 2016, the interest rate applied on the funding became more attractive, as eligible lending by banks increased. The operations sought to ease credit conditions for the real economy by allowing banks to replace more costly funding sources and incentivising them to pass on the associated funding relief in the form of more favourable credit conditions for the real economy.

A large percentage of banks reported that TLTRO funds were used to increase lending, and the effects were indeed strongest for banks that specialise in lending to the corporate sector (see Chart 28). The left-hand panel shows that on average, 84% of banks reported that they used the TLTRO funds to grant loans to enterprises, while the figure for households for house purchases was 35%. Moreover, as might be expected, banks that predominantly target the corporate sector are among those that report the highest impact from the policy on lending. Retail lenders that have a larger share of housing loans, which were excluded from the conditional liquidity operations, reported the lowest effects overall.

Chart 28
Impact of TLTROs on loan volumes



Sources: Euro area bank lending survey and iBLS.
 Notes: Left-hand panel uses aggregate euro area BLS data; responses refer to a question on whether funds obtained via the TLTROs will be used for granting loans and to the six months ending with the date on the x-axis. Right-hand panel uses iBLS data for individual banks matched to business model classification. iBLS data for a sub-sample of banks from 13 euro area countries: Belgium, Germany, Estonia, Ireland, Spain, France, Italy, Lithuania, Luxembourg, Netherlands, Austria, Portugal and Slovakia. The latest observation is for the second quarter of 2017.

Asset purchase programme

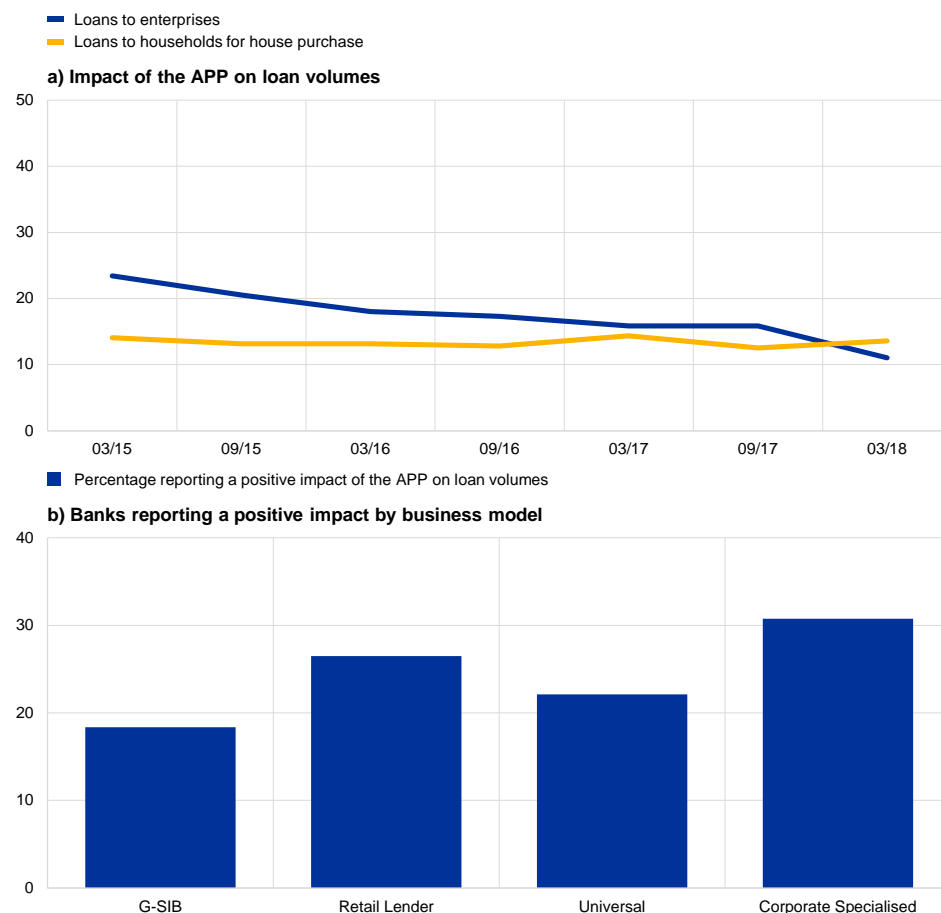
In January 2015, to further ease the monetary policy stance, the ECB Governing Council announced the introduction of the APP, on the back of an inflation outlook that

had continued to deteriorate. The expanded APP encompasses purchases of a number of assets: (i) covered bonds, (ii) asset-backed securities (which were part of the credit-easing package of June 2014), (iii) public sector securities and (iv) corporate sector securities (added for the first time in 2015).

Euro area banks reported that the APP led to increased loan volumes and the impact was stronger for banks with larger holdings of sovereign bonds and with business models that are more focused on the euro area (Chart 29). The left-hand panel shows that on average around 17% and 13% of banks reported that APP liquidity was used to grant loans to enterprises and to households for house purchases respectively. The right-hand panel shows that more globally diversified G-SIBs reported the lowest impact, probably because they hold a smaller share of assets eligible for purchase and are relatively more dependent on liabilities outside the euro area. While all business models reported a positive effect, corporate wholesale and specialised banks, which have high holdings of euro area sovereign bonds, reported greater effects.

Chart 29
Impact of APP on loan volumes

(y-axis: percentage reporting a positive impact; b) percentages)



Source: Euro area bank lending survey.

Notes: Left-hand panel uses aggregate euro area BLS data. Responses refer to a question on the impact of the APP on lending volumes and to the six months ending with the date on the x-axis. From March 2015 until September 2017, results are an average of responses regarding the effect of APP-related funds obtained through sales of marketable securities on the one hand and the effect of deposit inflows on lending on the other, while in March 2018 the responses refer overall to how the APP has impacted loan volumes; right-hand panel uses iBLS matched to business model classification for a sub-sample of banks from 13 euro area countries: Belgium, Germany, Estonia, Ireland, Spain, France, Italy, Lithuania, Luxembourg, Netherlands, Austria, Portugal and Slovakia. The latest observation is for the first quarter of 2018.

5.3 Impact on profitability

Monetary policy can affect bank profitability through several different channels, and the overall impact from these channels is unclear ex ante. On the one hand, monetary policy can lead to lower net interest income amid a flattening of the yield curve. Indeed, the latter is likely to translate into lower unit interest margins, since liabilities tend to have shorter maturities and to respond less to decreasing interest rates, in particular at very low levels. Furthermore, the negative DFR imposes a direct cost on banks' holdings of excess liquidity. On the other hand, the package of monetary policy measures in place ensures that bank funding conditions are meaningfully eased, e.g. by allowing banks to obtain long-term funding at negative rates through the TLTROs. More importantly, the adverse effects on net interest

margins are at least partly offset by the positive impact of policy measures on macroeconomic conditions, which lead to higher intermediation volumes and better credit quality. At the same time, asset purchases and other measures contributing to lower interest rates increase the value of the securities held by banks, with a positive impact on profits.

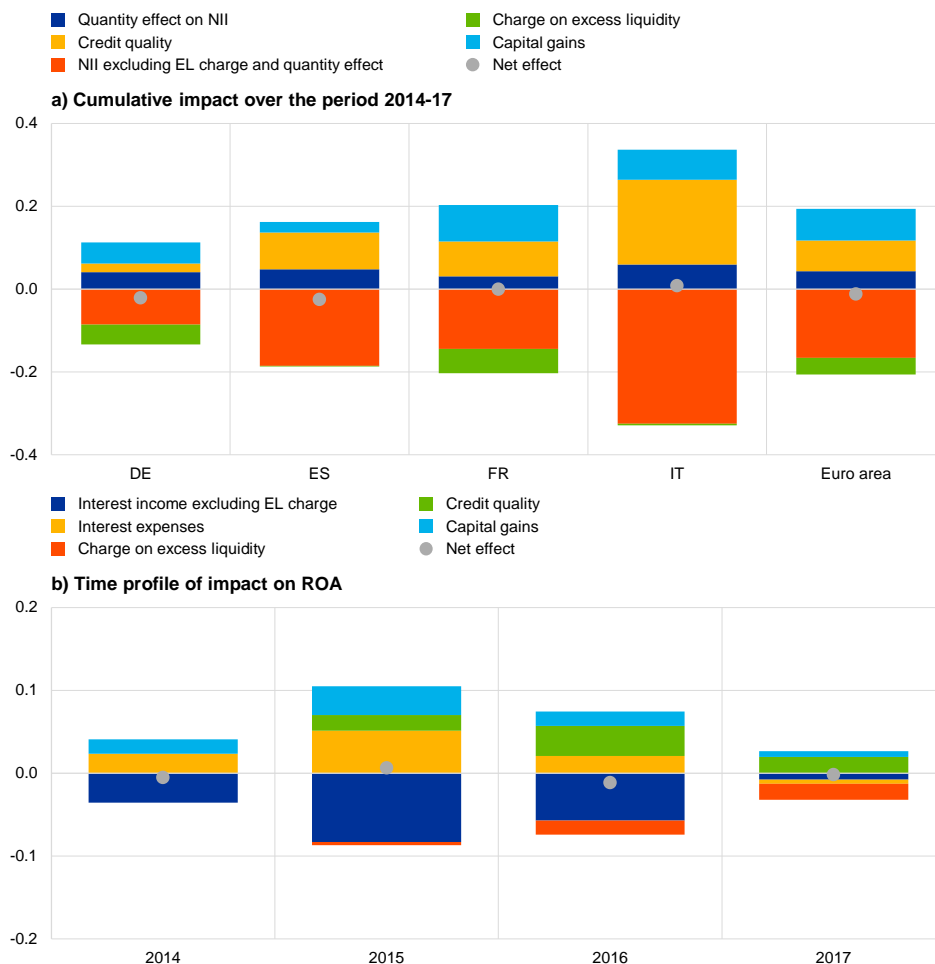
The ECB's non-standard monetary policy measures have a positive impact on credit quality and induce capital gains, which together tend to offset the decline in net interest income. An encompassing assessment is made by comparing actual developments and baseline projections for the period from 2014 to 2017 with a counterfactual scenario which excludes the effect of the monetary policy measures announced since June 2014. In line with the general perception, also reported in many market commentaries, the reduction in interest rates on a large set of financial assets at different maturities is reflected in lower bank net interest income. Savings in funding costs do not fully offset lower interest income in the context of a flatter yield curve, as banks tend to fund longer-term assets with shorter-term liabilities, thereby engaging in maturity transformation. This is compounded by the fact that, as discussed above, deposit rates tend to be particularly sticky at very low interest rate levels. At the same time, increases in the market value of sovereign bonds held by banks generate capital gains. In addition, the estimated positive effects of the recent monetary policy measures on the economic outlook contribute to increasing intermediation volumes and to improving credit quality.

On balance, the impact of current monetary policy does not appear particularly strong compared with the multiple other factors challenging bank profitability – some structural, some cyclical. The overall impact of recent monetary policy measures on bank profitability is found to be broadly neutral, as the effects on different components of bank profitability tend to largely offset each other (Chart 30). Indeed, weak – albeit improving – macroeconomic prospects are currently at the heart of the cyclical challenges facing banks. Therefore, by supporting macroeconomic recovery and price stability, accommodative monetary policy can make an important contribution to strengthening the operating environment for banks. More generally, a recent paper by Altavilla, Boucinha and Peydró (2018) finds that while there is a positive correlation between bank profitability and both the level and the slope of the yield curve, this is largely driven by the fact that banks are hampered by weak macroeconomic dynamics and, at the same time, interest rates set by central banks respond to these macroeconomic dynamics. As such, in order to assess the link between monetary policy and bank profitability it is important to appropriately account for current and expected macroeconomic conditions. When doing so, monetary policy easing is not found to lead to lower bank profits.

Chart 30

Impact of non-standard monetary policy measures on bank profitability

(contribution to ROA, percentage points)



Sources: European Banking Authority, ECB and ECB calculations.
 Notes: Capital gains based on data on a consolidated basis for 68 euro area banking groups included in the list of significant institutions under direct ECB supervision and in the 2014 EU-wide stress test. Euro area figures calculated as the weighted average for the countries included in the sample using the ECB's Consolidated Banking Data (CBD) for the weight of each country's banking system in the euro area aggregate. NII stands for net interest income and EL for excess liquidity.

The estimated impact of monetary policy on bank profitability is not found to change significantly over the projection horizon, as higher capital gains coincide with larger compressions in net interest income (Chart 30b). The effect on net interest income is found to be U-shaped and negative over the projection horizon. Initially, the impact is increasingly negative, as interest rates on (longer-term) assets are compressed more than those on (shorter-term) liabilities. This is in line with the flattening of the term structure induced by the APP. As the macroeconomic benefits of the measures materialise, banks benefit from lower costs associated with loan losses and from an increase in intermediation amounts, which mitigates the negative effect of the compression of unit margins. Finally, the fact that the excess liquidity generated by the APP is remunerated at the Eurosystem's negative DFR contributes to a decrease in net interest income, and this negative contribution is increasing over time.

6 Conclusions

This paper provides an overview of some of banking sector indicators and issues that are relevant for monetary policy analysis, given the crucial role played by banks in providing financing for investment and consumption in the euro area. We discuss the main developments in bank assets and liabilities in the euro area, including banks' funding position, risk-bearing capacity and profitability. The paper then analyses how the non-standard monetary policy measures introduced during the crisis have helped restore the functioning of the monetary policy transmission mechanism. First, it reviews how the credit-easing package of June 2014 helped normalise the pass-through of monetary policy to bank lending rates. It subsequently provides evidence of the impact of individual measures on lending volumes using survey data and, finally, presents an assessment of the overall impact of these measures on bank profitability.

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