3 Euro area financial institutions

The risk outlook for banks has remained broadly unchanged since May. Euro area banks' stock prices experienced bouts of volatility over the past six months amid continued concerns about the low nominal growth environment as well as the large stock of unresolved non-performing assets in some countries. In October and early November, however, banks' stock prices recovered somewhat. This was partly related to the steepening of yield curves that, if sustained, may provide some support for euro area banks' profitability prospects, although these are currently at low levels. Furthermore, market analysts became somewhat less concerned that the finalisation of Basel III would lead to a further significant tightening of capital standards. This notwithstanding, structural factors – including overcapacity in certain banking markets, a limited degree of income diversification and cost inefficiencies in several banking sectors – also continue to cloud the outlook for the euro area banking system. In addition, limited organic capital generation and increased constraints on banks' external financing are weighing on the banking sector's capacity to build up capital buffers, thereby creating the risk of eventually hampering their ability to support the economic recovery via higher lending.

Similar to banks, euro area insurers continue to face challenges from the low-growth and low-yield environment. In particular, life insurers' profitability prospects are challenged by the prolonged period of low interest rates. Facing these headwinds, the sector has continued to adjust its portfolio allocation towards higher-yielding but more risky and illiquid assets to boost returns, though at a slower pace than in 2015.

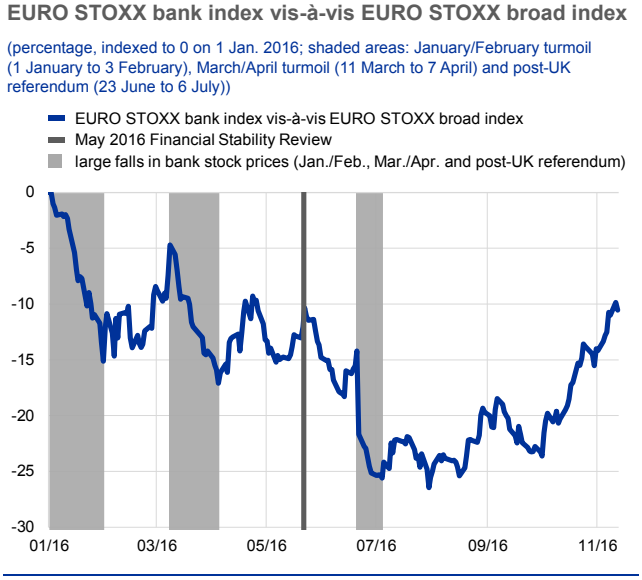
Growth in the euro area investment fund sector, underpinning much of the expansion of the non-bank sector over the last years, recovered in the second and third quarters of 2016 amid volatile asset markets and continued net inflows. While euro area-domiciled investment funds have remained resilient to recent periods of market stress, increased risk-taking by institutional investors over the past years has led to a shift towards investments with longer maturities and higher credit risk. For bond funds, in particular, this implies heightened sensitivity to a prospective simultaneous reversal in bond yields and fund flows.

On the policy front, the reform of the risk-based capital framework is nearing completion. This initiative includes the finalisation of the work on reducing excessive variability in risk-weighted assets as well as establishing a new framework for the standardised approaches. The finalisation of these elements of the Basel III framework should help reduce regulatory uncertainty and restore confidence in the risk-based capital framework.

3.1 Banks are sufficiently capitalised, but profitability concerns continue to linger

3.1.1 Profitability challenges coupled with low nominal growth could unearth vulnerabilities in the banking sector[20]

Chart 3.1
Several strong corrections in euro area banks' stock prices in 2016



Sources: Bloomberg and ECB calculations.
Note: Large bank stock corrections are defined here as a drop by more than 10% vis-à-vis the overall index.

Stock market valuations experienced bouts of volatility in the course of 2016 amid continued concerns about bank profitability. In a low nominal growth and low interest rate environment, persistently weak bank profitability coupled with a large stock of legacy problem assets in some countries induced further corrections in banks' share prices. Marked corrections in bank equity valuations took place after the "Brexit" referendum on 23 June and, to a much lesser degree, after the disclosure of EU-wide stress-test results in late July. In October and early November, euro area banks' stock prices recovered and reached levels similar to those seen at the beginning of the review period. Despite these recent corrections, the overall volatile stock price developments led to some increase in banks' cost of equity, which – coupled with low profitability levels – led to a small widening of the gap between banks' return on equity and cost of equity. Should banks' cost of equity remain higher for an extended period of time, this could lead to increased constraints on banks' external financing which, together with limited organic capital generation, could weigh on their capacity to build up capital buffers, thereby creating the risk of eventually hampering their ability to provide credit to the real economy.

Looking ahead, cyclical challenges related to the subdued economic outlook entail downside risks to the prospects for bank profitability. Furthermore, in some countries, a persistent high stock of legacy problem assets continues to tie up capital and weigh on banks' ability to lend. Structural factors, including overcapacity in certain banking markets, a limited degree of income diversification and cost inefficiencies in several banking sectors also continue to cloud the outlook for the euro area banking system.

[20] The analysis of profitability, asset quality and solvency trends in this section is based on data for SSM significant institutions. Aggregate ratios for different time periods are calculated for a balanced sample of significant institutions.

Renewed concerns about banks' profitability prospects contributed to occasional bouts of volatility in stock markets

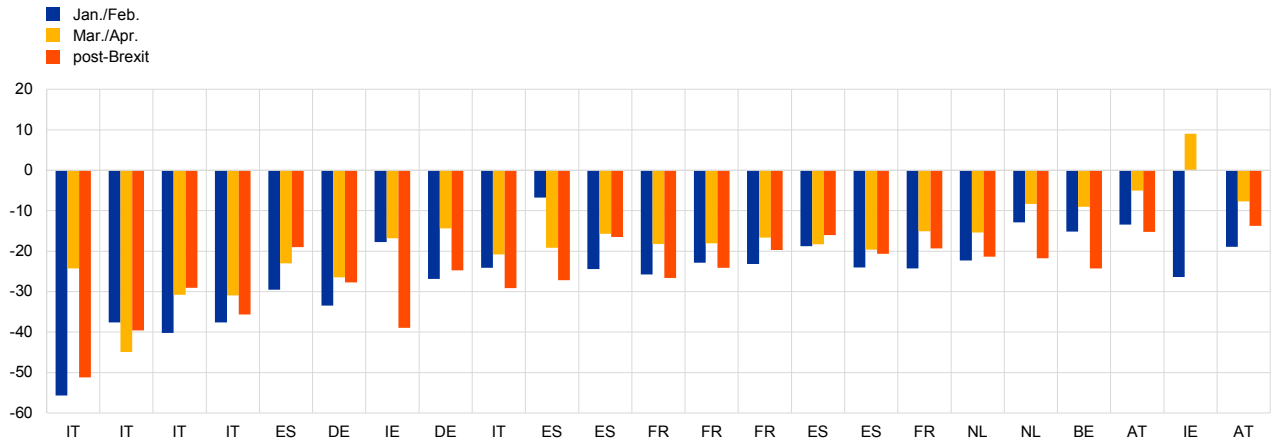
Euro area bank stocks have been subject to a number of corrections in 2016. The repeated stock market corrections have, overall, been sharp but relatively short-lived (see **Chart 3.1**). Looking at the individual stock price developments, some commonality in price discrimination can be observed. Banks which experienced the largest price declines during the correction around the turn of the year were also hard-hit during the spring turmoil and following the UK referendum (see **Chart 2.1**).

Chart 3.2

Stock price discrimination across euro area banks relatively similar during the 2016 corrections

Stock price developments for 23 euro area listed banks during three periods of falling prices

(bars represent the percentage change in individual banks' stock prices during three periods: January/February (1 January to 3 February), March/April (11 March to 7 April) and post-UK referendum (23 June to 6 July), x-axis represents countries where individual banks are domiciled)



Sources: Bloomberg, Thomson Reuters Datastream and ECB calculations.

Concerns about low profitability and legacy assets can partly explain the marked periods of stock price corrections for euro area banks. Although stock price movements are inherently difficult to fully explain even ex post, there are some underlying features that probably contributed to market concerns about euro area bank stocks in 2016. First, one overriding theme is that low profitability prospects seem to have been the main culprit in the dismal performance of the sector. As analysts have gradually revised down banks' near-term earnings prospects, stock prices have shifted down accordingly (see **Chart 3.3**). Second, some price discrimination has taken place for banks with a large stock of legacy non-performing assets. This can be illustrated by the behaviour after the outcome of the UK referendum when large price falls were observed for euro area banks with elevated levels of non-performing loans (NPLs). By contrast, no discernible difference in the stock price performance of banks with high versus low direct exposure to the United Kingdom could be detected despite the downward revisions to UK economic growth prospects that took place after the referendum (see **Chart 2.4**). Third, stock prices for some banks have been further weakened by the perceived degree of business model complexity and high litigation costs.

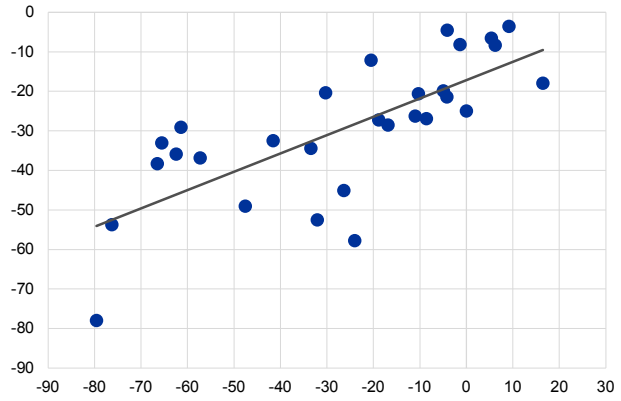
In October and early November, banks' stock prices recovered sharply, partly related to a perception that the steepening of yield curves recorded over the same period may, if sustained, provide some support to net interest margins. Furthermore, some of the increase in banks' stock prices in the latter part of the review period can be linked to market analysts becoming somewhat less concerned that the finalisation of Basel III would lead to a further significant tightening of capital standards.

Chart 3.3

Banks' stock price performance in 2016 closely tracks changes in profitability prospects

Changes in euro area banks' stock prices (x-axis) and changes in 2017 net income expectations (y-axis) since 1 January

(annual percentage change between 1 Jan. and 15 Nov. 2016)



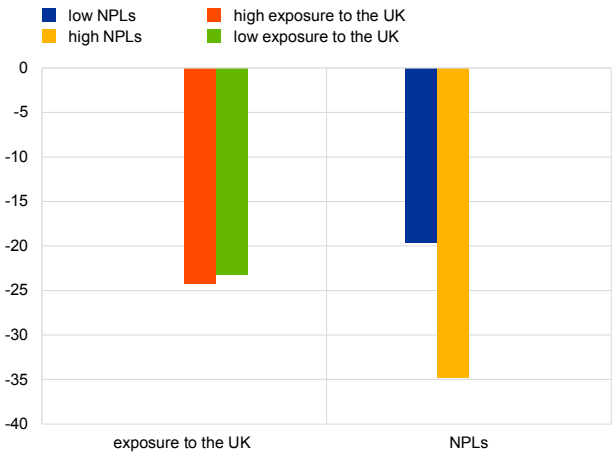
Sources: Bloomberg and ECB calculations.

Chart 3.4

Factors driving banks' stock price losses after the UK referendum

Euro area banks' stock price reactions around the UK referendum for banks with high/low direct exposure to the UK and for banks with high/low NPLs

(annual percentage change between 23 June and 27 June 2016)



Sources: Bloomberg, ECB and ECB calculations.
Note: Low and high-value samples divide the population of banks into two equal halves according to the measure (exposure to the United Kingdom and NPLs) and the median stock price loss is taken for each sample.

Overall, the systemic implications of the turmoil in banks' stock prices were limited. Over the past few years, banks have significantly strengthened their balance sheets and built up their resilience to adverse shocks. This was also confirmed by the overall comforting results of the EU-wide stress test published in late July. This suggests that the strong stock price corrections in the first three quarters of the year cannot be attributed to general concerns regarding euro area banks' solvency positions, with a few notable exceptions related to individual bank restructuring plans.

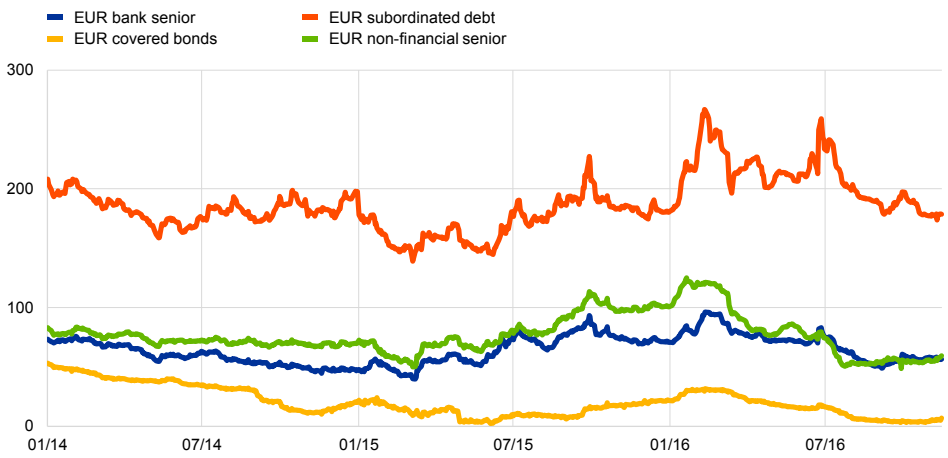
Bank funding markets have also been adversely affected by heightened volatility in financial markets in 2016, but funding stress remained generally contained. Spreads on subordinated bank debt widened markedly in the aftermath of the UK referendum, with spreads on senior bank debt also moving somewhat higher (see **Chart 3.5**). Funding conditions improved thereafter, with bank debt spreads tightening back to levels below those observed before the early 2016 episode of market turbulence.

Chart 3.5

Bank funding stress remained contained despite the temporary widening of spreads following the UK referendum

Spreads on euro area banks' senior debt, subordinated debt, covered bonds and non-financial senior debt

(Jan. 2014 – Nov. 2016; basis points)



Sources: ECB and Markit.

Persistently low profitability and the protracted corrections in bank equity valuations could dampen lending supply

The strong volatility in bank equity prices observed since the start of the year resulted in lower bank valuations and pushed banks' cost of equity higher (see Chart 3.6). Reflecting the poor performance of bank equity prices in the first three quarters of 2016, price-to-book ratios continued to decrease to levels significantly below one, raising concerns about the earnings-generating capacity of some of the existing assets. The corresponding increase in banks' cost of equity (COE) to around 10% in the second quarter of 2016, coupled with banks' return on equity (ROE) of around 5%[21] in the same period, contributed to a renewed widening of the ROE-COE gap. Banks that cannot deliver returns that at least equal their COE for an extended period face the risk of restricted access to equity markets, as well as the risk of increases in the cost of debt funding should credit investors become concerned about their resilience. This, in turn, could lead to an adverse feedback loop whereby higher funding costs could further depress bank profitability.

Stock market valuations have tracked future loan growth in recent years. Historically, bank equity prices and growth in loans to non-financial corporations have shown a strong correlation **(see Chart 3.7)**, which is why protracted declines in banks' stock prices and the increase in banks' cost of equity[22] have been a cause for

[21] This refers to the weighted average ROE of listed euro area banks in the EURO STOXX bank index for the 12-month period up to the second quarter of 2016.

[22] This is not a mechanical relationship. For example, a drop in stock prices with a proportional fall in earnings expectations would leave the cost of equity unchanged.

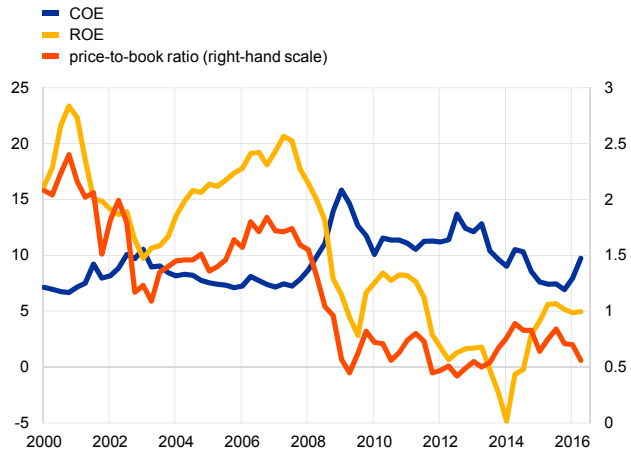
concern in the markets as regards future lending dynamics. Although such high correlations between variables do not necessarily signal a causal relationship, it is reasonable to assume that a higher cost of equity (and lower stock prices) makes it more costly to fund new lending and results in lower credit growth. At the same time, since bank credit is simultaneously determined by supply and demand, various factors could, in theory, drive the strong co-movement, such as the economic outlook, borrowers' asset quality, banks' balance sheet health or earnings prospects.

Chart 3.6

The profitability gap increased again

Cost of equity, return on equity and price-to-book ratio

(Q1 2000 – Q2 2016; percentage)



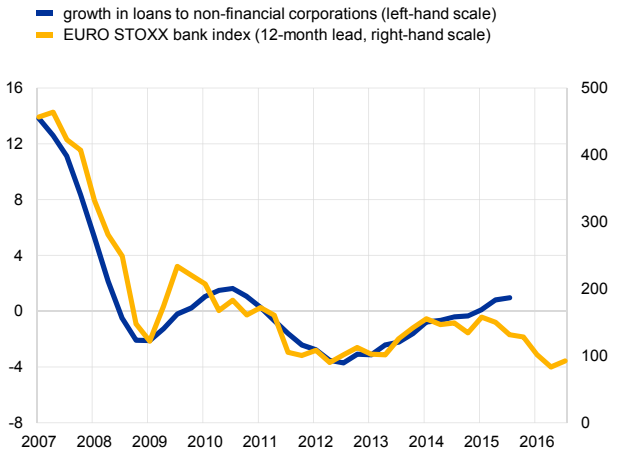
Sources: Bloomberg, Thomson Reuters Datastream and ECB calculations.
Note: Cost of equity is the expected return on the EURO STOXX weekly market index with one-year rolling betas.

Chart 3.7

EURO STOXX bank index largely co-moves with future loan growth

Annual growth in loans to non-financial corporations and the EURO STOXX bank index

(Q1 2007 – Q3 2016; percentage, index)



Sources: Bloomberg, ECB and ECB calculations.

The renewed slight widening of banks' negative profitability gap coincides with a period of continuing adjustment to evolving capital requirements, which may restrict credit provision to households and firms. Banks are still adjusting to new capital requirements, with some regulatory ambiguity remaining about key elements of regulation (e.g. regarding the calibration of risk-weighted capital requirements). This may have translated into some uncertainty in banks about how pending regulatory changes may affect certain business lines and, ultimately, their overall capital requirements. The volatility in banks' share prices observed throughout the year could make external capital accumulation more difficult via an increase in banks' cost of equity, which – together with limited internal capital generation due to low profitability – could mean less additional capital accumulation by banks in the near future, thereby constraining their lending supply. However, the reform of the risk-weighted capital framework – a source of regulatory uncertainty for both banks and investors – is nearing its finalisation, suggesting that this potential impediment is becoming less important.

Challenges for bank profitability increasingly derive from cyclical factors despite some recent resilience

Bank profitability remained at low levels in the first half of 2016, as falling loan loss provisions resulting from improved credit quality were increasingly offset by weaker revenues in a low interest rate and a flat yield curve environment. Euro area significant institutions' aggregate ROE dropped to 5.5% in the first half of 2016, from 6.5% a year earlier. Continued weak profitability mainly reflects the challenges for banks to generate revenues in a low growth and low interest rate environment, as illustrated by declines in both net interest income and, in particular, non-interest income in the first half of the year (see **Chart 3.8**). On the positive side, loan loss provisions continued to fall amid a gradual (albeit modest) economic recovery, thereby largely offsetting weaker revenues. Taking a longer perspective, **Box 4** looks at the impact that monetary policy measures had on bank profitability. The results suggest that the impact stemming from monetary policy does not appear to be particularly strong compared with the multiple other factors challenging bank profitability – some structural, some cyclical.

Box 4
The ECB's monetary policy and bank profitability

Banks' ability to generate adequate profits is relevant for the sustainability of the banking system and, as such, for its ability to provide adequate funding to the economy. Profitable banks are able to attract capital from market investors and to generate capital through retained earnings. Since the financial crisis, euro area banks' profitability has been low. This has reflected many factors, including the recognition of losses in the wake of the crisis, restructuring efforts with the aim of improving resilience, as well as an environment of low economic growth and low interest rates. The ECB has mitigated risks to euro area price stability stemming from the crisis by lowering policy rates and adopting a wide range of non-conventional monetary policy measures, in particular the negative deposit facility rate, the expanded asset purchase programme and the targeted longer-term refinancing operations (TLTROs). Since the transmission of these measures hinges on the banking system, they have the potential to affect bank profitability.

In addition to its aggregate impacts, monetary policy action specifically affects bank profitability through several different channels – with an unclear ex ante cumulative impact. 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, negative deposit facility rates impose 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 leads to increased intermediation activity and credit quality. At the same time, asset

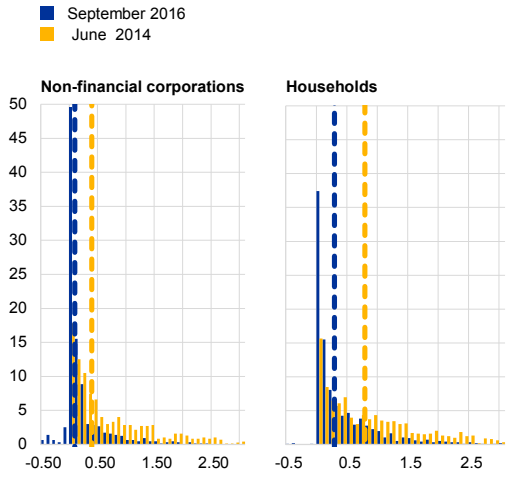
purchases and other measures contributing to lower interest rates increase the value of the securities held by banks, with a positive impact on profits.[23]

Chart A

Deposit rates have been stacking up against the zero line

Distribution of interest rates on deposits held by households and NFCs across individual MFIs

(percentage per annum)



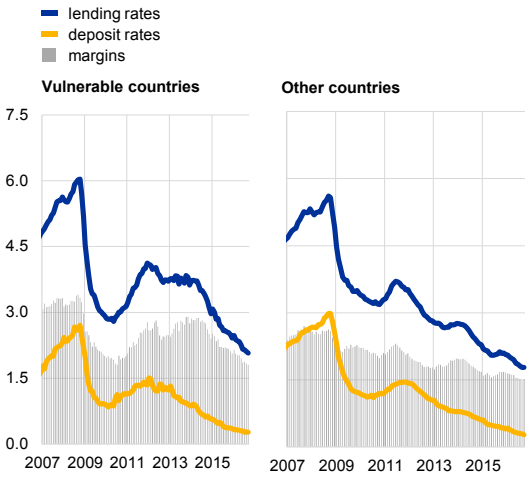
Source: ECB.
Notes: Deposit rates on new business as reported by individual banks for each of the available product categories. The dashed lines show the weighted average deposit rates in June 2014 and July 2016.

Chart B

Loan-deposit margins have been narrowing since the introduction of the credit easing package in June 2014

Loan and deposit interest rates and margins on new business

(percentage per annum)



Sources: ECB and ECB calculations.
Notes: Loan and deposit composite rates are calculated using the corresponding outstanding amount volumes as weights. Latest observation: September 2016.

Starting with the effect on net interest income, a deterioration can occur if interest rates pertinent for the assets side of bank balance sheets decline by more than those on the liabilities side. Such an asymmetric effect is more pronounced when policy and short-term market rates are negative. An important reason for this is that banks may be unable or unwilling to lower the rates they pay on retail deposits below zero, given competitive pressures in the deposit market or the fact that at some stage banknotes could become a more attractive store of value for these depositors. Evidence for the euro area points to some downward rigidity in the pricing of deposits, as the distribution of individual deposit rates has been increasingly stacking up against the zero line (Chart A). At the same time, in the case of households only 37% of new deposits were, as of September 2016, yielding a 0% return (compared with 50% in the case of non-financial corporations (NFCs)), indicating that in this segment the scope for repricing may not have been fully exhausted yet. This notwithstanding, downward rigidity of deposit rates as lending rates continue to fall translates into a narrowing of loan-deposit margins earned by banks, as indeed has been observed since the introduction of the ECB's credit easing package in June 2014 (Chart B). The narrowing of margins has been more pronounced in the case of banks in euro area countries most affected by the financial crisis than in other euro area countries, where the margins are, however, lower on

[23] The extent to which increases in the value of securities held is reflected in higher bank profits depends on the valuation method used (i.e. whether holdings are marked to market), which in turn depends on the accounting portfolio the securities are held in.

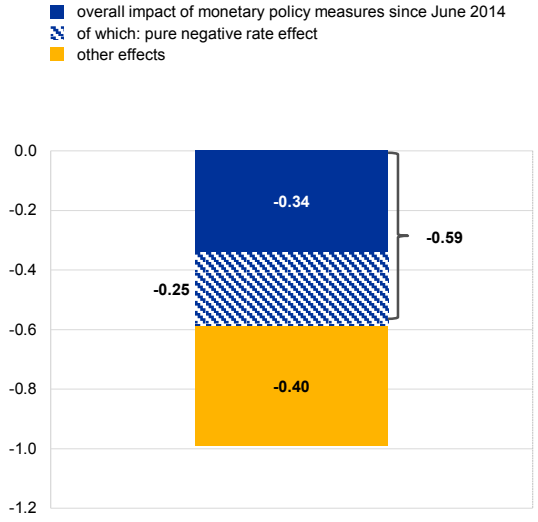
average. At the same time, lending rates in vulnerable countries likely embed a higher credit risk component, which – to some extent – is reflected in the margin.

Chart C

A quarter of the reduction in loan-deposit margins can be attributed to negative rates

Model-based decomposition of the change in median loan-deposit margin between June 2014 and September 2016

(percentage per annum)



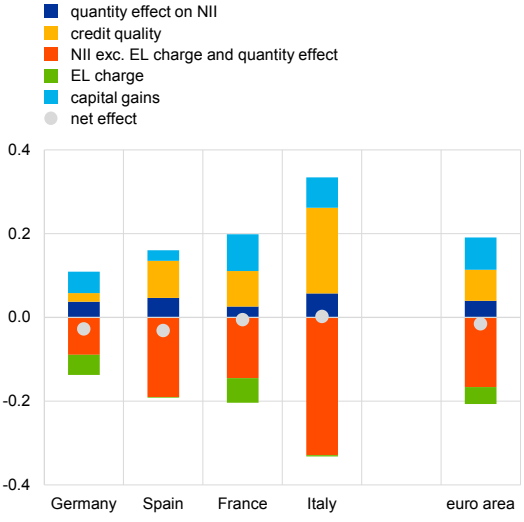
Sources: ECB and ECB estimates.
Note: Loan-deposit margin refers to new business.

Chart D

The overall impact of non-standard monetary policy measures on bank profitability is expected to be modest

Estimated effect of monetary policy on bank profitability over the period 2014-17

(percentage point contribution to return on assets)



Sources: European Banking Authority, ECB and ECB estimates.
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 CBD data 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.

Only a part of the narrowing of loan-deposit margins can be directly attributed to negative rates. An illustrative model-based analysis can be used to decompose the overall reduction in loan-deposit margins into effects that are specific to the negative rate environment and other factors. Individual bank loan-deposit margins are modelled on the basis of the level of the short-term interest rate (three-month EURIBOR), the charge on excess central bank reserves (i.e. the negative deposit facility rate), the slope of the yield curve (spread between ten- and two-year government bond yields), individual bank characteristics (size of excess liquidity holdings, reliance on core deposits and size of the loan portfolio) and the unemployment rate, to capture the state of the macroeconomy as a proxy for credit risk.[24] In this model, the impact of negative rates on bank margins is captured via an interaction term between the level of the short-term rate and the charge on excess liquidity. According to this analysis, a quarter of the 99 basis point reduction in the median loan-deposit margin over the June 2014-September 2016 period can be attributed to this impact (Chart C). A further third of the narrowing of margins is associated with the overall impact of the measures decided since June 2014, via their effect on market rates.

[24] The model also includes a constant, a lag of the dependent variable and bank fixed effects.

The ECB's non-standard monetary policy measures have a positive impact on credit quality and capital gains that tends to offset the decline in net interest income. An encompassing assessment including all the channels described above is made by comparing actual developments and baseline projections for the period between 2014 and 2017 with a counterfactual scenario which excludes the effect of the monetary policy measures decided since June 2014. [25] 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 levels of interest rates. 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 to be 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 would be expected to be broadly neutral as the effects on different components of bank profitability tend to largely offset each other (Chart D). Indeed, weak macroeconomic prospects are currently at the heart of 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.

Bank profitability continued to display significant heterogeneity across euro area countries. This was partly related to differences in banks' and banking sectors' sensitivity towards the low interest rate environment, as well as to large cross-country differences in the magnitude of NPL stock problems. Sensitivity to the low interest rate environment is dependent on a number of factors, such as the reliance on net interest income for revenue generation, the interest rate sensitivity of assets (e.g. the share of floating rate mortgage loans), the share of deposit funding, the room for further deposit repricing, as well as market structure or the degree of bank competition.

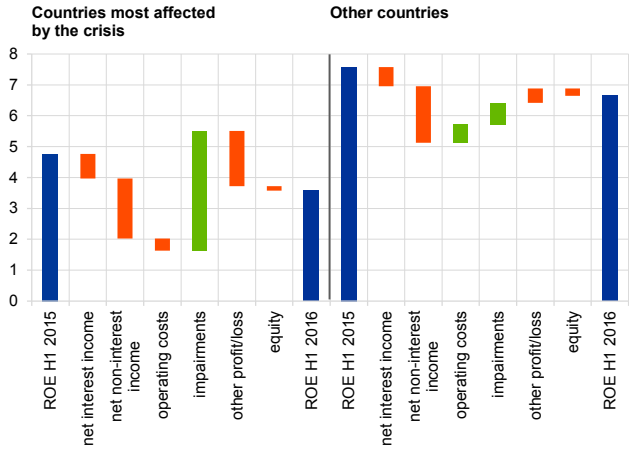
[25] The impact of the APP on bond yields and the respective effect on lending rates and volumes is consistent with the Eurosystem macroeconomic projections. The decrease in interest rates brought about by the APP is reflected in new business volumes and in the outstanding amount of variable rate instruments. For debt securities held and issued by banks, detailed information on maturity and the type of interest rate is retrieved from the Securities Holdings Statistics (SHS) database. For loans and deposits, this information is proxied based on MFI balance sheet data. Due to the low level of interest rates, it is assumed that banks only benefit from lower interest rates on long-term deposits. The assessment of capital gains takes into account detailed data on the maturity, counterparty country and accounting portfolio of securities held by banks, as published by the EBA.

Chart 3.8

Euro area banks' profitability remained at low levels in the first half of 2016, as revenue declines were not offset by lower provisioning

Decomposition of the change in significant institutions' aggregate return on equity in the first half of 2016

(H1 2015 – H1 2016; percentage points)



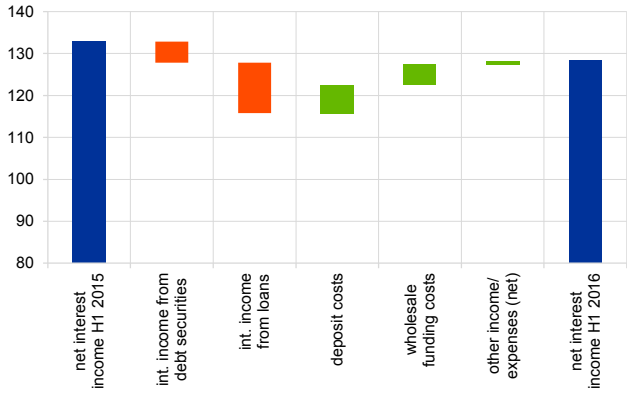
Source: ECB supervisory data.
Note: Based on a sample of 101 significant institutions.

Chart 3.9

Net interest income dropped as a fall in lending and securities-related interest income was not offset by lower funding costs

Decomposition of the change in significant institutions' aggregate net interest income in the first half of 2016

(H1 2015 – H1 2016; EUR billions)



Sources: ECB supervisory data.
Note: Based on a sample of 101 significant institutions.

Looking at the key drivers of bank profits, net interest income remained under pressure, mainly as a result of margin compression. The aggregate net interest income of euro area significant institutions fell by around 3% in the first half of 2016 on a year-on-year basis, mainly due to the compression of margins. In fact, euro area banks' net interest margin (defined as the ratio of net interest income to total assets) dropped to 1.18% in the first half of 2016, from 1.24% a year earlier. A decomposition of the change in euro area significant institutions' aggregate net interest income shows that the significant decline in interest income from lending activities (in particular from household loans) was the main drag on net interest income, while a lower contribution of interest income from the debt securities portfolio also played a role (see **Chart 3.9**).

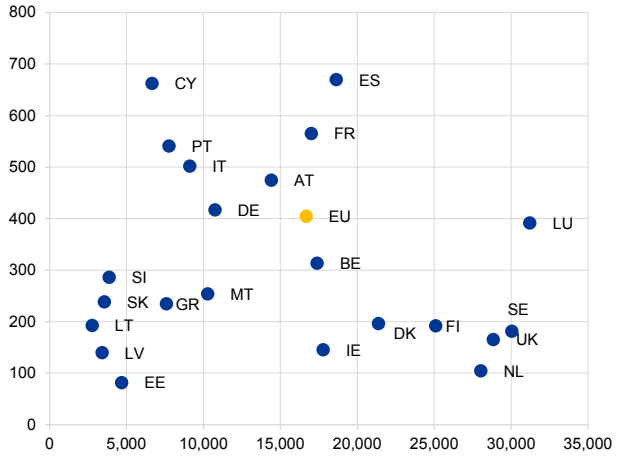
Euro area banks were not able to compensate for the decline in net interest income by increasing non-interest income. Following an increase in 2015, euro area significant institutions reported a 4% year-on-year decline in net fee and commission income in the first half of 2016, mainly due to a drop in fee income components more sensitive to financial market volatility, such as those related to securities issuance, asset management or the distribution of investment products (see Special Feature C). Likewise, banks' trading income has been negatively affected by the repeated bouts of volatility during the course of the first half of 2016, with the approximate 20% annual decline also influenced by the mostly favourable financial market conditions in the corresponding period of 2015.

Chart 3.10

Significant diversity in the EU in terms of bank efficiency and branch network density

Assets per employee and branch network density in EU countries

(2015; x-axis: assets per employee (EUR thousands); y-axis: number of bank branches per 1 million inhabitants)



Source: ECB.

Continued challenges to revenue generation shifted banks' focus to cost-cutting efforts, but progress in improving cost-efficiency remains uneven across countries and institutions. Notwithstanding significant cost-cutting efforts since the 2008 financial crisis,[26] at the country level, there is significant diversity in the European Union in terms of bank efficiency (proxied by assets per employee) and branch density (see **Chart 3.10**).[27] While this reflects a multitude of factors (e.g. banking structure, financial depth, social/cultural factors, differences in relative prices of production factors), this heterogeneity also suggests that in some banking sectors there is scope for further efficiency gains, in particular in those countries with low levels of assets per employee and low branch efficiency.

At bank level, a number of institutions have announced, or are implementing, cost-cutting plans as part of their restructuring efforts. Planned cost-cutting measures include headcount reductions, branch closures that are coupled with the digitalisation of processes, as well as the increased use of digital distribution channels. In fact, there seems to be a negative relationship between the proportion of customers using internet banking and branch network density, suggesting that a shift towards digital channels is key to branch network optimisation and could result in cost savings. At the same time, these cost-cutting measures are mostly part of multi-year strategies and are accompanied by restructuring costs or additional IT investment costs, so (net) cost savings will likely materialise only in the medium term. In fact, analysts see limited opportunities for material cost reductions by 2018, with only an aggregate 2% decline expected in large listed euro area banks' operating costs between 2016 and 2018.

Increasing competition from non-bank competitors (e.g. "fintech" companies) could also create opportunities for banks to boost bank profitability. By embracing fintech innovations and cooperating with fintech start-ups, banks could increase operational efficiency through cost-cutting. Accelerating technological advances could also give rise to new sources of revenue, possibly allowing banks' to protect their current market shares. The digitalisation of financial services is already quite advanced in several Nordic countries, which is also reflected in their cost-to-income ratios which are the lowest in the European Union.

Looking ahead, banks' return to sustainable profitability will depend on their ability to adjust to an operating environment of stricter regulatory requirements and low interest rates. Banks with business models that are largely oriented towards retail customers will be more vulnerable to the low interest rate

[26] For instance, this included a reduction in the number of branches by over 30% in several countries.

[27] Other measures of efficiency (productivity) include revenues/employees or employees/customers.

environment, as will banks with less income diversification. Moreover, banks with higher cost structures will need to further increase cost-efficiency. Accordingly, medium-term strategic plans announced by banks suggest that responses to the above challenges will include, among other things, the diversification of income sources (in particular by increasing the share of fee income), a shift towards higher-margin lending activities (e.g. consumer lending), as well as cost containment. Competitive pressures from both within and outside the banking sector (e.g. from fintech companies) likewise indicate increasing difficulties for banks to continue operating efficiently with their existing business models, although some banks are enhancing their business strategies with measures that aim to exploit the opportunities from digitalisation (e.g. via the acquisition of or partnerships with fintech companies).

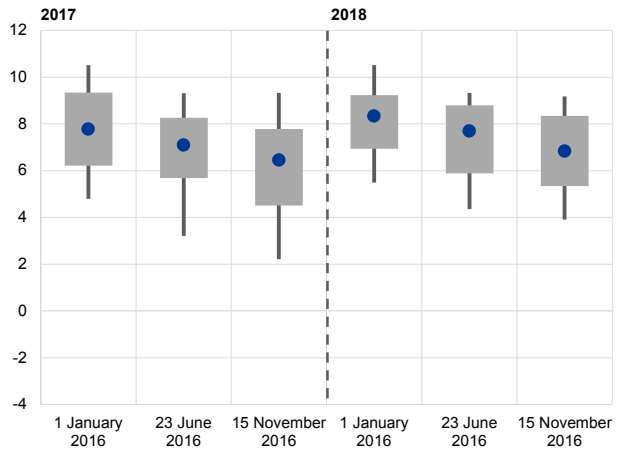
Structural challenges to profitability in some banking sectors are also linked to industry structure and excess capacity. Despite a rationalisation of branch networks and headcount reductions since the financial crisis, cost-efficiency varies widely across banks and countries, suggesting that some banks have considerable room for improving operational efficiency either via organic cost-cutting or cost-efficiency gains through consolidation. Consolidation could bring some profitability benefits at the sector level by increasing cost and revenue synergies without worsening the so-called "too-big-to-fail" problem. However, progress in bank consolidation in the euro area, in particular across borders, remains limited to date.

Chart 3.11

Analysts have continued to lower their expectations for banks' future profitability

Return on equity forecasts for listed euro area banks for 2017 and 2018

(2017-18; percentage)



Source: Bloomberg.

Overall, these cyclical and structural profitability challenges are also mirrored in the downward revisions of analysts' expectations for banks' future profitability over the past six months. Since late June, analysts have continued to lower their return on equity forecasts for listed euro area banks, with the median ROE forecasts between 6% and 7% for 2017 and 2018 (see **Chart 3.11**). This suggests that market participants do not foresee a material improvement in bank profitability in the next two years, possibly implying the continuation of the negative profitability gap for most banks.

Despite a modest improvement in asset quality, the large stock of unresolved legacy assets in some countries continues to weigh on new lending

Euro area banks' asset quality slightly improved in the first half of 2016, mainly driven by a decline in NPL ratios in the corporate sector. The aggregate non-performing exposure (NPE) ratio for euro area significant institutions (for total loans and advances) dropped to 6.8% at end-June 2016 from 7.2% at end-2015 (see **Chart 3.12**), with improvements also extending to the majority of high NPE countries. The decline in the aggregate NPE ratio was due to a

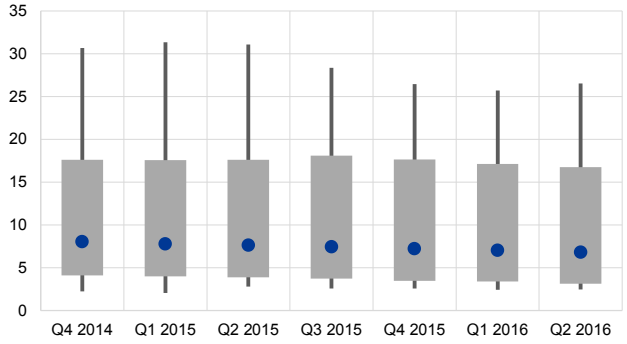
combination of a 2% decline in NPEs and a 3.7% increase in total loans (or 1.4% for loans to the non-financial private sector).[28] By sector, the improvement in euro area banks' loan quality was mainly driven by the 0.6 percentage point drop in the NPE ratio for corporate loans, although it still stood at around 12% at end-June 2016. By loan type, the largest NPE ratio declines in the first half of 2016 were observed for small and medium-sized enterprise (SME), commercial real estate (CRE) and consumer loans, although they remain at high levels (see **Chart 3.13**).

Chart 3.12

Banks' asset quality modestly improved in the first half of 2016, but NPE ratios remain stubbornly high in some countries

Non-performing exposure ratios of significant institutions in the euro area (based on country aggregates)

(Q4 2014 – Q2 2016; percentage; median, interquartile range and 10th-90th percentile range)



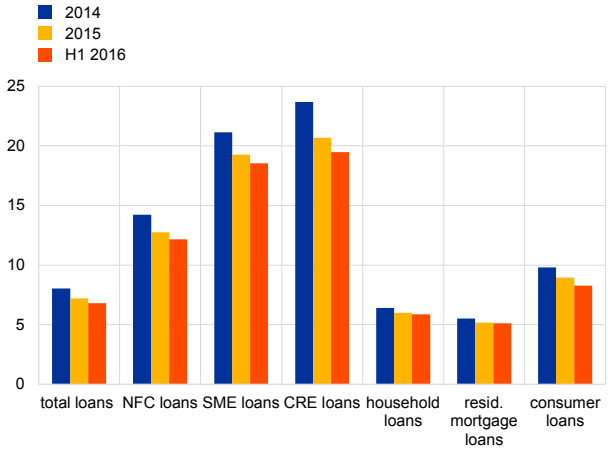
Source: ECB.
Notes: Based on country aggregates for significant institutions. Non-performing exposure ratios are shown for total loans and advances.

Chart 3.13

The modest decline in banks' aggregate NPE ratio was driven by a drop in NPE ratios for CRE and SME loans, although they still remain at elevated levels

Non-performing exposure ratios of significant institutions in the euro area, by sector and loan type

(2014 – H1 2016; percentage)



Source: ECB.

At the same time, the coverage of non-performing loans by loan loss reserves remained broadly stable in the first half of 2016, though showing some improvement at banks with below-average coverage ratios. The aggregate ratio of reserves to NPEs (for loans and advances) remained broadly unchanged between end-2015 and June 2016, at around 46% (see **Chart 3.14**). Coverage ratios vary widely in the euro area, with country-level ratios ranging from 28% to 67% at the end of the first half of 2016. Coverage ratios improved in some countries where NPE ratios are high, but in some cases remain below the euro area average.

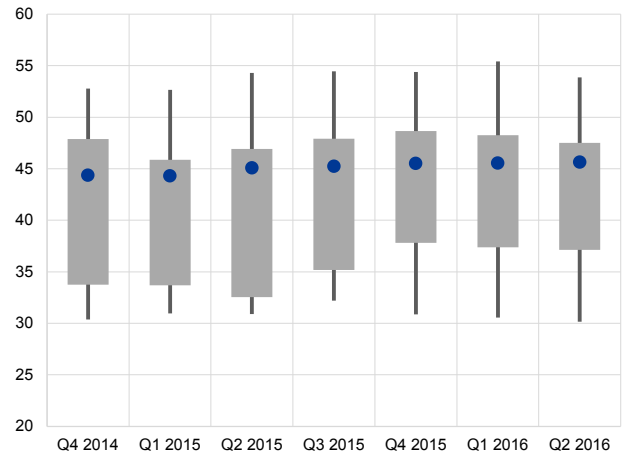
[28] Much of the increase in total loans was related to loans to central banks, credit institutions and general governments.

Chart 3.14

Coverage ratios remained broadly stable in the first half of 2016

Coverage ratios of significant institutions in the euro area (based on country aggregates)

(Q4 2014 – Q2 2016; percentage; median, interquartile range and 10th-90th percentile range)



Source: ECB.
Notes: Based on country aggregates for significant institutions. The coverage ratio is defined as the ratio of accumulated impairments on NPEs to NPEs.

Despite recent modest improvements, progress in reducing NPE levels remains slow in several countries, leading to increased supervisory efforts to improve NPL management practices. In this context, the draft ECB guidance on non-performing loans[29] recommends that banks with a high level of NPLs establish a clear strategy aligned with their business plan and risk management framework to effectively manage and ultimately reduce their NPL stock. The draft guidance recommends that banks with high NPLs implement realistic and ambitious NPL reduction targets, while recognising that it will take some time until NPLs are reduced to reasonable levels. At the same time, supervisors also aim to focus more closely on the timeliness of provisions and write-offs (for a further discussion of issues related to NPL resolution, see Special Feature B).

Looking beyond the challenges arising from legacy problem assets, some euro area banks continue to be faced with elevated credit quality concerns relating to their exposures to emerging economies. While direct exposures of euro area banks to emerging market assets remain limited (see Box 1 of the May 2016 FSR), potential shocks to EMEs could also be transmitted through indirect channels via trade links and a broader financial market confidence channel. Analysis of potential spillovers from emerging markets to euro area banks presented in **Box 5** suggests that the responses of euro area banks to EME sovereign shocks could be sizeable, in particular in the event of a broad EME market stress.

Bank capital positions improved further

Banks' solvency ratios improved further in the first half of 2016, at least on a fully loaded basis, mainly helped by increases in capital. Euro area significant institutions' fully loaded common equity Tier 1 (CET1) ratio increased further in the first two quarters of 2016, with the median ratio rising by around 30 basis points to 13.4% (see **Chart 3.15**). At the same time, the median phased-in CET1 ratio remained broadly unchanged from end-2015, at just below 14%, with a slight decline in the first quarter of 2016, due to higher CET1 deductions from the beginning of 2016 in line with the CRD IV phase-in schedule, followed by an uptick in the second quarter. The improvement in banks' aggregate fully loaded CET1 ratio was mainly driven by increases in CET1 capital, on aggregate, which offset the modest negative impact of risk-weighted asset increases (see **Chart 3.16**).

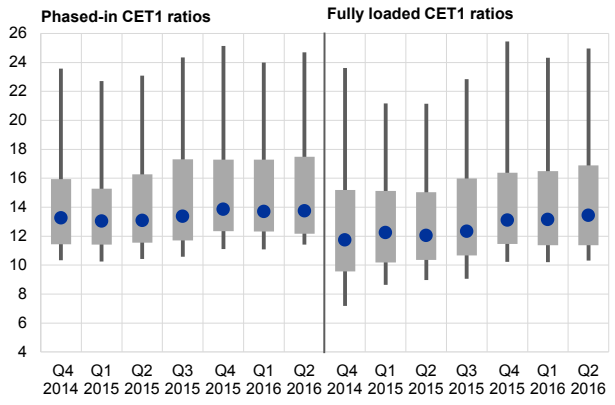
[29] See Draft guidance to banks on non-performing loans, ECB, September 2016.

Chart 3.15

Solvency ratios remained broadly stable on a phased-in CET1 basis in the first two quarters of 2016, but continued to increase on a fully loaded basis

Phased-in and fully loaded common equity Tier 1 capital ratios of significant institutions in the euro area

(Q4 2014 – Q2 2016; percentage; median, interquartile range and 10th-90th percentile range)



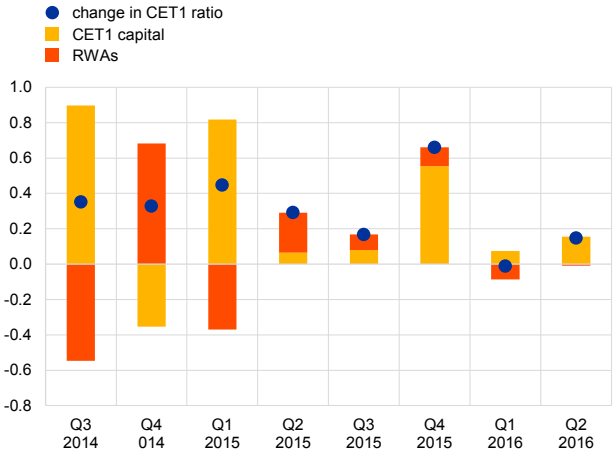
Source: ECB.

Chart 3.16

The improvement in banks' aggregate fully loaded CET1 ratios was driven by increases in CET1 capital, which offset the impact of risk-weighted asset increases

Contribution of changes in capital and risk-weighted assets to euro area institutions' aggregate fully loaded common equity Tier 1 capital ratio

(Q3 2014 – Q2 2016; percentage points)



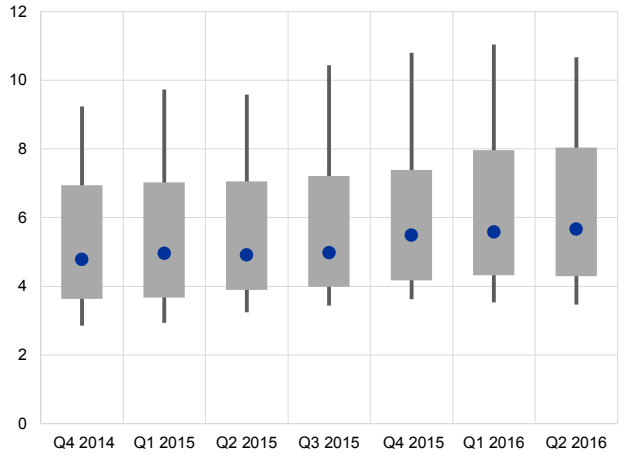
Sources: ECB and ECB calculations.
Note: Changes in risk-weighted assets (RWAs) are shown with the opposite sign as their decline (increase) indicates a positive (negative) contribution to the capital ratios.

Chart 3.17

Leverage ratios edged up further, with the large majority of banks above 4%

Distribution of euro area significant institutions' fully loaded Basel III leverage ratios

(Q4 2014 – Q2 2016; percentage; median, interquartile range and 10th-90th percentile range)



Source: ECB supervisory data.

Euro area banks' leverage ratios also continued to improve in the first half of 2016. At end-June 2016, the median fully loaded leverage ratio for significant institutions rose to 5.7% from 5.5% six months earlier (see **Chart 3.17**). Differences across banks of different sizes persisted, with euro area global systemically important banks (G-SIBs) remaining significantly more leveraged than other significant banks, while (according to the latest Basel consultation document) they are likely to face leverage ratio requirements in excess of 3%. The median leverage ratio for euro area G-SIBs stood at 4% at end-June 2016, but some institutions still need to make further progress to reach their leverage ratio target of at least 4%.

Looking ahead, the finalisation of Basel III capital rules will have an important bearing on banks' capital requirements, although it should not result in a significant increase in overall capital requirements in the banking system. The elements of the Basel III framework being finalised include the work on reducing excessive variability in risk-weighted assets, a new standardised approach for credit risk and a new operational risk framework, as well as the design of the leverage ratio (see Section 3.3 for more details). The finalisation of these

elements will substantially reduce regulatory uncertainty, which has been a key concern for the banking industry recently.

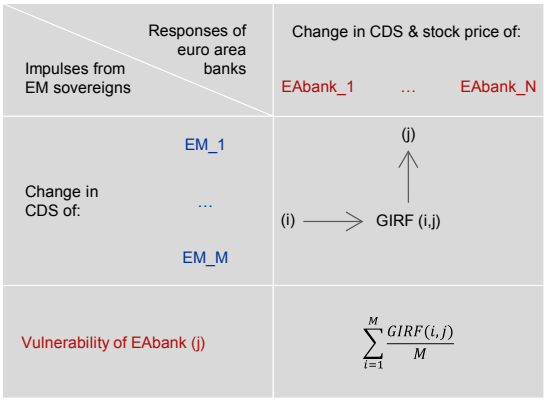
Box 5

The potential for spillovers from emerging markets to euro area banks

Many emerging market economies (EMEs) are facing a difficult combination of slow growth, weak commodity prices, and further tightening credit conditions. These challenging aggregate conditions point to the potential for negative spillovers to the euro area. Direct exposures of euro area banks to emerging market assets remain limited (see Box 1 of the May 2016 FSR). At the same time, potential shocks could be transmitted through indirect channels to euro area banks via EMEs' trade links with euro area countries and a broader financial market confidence channel stemming from uncertainty about growth prospects in EMEs. Such indirect channels are complex. One way of gauging them is by measuring the market perception of the potential for spillovers of financial risk from emerging markets to euro area banks.

Chart A

Computation of a bank-specific vulnerability measure



Source: ECB.

A possible modelling strategy is to relate shocks to financial market pricing of EME sovereigns to the response of European banks[30]**.** Specifically, measures of euro area bank vulnerability to EME sovereign shocks can be derived based on generalised impulse responses (GIRs) from a mixed cross section global vector autoregressive (MCS-GVAR) model, comprising credit default swap (CDS) spreads and bank equity returns as the main inputs to the model.[31] The model is estimated based on daily data spanning the period from January 2011 to September 2016 and includes two institutional sectors: sovereigns (of emerging markets and the euro area) and banks (of the euro area).[32] The model relates daily changes in CDS spreads for sovereigns and banks, together with daily bank equity returns for banks. The VIX (the Chicago Board Options Exchange's Volatility Index) is included in the model to control for global conditions. To construct the model, three sets of weights are used, linking the two cross-sections: (i) to link sovereigns, trade weights are used (the sum of nominal bilateral exports and imports for any pair of countries); (ii) to link banks, bilateral loan and deposit volume exposures

30 Gross, M. and Tereanu, E., "Assessing the spillover potential from emerging market economies to European banks", ECB, mimeo.

31 Gross, M. and Kok, C., "Measuring contagion potential among sovereigns and banks using a mixed cross section GVAR", *Working Paper Series*, No 1570, ECB, August 2013. See also Gross, M., Kok, C. and Zochowski, D., "The impact of bank capital on economic activity – Evidence from a Mixed-Cross-Section GVAR model", *Working Paper Series*, No 1888, ECB, March 2016; and Gross, M., Henry, J. and Semmler, W., "Destabilizing effects of bank overleveraging on real activity – An analysis based on a Threshold MCS-GVAR model", *Macroeconomic Dynamics*, forthcoming.

32 The sample comprises 16 EU sovereigns, 19 EME sovereigns and 18 EU banks. The sample choice was driven by CDS data availability and sufficient market liquidity as well as sufficient bank size (drawing on the SSM sample of banks).

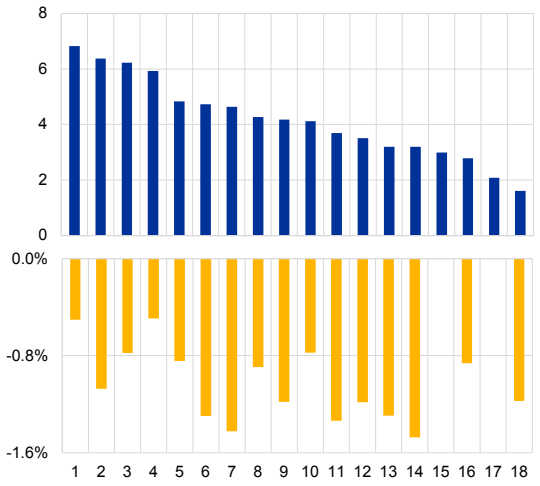
from a supervisory database are used; and (iii) to link euro area banks and countries, supervisory data on total bank assets vis-à-vis a country are employed.

Chart B

Bank CDS responses are more pronounced compared with equity price returns

Responses of selected euro area banks' CDS spreads and equity returns to an EME sovereign shock

(top panel: bank CDS spreads (blue), basis points; bottom panel: bank equity returns (yellow), percentages)



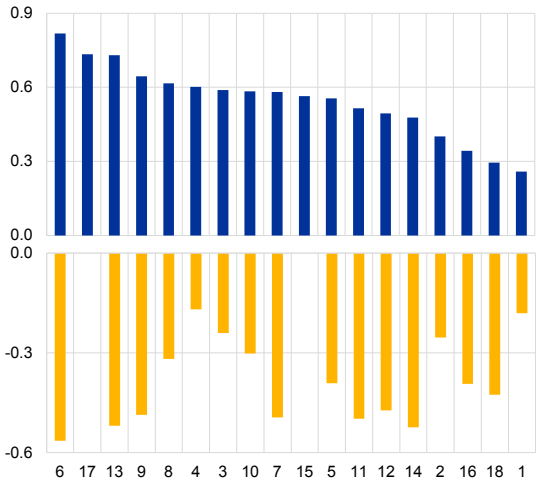
Sources: ECB and ECB calculations.

Chart C

Despite heterogeneity, some of the CDS responses appear sizeable

Normalised responses of selected euro area banks' CDS spreads and equity returns to an EME sovereign shock

(top panel: bank CDS spreads (blue); bottom panel: bank equity returns (yellow), multiples of own standard deviations)



Sources: ECB and ECB calculations.

A set of GIRs can be computed using this model by sequentially alternating the "shock origin" and recording all other responses. While this can be examined from multiple perspectives, a relevant choice for this analysis is a "bank average vulnerability measure" (Chart A). The bank-specific vulnerability estimates are represented by the maximum of the cumulative CDS spread changes, and the minimum of the cumulative returns of bank equity prices, both over a five-business-day simulation horizon (Chart B). The size of the shock considered for the EME sovereigns was based on a rare one-day-in-four-years event.[33] The resulting responses are also presented in normalised form in Chart C, expressed as multiples of historical standard deviations of the banks' daily CDS spreads and equity price returns.[34] The average standard deviation multiple across banks equals 0.54 and -0.35 for CDS and equity price responses, respectively. Some banks' CDS responses appear sizeable, reaching standard deviation multiples of up to 0.8.

[33] Based on the observed EME daily sovereign CDS changes (not the model residuals). The shocks corresponding to the 0.1% probability range between 11 basis points for Qatar and 110 basis points for Russia (an average of about 100 basis points across EMEs). Relative to the end-of-sample observation on 13 September 2016, the shocks correspond to multiples between 1.1 and 1.7 (an average of 1.3).

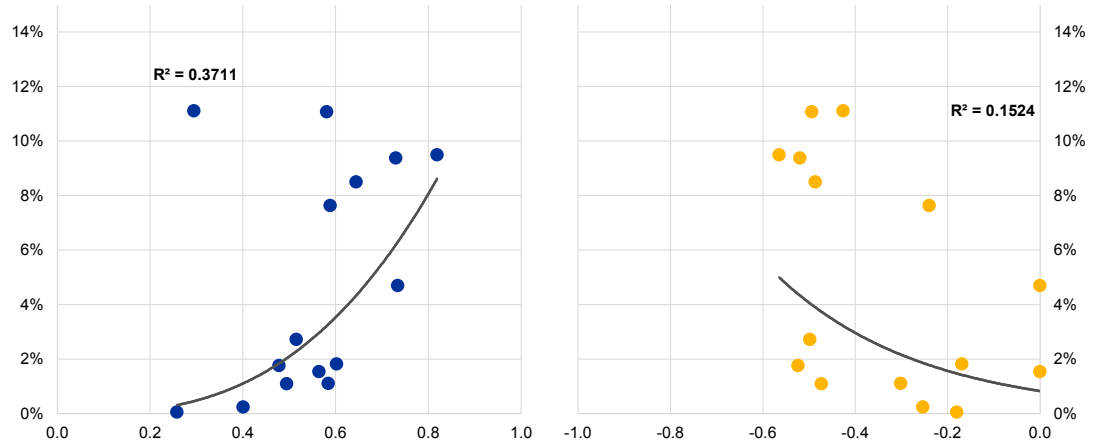
[34] The normalisation is meant to place the response in relation to each bank's idiosyncratic amount of risk and thereby make the responses across banks more comparable. The rationale is that the same raw CDS or equity price response does not have the same implication for a bank that has been significantly more risky (volatile) in historical terms.

Chart D

The correlation between banks' CDS and equity responses to an EME shock and the relative size of the direct exposure is of the expected sign; however, the size of exposure is not sufficient to explain the magnitude of the responses

Correlation between bank responses to an EME shock and the relative size of the direct exposure

(x-axis: individual banks' exposure weight, percentage of total direct exposure to EMEs in the sample; y-axis: bank normalised CDS response (in multiples of own standard deviations (blue dots), bank normalised equity return response (in multiples of own standard deviations (yellow dots))



Sources: ECB and ECB calculations.

The analysis suggests that simply the "width" of a direct exposure channel (identified through actual asset holdings in an emerging market) may not be sufficient to assess the spillover potential from EMEs to European banks (Chart D). Although the positive (negative) relation between CDS spreads (equity prices) and the exposure weights is confirmed in the data, the low R^2 in Chart D suggests that the type of exposures, the extent to which banks are hedged, and the sufficiency of loan loss reserves for loan book exposures all appear to play a role in determining the banks' susceptibility to an EME sovereign shock. Overall, the analysis suggests that the responses of euro area banks could be sizeable, in particular in the event of a broad EME market stress, and they appear to be heterogeneous. Therefore, a close monitoring and assessment of the channels transmitting emerging market vulnerabilities to euro area banks is warranted.[35]

3.1.2 Euro area insurance sector: constrained by headwinds from the low-yield environment amid weak macroeconomic conditions

Like banks, large euro area insurers continue to face challenges from the low-yield environment amid weak macroeconomic conditions. In particular, the

[35] A few caveats should be noted. The model is not a structural model (it can be referred to as semi-structural instead, given that it involves various weight sets, including supervisory exposure data) and hence it remains difficult to distinguish the relative importance of profitability and solvency concerns, for instance, or to identify causal relationships more generally. Moreover, the CDS spreads and bank equity prices measure risk perceptions only approximately, while the complex interactions between EME sovereigns and euro area banks would be only partially reflected in links informed by bilateral trade and asset exposures.

prolonged period of low rates continues to weaken insurers' investment income, while low discount rates also imply an elevated level of liabilities. In addition, underwriting new business is also challenging in a weak economic environment. Facing those headwinds, the sector has continued to adjust its portfolio allocation towards more risky and illiquid assets to boost returns from investments, though at a slower pace than in 2015. While the financial performance of large euro area insurers has remained subdued, it proved to be resilient to recent bouts of market volatility such as those following the outcome of the UK referendum on EU membership. Although profitability prospects are weakening, especially for life insurers, the profitability of most large euro area insurers remains solid so far.

The sector has also continued to adjust to the new Solvency II regime, which entered into force in January 2016. Although the first annual statements under the new regime are required to be published only in early 2017, some insurers have already started to voluntarily disclose Solvency II figures. The comparability of these figures is however hampered by the transitional measures in place. The provisional figures show that the Solvency II ratios of large euro area insurers are above the prudential requirement of 100%, ranging from around 140% to around 240% in the first quarter of 2016.

Despite ongoing adjustment of business models, life insurers' profitability in particular is challenged by the prolonged period of low interest rates. To limit their exposure to interest rate risk, life insurers have aimed to increase their sales of unit-linked policies over the last couple of years, but the sales lost some growth momentum in the first half of 2016. These developments could reflect the low attractiveness of these products compared with traditional saving products and/or intense competition from asset management products offered by the rest of the financial sector. As a result, some insurers have recently opted to offer products which combine guaranteed and unit-linked components or are fee-based. Although not an immediate financial stability concern, life insurers need to tackle the current challenges as soon as possible in order to prevent solvency concerns in the medium-to-long term.

Non-life insurers are somewhat less affected by the low-yield environment, but they also face significant challenges. Competitive pressures in the sector have been intensified by digital start-ups, which offer highly personalised, timely and convenient products. Despite being small scale, investment in the so-called "insurtech" start-ups more than tripled in 2015. Most recently, the performance of both the non-life and the reinsurance industry has been dampened by the recent surge in catastrophe losses related inter alia to strong earthquakes in Japan and Ecuador as well as powerful storms in Europe and the United States. In addition, the reinsurance sector continues to compete with alternative capital sources such as catastrophe bonds, which are on the rise.

Financial condition of large insurers[36]

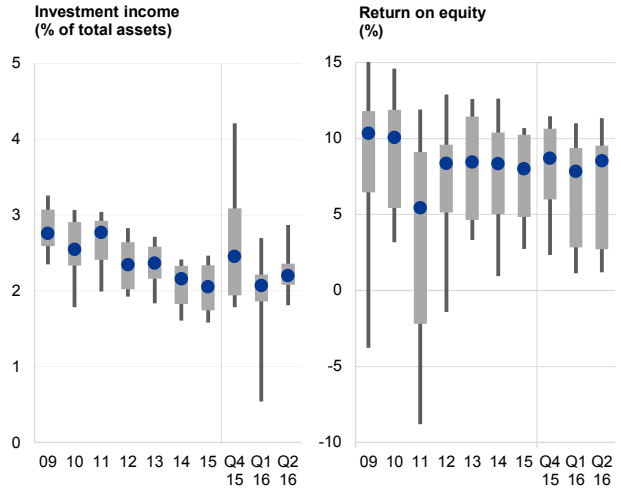
The performance of large euro area insurers remained subdued as insurers continued to face the low-yield environment and weak macroeconomic conditions. Overall, the low-yield environment continued to be a drag on insurers' investment income over total assets, which dropped back to levels close to 2% after the strong results recorded in the last quarter of 2015 (see **Chart 3.18**). In the weak macroeconomic conditions, both life and non-life insurers also faced significant challenges in underwriting new business. The annual growth rate of life premiums in the first half of 2016 turned negative for many large euro area insurers, while the median growth rate in the non-life segment was close to zero in the same period (see **Chart 3.19**). Since many life insurers have recently been shifting their business models from guaranteed to unit-linked products, the weak results may reflect the difficulty in selling these products amid competition from other sectors (such as investment funds) and generally low expectations regarding future yields on investments.[37] The developments are, however, heterogeneous across the individual life insurance firms, which suggests that competition within the life insurance sector has also played a role. Similarly, intense competition in the non-life sector continues to partly explain the modest growth in this segment.

Chart 3.18

Investment income dropped after the strong results in the last quarter of 2015

Investment income and return on equity for a sample of large euro area insurers

(2009 – Q2 2016; percentage, 10th and 90th percentiles, interquartile distribution and median)



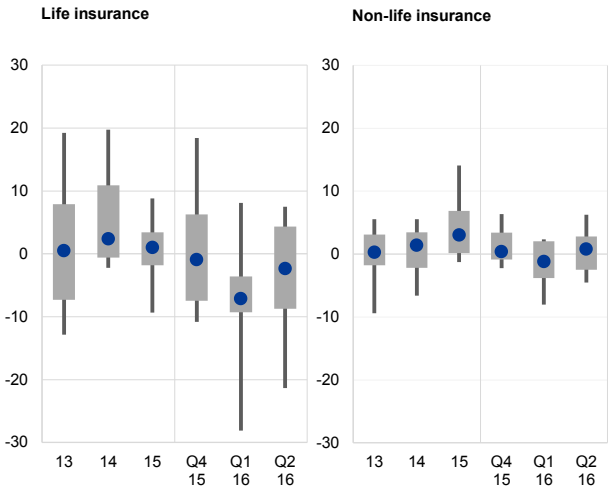
Sources: Bloomberg, individual institutions' financial reports and ECB calculations.
Note: Investment income excludes unrealised gains and losses.

Chart 3.19

Underwriting business in life insurance faces significant challenges due to a change in business mix

Annual growth rates of gross premiums written for a sample of large euro area insurers

(2013 – Q2 2016; percentage, 10th and 90th percentiles, interquartile distribution and median)



Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

[36] The analysis is based on a varying sample of 24 listed insurers and reinsurers with total combined assets of about €4.5 trillion in 2015, which represent around 65% of the assets in the euro area insurance sector. Quarterly data were only available for a sub-sample of these insurers.

[37] In unit-linked products, policyholders (rather than insurance companies) bear the capital market risk as the return on these products is directly linked to the performance of financial markets.

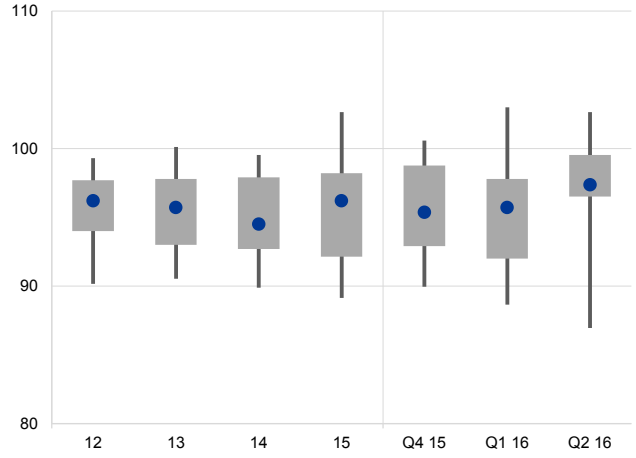
Despite the challenging operating environment, the profitability of most large euro area insurers remained solid. Specifically, the median return on equity hovered at around 8% in the first half of 2016, which is in line with the results in the previous four years. Having said this, the quarter of firms at the low end of the distribution exhibited returns on equity below 3% in the two first quarters of 2016, which is around 2 percentage points less than in 2015. Hence, the weak investment income and underwriting results also weighed on the overall profitability outcomes of some large insurers. On the non-life side, the uptick in catastrophe losses in the second quarter of 2016 also pushed the combined ratios – which measure incurred losses and expenses as a proportion of premiums earned – closer to 100% (see **Chart 3.20**). By and large, however, the ratios remained below 100%, which indicates that most non-life companies are managing the balance between the costs and underwriting profits of their daily business in a sustainable manner.

Chart 3.20

As natural catastrophe losses ticked up, the costs of non-life business increased

Combined ratio for a sample of large euro area insurers

(2012 – Q2 2016; percentage, 10th and 90th percentiles, interquartile distribution and median)



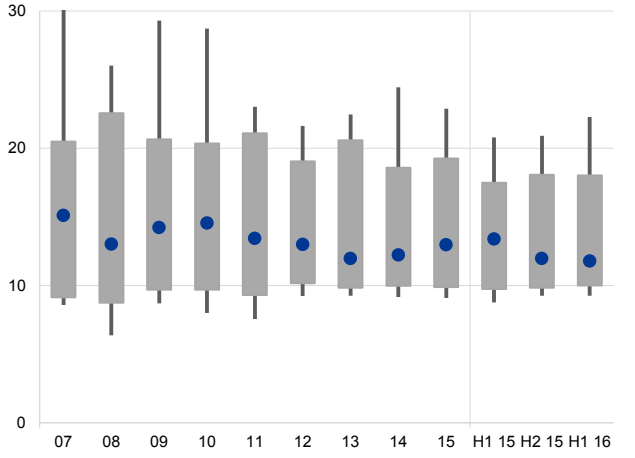
Sources: Bloomberg, individual institutions' financial reports and ECB calculations.
Notes: The combined ratio expresses the sum of incurred insurance losses and expenses as a share of net premiums earned. A ratio of below 100% indicates an underwriting profit.

Chart 3.21

Capital positions of euro area global insurers solid despite the decrease in the first half of 2016

Capital distribution for a sample of large euro area insurers

(2007 – H1 2016; percentage of total assets, 10th and 90th percentiles, interquartile distribution and median)



Sources: Bloomberg, individual institutions' financial reports and ECB calculations.
Note: Capital is the sum of borrowing, preferred equity, minority interests, policyholders' equity and total common equity.

Large euro area insurers' capital positions remained at comfortable levels (see Chart 3.21). In recent years, European insurers have been building up capital buffers in order to meet the requirements of the Solvency II regime, which came into force in January 2016. In particular, insurers have been changing their business mix towards less capital risk-intensive products and increasing maturities on the assets side in order to decrease the maturity mismatch between assets and liabilities. In addition, the preparation for the new regime was accompanied by a recent surge in mergers and acquisitions, which reached a record high in 2015.[38]

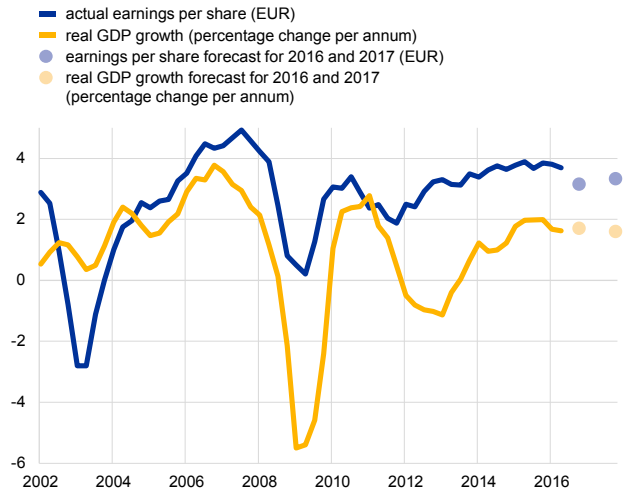
[38] For more details, see *Insurance M&A struggles to keep up with 2015's record pace*, SNL, September 2016 (link).

Chart 3.22

Analysts expect a slight drop in profitability for large euro area insurers

Earnings per share of selected euro area insurers and euro area real GDP growth

(Q1 2002 – 2017)



Sources: ECB, Thomson Reuters Datastream and ECB calculations.
Note: The real GDP growth forecast is based on the September 2016 ECB staff macroeconomic projections for the euro area.

Although the first annual statements under the Solvency II regime are required to be published only in early 2017, some insurers have already started to disclose Solvency II figures on a voluntary basis. The provisional figures – available for around half of the firms in the sample – show that the Solvency II ratios are above the prudential requirement of 100%, ranging from around 140% to around 240% in the first quarter of 2016.[39] Although Solvency II introduces a harmonised regime for insurance companies at the European level, the reported ratios are not fully comparable, owing to the complex nature of the underlying capital models, a number of transitional measures in place and some discretion in the implementation of the new regime across jurisdictions.[40] In addition, the current level of the ultimate forward rate (UFR) provided in Solvency II may not appropriately reflect the long-term expectations about interest rates and inflation. A downward adjustment of the UFR – as discussed by the European Insurance and Occupational Pensions Authority (EIOPA) – would lead to higher valuations of insurance liabilities with negative effects on solvency ratios.[41]

Insurance sector outlook: market indicators

Market-based indicators suggest a slight drop in insurers' profitability over the next years. Amid the low-yield and weak macroeconomic environment, profitability forecasts suggest a declining trend in the next years (see **Chart 3.22**). The profitability outlook remains particularly challenging in the low-yield environment for insurers with high policyholder guarantees operating in countries with limited scope to lower these guarantees, especially if those are non-diversified, small and medium-sized life insurers. The subdued growth outlook, combined with increased political uncertainty at both the national and EU level, further weigh on insurers' profitability prospects in both the life and non-life segments.

39 The Solvency II ratio is calculated as total available capital resources over the Solvency Capital Requirement (SCR). The latter is calibrated using the value at risk (VaR) of the basic funds of a company subject to a confidence level of 99.5% over a one-year period. Hence, a ratio over 100% indicates that an insurance firm has available capital resources that exceed the SCR.

40 The SCR (i.e. the denominator in Solvency II ratios) may be calculated using either the standard formula prescribed by the European Insurance and Occupational Pensions Authority (EIOPA) or an internal model formula validated by the supervisory authorities.

41 In April 2016, EIOPA issued a consultation paper, in which it states its intention to adopt a methodology to derive the UFR that would lead to a downward adjustment of the current level. The current level for obligations denominated in most currencies including the euro is set to 4.2%. Under Solvency II, the UFR is used to determine long-term risk-free interest rates, which are not directly observable in the market and thus require extrapolation towards a specific level (the UFR). The extrapolated rates are then used to discount insurers' long-term liabilities, i.e. the higher the UFR, the lower the present value of those liabilities.

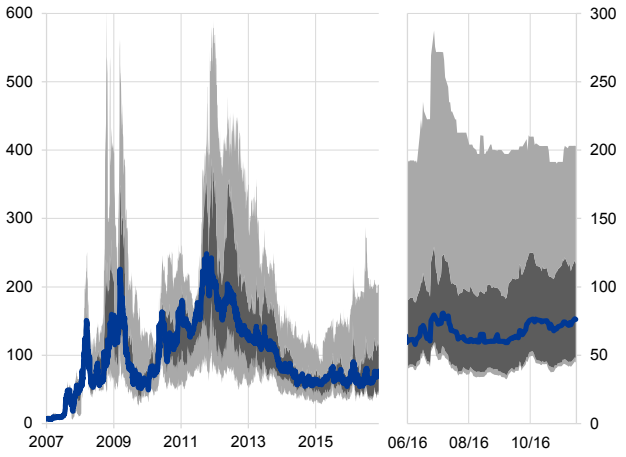
Spreads on credit default swaps (CDSs) written on euro area insurers have continued to widen (see Chart 3.23). This trend can be partially attributed to recent increases in insurers' exposure to more risky and illiquid assets. Although insurance firms need additional capital buffers for riskier investments to meet the solvency requirements, insurers are expected to continue piling up investment risk over the next year in their search for yield. Because of insurers' long-term liabilities, they are likely to (further) increase their investment in illiquid assets such as private equity, property and infrastructure, which are less attractive for other types of investors that have to keep their books more liquid. More investment risks on insurers' assets side make them more vulnerable to adverse economic and market shocks, which in turn could contribute to a further deterioration in credit and equity markets with negative repercussions for insurers' capital positions.[42]

Chart 3.23

Widening CDS spreads indicate an increase in concerns about credit risk

CDS spread for large euro area insurers

(3 Jan. 2007 – 15 Nov. 2016; basis points, senior debt, five-year maturity)



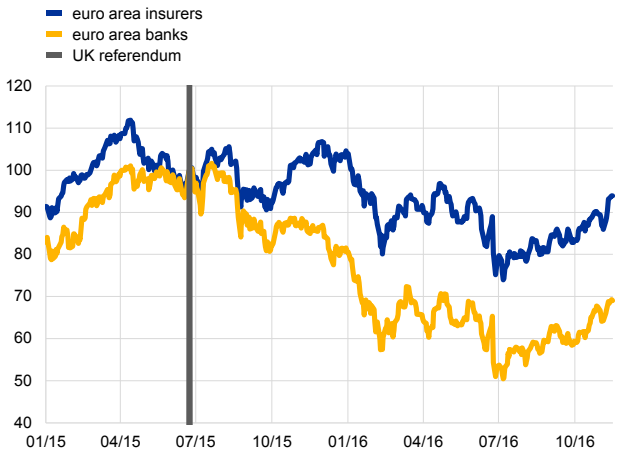
Sources: ECB, Thomson Reuters Datastream and ECB calculations.
Note: The light and dark shaded areas indicate, respectively, the minimum/maximum range and interquartile range for the CDS spreads of selected large euro area insurers.

Chart 3.24

Stock prices of euro area insurers reacted less than those of banks to the UK referendum outcome

Stock price indices for euro area insurers and banks

(1 Jan. 2015 – 15 Nov. 2016; daily observations, indexed to 100 on 23 June 2016)



Sources: Thomson Reuters Datastream and ECB calculations.
Note: Based on euro area insurance and bank indices.

Insurers' stock prices and CDS spreads experienced elevated volatility after the outcome of the UK referendum held on 23 June 2016. Market reactions to the outcome were, however, relatively short-lived and they were also more contained than those recorded in the banking sector. More specifically, the declines of euro area banks' stocks in the days following the UK referendum exceeded those of euro area insurers and overall the bank stocks have remained at lower levels since then (see **Chart 3.24**). Looking forward, the long-term impact of the UK referendum outcome on the insurance sector is expected to substantially depend on the new regime to be agreed between the United Kingdom and other EU countries. With respect to the new Solvency II regime, insurers in both the euro area and the United

[42] See also the discussion in the next section on recent adjustments in investment portfolios.

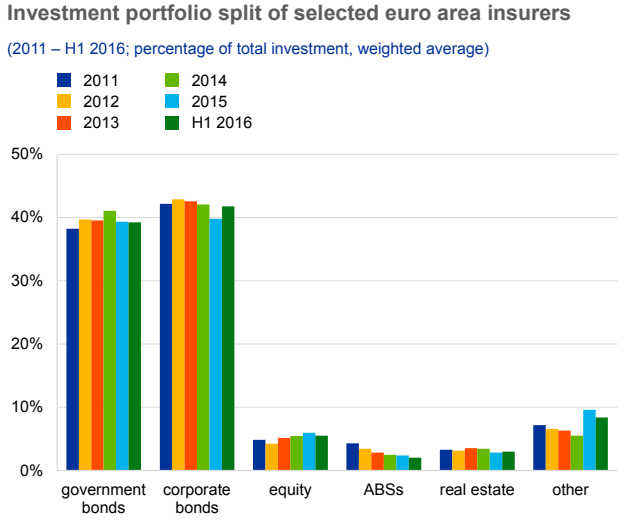
Kingdom have already covered the implementation costs and, therefore, large deviations from this regime are not expected in the short-to-medium term.

Investment portfolios adjusted further in the low-rate environment

The bulk of euro area insurers' portfolios remain invested in fixed income instruments, which makes the sector's investment income particularly sensitive to interest rate risk (see Chart 3.25). Specifically, as insurers' portfolios continue to be dominated by government and corporate bonds, investment income tends to decline in a prolonged period of low interest rates because maturing assets and cash flows from premiums are typically (re)invested in low-yielding instruments. Although low rates also imply higher valuations, the valuation effect is typically lower on the assets side than on the liabilities side because the duration of the liabilities often exceeds that of the assets. This poses major challenges for life insurers, which are bound to pay out long-term guaranteed rates on the bulk of their liabilities. Therefore, investment strategies of many euro area insurers have recently been driven by the need to boost yields from investment, which is then reflected by gradual shifts in portfolio allocations.

Chart 3.25

Euro area insurers' investment portfolios shift towards corporate bonds



Sources: JPMorgan Cazenove, individual institutions' financial reports and ECB calculations.
Note: Based on data for 15 large euro area insurers and reinsurers.

The trend towards riskier investment portfolios continues, although at a slower pace than in 2015. First of all, large euro area insurers significantly increased holdings of corporate bonds, which are riskier than other fixed income instruments such as government bonds (see **Chart 3.25**). Second, a breakdown of the bond portfolio by rating suggests that holdings of BBB bonds are the second most prominent investment category in euro area insurers' bond portfolios (after AA-rated bonds) (see **Chart 3.26**).[43] Third, large euro area insurers increased their exposures to government bonds issued by "other" countries, i.e. neither the euro area, nor the United Kingdom, nor the United States (see **Chart 3.27**). Furthermore, reports from individual firms also suggest that insurers are increasing their exposures to illiquid assets such as property and infrastructure investments. These features notwithstanding, the pace of the portfolio adjustment in the first half of 2016 slowed down and was somewhat less pronounced than in previous years.

Although alternative investment allocations can bring diversification benefits, the increasing riskiness and illiquidity of insurers' portfolios is also a potential source of risk to financial stability. Large euro area insurers are important

[43] See also **Chart 3.35**.

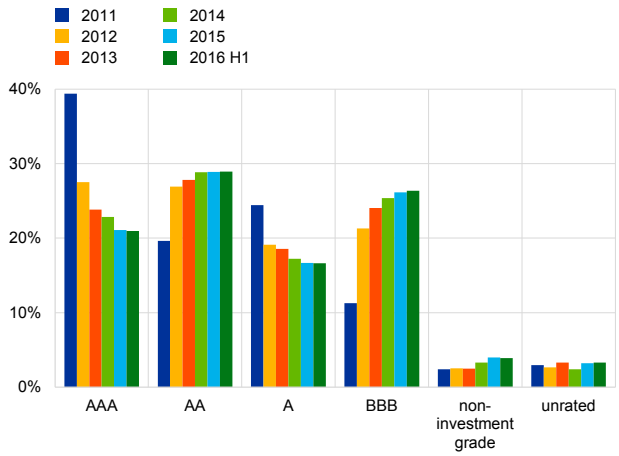
institutional investors and, therefore, their investment behaviour plays a key role in the stability of the financial system. In particular, if several large insurers were simultaneously forced to liquidate parts of their financial portfolios (e.g. to cover losses from a large catastrophic event, as a reaction to adverse economic and market shocks or in the event of mass rating migration[44]), they would have to sell the financial assets at market value. The associated market impact of such sales could induce another wave of fire sales, potentially threatening the stability of the financial system. Though limited, there is some evidence that insurers in a few countries acted procyclically with their asset allocations (e.g. following the dotcom crash of the early 2000s or during the recent financial and the European sovereign debt crises).[45] For the assessment of the potential spillover effects between insurance companies, banks and shadow banks, see Box 6, which presents a time-varying measure of interconnectedness among these different market players and thus provides insights about the contagion risks in the European financial sector as a whole.

Chart 3.26

The trend towards increasing exposures to higher-yielding bonds slowed down…

Bond investments of selected large euro area insurers split by rating category

(2011 – H1 2016; percentage of total investment portfolio, weighted average)



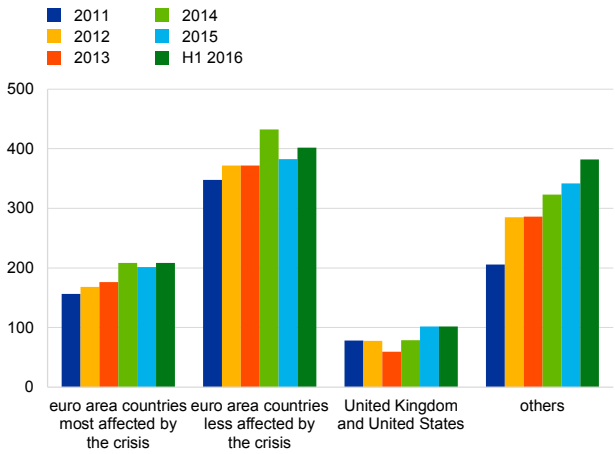
Sources: JPMorgan Cazenove, individual institutions' financial reports and ECB calculations.
Note: Based on data for 15 large euro area insurers and reinsurers.

Chart 3.27

…while exposures to non-euro area sovereigns continued to increase

Geographical split of the government bond holdings of selected large euro area insurers

(2011 – H1 2016; EUR billions)



Sources: JPMorgan Cazenove, individual institutions' financial reports and ECB calculations.
Notes: Euro area countries most affected by the crisis include Greece, Ireland, Italy, Portugal and Spain. Euro area countries less affected by the crisis include Belgium, France, Germany, Luxembourg and the Netherlands. The countries are split into the two different groups on the basis of whether a country experienced a significant deterioration in its long-term credit rating since the onset of the financial crisis. A significant deterioration is defined as a downgrade by two or more credit quality steps on the Eurosystem's harmonised rating scale between the end of 2008 and the end of 2015 according to at least one of the three credit rating agencies which cover all euro area sovereigns. Based on available data for 15 large euro area insurers and reinsurers.

[44] For a discussion of a mass rating migration as a possible trigger for forced selling of investment assets, see Section 3.1.2 of *Financial Stability Review*, ECB, May 2016, p. 82.

[45] For more details, see Section 3.2 of *Report on systemic risks in the EU insurance sector*, ESRB, December 2015, p. 15.

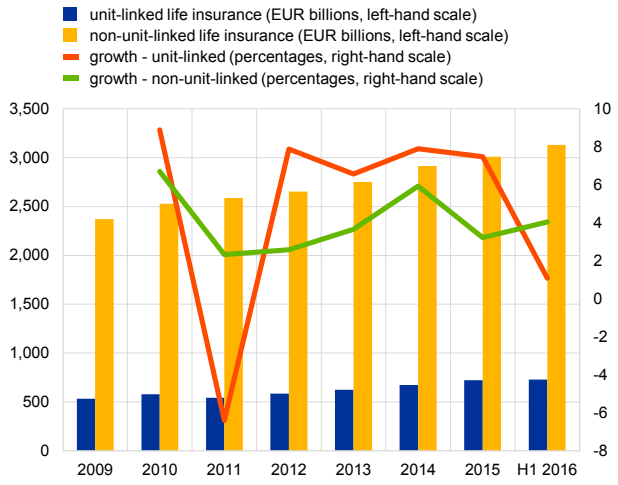
Life insurance: unit-linked business loses growth momentum

To limit exposures to interest rate risk, life insurers have been increasingly offering unit-linked products (see Chart 3.28). Historically, life insurers in the euro area offered traditional saving policies with guaranteed rates of return[46] and, as a result, this type of policy represents more than 80% of life insurance policies in the euro area. One disadvantage of these policies from the insurer's point of view is that the insurer bears the interest rate risk. This is proving to be particularly challenging in the current low-yield environment, in which it has become difficult for insurers to generate a margin above the average guaranteed rate on existing business. Therefore, many life insurers have reoriented their offering towards unit-linked policies (i.e. policies in which the investment risk is borne by the policyholder) and net equity of households invested in unit-linked products grew at an annual rate of around 8% in 2014 and 2015. These growth rates should however be interpreted with caution because they do not reflect only the actual sales/purchases but incorporate also other factors, notably changes in valuation, which are likely to be a significant factor driving fluctuations in the growth of unit-linked products over time.[47]

Chart 3.28
Unit-linked life insurance loses growth momentum

Net equity of households in unit-linked and non-unit-linked life insurance products

(2009 – H1 2016; percentage, EUR billions)



Source: ECB insurance corporation and pension fund statistics.
Notes: Based on data from 15 euro area countries. The ECB's insurance corporation and pension fund statistics are collected taking a short-term approach and are not fully harmonised.

Despite these limitations, the available data suggest that sales of unit-linked products have lost some growth momentum in the first half of 2016. Specifically, the growth rate of unit-linked products in this period dropped to around 1% only, compared with around 4% for non-unit-linked life policies. The drop suggests that euro area insurers may face difficulties in selling (purely) unit-linked products in the future. One likely reason is that risk-averse policyholders find these products less attractive than traditional saving products, especially in the current low-rate environment. Another reason could be that unit-linked policies are similar to saving and asset management products offered by other financial institutions and thus insurers face particularly intense competition in this market segment.

Going forward, alternative saving products, which combine guaranteed and unit-linked components, or fee-based products, may prove to be a more promising avenue. Although products with combined elements provide lower guarantees than traditional saving policies (e.g. guarantees may be offered only at the maturity of the policy and not on a yearly basis), they may still be sufficiently attractive for policyholders to achieve decent sales, while at the same time they also

46 Traditional life insurance products offer a yearly guarantee for a long duration.

47 Because of current data limitations, it is not possible to separate the two effects. In particular, the ECB's insurance corporation and pension fund statistics are collected taking a short-term approach and do not contain data on transactions. Therefore, the figures reflect – in addition to the actual flows of financing (sales and purchases of items) – several other factors such as valuation effects arising from changes in prices or exchange rates, reclassifications, other changes in the volume of assets and/or improvements in data quality (e.g. better coverage).

limit insurers' exposures to interest rate risk. Since part of the investment risk is still borne by insurers, these products do not however mitigate financial stability risk to the same extent as pure unit-linked products.

Non-life insurance and reinsurance markets: intense competition and technology reshape business

Non-life insurers also face significant challenges, despite being somewhat less affected by the low-yield environment than life insurers. Since non-life insurers tend to have both liabilities and assets of lower duration than life insurers, they are somewhat less exposed to a prolonged period of low interest rates than life insurers. [48] Still, as low yields put downward pressure on investment margins, most non-life firms cope with this environment by focusing on underwriting discipline and cost optimisation. Underwriting new business has, however, also become increasingly difficult in the prolonged weak macroeconomic environment and amid tough competition coupled with a mature insurance market in the euro area.

Traditional market incumbents, especially in non-life retail business, also face increasing competition from digital start-ups and other software-based companies. These companies usually reduce operational costs through highly automated processes, on the one hand, while providing highly personalised, timely and convenient services, on the other. Despite its small scale at the moment, the insurance technology industry ("insurtech") is growing quickly. Compared with 2014, investment in insurtech start-ups more than tripled in 2015, rising to above USD 2.6 billion, and it is becoming a global (rather than US-specific) phenomenon.[49] New market entrants often focus on filling market gaps that arise from new trends. By being "connected" in real time, insurtech firms often benefit from access to vast amounts of data about the customer, which enables them to monitor customers' habits and to adjust pricing to more accurately reflect the underlying risks. Therefore, investments in innovation and technology have become one of the key strategic considerations also for the traditional market incumbents.

The surge in catastrophe losses in the first half of 2016 has dampened the performance of the non-life and reinsurance industries, but may have a positive impact in the long run. Total insured losses amounted to USD 27 billion across the globe. Although in line with the ten-year historical average, the figure significantly exceeds the 30-year historical average of USD 15 billion. Among others, the main drivers of these losses were strong earthquakes in Japan and Ecuador as well as powerful storms in Europe and the United States.[50] As this surge comes after

[48] For more details on the impact of the low interest rate environment on different types of euro area insurers, see Special Feature B by Berdin, E., Kok, C., Mikkonen, K., Pancaro, C. and Vendrell Simon, J. M., entitled "Euro area insurers and the low interest rate environment", *Financial Stability Review*, ECB, November 2015, pp. 134-146.

[49] For more details, see Frenzy et al., "Innovation in insurance: How technology is changing the industry", Institute of International Finance, September 2016 (available here). Data on investment in insurtech start-ups come from CB Insights (www.cbinsights.com).

[50] For more details, see "Loss review for the first half of 2016: Storms and earthquakes drive losses up", MunichRe, July 2016 (available here).

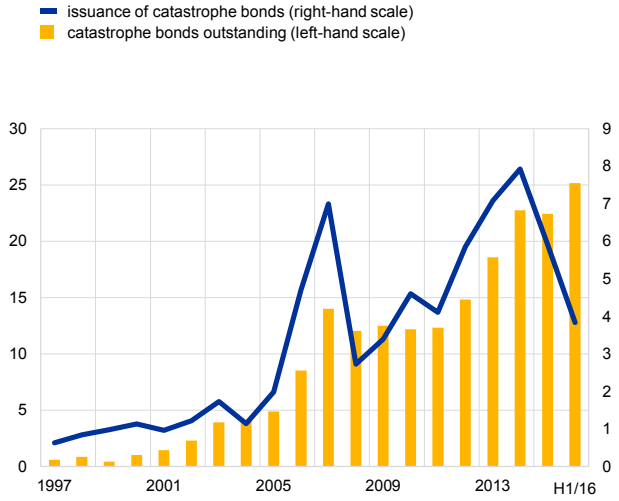
several years of below-average catastrophe losses that contributed to declining reinsurance rates and prices (see **Chart 3.30**), the recent catastrophe loss experience may help trigger demand for reinsurance in the future. Higher demand for reinsurance could also be induced by the new Solvency II regime, under which the purchase of reinsurance products brings capital relief.

Chart 3.29

Amounts outstanding of catastrophe bonds continue to rise…

Catastrophe bond issuance and amounts outstanding

(1997 – H1 2016; USD billions)



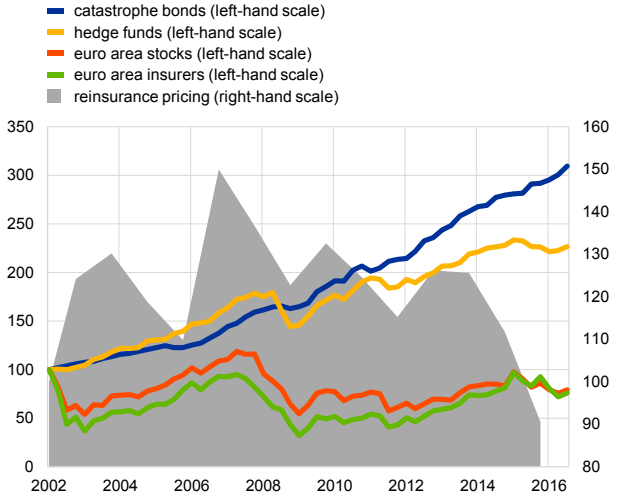
Source: Guy Carpenter.

Chart 3.30

…as they withstand recent bouts of market volatility and confirm their uncorrelated nature

Cumulative return profiles, broken down by market asset class and reinsurance pricing

(Q1 2002 – Q2 2016; index: Q1 2002 = 100)



Sources: Bloomberg, Guy Carpenter and ECB calculations.
Notes: The series for pricing ends in Q4 2015. The EURO STOXX index is used as the benchmark for euro area stocks. The Guy Carpenter World Property Catastrophe RoL Index tracks changes in property catastrophe reinsurance premium rates on a worldwide basis.

Alternative capital sources such as catastrophe bonds continue to challenge the traditional reinsurance business. Despite the decline in catastrophe bond issuance in 2015, the outstanding amounts continued to rise during the first half of 2016 and exceeded USD 25 billion at the end of June 2016 (see **Chart 3.29**). The uncorrelated nature of the underlying risk of catastrophe bonds with the rest of the financial markets,[51] coupled with relatively high yields, is particularly appealing to investors in the current environment, as high-yielding alternative investments with diversification benefits are scarce. Catastrophe bonds indeed proved to be resilient to the recent bouts of market volatility and equity declines (see **Chart 3.30**). Nevertheless, given the absence of large-scale catastrophe losses in recent years, the robustness of the catastrophe bond market when faced with such events is still to be tested.

[51] Compared with bonds issued by a certain company/sovereign, the main risk faced by investors in catastrophe bonds is typically a risk linked to a (natural) catastrophe event instead of a risk linked to a credit event. If a catastrophe event occurs, the principal (or part thereof) is not paid out to the investor, but is used by the insurance company to cover its claims.

Box 6

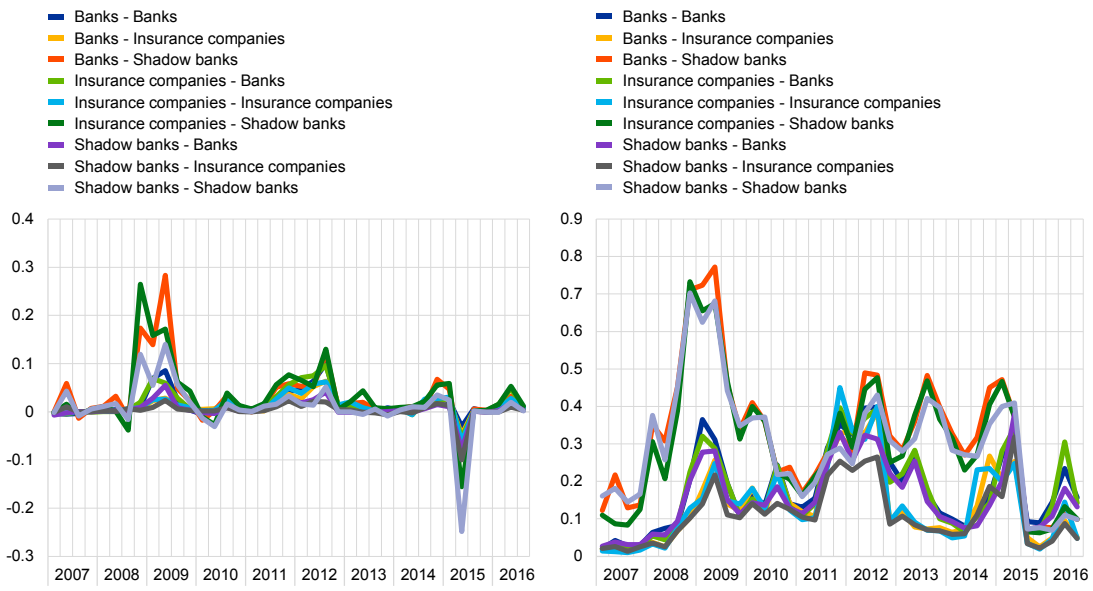
Assessing the spillover potential between banks, shadow banks and insurance companies in Europe

Financial distress in the non-bank financial sector can be transmitted to the banking sector through a number of direct and indirect transmission channels. First, the banking sector may be directly exposed to non-bank financial institutions through equity investment or credit claims. Credit claims often arise in connection with prime brokerage services through which non-bank financial firms increase their leverage. In addition, the liquidity credit lines that provide non-financial firms with a backstop against an outflow of their short-term liabilities could also give rise to a significant exposure. Second, non-bank financial institutions play an important role in the funding of the banking sector by investing in bank debt securities and providing liquidity through secured money markets, as well as through the provision of collateral. Third, banks and non-bank financial institutions are also indirectly interconnected through common exposures to assets. Distress in one of these sectors may give rise to asset fire sales, which would depress the prices of assets held by the other sector and, through mark-to-market accounting, adversely impact the profits and capital of that sector.

Chart A

dCoES estimates for a significant sample of banks, shadow banks and insurance companies

(dCoES measured in PD percentage points)



Sources: ECB and ECB calculations.
Notes: The weighted aggregate dCoES estimates are total asset-weighted averages of the underlying institution-to-institution level dCoES estimates linking all pairs of institutions from a sample of 1,911 firms. The chart on the right shows the 95th percentile of the institution-to-institution level estimates per sector combination instead of a weighted aggregate.

Against this backdrop, assessing the potential for contagion among different kinds of financial institutions is an important element to understand the systemic dimension of financial stability risks in the European financial sector as a whole. To this end, a time-varying measure of the interconnectedness of shadow banks, banks and insurance companies has been developed. The analysis relies on the delta-Conditional Expected Shortfall (dCoES) methodology which is a non-parametric variant of the parametric CoVaR/CoES method developed by Adrian and Brunnermeier

(2014)[52]. Using the expected shortfall (ES) concept, one can measure the marginal contribution of an institution *i* to *j*'s (tail) risk, as the difference between the conditional ES, which attempts to measure risk in the tail, and the median conditional ES, reflecting conditions for institution i during normal, non-stressed market conditions:

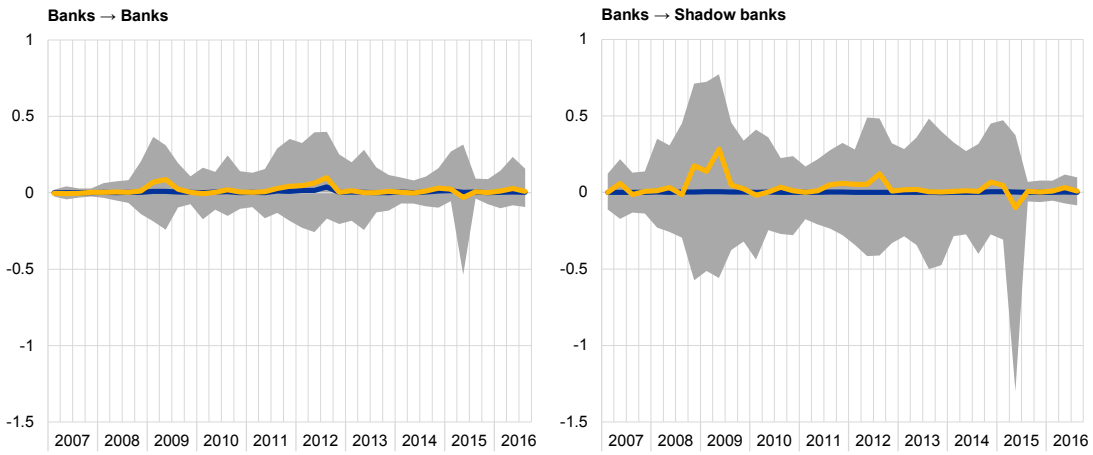
$$dCoES_q^{j|i} = CoES_q^{j|i} - CoES_{50}^{j|i}$$

This measure is computed for all pairs of institutions in a combined sample of 1,911 firms from Europe, based on one-quarter non-overlapping windows of daily data for their probabilities of default (PDs) over the period from January 2007 to September 2016.[53] The time-varying institution-to-institution level dCoES estimates are grouped into three sectors to subsequently compute asset-weighted aggregates linking the three sectors. The results are shown in Chart A. They suggest that there are two periods during which significant rises in spillover potential could be observed: Q4 2008-Q2 2009 and Q3 2011-Q3 2012. The two periods correspond to: (i) the aftermath of the collapse of Lehman Brothers that marked the beginning of the global financial crisis; and (ii) the ensuing euro area sovereign debt crisis that reached its apogee between the third quarter of 2011 and the third quarter of 2012.

Chart B

dCoES estimates over the Q1 2007-Q3 2016 period

(dCoES measured in PD percentage points)



Sources: ECB and ECB calculations.
Note: The weighted aggregate dCoES estimates (yellow line) are total asset-weighted averages of the underlying institution-to-institution level dCoES estimates linking all pairs of institutions belonging to the two sectors indicated in the header of the chart.

Chart B presents as an example out of the nine possible sector combinations the evolution of the cross-institution distribution of the dCoES weighted aggregates (in this case along with the whole cross-institution distribution) for the bank-bank and bank-shadow bank combinations to provide an additional illustration of the results. The weighted aggregate dCoES from Chart A (left panel) for these two sector combinations correspond to the yellow lines in Chart B, while the 95th percentile

[52] Adrian, T. and Brunnermeier, M. K., "CoVaR", Federal Reserve Bank of New York Staff Report No 348, September 2008 (revised September 2014).

[53] This measure is calculated using expected default frequencies provided by Moody's KMV for a sample of 1,911 financial institutions from 20 EU countries. The data cover 39 quarters of daily data (2,534 daily observations) over the Q1 2007-Q3 2016 period. Of the 1,911 total, 14% are banks. The remainder of the sample includes insurance companies, finance companies, investment management companies, and security brokers and dealers.

evolution from Chart A (right panel) corresponds to the upper end of the shaded area in Chart B. The visualisation helps reveal again the wider distribution of the potential for contagion including the shadow banking system over the considered time period.

Overall, tail risk-based measures such as the dCoES are useful as a contemporaneous monitoring tool, which in addition to an aggregate measurement of spillover strength across specific financial market segments can also be used to identify the most influential or most vulnerable firms (over time) or those firms that are both influential and vulnerable at the same time (not presented here). Such tail-risk measurement remains a reduced-form measurement, however, and warrants a deeper structural investigation with a view to identifying changes in exposure structures, for instance, to seek answers as to why spillover potential changes over time.

3.1.3 The non-bank financial sector continues to grow on account of investment fund inflows, following an intermittent slowdown

Growth in the investment fund sector, underpinning much of the expansion of the non-bank sector over the last years, recovered during the second and third quarters of 2016 amid volatile asset markets and continued net inflows. Growth of the investment fund sector, which was previously helped in the euro area as well as globally by credit disintermediation and the low interest rate environment in the aftermath of the global financial crisis, continued to rise in the second and third quarters of 2016. While a partial reversal of net inflows could be observed at the beginning of 2016, inflows resumed in the following months amid volatile asset markets. These inflows were concentrated mainly in bond and mixed funds, whereas equity funds domiciled in the euro area received very limited net inflows and net outflows could be observed for hedge funds (see **Chart 3.31**). The large and growing exposures of euro area investment funds over the past decade, in particular, have spurred concerns that the potential for this sector to amplify market-wide shocks has increased. Open-ended funds seemingly offer investors the possibility to engage in less-liquid markets, while being able to quickly respond to market-moving events by selling fund shares. On the downside, investors' overall demand for liquidity can suddenly rise in a market downturn, thus forcing the funds to adjust portfolios with an impact on secondary market liquidity when such liquidity is needed the most.

The run on some property funds in the aftermath of the UK referendum was a reminder that open-ended fund structures with daily callable claims can bear significant liquidity risk. Redemption requests started before the referendum, when investors began mitigating risks of negative effects on UK real estate in the event of "Brexit". Between April and July 2016 the UK commercial property fund markets experienced cumulated net outflows of about 10% of managed assets (see **Chart 3.32**). In the week starting on 4 July, some of the largest UK commercial property funds (managing more than GBP 20 billion of assets, representing 60-70% of the market) announced the suspension of redemptions when redemption requests had grown too large following the UK referendum. Containment measures used by the fund managers prevented further outflows and safeguarded shareholders who

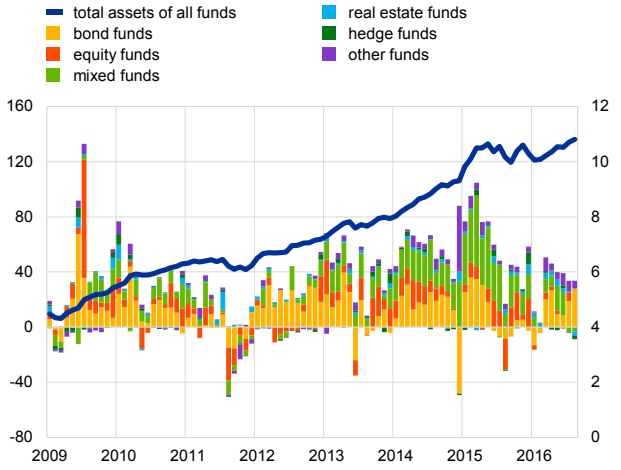
remained invested in the funds. Given both the largely idiosyncratic shock to the UK commercial real estate market and the limited exposures of euro area real estate funds to that market, channels for direct contagion from this event to euro area investment funds were limited. Only 7% of euro area real estate fund assets are invested outside the euro area (around €20 billion), including the United Kingdom. At the same time, euro area-domiciled property funds have notice periods or redemption gates in place and therefore are less prone to runs. The experience in the UK property fund market also showed that containment tools, such as the suspension of redemptions, can be effective in dealing with a sector in distress, but these measures are not suited to pre-empting the build-up of system-wide risks.

Chart 3.31

Growth in euro area investment funds continued due to net inflows amid volatile asset markets

Monthly net flows by type of fund and total assets

(Jan. 2009 – Aug. 2016; net flows in EUR billions (left-hand scale), total assets in EUR trillions (right-hand scale))



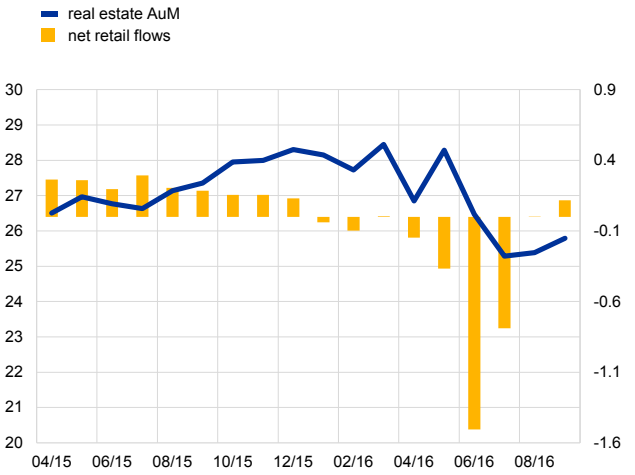
Source: ECB investment fund statistics.

Chart 3.32

British property funds had to cope with large outflows following the UK referendum in June

UK investment fund flows and funds under management

(Apr. 2015 – Sep. 2016; total assets in EUR billions (left-hand scale), net flows in EUR billions (right-hand scale))



Sources: The Investment Association and ECB calculations.
Notes: Funds domiciled in the United Kingdom invested in UK commercial real estate. AuM stands for assets under management.

Global investors withdrew money from European equities in a market environment affected by uncertainties following the UK referendum, continued low profitability prospects of euro area banks, and still modest nominal growth in the euro area. Continuous net outflows from euro area equities have been observed since last year, while net flows into UK equities turned negative only since the run-up to the referendum (see **Chart 3.33**). A less negative outlook than anticipated has yet to persuade investors to stop allocating money away from European equities. Meanwhile, fixed income funds invested in the euro area and the United Kingdom have experienced a reversal of net flows since March. The cumulated net inflows have turned positive since then for both funds invested in the euro area and those invested in the United Kingdom. While the sector has generally been able to cope with more volatile flows, the concern is that some investment funds have become increasingly vulnerable to a sudden reversal of flows under more extreme market scenarios.

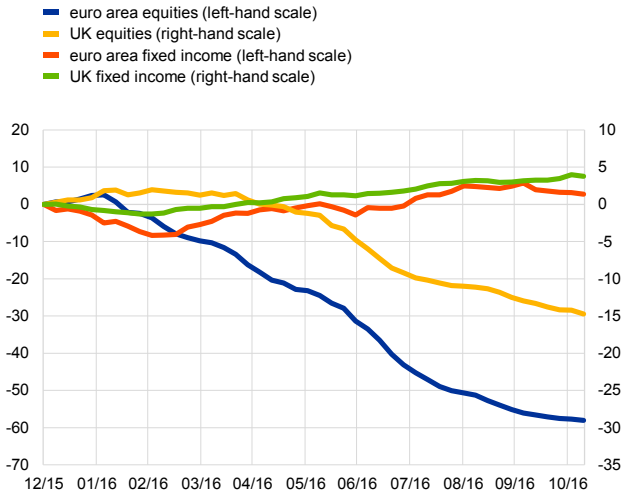
Institutional investors have been reconsidering their asset allocations in the light of continued central bank asset purchases and have been increasing their exposures to assets outside the euro area sovereign bond markets. As low or negative-yielding government bonds appeared increasingly unattractive, euro area investment funds have become a net seller of these bonds in the three quarters since the fourth quarter of 2015. The exposures have been reduced by a net amount of €57 billion (see **Chart 3.34**). Euro area investment funds have also sold €48 billion worth of MFI debt securities since the fourth quarter of 2014. Meanwhile, the funds have been stepping up exposures to the non-financial corporate sector, and the non-euro area bond markets including those of the United States, emerging markets and the rest of the EU. Around 48% of total euro area investment funds' financial assets are held in non-euro area equities and debt securities.

Chart 3.33

Global investors avoided UK and euro area equities, but until recently remained positive about fixed income

Investment funds' cumulated net country flows

(30 Dec. 2015 – 9 Nov. 2016; cumulated weekly net flows in EUR billions)



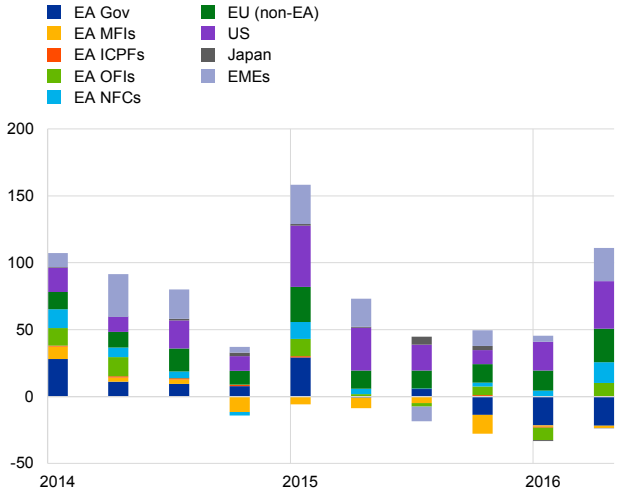
Sources: EPFR and ECB calculations.

Chart 3.34

Euro area investment funds have become a net seller of euro area government bonds

Quarterly net purchases of fixed income securities by euro area investment funds

(Q1 2014 – Q2 2016; net transactions in EUR billions)



Sources: ECB investment fund statistics and ECB calculations.
Notes: EMEs stands for emerging market economies, NFCs for non-financial corporations, OFIs for other financial intermediaries, ICPFs for insurance corporations and pension funds and MFIs for monetary financial institutions.

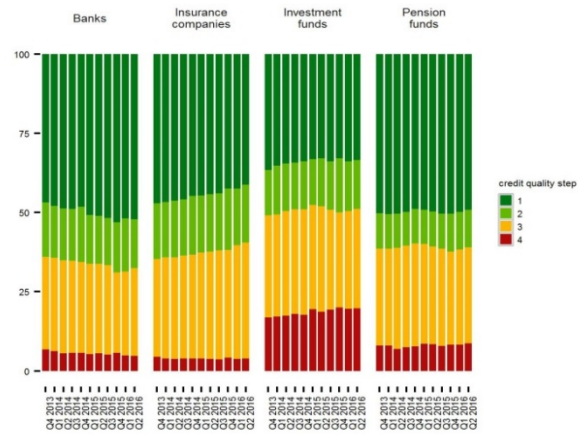
Cross-border exposures have grown significantly over the past years, leaving the euro area fund sector more exposed to developments in global markets. In terms of country allocation, the available breakdowns show that 15% of debt and equity instruments (including fund shares) are held in the United States, 9% in the non-euro area EU countries, and 2% in Japan. Exposures to emerging markets of up to 15% had temporarily been reduced in the light of elevated market volatility in the third quarter of 2015. However, another €40 billion of debt and equity securities have been added since then. With its large and growing share in cross-border exposures, the investment fund sector represents an important channel for spillovers to and from the euro area.

Chart 3.35

Some slowdown in the portfolio shifts of investment funds towards lower-rated debt securities

Euro area financial institutions' holdings of debt securities, broken down by rating and sector

(Q4 2013 – Q2 2016; percentage of total assets)



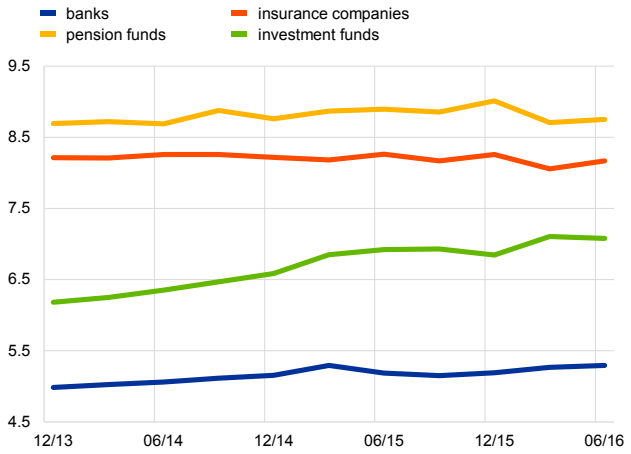
Sources: ECB Securities Holdings Statistics by Sector and ECB calculations.
Notes: Credit quality steps are defined in accordance with the Eurosystem credit assessment framework (ECAF), which provides a harmonised rating scale classifying ratings into three credit quality steps. The first category includes securities rated from AAA to AA-, the second from A+ to A- and the third from BBB+ to BBB-. A fourth category is added which includes all rated securities with a rating below credit quality step three. The analysis is based on the nominal amounts of euro and foreign currency-denominated securities, including "alive" and "non-alive" securities. The investment fund sector excludes money market funds.

Chart 3.36

Investment funds continued to increase residual maturities in their portfolios

Average residual maturity of debt securities held by the euro area financial sector

(Q4 2013 – Q2 2016; average residual maturity in years)



Sources: ECB Securities Holdings Statistics by Sector and ECB calculations.
Notes: Long- and short-term, euro and foreign currency-denominated debt securities are included only if they have an ISIN reported, are considered "alive" and have a residual maturity of up to 30 years. Banks hold a particularly large share of securities with reported maturity exceeding 30 years for which precise information is less reliable (e.g. for securities without a definite date of maturity) and which are therefore excluded. In order to estimate the average, residual maturities are weighted by the nominal amount held of each security by each sector over the total debt holdings of each sector.

In a negative-yield environment, it seems that institutional investors have been venturing into longer maturities and further down the credit risk spectrum. A common pattern observed during the past few years is that some institutional investors have shifted their asset allocation from higher to lower-rated debt securities and increased the duration of their portfolios (see **Chart 3.35** and **Chart 3.36**). This pattern is particularly pronounced for investment funds and insurance companies, but may also be present in other institutions which fall outside the limited scope of official statistics. Increased risk-taking by investment funds is also evident in their allocation to bail-inable bank debt securities. A clear shift in allocation can be observed in the last two years from debt securities with higher to lower seniority levels (see **Box 7**). These patterns seem to support the general trend of increased risk-taking by investment funds and ICPFs, matching their portfolio shifts towards lower-rated debt securities. The longer durations and higher risk exposures leave investors more exposed to any nominal changes in rates as well as spreads.

Box 7

The evolution of sectoral holdings of bail-inable bank debt

The sectoral distribution of holdings of bank debt has a clear bearing on contagion and – by extension – on financial stability in the event of bank distress. Indeed, under the new bail-in regime in the EU, eventual write-downs (and/or conversion into equity) upon bank bail-in need to be distributed among shareholders and creditors according to a predefined creditor hierarchy, while

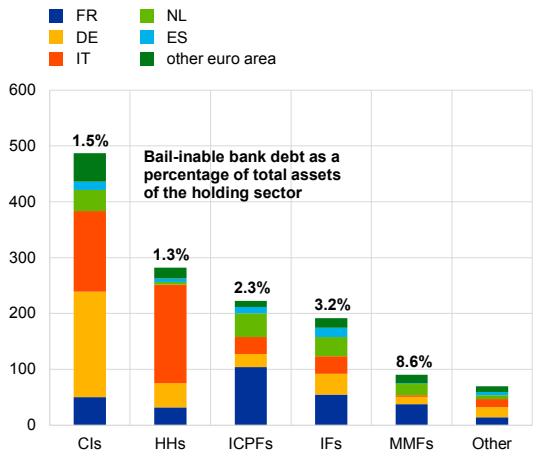
avoiding contagion effects on the broader financial system.[54] On the one hand, if a bank were to struggle, high financial sector concentration of its bail-inable debt could lead to concerns over spillover effects. On the other hand, if the bail-inable instruments were held mainly by the household sector, the use of bail-in tools in a bank resolution process may have negative effects on the economy resulting from effects on spending and potential political tensions.

Chart A

Some heterogeneity of bank debt holdings across sectors and by country of issuance

Holdings of bail-inable bank debt securities by euro area holding sector and by country of issuance

(Q1 2016; EUR billions)



Sources: ECB Securities Holdings Statistics by Sector and ECB calculations.
Notes: Bail-inable debt includes senior unsecured and subordinated bank debt securities. Breakdowns in the chart show issuance by domicile of the issuing bank and holdings by euro area sectors. Percentages on top of columns show debt holdings relative to total assets (for financial sectors) and relative to financial assets (for households).

For macroprudential, supervisory and resolution authorities, such financial stability concerns underscore the importance of assessing the distribution of such bail-inable debt and monitoring its evolution over time. With a view to examining the sectoral holdings of debt issued by euro area banks in a cross-sectional and time dimension, the ECB's Securities Holdings Statistics (SHS) can be used for this purpose and can be combined with information from the Centralised Securities Database (CSDB) on the type of debt and the seniority level, allowing a granular view of the holdings also by seniority type.

At the euro area level, there is some heterogeneity in the holdings of bail-inable bank debt across sectors and by country of issuance (see Chart A). For instance, bail-inable debt issued by French banks is held predominantly by insurance corporations and pension funds (ICPFs), whereas debt issued by German banks is held predominantly by credit institutions (CIs). A large share of the bail-inable debt issued by Italian banks is held by households (HHs), while that held by credit institutions is lower but also significant. For other countries, the share of households is much smaller, although it is non-negligible for debt issued by German banks. Sectoral exposures are relatively minor when compared with the amount of total assets held by each sector. Only money market funds (MMFs) have notable exposures to bail-inable bank debt relative to the size of their balance sheets (8.6%) due to their distinct business model.[55]

Cross-country differences also exist in the investor base of bail-inable bank debt when distinguishing between the domiciles of investors at the national, euro area and international levels (see Chart B). Much of the bail-inable debt of the two largest issuing countries, i.e. Germany and France, is held either domestically or outside the euro area. The large share of non-euro area holdings may indicate that bail-in operations on euro area banks can also

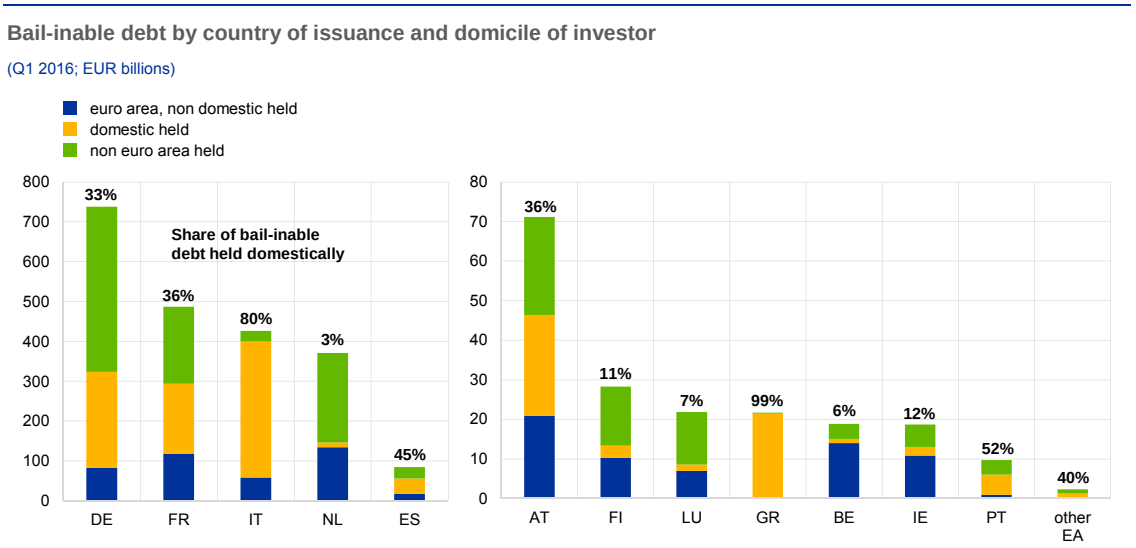
54 The bail-in tool as prescribed by the EU Bank Recovery and Resolution Directive (BRRD) enables the resolution authority to write down and to convert into equity the claims of a broad range of bank creditors, according to a predefined creditor hierarchy. For more details, see the special feature entitled "Systemic implications of the European bail-in tool: a multi-layered network analysis", *Financial Stability Review*, ECB, May 2016.

55 For a more detailed analysis of the who-to-whom holdings, see Hüser, A.-C. and Kok, C., "Mapping bank securities across euro area sectors: comparing funding and exposure networks", *ECB mimeo*.

have non-negligible effects on the rest of the world. There is a more limited share of non-domestic euro area holdings, except for issuances by Dutch banks, and to some extent French banks, which are held by a geographically more diversified investor base. Italy stands out with a relatively high share of domestic investors. Overall, the large share of intra-bank holdings reflects a high degree of interconnectedness in the euro area banking sector.[56]

Chart B

Home bias present in most countries, but a relatively high share of non-euro area investors



Sources: ECB Securities Holdings Statistics by Sector and ECB calculations.
Notes: Bail-inable bank debt includes senior unsecured and subordinated debt issuances and excludes secured issuances (e.g. covered bonds) and issuances for which a seniority flag was not available in the database.

The evolution of sectoral holdings of bail-inable bank securities shows some notable patterns coinciding with the introduction of the BRRD (see Chart C). The BRRD was introduced at the beginning of 2015 and the bail-in tool came into force in January 2016. Against this background, given the increased likelihood of being bailed in, some investors may have been incentivised to reduce their holdings of bank securities lower in the creditor hierarchy, while increasing holdings of securities with higher seniority (or disposing of holdings of bank debt and equity altogether).[57] The decrease in bank debt holdings of credit institutions stands out in particular. This decline in exposures to bail-inable debt was accompanied by a relative increase of secured debt holdings between the fourth quarter of 2014 and the first quarter of 2016. Households have also decreased their holdings of bank debt overall, but – unlike banks – they have increased their share of subordinated debt.

[56] For a more detailed analysis of the cross-country, cross-sectoral differences in bank debt holdings, see Pigrum, C., Reininger, T. and Stern, C., "Bail-in: who invests in non-covered debt securities issued by banks", *Oesterreichische Nationalbank Financial Stability Report*, forthcoming.

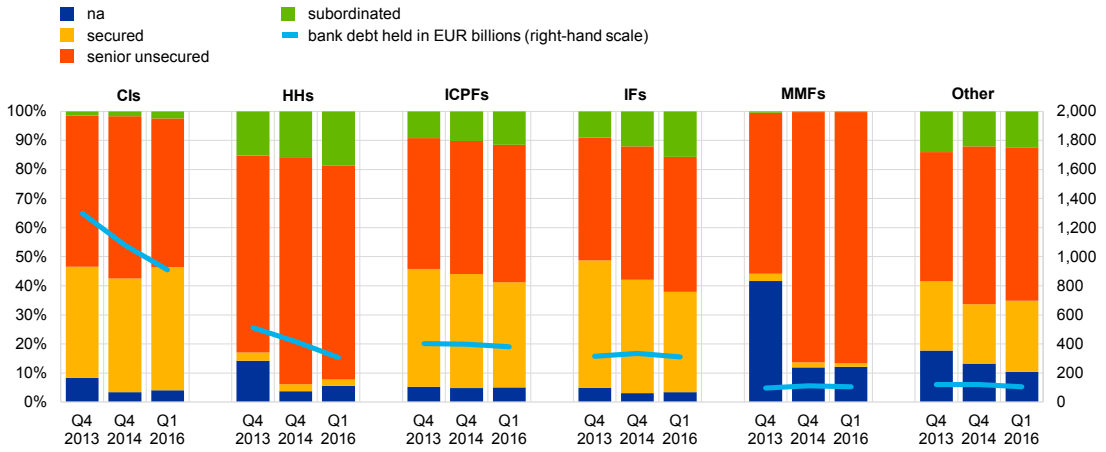
[57] If the bail-in is triggered, shareholders will be bailed in first, followed by subordinated and then senior unsecured creditors. See also Special Feature B, *Financial Stability Review*, ECB, May 2016.

Chart C

The non-bank sectors have shifted their holdings from higher to lower seniority levels, while banks have reduced their exposures to bail-inable debt

Share in nominal bank debt securities holdings by sector and seniority

(Q4 2013, Q4 2014, Q1 2016; percentages (left-hand scale), EUR billions (right-hand scale))



Sources: ECB and ECB calculations.
Notes: Seniority levels are classified into subordinated debt, senior unsecured debt (both bail-inable) and secured debt (not bail-inable). The residual "na" includes securities for which a seniority flag was not available in the database. The calculations are based on the nominal amounts of euro and foreign currency-denominated securities, including "alive" and "non-alive" securities. The investment fund (IF) sector excludes money market funds. "Other" includes financial vehicle corporations, other financial intermediaries, non-financial corporations, governments and holdings not classified elsewhere.

Another important observation is the clear shift in asset allocation by the non-bank sectors from debt securities with higher to lower seniority levels over the last two years. Such a shift is more pronounced for investment funds (IFs), but it can also be observed for ICPFs and households. These patterns seem to be in line with the general trend of increased risk-taking by investment funds and ICPFs observed in their portfolio shifts towards lower-rated debt securities. Based on market values, there are indications that exposures of most sectors to bank equities have declined, most notably for investment funds, credit institutions and households, reflecting falling bank stock prices as well as portfolio shifts within the securities holdings.[58] Overall, it appears that exposures to unsecured bank debt have partly shifted from the banking sector to households, ICPFs and investment funds. Tighter risk-taking constraints for banks compared with other sectors may have played a role in these shifts of bail-inable bank debt.[59]

These shifts of bail-inable debt holdings to sectors outside the core financial system may appear desirable from a financial stability perspective, because risks are borne by investors that are potentially of less systemic relevance. However, there are diverging views as to who should optimally be invested in bail-inable debt securities. Should the risk of losses materialise for a broader set of investors, including private savers, this could have a detrimental effect on spending and the economy. Moreover, the sophistication of investors should matter as the market-disciplining effect of bail-in could be limited, for instance, if households were not demanding adequate risk premia. Ultimately, the observed shifts in bail-inable debt holdings also lend support to concerns

[58] Given that equity holdings are measured at market value, it is not possible to fully disentangle the share of the decrease due to the shedding of assets and the share due to lower equity prices, which have been falling over the same period.

[59] See also the discussion in Special Feature B, *Financial Stability Review*, ECB, May 2016.

about the growing susceptibility of non-bank financial intermediaries[60] and political considerations associated with any bail-in decision which would affect a broader investor base.

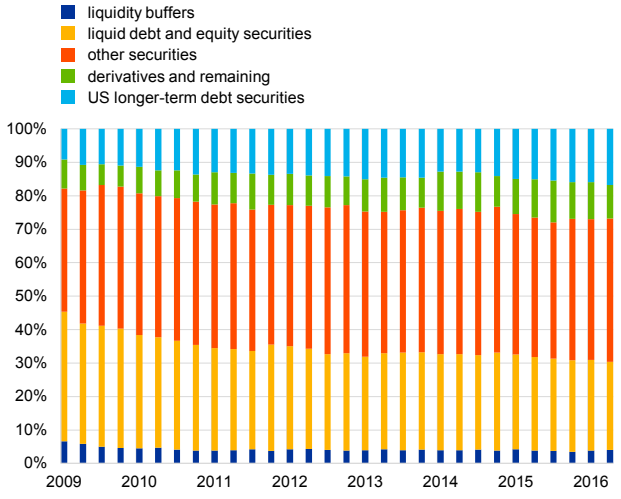
Illiquidity can be another source of relative yield amid these changing investment patterns, where the less-liquid instruments offer seemingly higher returns but at the risk of worse future fund performance if forced to sell in a market downturn. Liquidity and maturity transformation continues to grow among bond funds in the context of these changing sector-wide investment patterns. Balance sheet indicators point to a decrease in the most-liquid positions of bond funds since 2009, including cash holdings, debt securities issued by euro area governments and short-term instruments (see **Chart 3.37** and **Chart 3.38**).

Chart 3.37

Composition of assets held by euro area bond funds has shifted towards longer-term and less-liquid assets

Assets held by euro area bond funds

(Q1 2009 – Q2 2016; percentage of total assets)



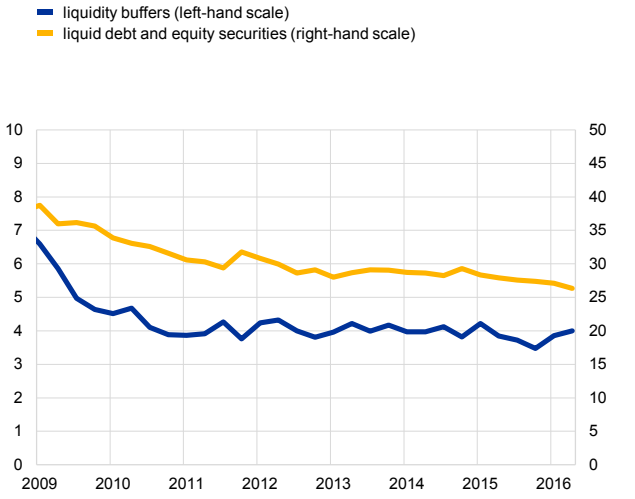
Sources: ECB investment fund statistics and ECB calculations.
Notes: Liquidity buffers include loans and deposits, where the statistical classification does not allow a distinction between loans and deposits. Liquid debt and equity securities include debt securities issued by euro area governments, debt securities issued with an original maturity under one year and equities issued in the EU, Japan and the United States. "Derivatives and remaining" refers to derivatives exposures and other on-balance-sheet exposures, including accrued interest.

Chart 3.38

Bond funds' liquidity buffers and share in liquid assets have declined since the global crisis

Bond funds' cash buffers and liquid assets

(Q1 2009 – Q2 2016; percentage of total assets)



Sources: ECB investment fund statistics and ECB calculations.
Note: See the notes to **Chart 3.37**.

While the sector faces higher liquidity and maturity mismatches, redemption profiles of most bond funds have remained unchanged. In the current market environment, rent-seeking seems all the more attractive for investors if positions can be unwound upon the first signs of distress. In such an environment, open-ended mutual funds, exchange-traded funds (ETFs) and other structures seemingly offer the possibility to engage in higher-yielding markets, but without giving up the possibility to liquidate positions quickly upon signs of distress. However, the higher risk and longer

[60] For an analysis of the possible role of institutional investors in bank debt securities markets, see Oprică, S. and Weistroffer, C., "Institutional presence in secondary bank bond markets – How does it affect liquidity and volatility?", *Working Paper Series*, ECB, forthcoming.

durations also leave investors more exposed to any nominal changes in rates as well as spreads. Less-liquid portfolios and lower cash holdings leave a limited buffer against bouts of volatility and large outflows. Concerns remain that investors' overall demand for liquidity could suddenly rise, thus adding to market pressures and contributing to a decline in secondary market liquidity.

Fixed income strategies have become increasingly dependent on market-wide risk factors, which could amplify the effect of possible asset price corrections. Generating absolute returns has gradually become more challenging in the low interest rate environment. Fund managers face the difficult choice between expanding their cyclical exposures, including those with longer duration and lower ratings, and raising exposures which are less risky but yield negative returns and possibly attract fewer inflows. Higher cross-asset correlations have made it even more difficult to keep return sensitivity to market-wide factors at bay. As a result of these higher correlations and the growing share of fund-intermediated investments, strategies have become more crowded in fixed income markets. Estimated market betas for a large sample of UCITS fixed income funds relative to fund-specific benchmark indices point to a gradual increase in market-wide risk exposures over the past years (see **Chart 14** in the Overview). This has made funds increasingly exposed to market-wide risk, strengthening channels for the transmission of market-wide shocks, not only among bond funds but also to other types of investors. These channels have become more important with the growth of the non-bank financial sector in recent years in general.

The euro area money market fund (MMF) sector continued to grow amid the current negative rate environment. Following a prolonged period of net outflows after the financial crisis, cumulated net flows started to level off in 2014 and grew in 2015. In the first quarter of 2016 some net outflows could be observed mainly from non-euro area investors, while in the second quarter MMFs received more broad-based net inflows. Non-euro area investors as well as euro area investors have contributed to this growth; the figures shown in **Chart 3.39** include euro as well as foreign currency flows into euro area MMFs, including GBP and USD flows. The reasons for the expansion of MMFs include lower competition from banks amid an environment of ample liquidity and few alternatives for cash-like instruments where investors are sensitive to relative performance. Some MMFs have reportedly received inflows from large non-financial corporates that face zero or negative bank deposit rates on their overnight deposits, rendering fund investments more attractive in comparison. These corporates have partly shifted the cash balances that they previously held in overnight bank accounts to money market funds.

Money market funds have incentives to take somewhat higher risk, as they compete with alternative cash-like investments. It is noteworthy that, on average, bank deposits are still to some extent higher yielding than MMF returns (see **Chart 3.40**). While bank deposit rates for corporates are still slightly positive on average, MMF returns have in fact been negative since 2015. However, these average rates conceal heterogeneity of bank deposit rates offered to different depositor types, i.e. with some banks passing on negative policy rates to non-financial corporates. In order to maintain returns relative to alternative cash or cash-like claims above critical

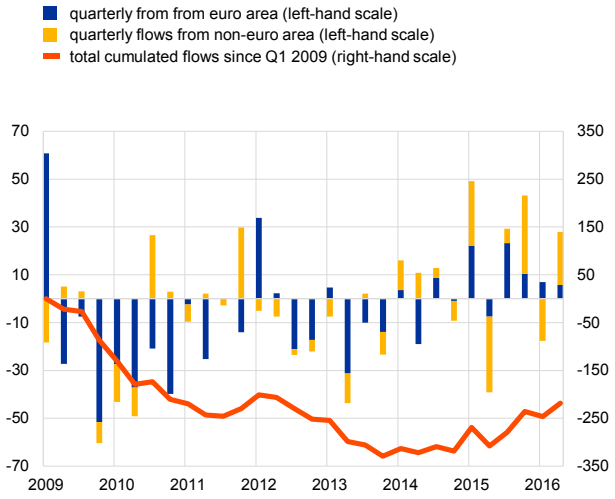
levels, euro-denominated MMFs have an incentive to venture into higher-yielding assets and to take on more risk. MMF balance sheet data suggest that MMFs have recently increased their share of non-government paper, looking for potentially higher-yielding assets. However, such risk-taking is bound by regulatory limits regarding certain asset exposures. MMFs are also inclined to engage more in maturity transformation, albeit within regulatory limits. Regarding MMF's corporate exposures, since 2014 the share of MMFs' holdings of non-financial corporate debt has risen at the expense of holdings of debt securities issued by credit institutions. These shifts in exposures come with a risk of unravelling if short-term rates were to rise.

Chart 3.39

Money market funds have received net inflows in the recent quarters in the low-yield environment

Quarterly net flows into and out of MMFs

(Q1 2009 – Q2 2016; shares issued (flows) in EUR billions)



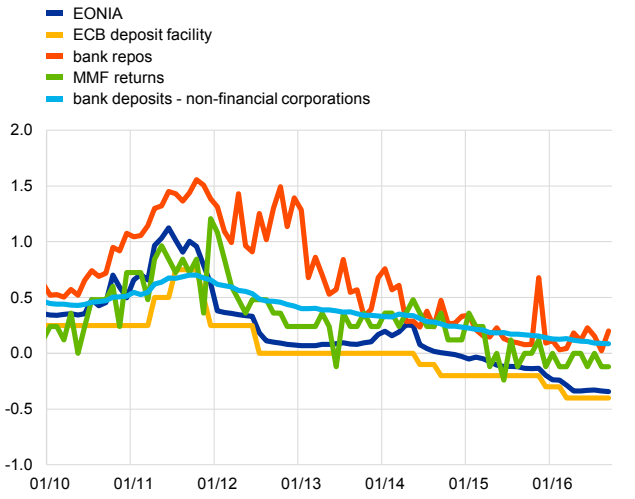
Sources: ECB BSI statistics and ECB calculations.

Chart 3.40

Money market funds appear relatively attractive as they compete with alternative cash-like instruments

Annualised returns of euro-denominated MMFs in comparison with interbank, policy and deposit rates

(Jan. 2010 – Sep. 2016; percentage)

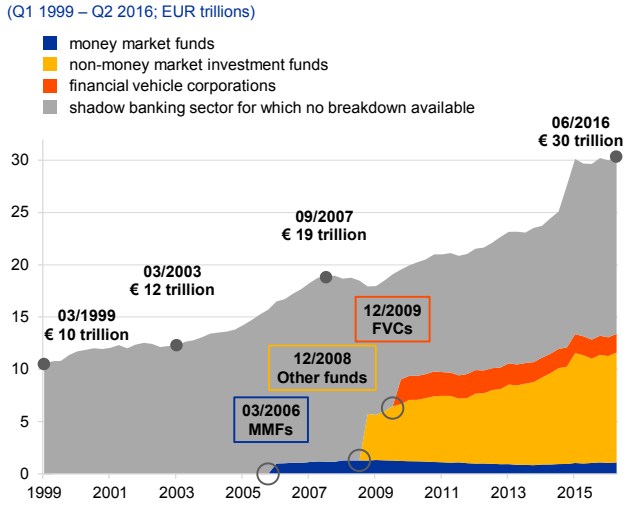


Sources: EPFR, ECB and ECB calculations.
Notes: MMF returns are based on EPFR data for euro-denominated funds. Bank repo and deposit rates are based on the ECB MFI interest rate statistics using the narrowly defined effective rate.

As regards foreign currency-denominated MMFs, USD MMFs expanded faster than funds investing in the euro-denominated money market. The MMF holdings of USD securities have been on the rise since 2011. However, some of the increase in the USD assets underlying growth of the sector more recently was also driven by exchange rate effects, i.e. the US dollar appreciating against the euro. In the United States, anticipation of new regulation which came into force on 14 October led to a significant shift from prime funds to government funds. A main element of the new regulation is that prime funds in the United States need to transact at a variable net asset value (VNAV), whereas the funds transacted previously at constant net asset value (CNAV). Stricter regulations for US prime MMFs may have resulted in a decline in the supply of unsecured US dollar funding by these funds. A broader-based USD funding risk for euro area banks appears to be limited though, as the current low-yield environment has so far ensured ample

liquidity. An abrupt shift in risk sentiment could still lead to a shortage of USD funding for some weaker euro area banks.

Chart 3.41
The assets of the non-bank, non-insurance financial sector have somewhat expanded



Sources: ECB and ECB calculations.
Notes: A breakdown of statistical data for MMFs, other funds and financial vehicle corporations (FVCs) is available only from the indicated dates onwards. The broad shadow banking sector includes MMFs and all other non-monetary financial institutions apart from insurance corporations and pension funds.

Concerns remain that risks may be building up in the parts of the financial sector for which a detailed statistical breakdown is not readily available. Total assets held by the non-bank, non-insurance financial sector comprising MMFs, non-MMF investment funds and financial vehicle corporations (FVCs) have somewhat expanded since the first quarter of 2016 (see **Chart 3.41**). Growth in the investment fund sector has picked up again, driving the expansion of the non-bank financial sector, while the much smaller MMF sector has also continued to grow. FVCs have remained stable over the past quarters owing to somewhat stronger loan origination and securitisation activity by euro area credit institutions. While it appears that the non-bank financial sector is growing, a significant proportion (up to 50%) cannot be classified by euro area accounts according to the type of entity (the residual "other financial intermediaries" or OFIs). In the past few years, the ECB has started to collect some balance sheet data for the OFI sector, which has shed some light on the composition of and notable shifts within non-bank financial sector assets. At the national level, more detailed information on the types of entities is available for at least some countries. For example, De Nederlandsche Bank collects monthly survey data on so-called special financial institutions (SFIs), which include information on individual sub-sector components, such as holding companies. From these national sources it is estimated that at least two-thirds of the residual OFIs are special financial institutions, holding companies or other entities not engaged in shadow banking activities. For the remainder, there is a possibility that those entities engage in risky liquidity transformation or credit intermediation.[61]

Significant progress has been made more recently in reducing this OFI residual by enhancing statistics at the national level. For instance, the Central Bank of Ireland has introduced a non-securitisation special-purpose vehicle (SPV) data collection. In order to address data gaps and to improve oversight of the SPV sector, new quarterly reporting requirements for SPVs were announced in July. This data collection is based on the application of the FVC granular reporting form to SPVs which are not principally engaged in securitisation. Further data collections are undertaken by the ECB for the sectoral accounts which might help to produce additional data breakdowns for the OFI sub-sectors and further reduce the OFI residual.

[61] The Financial Stability Board has been gathering data at the national level to close the remaining gaps and to help determine whether certain entities engage in shadow banking activities.

3.2 Evaluating the resilience of euro area financial institutions through scenario analysis

This section provides a quantitative assessment of four macro-financial scenarios that map the main systemic risks identified in the analysis presented in the previous sections of this report (see Table 3.1). The assessment of the impact of macro-financial shocks on euro area banks and insurers is based on a macroprudential simulation exercise involving top-down stress-testing tools.[62] The presented results for the euro area banking groups are not comparable with the results of bottom-up supervisory exercises, such as the 2016 European Banking Authority (EBA) bank stress-testing exercise, which relied primarily on the internal bank risk models instead of top-down models. Moreover, the adverse scenario used for the EBA exercise encompasses several risk factors instead of the more targeted scenarios designed for this assessment. Similarly, the results for the euro area insurers are obtained using a conceptually and methodologically different approach from the ongoing bottom-up EU-wide stress-testing exercise carried out by the European Insurance and Occupational Pensions Authority (EIOPA), which also covers a much broader range of European insurers. [63] Due to the limited availability of disaggregated data on assets, liabilities, capital and profitability of financial institutions other than banks and insurers, this section does not assess the resilience of these parts of the financial sector or possible feedback from banks and insurers to other non-bank financial institutions. It only considers potential spillovers from investment funds to euro area banks and insurers.

Table 3.1

Mapping the main systemic risks into adverse macro-financial scenarios

Risk	Scenario	Key assumptions driving impact on GDP
Global risk repricing leading to financial contagion, triggered by heightened political uncertainty in advanced economies and continued fragilities in emerging markets	Global risk aversion scenario	Financial market turbulence triggered by an increase in long-term risk-free interest rates, stock price declines, a widening of corporate bond spreads and lower euro area foreign demand
Adverse feedback loop between weak bank profitability and low nominal growth, amid challenges in addressing high levels of non-performing loans in some countries	Weak bank operating environment scenario	Shocks to private investment and consumption
Re-emerging sovereign and non-financial private sector debt sustainability concerns in a low nominal growth environment, if political uncertainty leads to stalling reforms at the national and European levels	Debt sustainability crisis scenario	Renewed rise in sovereign bond yields to elevated levels and stock price declines
Prospective stress in the investment fund sector amplifying liquidity risks and spillovers to the broader financial system	Investment fund spillover scenario	Broad-based disorderly asset sales by the investment fund sector, leading to higher bank funding spreads, falling asset prices and a higher cost of capital for the real economy

Source: ECB.

62 The tools employed are: (i) a forward-looking solvency analysis, similar to a top-down stress test, for euro area banks; and (ii) a forward-looking analysis of the assets and liabilities side of the euro area insurance sector. For a more detailed description of the tools, see Henry, J. and Kok, C. (eds.), "A macro stress-testing framework for systemic risk analysis", *Occasional Paper Series*, No 152, ECB, October 2013, as well as "A macro stress-testing framework for bank solvency analysis", *Monthly Bulletin*, ECB, August 2013.

63 For a description of the methodology and results of the EIOPA exercises, see *EIOPA insurance stress test 2014*, 28 November 2014. The results of the ongoing 2016 EU-wide insurance exercise are expected to be disclosed in December 2016.

Main features of the adverse macro-financial scenarios

The four macro-financial scenarios are designed using a range of tools. Statistical simulations are used to derive shocks to government bond spreads, stock prices, and asset values of investment funds, as well as responses of other financial market parameters to these shocks. International spillovers of financial shocks from non-EU countries are modelled using Bayesian vector autoregression (BVAR) models and a global vector autoregression (GVAR) model[64], while the impact of global developments outside the European Union on euro area foreign demand is assessed using NiGEM (National Institute Global Econometric Model). The impact of the shocks on the euro area economies has been derived using stress-test elasticities (STEs).[65] The baseline scenario used in the assessment is derived from the European Commission's spring economic forecast.

The global risk aversion scenario reflects the risk of an abrupt reversal of investor confidence and rise in risk aversion worldwide. This scenario would be triggered by simultaneous financial market turmoil in the fixed income markets in the advanced economies and a rapid increase in global financial market uncertainty. The heightened market volatility would push the prices of euro area financial assets down. Stock prices would fall by 14% and long-term interest rates would increase by slightly more than 100 basis points. The economic outlook for the euro area would be adversely affected by the reduction in foreign demand for euro area exports by about 8%, concentrated in the emerging market economies. This scenario translates into an overall deviation of euro area GDP of 1.7% below the baseline level by the middle of 2018.

The weak bank operating environment scenario captures the risk of persistently weaker than anticipated domestic economic activity in many euro area countries, in an environment of negative headline inflation. It includes a sharp decline in private consumption and investment, and assumes that commodity prices would return to their very low levels observed in early 2016. Overall, the level of euro area real GDP would stand about 4.1% below the baseline by mid-2018. Interest rates and bank funding costs would remain low, evolving in line with the baseline projection in this scenario.

The debt sustainability crisis scenario envisages a renewed increase in euro area sovereign bond yields to elevated levels. Long-term government bond yields are assumed to increase over a one-year period by about 90 basis points above current market expectations. A significant dispersion of government bond yields across euro area countries would re-emerge, as the shocks to sovereigns with weaker fundamentals would exceed 200 basis points. Responding to the adverse developments in the sovereign debt markets, euro area stock prices would fall

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64 For details on the GVAR model, see Dees, S., di Mauro, F., Pesaran, M. H. and Smith, L. V., "Exploring the International Linkages of the Euro Area: A Global VAR Analysis", *Journal of Applied Econometrics*, Vol. 22, 2007, pp. 1-38.

65 STEs are a multi-country, EU-wide simulation tool. They are based on impulse response functions (from ESCB central banks' models) of endogenous variables responding to predefined exogenous shocks. They also incorporate intra-EU trade spillovers.

sharply, by 20%. The debt sustainability concerns would also trigger a demand shock in the residential property markets, leading to a decline in house prices by about 14% below the baseline levels. These developments would reduce euro area GDP by about 1.2% compared with the baseline by the second quarter of 2018.

The investment fund spillover scenario considers the spillovers from the non-bank financial sector to the euro area banking and insurance sectors via the funding channel and lower asset valuations. Unexpected increases in redemptions by investors in investment funds would lead to forced sales, which would put lasting pressure on euro area asset prices.[66] Funding constraints in the euro area banking sector would emerge and the cost of funding – in particular through short-term and long-term unsecured instruments – would increase. Banks would adjust to tighter funding conditions by increasing their lending spreads, thus increasing the cost of capital of the private sector. Overall, this scenario would reduce euro area GDP by about 0.9% compared with the baseline level by the second quarter of 2018. Bank long-term funding spreads would increase by about 50 basis points and short-term unsecured money market spreads would widen by about 45 basis points.

Looking at the impact of the different scenarios, the weak bank operating environment scenario would have the strongest impact on euro area economic activity, while the debt sustainability scenario would lead to the most pronounced impact on property prices and the global risk aversion scenario would cause the largest increase in government bond yields (see Table 3.2). The first two scenarios, corresponding to medium-level systemic risks, are considered to be more probable than the other two scenarios, which are associated with potential systemic risks (see the Overview). Therefore, the global risk aversion scenario and the weak bank operating environment scenario represent a somewhat greater cause for concern.

Table 3.2

Overall impact on euro area GDP growth under the adverse macro-financial scenarios

	2015	2016	2017	Q2 2018
Baseline (annual percentage growth rates)	1.7	1.6	1.8	
		percentage point dev. from baseline growth		% dev. from baseline level
Global risk aversion scenario		-0.4	-0.9	-1.7%
Weak bank operating environment scenario		-1.2	-2.1	-4.1%
Debt sustainability crisis scenario		-0.2	-0.7	-1.2%
Investment fund spillover scenario		-0.2	-0.5	-0.9%

Sources: European Commission, ECB.

With regard to the key financial market parameters, the global risk aversion scenario involves a steepening of the yield curves in the euro area, with

66 As data on the composition of balance sheets of these institutions are scarce, statistical simulations are employed to calibrate this scenario. These simulations are based on historically observed relationships between returns on investment in shadow banking entities and financial market variables, such as stock prices or interest rates.

limited cross-country variation, together with a significant drop in stock prices (see Table 3.3). By contrast, the degree of steepening of the yield curve under the debt sustainability crisis scenario exhibits a large dispersion across the individual euro area countries. Under the weak bank operating environment scenario, the yield curve would remain unchanged, while in the case of the investment fund spillover scenario, a slight flattening would be associated with an upward shift of the curve.

Table 3.3

Overall impact of the adverse macro-financial scenarios on interest rates and asset prices

	Global risk aversion scenario	Weak bank operating environment scenario	Debt sustainability crisis scenario	Investment fund spillover scenario
Average euro area increase in short-term interest rates (basis points)	0	0	0	45
Average euro area increase in long-term government bond yields (basis points)	100	0	90	65
Reduction in euro area real estate prices (% deviation from baseline)	-3	-2	-14	-2
Reduction in euro area equity prices (%)	-14	0	-13	-24

Source: ECB.

The four risks may act as triggers for each other, so that the scenarios may materialise jointly, reinforcing the already severe macro-financial conditions prevailing under each of the individual scenarios.

Solvency results for euro area banking groups

The impact of the four scenarios on bank solvency is broken down into the direct impact on the capital of individual banks, on the one hand, and indirect effects stemming from cross-institutional contagion, on the other. The direct impact is obtained from a projection of the main variables that determine banks' solvency, such as the credit risk parameters, profits and risk-weighted assets. The indirect effects are related to the hypothetical defaults by banks breaching the minimum capital requirements as a result of losses borne through the direct impact, thereby amplifying the losses of other institutions.

Under the baseline scenario, the capital position of the euro area banking groups[67] is projected to improve. The aggregate common equity Tier 1 (CET1) capital ratio is projected to increase by about 0.8 percentage point, to 14.1% by the middle of 2018 (see **Chart 3.42**). This improvement would be driven by positive operating profits, which exceed the negative contribution of credit losses by about 0.8 percentage point. Other effects on capital play a marginal role.

The debt sustainability crisis scenario would, in spite of its relatively low likelihood, lead to the most severe outcome in terms of bank solvency (see Chart 3.43). It would be followed by the global risk aversion scenario and the investment fund spillover scenario. While the impact of the weak bank operating

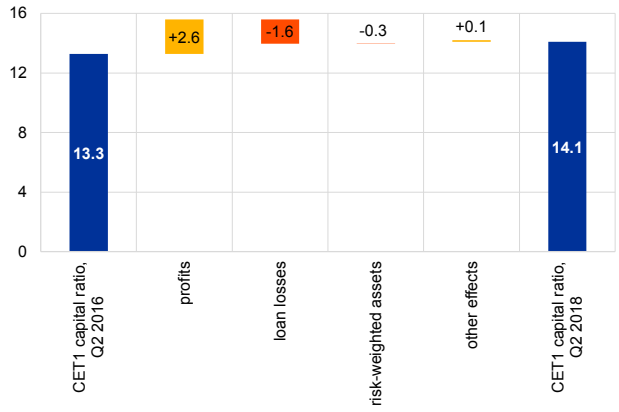
[67] The scenario analysis covers about 100 large and medium-sized banking groups directly supervised by the ECB. The starting point for the analysis is at end-June 2016.

environment scenario would be the least severe, the repercussions of that scenario would be likely to persist beyond the two-year horizon presented here owing to the transmission lag between economic conditions and bank solvency.

Chart 3.42

Under the baseline scenario, the euro area bank solvency position would improve by 0.8 percentage point

Average contribution of changes in profits, loan losses and risk-weighted assets to the CET1 capital ratios of euro area banking groups under the baseline scenario (percentage of CET1 capital ratio and percentage point contribution)

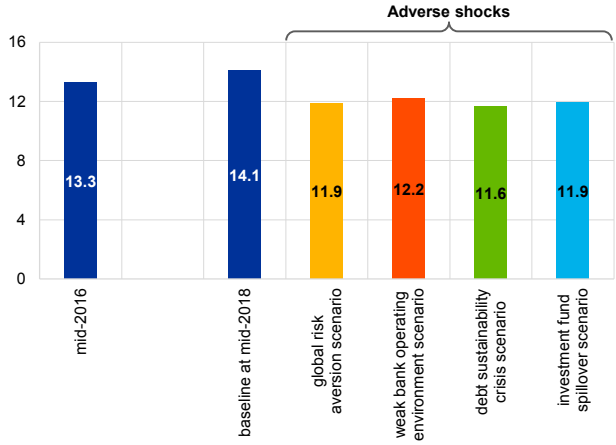


Sources: Individual institutions' financial reports, EBA, ECB and ECB calculations.

Chart 3.43

The adverse scenarios would reduce the aggregate capital ratio by between 1.9 and 2.5 percentage points

Average CET1 capital ratios of euro area banking groups under the baseline and adverse scenarios (2016-18; percentage, average of euro area banking groups)



Sources: Individual institutions' financial reports, EBA, ECB and ECB calculations.

The adverse scenarios would lead to an increase in the cost of credit risk. The deviation of bank capital ratios from the baseline projection is largely explained by higher impairment provisions on loans, which would reduce the aggregate CET1 capital ratio by between 0.7 and 1.0 percentage point compared with the baseline result. These provisions would be particularly high under the weak bank operating environment scenario, amounting to 2.5% of risk-weighted assets, reflecting the sharp deterioration in economic conditions assumed under that scenario.

Operating profits would fall under all adverse scenarios. The most pronounced impact would be observed under the investment fund spillover scenario (-0.8 percentage point compared with the baseline), under which net interest income would contract, reflecting the assumed shocks to the cost of wholesale unsecured funding. The weak bank operating environment scenario would be the most benign of the four scenarios with respect to operating profits, which deviate by -0.5 percentage point from the baseline.

Losses on debt securities held at fair value would be relatively high under the debt sustainability crisis scenario, contributing about 0.5 percentage point to the decline in the CET1 ratio. The impact of changes in risk-weighted assets and other items would be more homogeneous across the four scenarios. The increase in risk-weighted assets would reduce the aggregate CET1 ratio by up to 0.2 percentage point.

Only a few small banks would face solvency difficulties under the adverse scenarios. The share of euro area banks with a CET1 ratio lower than 6% of bank total assets would not exceed 1.5% under any of the four scenarios. For the majority of banks, the CET1 ratio would remain above 12% (see **Chart 3.44**).

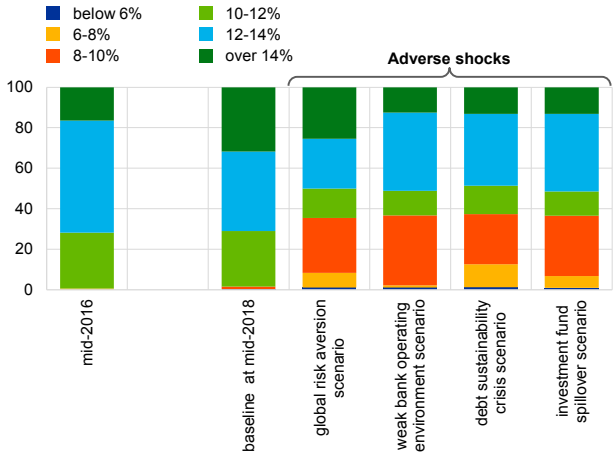
The impact of interbank contagion on bank solvency is therefore projected to be moderate (see Chart 3.45).[68] For the simulated networks with the strongest contagion effects, the system-wide CET1 capital ratio would fall, in addition to the first-round losses, by less than 0.05 percentage point under the debt sustainability crisis scenario. Contagion effects would be even more muted under the other three scenarios. It should nonetheless be noted that this simulation is restricted to direct contagion via bilateral exposures, and does not capture contagion through other channels such as asset prices or the price and availability of funding.

Chart 3.44

The vast majority of banks would remain well capitalised under the four adverse scenarios

Distribution of banks' assets by CET1 capital ratio

(percentage)



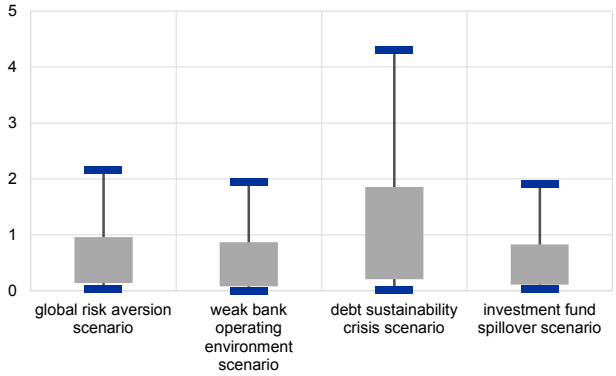
Sources: Individual institutions' financial reports, EBA, ECB and ECB calculations.

Chart 3.45

Contagion through interbank exposures would lead to a minor increase in the total solvency impact

Reduction of the CET1 capital ratio of euro area banks due to interbank contagion: dispersion across simulations

(basis points of CET1 capital ratio; box: interquartile range; bars: 10th-90th percentile range)



Sources: Individual institutions' financial reports, EBA, ECB and ECB calculations.

The findings of this scenario analysis are in line with the conclusions of the 2016 EU-wide stress-testing exercise coordinated by the EBA. Although that exercise is of a different nature, it also demonstrates the overall resilience of the largest euro area banks[69] to adverse macro-financial developments of a more complex and severe nature. The adverse scenario of that exercise captured jointly the main risks to financial stability in the EU identified by the European Systemic Risk Board (ESRB). It assumed that a protracted recession would take place in the

[68] For a description of the methodology, see Hałaj, G. and Kok, C., "Assessing interbank contagion using simulated networks", *Working Paper Series*, No 1506, ECB, 2013, and Computational Management Science (10.1007/s10287-013-0168-4).

[69] The sample of the EU-wide stress-testing exercise was narrower than the sample used in this report, consisting of the 37 largest euro area banking groups and a further 14 banking groups based in non-euro area EU countries.

euro area, coupled with deflation persisting for two years and major financial market turbulence.[70] Overall, euro area GDP would deviate from its baseline level by 6.8% by the end of 2018. Under these adverse conditions, the aggregate CET1 ratio of the largest euro area banks would fall from about 13.0% to about 9.1%. Although the stress impact would be considerable, it would not trigger a large-scale solvency issue for EU banks.

Assessing the resilience of euro area insurers

The assessment of the impact of the main euro area financial stability risks on large euro area insurers is conducted using publicly available data for 11 major euro area insurance groups up to the fourth quarter of 2015. Shocks to the insurers in the sample are assumed to be instantaneous and to hit the valuation of both the assets and liabilities of insurance corporations. Due to the lack of sufficiently granular data, this impact assessment aims to spell out the main risks in economic terms, i.e. changes in net asset value, rather than trying to gauge the impact in terms of prudential solvency ratios.

The following market, credit and underwriting risks are assessed: (i) an increase in interest rates; (ii) a fall in equity and property prices; (iii) a deterioration in the creditworthiness of borrowers through a widening of credit spreads for marketable instruments; (iv) an increase in lapse rates[71]; and (v) an increase in loss rates of loan portfolios. This assessment uses the same four scenarios that were presented earlier in this section. **Table 3.4** summarises the key aspects of the scenarios used in this exercise. Against this background, the risks for insurance companies are transmitted through three channels, namely: (i) valuation effects on financial securities and liabilities owing to changes in stock prices, sovereign yields and swap rates; (ii) sales of assets due to unforeseen redemptions resulting from increased lapse rates; and (iii) changes in the credit quality of loan portfolios. In this context, a number of simplifying assumptions had to be made for this exercise.[72]

[70] The four systemic risks identified by the ESRB General Board as the most material threats to the EU financial system are: (i) a sudden increase in global risk premia, amplified by low secondary market liquidity; (ii) low profitability prospects in a low nominal growth environment; (iii) rising debt sustainability concerns in public and non-financial private sectors; and (iv) prospective stress in the shadow banking sector, amplified by spillover and liquidity risk. For the detailed description of the scenario of the 2016 EU-wide bank stress-testing exercise, see *Adverse macro-financial scenario for the EBA 2016 EU-wide bank stress testing exercise*, European Systemic Risk Board, 29 January 2016.

[71] The lapse rate is defined as the fraction of contracts terminated prematurely by policyholders.

[72] For a comprehensive explanation of the underlying assumptions, please refer to Section 3.2 of the May 2015 FSR.

Table 3.4

Technical assumptions regarding the individual risk drivers of insurers' balance sheets

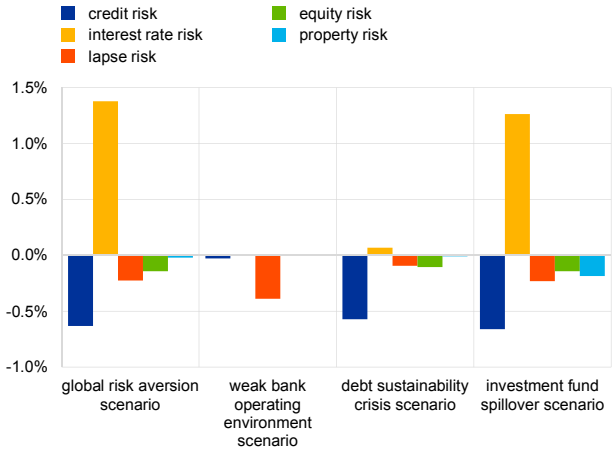
Risk drivers	Technical assumptions
Credit risk	Credit risk assessment carried out using: (i) breakdowns by rating or region, depending on data availability; and (ii) loss rate starting levels, which are stressed using the same methodology as that applied for assessing the resilience of euro area banks.
Interest rate risk transmission	Sensitivities to interest rate changes computed for each interest rate-sensitive asset and liability exposure. Relevant yield curves used to project asset and liability cash-flow streams, to calculate internal rates of return, and to discount the cash flows using yield curve shocks.
Market valuations of securities	Haircuts for debt securities derived from changes in the value of representative securities implied by the increase in interest rates under each shock and uniformly applied across the sample of large euro area insurers. Valuation haircuts applied to government bond portfolios estimated on the basis of representative euro area sovereign bonds across maturities. Haircuts for corporate bonds derived from a widening of credit spreads. Stock prices estimated using a representative euro area benchmark.
Lapse risk	Lapse risk quantified by projecting insurers' cash flows over a two-year horizon, assuming a static composition of contracts and the reinvestment of maturing assets without a change in the asset allocation. Lapse rates linked to macroeconomic variables[73]. Unexpected component of lapses[74] leads to surrender payments[75]. In the case of negative cash flows from surrender payments, the insurer is obliged to use cash reserves or sell assets to meet obligations. Lapse risk equals the cash or other assets needed to cover surrender payments.
Other assumptions specific to the sensitivity of investment income	Investment income earned from reinvested assets shocked on the basis of investment income earned at the beginning of the simulation horizon. All other assets assumed to earn the initial investment income throughout the simulation horizon. Maturing fixed income assets reinvested retaining the initial asset composition. Underwriting business component of operating profit assumed to remain constant throughout the simulation horizon. No distribution of dividends assumed.

Source: ECB.

Chart 3.46

Change in the net asset values of large euro area insurers under different scenarios

(Q4 2015; percentage of total assets)



Sources: Individual institutions' financial reports and ECB calculations.

The investment fund spillover scenario is projected to have the strongest adverse impact on insurance companies (see Chart 3.46). It is followed by the weak bank operating environment scenario. In these two scenarios, euro area insurers exhibit average total declines in their net asset values amounting, respectively, to 0.7% and 0.4% of their total assets. Insurers are projected to benefit from the global risk aversion scenario, under which their net asset values are projected to increase. The impact of the debt sustainability crisis scenario is projected to be limited.

Under all the considered scenarios but the weak bank operating environment scenario, valuation of corporate and bank bonds appears to be the most significant negative driver in terms of the change in net asset value. Although the channels of materialisation of macro-financial risks are heterogeneous across individual insurance groups, the widening of credit spreads leads to a similar quantitative impact across three scenarios, i.e. the debt sustainability crisis, the global risk aversion, and the investment fund spillover scenarios. Changes in credit spreads, related mainly to

73 Sensitivities of lapse rates to GDP and unemployment were derived by taking the mean of a number of elasticity values, collected from the literature (e.g. Honegger, R. and Mathis, C., "Duration of life insurance liabilities and asset liability management", *Working Paper*, Actuarial Approach for Financial Risks (AFIR), 1993; Kim, C., "Report to the policyholder behaviour in the tail subgroups project", *Technical Report*, Society of Actuaries, 2005; and Smith, S., "Stopping short? Evidence on contributions to long-term savings from aggregate and micro data", *Discussion Paper*, Financial Markets Group, London School of Economics, 2004) or calculated by the ECB.

74 The unexpected component of lapses is defined as the difference between the projected lapse rate and the average lapse rate reported by large European insurers.

75 It is assumed that 50% of the total amount represented by the extra lapse rates has to be paid due to the existence of penalties in the contracts, which lower the insurers' risk.

corporate bonds, cause, in the first of these scenarios, a decline of about 0.7% in net asset values expressed as a percentage of total assets. Under the other two scenarios, the decrease would be slightly smaller.

Interest rate shocks contribute positively to net asset values of insurers under the debt sustainability crisis and global risk aversion scenarios, fully compensating for the adverse impact of the other risks, including credit risk. The positive impact of the interest rate shock reflects the specific nature of insurers' balance sheet structure, namely the overall longer duration of liabilities relative to the duration of assets. Liabilities of insurers fall in value by more than the assets, as the rise in interest rates is combined with a simultaneous steepening of the yield curve. The magnitude of the positive impact on insurers' balance sheets reaches 1.4% of total assets in the global risk aversion scenario and 1.3% in the debt sustainability crisis scenario. By contrast, under the investment fund spillover scenario, the moderate flattening of the yield curve has an almost neutral effect on insurers' net asset values as a percentage of total assets, at +0.1%. By assuming an unchanged yield curve, the weak bank operating environment scenario has a muted impact on interest rate risk.

Variations in equity price losses would be moderate. The negative impact of the adverse equity price shocks would reach, at most, 0.14% of net asset value under the global risk aversion and the debt sustainability crisis scenarios. The weak impact reflects the limited exposure of euro area insurers to equity risk. Finally, lapse risk-related losses would be the highest under the weak bank operating environment scenario, reflecting the more adverse developments in GDP growth and the unemployment rate under this scenario.

In comparison with the previous exercise[76], the stress impacts are more contained, reflecting the greater resilience of the insurance sector to the threats targeted by the macro-financial scenarios, in spite of the persistence of the low interest rate environment.

3.3 Regulatory framework

This section provides an overview of a number of regulatory initiatives in the areas of banking, financial markets, financial infrastructures and insurance that are of particular importance for enhancing financial stability in the EU. The initiatives aim at both reducing systemic risk and strengthening the resilience of the financial system as a whole.

[76] Please refer to Section 3.2 of the May 2016 FSR.

Regulatory initiatives for the banking sector

1. Prudential rules for banks

Macroprudential review:

A key regulatory initiative from a financial stability perspective is the review of the EU macroprudential framework. In its consultation document, published on 1 August, the European Commission highlighted that macroprudential regulation has evolved incrementally over recent years and this piecemeal approach has created a number of weaknesses in the framework. The review therefore aims to align the different elements of the macroprudential framework to ensure it functions more effectively and to create the right balance between national flexibility and the harmonisation of rules at the EU level.

The establishment of a sound regulatory framework is of paramount importance for national designated authorities (NDAs), as well as for the ECB when acting in its capacity as a macroprudential authority, for the effective conduct of macroprudential policy in the Member States and in the Single Supervisory Mechanism (SSM), respectively. Against this background, the importance of macroprudential policy as a complement to monetary policy and microprudential policy should be highlighted. This complementarity of policies is particularly important in a monetary union where macroprudential policy can address country or sector-specific imbalances, thereby also contributing to addressing the heterogeneity in financial and business cycles across Member States.

The ECB fully supports a comprehensive review of the macroprudential policy framework. The primary objective of the revision should be to enhance the effectiveness of the macroprudential policy framework without impeding the effectiveness of the other complementary policies. In this regard, it is important to reflect the new institutional landscape in the macroprudential policy framework, notably the establishment of the SSM, as well as to revise the specific powers of micro- and macroprudential authorities, streamline the coordination mechanism between authorities, broaden the macroprudential policy tools and simplify their activation mechanism so as to ensure that authorities can address systemic risks in a timely and effective manner.

Of particular importance from the ECB's perspective is the proper recognition in all relevant pieces of EU law of its responsibility – together with the NDAs – for the macroprudential policy of the Member States participating in the SSM. This requires a thorough revision of the current legislation since the macroprudential framework set out in the Capital Requirements Regulation and Directive (CRR/CRD IV) as well as in the ESRB Regulation predates the establishment of the banking union and in particular of the SSM. The ECB looks forward to contributing to the legislative work in this area.

Review of the capital framework:

The Basel Committee on Banking Supervision (BCBS) has undertaken a strategic review of the capital framework to tackle the excessive and unwarranted variability in risk-weighted assets (RWAs), reduce the complexity of the regulatory framework and improve the comparability of banks' capital ratios. In this context, the BCBS published on 10 December 2015 a consultation document with proposed revisions to the standardised approach (SA) for credit risk, aimed at striking an appropriate balance between simplicity and risk sensitivity. In this regard, the Committee proposed not to assign a flat risk weight to mortgages any longer, but to link the risk weighting to the loan-to-value (LTV) ratio. Furthermore, a different treatment with higher risk weights has been proposed for real estate exposures where repayment is materially dependent on the cash flows generated by the property securing the exposure. For exposures to banks and corporates, the December 2015 proposal reintroduced the use of ratings, albeit in a non-mechanistic manner (the previous BCBS consultation document, published in December 2014, had removed all references to external credit ratings and substituted them with a set of risk drivers). The BCBS also published on 24 March 2016 a consultation document on the revision of the internal ratings-based (IRB) approach for credit risk. The BCBS has proposed: (i) removing the option to use the IRB approach for certain exposure classes for which modelling is regarded as insufficiently reliable for regulatory capital purposes; (ii) setting floors for model parameters for exposure classes where constrained modelling will be allowed; and (iii) better specifying parameter estimation practices where the IRB approach remains available. Finally, the BCBS is considering the potential introduction of an aggregate output floor based on the risk weights obtained under the standardised approach.

These reforms are intended to finalise Basel III, strengthening bank capital rules and restoring confidence in the risk-based capital framework. The BCBS's oversight body, the Group of Central Bank Governors and Heads of Supervision (GHOS), has attached a condition to the adoption of the new rules, namely that the reforms should not significantly increase overall capital requirements. This commitment, first made in January 2016 and reiterated in September 2016, refers to the banking system as a whole and does not exclude that some "outlier" banks might face a significant increase in capital requirements. The BCBS has conducted in the course of 2016 a cumulative quantitative impact study (QIS) aimed at testing the effects of the proposed new rules on capital levels, taking into account all the changes introduced to finalise the Basel III framework (e.g. the new standardised approach for credit risk, the revised IRB approach, the new operational risk framework and the final elements of the leverage ratio). The outcome of the QIS will help the BCBS to make an informed decision on the final design and calibration of the measures. The BCBS is studying the impact taking into account a set of policy scenarios, as well as different bank sizes and business models.

Liquidity regulation (net stable funding ratio, NSFR):

Ahead of the Basel NSFR implementation in the EU, the European Commission launched in May a consultation on several areas of concern. The consultation

follows the Commission's call for evidence in September 2015, in response to which many respondents expressed concerns about the fact that the NSFR could unduly constrain banks' ability to finance the real economy. The main areas of concern regard: (i) the excessive impact on bank lending and, in particular, on specific banking models; (ii) the identification of a more risk-sensitive measure than that proposed by the Basel standards to capture future funding risk arising from derivative transactions; (iii) the impact of the NSFR charges on short-term secured transactions with financial institutions, and (iv) the proportionality of the NSFR application. As highlighted in its response to the consultation, the Eurosystem considers that the available evidence for European banks does not suggest an excessive impact of the NSFR for the majority of banks, agrees with the deficiencies identified in the assessment of funding needs arising from derivatives exposures, and supports further work on this. Regarding the third issue, the Eurosystem considers the net funding requirements imposed on short-term secured transactions to be adequate to prevent institutions from over-relying on short-term wholesale funding to meet their funding needs. Finally, the Eurosystem considers that the NSFR should be applied irrespective of the size of a credit institution and supports the European Banking Authority (EBA)'s recommendation that central counterparties should be exempted from the NSFR, considering their role as intermediaries.

2. Crisis management and resolution of banks

BRRD/MREL:

Recent financial crises across EU Member States revealed particular deficiencies in banks' safeguards, highlighting the importance of ensuring sufficient and credible loss-absorbing capacity. In response to this challenge, and also following up on G20 and Financial Stability Board (FSB) recommendations, new regulatory requirements – namely the total loss-absorbing capacity (TLAC) for global systemically important banks (G-SIBs) at the international level and the minimum requirement for own funds and eligible liabilities (MREL) for all EU credit institutions – have been introduced. As regards the latter, MREL – as defined in the Bank Recovery and Resolution Directive (BRRD) – aims at ensuring that banks hold sufficient amounts of own funds and eligible liabilities that could be readily used to absorb losses and to recapitalise the bank in case of resolution. In this respect, MREL helps ensure that in cases of resolution the costs are shouldered by banks' shareholders and creditors, rather than taxpayers. Thus, MREL – also as a pillar that ensures the credibility of the bail-in regime – contributes to the resolvability of banks and to safeguarding financial stability, while at the same time it helps mitigate the build-up of systemic risk. Having said that, MREL contributes also to avoiding both moral hazard and the overburdening of public finances, which might have a severe impact on both the real economy and the financial system.

The BRRD, published in June 2014, has been transposed into the national legislation of all Member States. Furthermore, following the EBA's work – as provided in the BRRD – the European Commission published a delegated regulation in May 2016 supplementing the BRRD with regard to regulatory technical standards,

specifying the criteria relating to the methodology for setting MREL. It is foreseen that the BRRD will be revised by the end of 2016. In this context, the EBA published an interim report on MREL in June and the final MREL report, as required under the BRRD, is expected to be submitted to the Commission this year. Based on the findings of this EBA report, the Commission will submit a legislative proposal on the implementation of TLAC in the EU and make other revisions in the MREL framework by end-2016.

3. European Deposit Insurance Scheme (EDIS)

In November 2015 the Commission published a proposal for a regulation establishing a European Deposit Insurance Scheme (EDIS), accompanied by a communication on completing banking union. At the ECOFIN Council meeting on 17 June, the Council conclusions on a roadmap to complete banking union including risk-sharing (EDIS and a backstop to the Single Resolution Fund) and risk-reduction measures were adopted.

In the ECB's view, it is important that such a scheme is in place and operational as soon as possible and that progress continues to be made on the risk-reduction agenda. A rapid implementation of EDIS is necessary to ensure a uniformly high level of depositor protection across the banking union, so as to promote the completion of the banking union and to further enhance and safeguard financial stability. Deposit insurance is both an ex ante tool to enhance confidence and prevent bank runs and an ex post tool to protect against the adverse consequences of individual bank failures. In parallel, progress should continue on implementing reforms which will contribute to reducing risks in the banking system, such as implementing remaining banking reforms (e.g. TLAC) but also further measures such as the reduction of non-performing loans and a harmonisation of insolvency laws.

Table 3.5

Selected regulatory initiatives at the international level and new legislation and legislative proposals for the banking sector in the EU

Initiative	Description	Current status
SA and IRB review	The BCBS published a second consultation document on revisions to the standardised approach (SA) for credit risk. The proposals aim to strike an appropriate balance between simplicity and risk sensitivity. The BCBS also published a consultation document to address excessive RWA variability for credit risk related to the IRB approach, removing the option to use such an approach for certain exposures. Where the IRB appraoch is still allowed, input floors – e.g. for probability of default and loss given default – would be introduced, as well as a better specification of parameter estimations. The possibility of output floors in relation to the SA is also under consideration.	The second SA consultation document was published on 10 December 2015 (first consultation document: 22 December 2014). The IRB consultation document was published on 24 March 2016. In the course of 2016 the BCBS has conducted a QIS, the outcome of which will help the BCBS to make an informed decision on the final design and calibration of the revised SA and IRB framework.
TLAC standard and MREL review	The FSB agreed in November 2015 on a new international TLAC standard for G-SIBs, ensuring that there will be sufficient loss-absorbing and recapitalisation capacity in resolution. In the EU, TLAC will be implemented through the ongoing MREL review, which will be concluded in 2016.	The BRRD specifies that the EBA shall submit a report to the European Commission and, on the basis of this report, the Commission will submit a legislative proposal on the harmonised application of MREL, if appropriate, and implement TLAC for the G-SIBs in the EU. The EBA published an interim report on MREL in June and its final MREL report is expected this year. The Commission has indicated that a legislative proposal will be published before end-2016.
EDIS	The EDIS proposal foresees the establishment of a fully fledged European depositor protection scheme as of 2024, via an increased mutualisation in three steps (reinsurance, coinsurance, full EDIS).	The European Commission published a legislative proposal for a European Deposit Insurance Scheme on 24 November 2015, together with a communication on completing banking union. EDIS is considered the third pillar of a fully fledged banking union, as notably outlined in the Five Presidents' Report.[77] The EDIS proposal is currently being discussed at the Council in an Ad Hoc Working Party, which is also discussing so-called risk-reduction measures. Discussions at the European Parliament have also started. The ECB's legal opinion on the proposal was published on 20 April 2016.[78]
NSFR	The European Commission is currently implementing the NSFR in Europe. The NSFR becomes a minimum standard on 1 January 2018.	The European Commission consulted in May on several issues regarding the NSFR standard, to assess whether certain provisions of the standard could unduly constrain banks' ability to finance the real economy.
Simple, transparent and standardised (STS) securitisations	The STS initiative acknowledges that simple and transparent securitisations have performed better, including through crisis periods, than other securitisation structures and therefore should be treated in a differentiated manner in regulation. The proposed Securitisation Regulation would apply to all securitisations and includes due diligence, risk retention and transparency rules, together with criteria to identify STS securitisations. The proposal to amend the CRR puts forward, inter alia, lower capital charges for securitisations that meet the STS criteria, as well as a number of additional criteria specific to the bank capital framework.	The European Commission made the two proposals (the Securitisation Regulation and the CRR amendment) on 30 September 2015. The EU Council agreed on a negotiating stance on the two proposals on 2 December. The European Parliament expects to finalise its stance by the end of 2016. Trialogue negotiations are currently expected in early 2017. The ECB published its opinion on the Commission's proposals on 14 March. The BCBS incorporated STC (simple, transparent and comparable) securitisations in the bank capital framework and published an updated securitisation framework in July 2016.

Regulatory initiatives for financial markets and financial infrastructures

In addition to the initiatives in the area of banking regulation, several steps have also been taken to address the risks in financial markets and to strengthen the resilience of financial infrastructures.

1. Market-based finance/investment funds

In the field of market-based finance, the FSB has continued its work on the deliverables laid out in the roadmap on "Transforming shadow banking into

77 Report on Complementing Europe's Economic and Monetary Union, published on 22 June 2015.

78 Opinion of the European Central Bank of 20 April 2016 (CON/2016/26).

resilient market-based financing", published on 14 November 2014. On 22 June 2016 the FSB published its proposed policy recommendations to address the risks associated with asset management activities, for public consultation. This work focuses on addressing vulnerabilities related to: (i) the mismatch between the liquidity of fund investments and redemption terms and conditions for fund units; (ii) leverage within investment funds; (iii) operational risk and challenges in transferring investment mandates in a stressed condition; and (iv) securities lending activities of asset managers and funds. The ECB actively supports this work, given the growing importance of this part of the financial system and the need to extend the macroprudential toolkit to mitigate risks to financial stability beyond banking.

In Europe, after the publication of the Regulation on transparency of securities financing transactions and of reuse on 23 December 2015, work is ongoing on the regulatory technical standards defining the data elements to be reported to trade repositories. Depending on the category of the reporting entity, the reporting will start at different stages from 12 to 21 months after the entry into force of the relevant technical standards (i.e. between mid-2018 and mid-2019).

2. Financial infrastructures

The ECB Regulation on oversight requirements for systemically important payment systems entered into force on 12 August 2014, aiming at, inter alia, ensuring efficient management of legal, credit, liquidity, operational, general business, custody, investment and other risks of systemically important payment systems (SIPSs). Four payment systems are subject to this Regulation: TARGET2 (operated by the Eurosystem), EURO1 and STEP2-T (both operated by EBA Clearing), and CORE (FR) (operated by STET). These systemically important payment systems had to comply with the requirements of the Regulation by August 2015. All of the systems are currently being assessed against the Regulation. The Regulation is currently being reviewed and it is envisaged to consult the public on potential revisions.

Implementation of the European Market Infrastructure Regulation (EMIR) has continued to progress. Since 21 June 2016 certain types of standardised interest rate swaps (IRSs) are required to be cleared through central counterparties (CCPs). A similar obligation will enter into force for standardised CDSs in February 2017. On 4 October 2016 the Commission adopted a delegated regulation specifying how margin should be exchanged for OTC derivative contracts that are not cleared by a CCP. The delegated regulation is subject to a period for objection by the European Parliament and the Council before it is published in the Official Journal of the European Union.

In September 2015 the ECB published its response to the Commission's consultation on the review of EMIR, in which it proposed amending the Regulation in order to fully recognise the ECB's role in the field of banking supervision, to address issues related to the quality and availability of derivatives data, and to further enhance the requirements for mitigating

procyclicality. Regarding procyclicality, the proposals aim to ensure that CCPs are adequately protected from increases in market volatility without needing to exert potentially destabilising liquidity pressure on their clearing members. Moreover, the ECB supports the inclusion of macroprudential intervention tools in EMIR (for example, providing authorities with the power to set time-varying margin and haircut requirements for derivative transactions), in order to prevent the build-up of systemic risk resulting, in particular, from excessive leverage, and to further limit the procyclicality of margins and haircuts.

Table 3.6

Selected new legislation and legislative proposals for financial markets and financial infrastructure in the EU

Initiative	Description	Current status
ECB Regulation on oversight requirements for systemically important payment systems	The aim of the Regulation is to ensure the efficient management of all types of risk that SIPSs face, together with sound governance arrangements, objective and open access, as well as the efficiency and effectiveness of SIPSs.	The Regulation entered into force on 12 August 2014.
European Market Infrastructure Regulation (EMIR)	The Regulation aims to bring more safety and transparency to the OTC derivatives market and sets out rules for, inter alia, central counterparties and trade repositories.	The Regulation entered into force on 16 August 2012.
Regulation on improving the safety and efficiency of securities settlement in the EU and on central securities depositories (CSD Regulation)	The aim of the Regulation is to increase the safety and efficiency of securities settlement and settlement infrastructures (i.e. central securities depositories) in the EU. It introduces an obligation of dematerialisation for most securities, harmonised settlement periods for most transactions in such securities, settlement discipline measures and common rules for central securities depositories.	The Regulation entered into force on 17 September 2014. The European Commission is currently considering technical standards drafted by the European Securities and Markets Authority (ESMA) and the EBA, in close cooperation with members of the ESCB. Once endorsed by the Commission, both the European Parliament and the Council have an objection period.
Markets in Financial Instruments Directive and Regulation (MiFID II/MiFIR)	The legislation applies to investment firms, market operators and services providing post-trade transparency information in the EU. It is set out in two pieces of legislation: a directly applicable regulation dealing, inter alia, with transparency and access to trading venues, and a directive governing authorisation and the organisation of trading venues and investor protection.	Directive 2014/65/EU on markets in financial instruments (MiFID II) and Regulation (EU) No 600/2014 on markets in financial instruments (MiFIR) were both published in the Official Journal of the EU on 12 June 2014.
Regulation on transparency of securities financing transactions and of reuse (SFTR)	The Regulation contains measures aimed at increasing the transparency of securities lending and repurchase agreements through the obligation to report all transactions to a central database. This seeks to facilitate regular supervision and to improve transparency towards investors and on re-hypothecation arrangements.	Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse was published in the Official Journal of the EU on 23 December 2015.

Regulatory initiatives for the insurance sector

In Europe, the European Insurance and Occupational Pensions Authority (EIOPA) launched the 2016 EU-wide insurance stress test, using the Solvency II framework and harmonised reporting requirements. The stress test will assess the resilience of the European insurance sector to severe adverse market scenarios.[79] The results will be disclosed in December 2016.[80] Moreover, EIOPA prepared – as requested by the European Commission – its technical advice[81] on the

79 The stress test comprises three scenarios: (i) the baseline scenario, i.e. the pre-stress valuation of the balance sheet; (ii) the scenario with a prolonged low-yield environment; and (iii) the "double-hit" scenario, i.e. a negative market shock to asset prices combined with a low risk-free rate.

80 See EIOPA's website for more information.

81 Final Report on Consultation Paper no. 16/004 on the request to EIOPA for further technical advice on the identification and calibration of other infrastructure investment risk categories, i.e. infrastructure corporates, EIOPA, 30 June 2016.

identification and calibration of infrastructure corporates. In its advice, EIOPA made some recommendations[82] to further support the aim of creating a high-quality, long-term asset class for infrastructure by capturing relevant investments in corporates. Furthermore, the Commission requested EIOPA's advice[83] on the review of specific items in the Solvency II Delegated Regulation, following the public consultation on the benefits, unintended effects, consistency and coherence of the financial legislation adopted in response to the financial crisis. The Commission asked EIOPA to focus on the proportionate and simplified application of the requirements, and the removal of unintended inconsistencies by 31 October 2017. At a later stage, EIOPA's technical advice may also be requested with regard to the removal of unjustified constraints on financing.

At the international level, the assessment methodology for the designation of global systemically important insurers (G-SIIs), which has been used since 2013, has been revised by the International Association of Insurance Supervisors (IAIS). The updated methodology[84] outlines a five-phase approach to the G-SII assessment process and modifies certain indicators used in the initial assessment methodology to improve, among other things, the connection with systemic risk and data quality. The IAIS also published a paper85 which explains why certain insurance product features and related activities may raise the potential for an insurer to pose systemic risk upon failure. In November the IAIS published a new list of insurers which have been designated as G-SIIs. This list is based on the updated methodology, but it includes the same entities as last year. Finally, the IAIS published a consultation paper on the risk-based global Insurance Capital Standard (ICS)[86] with the focus on valuation methodologies, qualifying capital resources and the implementation of risk-based approaches to determine regulatory capital requirements. The ICS is scheduled for adoption by the IAIS in late 2019.

Other initiatives

Capital markets union

The ECB supports the next steps to accelerate the capital markets union (CMU) as announced in the September 2016 European Commission communication. In this context, the ECB in particular welcomes the planned actions in the areas of insolvency law and taxation. A fully fledged CMU needs to tackle differences in the national and European legislative frameworks which pose an

82 EIOPA recommends that certain infrastructure corporates qualify for treatment as infrastructure projects provided that there is an equivalent level of risk. It recommends creating a separate differentiated treatment for equity investments in high-quality infrastructure corporates.

83 Request to EIOPA for Technical Advice on the Review of Specific Items in the Solvency II Delegated Regulation, European Commission, 18 July 2016.

84 *Updated G-SII Assessment Methodology*, IAIS, 16 June 2016.

85 *Systemic Risk from Insurance Product Features (previously referred to as Non-traditional Non-insurance activities and products)*, IAIS, 16 June 2016.

86 Risk-based Global Insurance Capital Standard Version 1.0, IAIS, 19 July 2016.

obstacle to cross-border activities. The ECB also supports and will contribute to the market infrastructure-related actions foreseen in the September 2015 Commission Action Plan, in particular the conflict of laws initiative and the code of conduct for withholding tax procedures.

In its response to the Commission's review of the EU macroprudential policy framework, the ECB highlighted a number of key CMU-related issues. First, the macroprudential framework needs to be aligned with the new institutional reality of the banking union. Second, an efficient framework with a complete toolkit will be essential to ensure the soundness of the banking sector, which will also benefit CMU as banks play an important role as financial intermediaries. Third, the review is essential to cater for potential financial stability effects of CMU and to ensure an effective and coherent prudential framework. Not least, the review provides the opportunity to create a framework for non-banks which would need to be anchored in legislation to enable authorities to address risks arising from the continuously growing non-bank sector. This is in particular important to meet the needs arising from more developed and integrated capital markets. The toolkit could include measures directed at non-bank entities and activities, such as margin and haircut requirements for derivatives and securities financing transactions as well as leverage and liquidity requirements for investment funds. However, at this stage it is important to first establish the legal basis for such macroprudential tools.

The STS securitisation framework, which has been supported by the ECB since its inception, is one of the "low-hanging fruits" of the CMU project. Following the rapid adoption by the European Council of its compromise text last December, work is progressing in the European Parliament, where the rapporteurs for the two securitisation proposals (the EU Securitisation Regulation and the CRR update) and Members of the European Parliament have proposed amendments. An important issue in the discussions is the level of the retention rate, where several parties support an increase to 20-25%, from the current 5% level. Proposals to increase the retention rate should take into consideration the impact on the policy objective of revitalising the European securitisation markets and whether measures to further increase alignment of interests are not better achieved by complementary policy actions such as increased transparency and the introduction of the framework for simple, transparent and standardised securitisations. A vote in the plenary session is expected by the end of the year. A rapid finalisation of the legislative proposal will be key to provide the necessary regulatory clarity and stability to securitisation market participants and to support sustainable growth of the EU securitisation market.

Finally, as the ECB has stressed in the past, CMU warrants a strengthened implementation and enforcement of rules, and an appropriate supervisory framework, which in the long run should lead to a single European capital markets supervisor.