

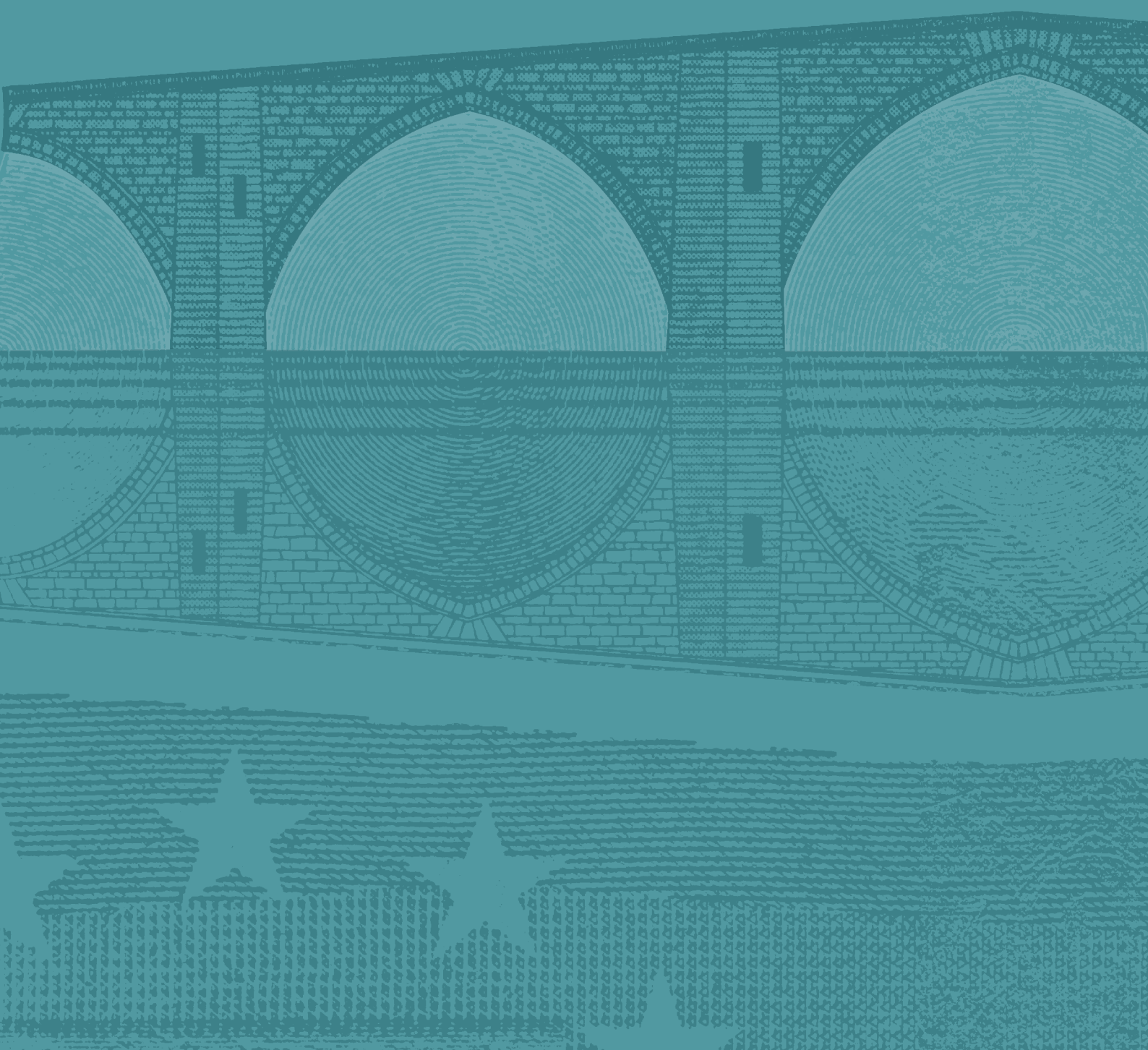


EUROPEAN CENTRAL BANK

EUROSYSTEM

# FINANCIAL STABILITY REVIEW

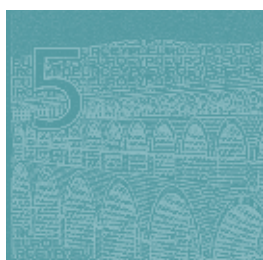
NOVEMBER 2014





EUROPEAN CENTRAL BANK

EUROSYSTEM



## FINANCIAL STABILITY REVIEW NOVEMBER 2014

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## ABBREVIATIONS

### COUNTRIES

|    |                |    |                |
|----|----------------|----|----------------|
| BE | Belgium        | LU | Luxembourg     |
| BG | Bulgaria       | HU | Hungary        |
| CZ | Czech Republic | MT | Malta          |
| DK | Denmark        | NL | Netherlands    |
| DE | Germany        | AT | Austria        |
| EE | Estonia        | PL | Poland         |
| IE | Ireland        | PT | Portugal       |
| GR | Greece         | RO | Romania        |
| ES | Spain          | SI | Slovenia       |
| FR | France         | SK | Slovakia       |
| HR | Croatia        | FI | Finland        |
| IT | Italy          | SE | Sweden         |
| CY | Cyprus         | UK | United Kingdom |
| LV | Latvia         | JP | Japan          |
| LT | Lithuania      | US | United States  |



## FOREWORD

The *Financial Stability Review* (FSR) reviews developments relevant for financial stability, in addition to identifying and prioritising main risks and vulnerabilities for the euro area financial sector. It does so to promote awareness of these risks among policy-makers, the financial industry and the public at large, with the ultimate goal of promoting financial stability. The ECB defines financial stability as a *condition* in which the financial system – intermediaries, markets and market infrastructures – can withstand shocks without major disruption in financial intermediation and in the effective allocation of savings to productive investment.

The FSR also plays an important role in the ECB's new macro- and micro-prudential tasks. With the establishment of the Single Supervisory Mechanism (SSM), the ECB was entrusted with the macro-prudential tasks and tools provided for under EU law. The FSR, by providing a financial system-wide assessment of risks and vulnerabilities, provides key input to the ECB's macro-prudential policy analysis. Such a euro area system-wide dimension is an important complement to micro-prudential banking supervision which is more focused on the soundness of individual institutions. At the same time, whereas the ECB's new roles in the macro- and micro-prudential realms rely primarily on banking sector instruments, the FSR continues to focus on risks and vulnerabilities of the financial system at large, including – in addition to banks – shadow banking activities including non-bank financial intermediaries, financial markets and market infrastructures.

This Review includes several special features that are aimed at deepening the ECB's financial stability analysis and supporting the work underlying the ECB's new macro-prudential function. The first analyses asset fire sales as a potential conduit of systemic stress in the banking system. The second discusses the measurement of the financial cycle in euro area countries, which can provide relevant information for the counter-cyclical objective of macro-prudential policies. The third presents some first considerations regarding the potential use of a macro-prudential instrument based on the net stable funding ratio, a new structural liquidity metric developed by the Basel Committee.

The Review has been prepared with the involvement of the ESCB/SSM Financial Stability Committee. This committee assists the decision-making bodies of the ECB, including the Supervisory Board, in the fulfilment of their tasks.

Vítor Constâncio  
Vice-President of the European Central Bank





## OVERVIEW

Despite intermittent financial market turbulence, euro area systemic stress has remained at low levels. Indicators of stress among euro area banks and sovereigns have declined further to levels last seen before the outbreak of the global financial crisis in 2007. Stress across the broader financial system has also remained contained (see Chart 1).

This belies a delicate situation, in which generally benign financial market sentiment has contrasted with a weak, fragile and uneven economic recovery. In fact, the environment of low nominal growth and high unemployment is the major underlying factor driving the challenges to financial stability. The resulting apparent disconnect between real economic and financial cycles has had implications for credit provision. On the one hand, bank-intermediated credit remains scarce, given a combination of weak demand and credit terms that may discourage borrowing and investment, which hinders the economic recovery. ECB monetary policy action – including the asset-backed securities purchase programme, the new covered bond purchase programme, and the targeted longer-term refinancing operations (TLTROs) – is providing key support, in particular to specific market segments that play a fundamental role in the financing of the economy. On the other hand, market-intermediated credit is rather abundant and available at conditions that resemble pre-crisis standards, underpinned by a global search for yield.

Amid these economic and financial developments, progress has continued in addressing legacy issues from the euro area crisis. A strengthening of euro area *bank* balance sheets continues, supported by the ECB's comprehensive assessment. Capital positions have been strengthened further, amid increased transparency and balance sheet repair. Notwithstanding this progress in enhancing balance sheet resilience, many euro area – as well as global – banks are still confronted with profitability challenges amid a cyclical recovery proceeding at different speeds around the globe. At the same time, progress in repairing balance sheets in the *non-financial sector* also continues apace. In particular, euro area *sovereigns* have focused on repairing fiscal fundamentals alongside structural reforms, although at an uneven pace across countries. Public debt sustainability challenges nonetheless remain, implying that the work of restoring the soundness of public finances is unfinished, while structural reform efforts are needed to enhance macroeconomic growth prospects.

A combination of these legacy issues as well as emerging risks yields three key risks to euro area financial stability over the next year and a half (see Table 1) that have the potential to be mutually reinforcing if triggered. Underlying all of these key risks is the uncertainty surrounding the weak, fragile and uneven economic recovery and the current period of very low inflation, which has the potential to aggravate and trigger the existing vulnerabilities should the current situation continue for longer than expected or conditions deteriorate further.

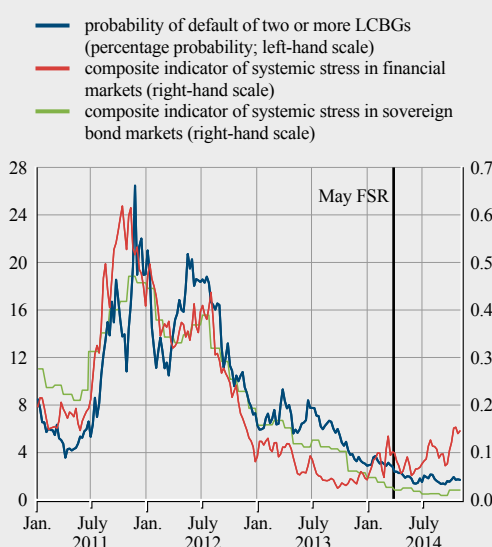
*Euro area stress has remained moderate...*

*... but vulnerabilities remain...*

*... despite progress in addressing banking and sovereign vulnerabilities*

**Chart 1 Measures of financial market, banking sector and sovereign stress in the euro area**

(Jan. 2011 – 14 Nov. 2014)



Sources: Bloomberg and ECB calculations.  
Notes: "Probability of default of two or more LCBGs" refers to the probability of simultaneous defaults in the sample of 15 large and complex banking groups (LCBGs) over a one-year horizon. For more information on composite indicators of systemic stress, see the notes to Chart 1.11.

*Three key risks to euro area financial stability*

Continued global search for yield...

Table 1 Key risks to euro area financial stability

|                                                                                                                                                                  | Current level (colour) and recent change (arrow)* |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 1. Abrupt reversal of the global search for yield, amplified by pockets of illiquidity, with signs of a growing use of leverage in the non-bank financial sector | →                                                 |
| 2. Persistent weak bank profitability in a weak, fragile and uneven macroeconomic recovery                                                                       | →                                                 |
| 3. Re-emergence of sovereign debt sustainability concerns, amid low nominal growth and wavering policy determination for fiscal and structural reforms           | ↑                                                 |
| pronounced systemic risk                                                                                                                                         | ■                                                 |
| medium-level systemic risk                                                                                                                                       | ■                                                 |
| potential systemic risk                                                                                                                                          | ■                                                 |

\*The colour indicates the current level of the risk which is a combination of the probability of materialisation and an estimate of the likely systemic impact of the identified risk over the next year and a half, based on the judgement of the ECB's staff. The arrows indicate whether this risk has intensified since the previous FSR.

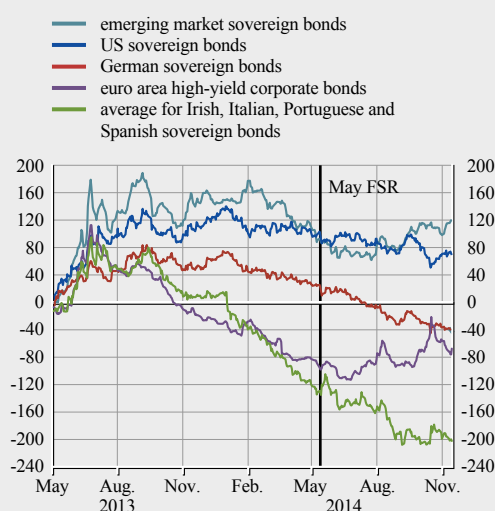
*Key risk 1: Abrupt reversal of the global search for yield, amplified by pockets of illiquidity, with signs of a growing use of leverage in the non-bank financial sector*

Despite bouts of volatility – linked to rising geopolitical tensions and weak economic data – a search for yield has persisted across global financial markets. The price of risk has remained low in most market segments, supported by historically low risk-free rates and measures of market volatility. This has been associated with an increased correlation within and across euro area bond, equity and money markets reminiscent of the years before the onset of the global financial crisis.

In Europe, this global strong demand for riskier assets has been most prominently seen in corporate and sovereign bond markets (see Charts 2 and 3), but also in valuations of other assets such as

Chart 2 Cumulative changes in bond yields since May 2013

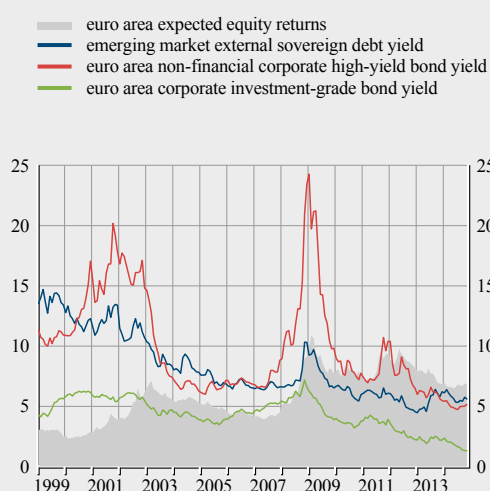
(2 May 2013 – 14 Nov. 2014; cumulative change in basis points; ten-year sovereign bond yields)



Sources: Bloomberg and JPMorgan Chase & Co.

Chart 3 Selected bond yields and expected euro area equity returns

(Jan. 1999 – Oct. 2014; percentages)



Sources: Bloomberg, Bank of America/Merrill Lynch indices, R. Shiller (Yale University), ECB and ECB calculations.  
Note: The euro area expected equity return is the inverted Shiller cyclically adjusted price/earnings ratio.

equities and the prime segment of commercial property (i.e. modern office and retail space in capital cities). During the bouts of volatility in recent months linked to weak economic data releases and geopolitical tensions, investors showed some signs of increased credit risk aversion, especially towards high-yield corporates and, more recently, vulnerable sovereigns (see Chart 2), but appeared willing to continue to seek yield by increasing duration exposures to higher-rated issuers.

The resilience of strong investor demand for lower-rated bonds, equities and other higher-yielding asset classes depends on continued strong risk appetite. Indeed, outflows from high-yield bonds and bouts of increased financial market volatility in recent months (see Chart 4) highlight investor uncertainty regarding valuations and the potential for sharp adjustments in the future. Global investor sentiment remains sensitive to changes in the economic outlook, geopolitical tensions and emerging market risks, notably related to larger economies such as China. In addition, while monetary policy settings in major economies, including the euro area, provide an anchor for expectations regarding short-term interest rates, yields on longer-dated bonds remain vulnerable to an increase in US term premia.

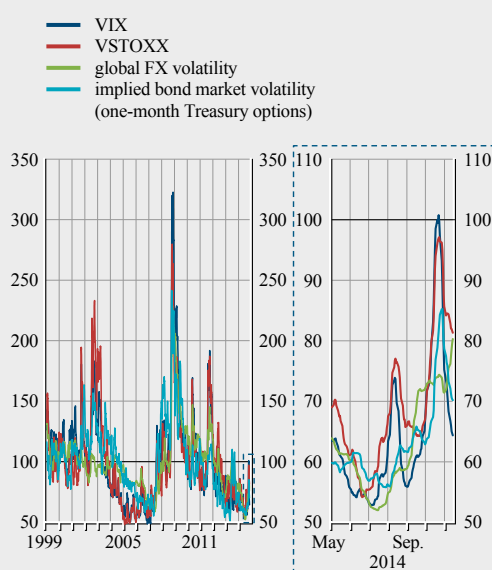
At the same time, financial stability risks may arise from investor complacency especially during periods of weak returns on financial assets when investors hunt for yield. Such periods have the potential to breed systemic risks, if they lead to an excessive build-up of leverage or maturity extension and mismatches. While leverage in the banking sector has remained in check, signs of increasing leverage have started to emerge in securities markets and among shadow banking entities, albeit from relatively low levels. In addition, continued low yields may place additional pressure on investors to improve returns by taking on higher duration risk exposures.

Along with signs of some increase in leverage and duration, concerns remain that the impact of a possible reversal of hunt-for-yield flows could be amplified by low market liquidity in some segments. For instance, although primary bond markets have seen continued strong investor demand, secondary market liquidity, in particular in corporate bond markets, has deteriorated in recent years. This has included lower daily trading volumes – in an environment of significantly higher amounts outstanding – and a reduction in the number of market-makers. Markets that are important for the functioning of bond markets, such as repo markets, have seen reduced activity since the outbreak of the financial crisis as well.

Although the euro area banking sector remains exposed to the risk of a repricing of market risk, the steady increase in the euro area shadow banking sector in recent years, amid a gradual shift from bank to market-based funding in the economy, suggests that vulnerabilities are likely to have been

Chart 4 Implied market volatilities

(Jan. 1999 – 14 Nov. 2014; ten-day moving average; index: average since 1999 = 100)



Source: Bloomberg.

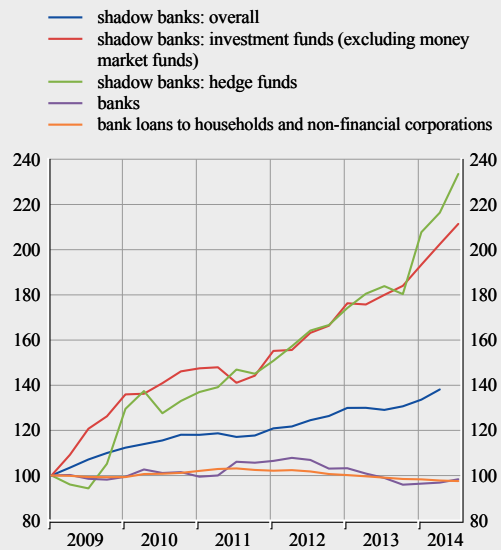
... dependent on sustained risk appetite

Vulnerabilities have been growing in the shadow banking sector...

growing more in this segment (see Chart 5). Any problem confronting investment funds could, however, propagate quickly to the banking sector and the real economy since they are highly interconnected with euro area credit institutions and an important source of funding for euro area banks, non-financial corporates and governments. The euro area investment fund sector has doubled in size since 2009, with assets reaching €8.9 trillion in the third quarter of 2014. Almost all of these funds are open-ended and the share of liquid assets as a percentage of shares/units issued has declined from 40% in 2009 to 33% in the third quarter of 2014. This raises stability concerns as demandable equity in these funds can have the same fire-sale properties as short-term debt funding. In addition, some segments of the shadow banking sector appear to have become more concentrated, for instance with the largest global asset managers accounting for an increasing share of assets under management.

**Chart 5 Assets of selected euro area financial sectors**

(Q1 2009 – Q3 2014; index: Q1 2009 = 100)



Sources: ECB and ECB calculations.

... which calls for implementation of prudential policies

With monetary policies aimed at preserving price stability, prudential policies are needed to address vulnerabilities from financial excesses. As the potential for adjustment in financial markets remains, micro- and macro-prudential policies need to be considered to ensure that financial intermediaries have sufficient buffers to withstand a reversal of risk premia. It also calls for further initiatives to monitor and assess vulnerabilities in the growing shadow banking sector, and for continued efforts to improve the oversight and the tools available for mitigating action as currently available tools have limited scope to deal with risks from shadow banking activities.

#### *Key risk 2: Persistent weak bank profitability in a weak, fragile and uneven macroeconomic recovery*

Bank profitability remains weak...

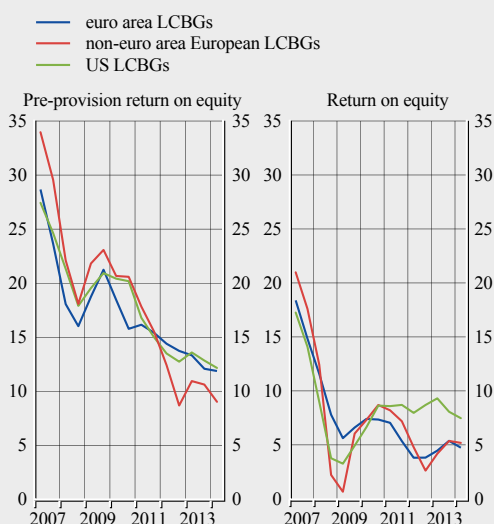
A confluence of cyclical and structural factors has led to a low profitability or loss-making environment for euro area banks. Clearly, the emergence from crisis and recession in the euro area has had a significant impact – with one-fifth of euro area significant banking groups<sup>1</sup> reporting losses in the first half of 2014, albeit down considerably from more than half of the banks reporting losses in the second half of 2013. Sluggish bank profitability has, however, not only been a challenge specific to euro area banks. Their aggregate financial performance closely resembles that of non-euro area European banks and – once correcting for provisioning – also that of their US peers (see Chart 6).

Persistent weak bank profitability could become a systemic concern if it limits banks' ability to improve their shock-absorbing capacity via retained earnings and provisioning. This could prevent

<sup>1</sup> "Significant banking groups" (SBGs) refers to around 90 euro area banking groups (depending on data availability) and is the consolidated group level analogue of the significant banks that fall under direct ECB supervision. Alongside this group of banks, the FSR also contains analysis of a sub-set of 18 euro area "large and complex banking groups" (LCBGs) – which is a sub-set of the SBGs – and 22 global LCBGs which are the largest, least substitutable and most interconnected banks. For further details, see "A new bank sample for the ECB's Financial Stability Review", *Financial Stability Review*, ECB, November 2013.

**Chart 6 Pre- and post-provision return on equity of euro area and global large and complex banking groups (LCBGs)**

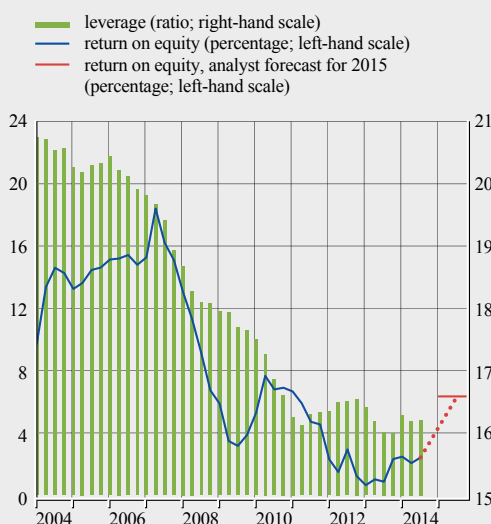
(H1 2007 – H1 2014; percentages; medians; two-period moving average)



Sources: SNL Financial and ECB calculations.  
Note: "Non-euro area European LCBGs" include banks from the United Kingdom, Switzerland, Sweden and Denmark.

**Chart 7 Return on equity and leverage of euro area significant banking groups**

(Q1 2004 – 2015; medians)



Sources: Bloomberg and ECB calculations.

banks around the world from engaging in new profitable lending activities and lead to more structural business model-related concerns in a low growth environment. In such circumstances, banks might be tempted to take on more risk to improve profitability, which in turn could make them more vulnerable to future shocks.

Cyclical headwinds affecting profitability are expected to dissipate as the economic environment improves, and signs of a levelling-off in the pace of non-performing loan formation have emerged in some countries. That said, the turning point does not appear to have been reached yet in some countries and the fragile and uneven economic recovery points to continued downside risks to the credit quality of banks' borrowers. At the same time, large one-off costs stemming from past conduct irregularities weigh on banks and could lead to market volatility, in particular for some large euro area banks that are active in capital market businesses.

Although cyclical factors mainly related to high loan loss provisioning needs continue to weigh heavily on euro area banks' financial performance, the fact that for many banks their return on equity has fallen below their cost of equity – shareholders' expected rate of return – also points to a structural need for further balance sheet adjustment in parts of the banking system. Current lower levels of profitability are also a result of – the much needed – de-risking of bank balance sheets, including a stark reduction in leverage (see Chart 7). The challenge for banks is therefore to improve profitability without unduly taking on risk.

While the challenges confronting banks can to a large extent be linked to legacy issues stemming from the financial crisis, including the weak economic environment, in some countries signs of new potential risks are emerging. In particular, property market developments in both the residential and (prime) commercial segments in some countries have been frothy, leaving property markets

*... due to both  
cyclical and  
structural factors...*

*... although efforts to build a stronger banking sector have been significant*

vulnerable to correction should investor sentiment deteriorate. The numerous property-related instruments in the newly acquired macro-prudential toolkit may contribute to attenuating financial cycles, while also increasing the resilience of banks and their borrowers.

Amid current legacy and new challenges confronting banks, efforts to clean up balance sheets, bolster capital positions and adjust business models continue. Bank balance sheets have been strengthened further, with a clear shift towards capital increases in 2014 – related to the comprehensive assessment carried out by the ECB – from deleveraging and de-risking in previous years. This has happened amid a significant reduction in the size of bank balance sheets since mid-2012. However, signs have emerged that the asset reduction process might have come to an end (see Chart 8), which, together with continuously improving capital buffers, can be seen as a positive development as it suggests that the trough in the bank performance cycle might have been reached. Aggregate data, however, conceal notable differences across banks and countries and further adjustments are needed in parts of the banking sector.

While the comprehensive assessment ensured that significant banks in the euro area have sufficient capital levels, progress needs to continue in parts of the banking system to address remaining fragilities and uncertainties. Further measures in this respect need to be taken mainly by banks themselves and needed action is likely to differ across banks or national banking sectors depending on whether banks are, for instance, faced with possible overcapacity in parts of the banking sector, high costs, or limited diversification of their income sources. In addition, continued prudent asset valuation enforcement, as well as timely and accurate risk controls by banks, should encourage banks to develop appropriate systems to deal with credit risk and enhance their capacity to deal with distressed borrowers. At the same time, further official sector policies can also provide support – in particular, legal frameworks should be sought that facilitate a timely and low-cost resolution of non-performing loans, thereby enabling a smooth interaction between banks and their distressed borrowers and freeing up additional lending capacity.

*Key risk 3: Re-emergence of sovereign debt sustainability concerns, amid low nominal growth and wavering policy determination for fiscal and structural reforms*

*Sovereign stress has remained contained...*

Sovereign stress has remained contained in the euro area since the publication of the May FSR, albeit with increasing challenges from a deterioration in the economic growth outlook. Building on the improved sovereign debt market conditions following the announcement of Outright Monetary Transactions in 2012 and more recent ECB policy action, market sentiment – especially towards more vulnerable euro area countries – has remained relatively favourable in recent months. Some gradual strengthening in cyclical economic conditions and the ongoing adjustment of fiscal fundamentals underpinned this development. The aggregate euro area fiscal deficit is expected to continue to fall and stay below the 3% Maastricht threshold this year as consolidation efforts and

**Chart 8 Evolution of total assets of euro area monetary financial institutions**

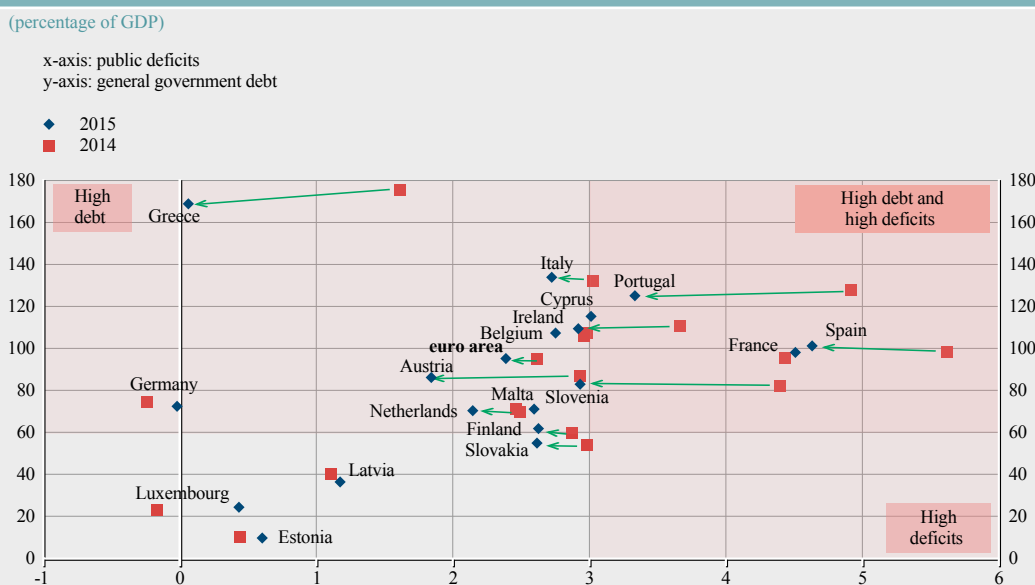
(May 2012 – Sep. 2014; EUR trillions)



Source: ECB.

Note: The red bars signal a decline and the green bars an increase in the given month.

Chart 9 General government debt and deficits in the euro area



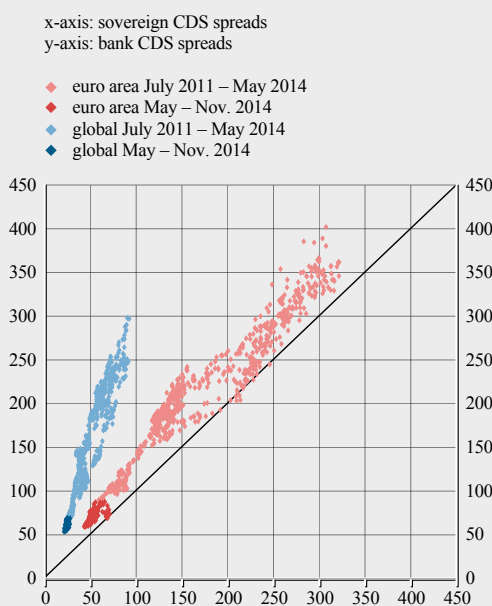
various reform and administrative measures have started to bear fruit and tax revenues have grown more strongly than initially expected in some countries. In addition, the unwinding of financial sector support is expected to contribute positively to the improvement of fiscal positions in 2014 and beyond in many countries (see Chart 9).

Sentiment towards sovereigns has also been supported by continued progress towards weakening the links between sovereigns and banks. Most notably, banking union preparations have continued with its first pillar, the Single Supervisory Mechanism (SSM), in place since 4 November. Regulatory initiatives – such as new bail-in rules – have also helped to weaken links between euro area banks and sovereigns, although the continued significant correlation in euro area banks' and sovereigns' borrowing costs highlights the need for continued progress (see Chart 10).

Despite the relatively benign sentiment towards euro area sovereigns, public debt sustainability challenges persist in the context of continued high debt levels in many countries, heightened

Chart 10 Sovereign and bank credit default swap spreads

(July 2011 – 14 Nov. 2014; basis points)



Sources: Bloomberg and ECB calculations.

Note: Average CDS spread for euro area and global LCBGs versus the average sovereign CDS spread where the LCBGs are headquartered (France, Germany, Italy, Spain and the Netherlands for euro area LCBGs and the United States, the United Kingdom, Switzerland, Denmark, Sweden and Japan for global LCBGs).

... but public debt sustainability challenges persist...

... which are also  
linked to search for  
yield and banking  
sector concerns

Policy action  
and regulatory  
advancements have  
continued

downside risks to the economic outlook and a low inflation environment. Uncertainties relating to sovereign debt sustainability are likely to remain over the medium term as government debt-to-GDP ratios are projected to stay at levels well above 100% in several euro area countries. This highlights the need for further adjustment of fiscal and economic fundamentals relevant for debt sustainability.

Debt sustainability concerns in the medium term remain susceptible to potential setbacks related to the aforementioned necessary further adjustment as well as the weak nominal growth outlook. The needed adjustment could run the risk of being delayed due to the recent relative calm in euro area financial markets, which has the potential to breed complacency in terms of fiscal consolidation and structural reforms. Reinforced rules at the European level should help to mitigate such risks, but reform fatigue or complacency at the national level could lead to a reassessment of sentiment towards euro area sovereigns. Debt sustainability concerns could also resurface during a prolonged period of very low inflation or if the economic outlook deteriorates, which would limit governments' room for manoeuvre for further fiscal adjustment.

Clearly, risks to the sovereign outlook are also closely linked to the risks stemming from the ongoing global search for yield or further stress in the banking sector. A generalised abrupt reversal of the global search for yield could lead to renewed increases in sovereign bond yields, in particular in lower-rated euro area countries, and could also translate into losses for banks on their sovereign debt holdings. In addition, while new bail-in rules will help shield public balance sheets and taxpayers from future national costs of bank recapitalisation, the potential for renewed adverse feedback loops between banks and sovereigns also remains. Continued efforts to swiftly and effectively implement all pillars of the banking union as well as the Bank Recovery and Resolution Directive are therefore needed.

#### MACRO-PRUDENTIAL POLICY ACTION AND REGULATORY INITIATIVES

Progress towards a safer financial system continues, with macro-prudential policy action and regulatory advancements at both the European and global levels.

In line with newly acquired macro-prudential policy mandates, a number of euro area countries have already announced and also implemented macro-prudential measures. These include *systemic risk measures* aimed at mitigating vulnerabilities stemming from the significant size, high concentration and interconnectedness of banking sectors. Different types of *residential property measures* have been adopted as well, with the aim of addressing unfavourable developments in property markets.

In the regulatory field, progress in strengthening banking sector resilience has continued, including weakening the links between sovereigns and banks. Notably, significant achievements have been made since the publication of the last issue of the FSR in the areas identified as central elements of an integrated financial framework in Europe, particularly in the euro area, namely the establishment of a Single Supervisory Mechanism, a common resolution framework and a Single Resolution Mechanism, along with more harmonised deposit insurance scheme parameters. Measures have not only been taken in the banking domain, however, but also across other financial institutions, as well as market infrastructures. Perhaps most importantly, as shadow banking grows in breadth around the world, regulation of this segment has also gathered pace.



# I MACRO-FINANCIAL AND CREDIT ENVIRONMENT

*Macro-financial conditions remain fragile in the euro area, with a very modest economic recovery contrasting with generally robust financial market sentiment. At the country level, fragmentation of the real economy continues to weigh on the underlying growth momentum despite further progress in euro area rebalancing. Risks surrounding the fragile, low nominal growth environment appear to have risen. In particular, geopolitical tensions – despite a limited global impact to date – have the potential to reignite risk aversion in financial markets and potentially also trigger a broad-based adjustment in global capital flows. Ultimately, uncertainties regarding the pace and sustainability of economic recovery in both emerging and advanced economies within and outside the euro area remain – amid continued macro-financial vulnerabilities and structural reform needs along the path to normalisation of macroeconomic policies in some major advanced economies.*

*Euro area sovereign stress has remained contained amid further improving market sentiment towards more vulnerable euro area economies, as well as some gradual strengthening in cyclical economic conditions and the ongoing adjustment of fiscal fundamentals. Risks nonetheless have increased in the current fragile growth environment, with related challenges for several countries in durably restoring the sustainability of public finances in the context of a prolonged period of low inflation and heightened downside risks to the economic outlook.*

*The weak economic recovery to date has also entailed challenges for the non-financial private sector, given muted developments in income and earnings. At the same time, household and corporate indebtedness remain high in several euro area countries. Financing conditions for euro area households and firms continued to ease, while recently introduced unconventional measures by the Eurosystem will help further reduce persistent fragmentation across countries and firm sizes. With time, a strengthening macroeconomic recovery should gradually translate into improved income and earnings prospects for households and non-financial corporations, which – together with the favourable interest rate environment – should help support the ongoing process of balance sheet repair.*

*In this environment, overall developments in euro area property markets have shown incipient signs of recovery, in particular driven by a turnaround in some countries and market segments with considerable post-crisis adjustments. Nonetheless, fragmentation across countries and different property types remains pronounced, albeit declining in terms of both price developments and valuations. The ongoing hunt for yield in prime commercial property, a weaker than expected economic recovery as well as possible corrections in some jurisdictions and regions with signs of overvaluation still represent risks to financial stability going forward.*

## I.1 ONGOING MODERATE RECOVERY, BUT DOWNSIDE RISKS ON THE RISE

The economic recovery has continued in the euro area in 2014, but has lost some of its momentum amid a softening in some major euro area countries towards the middle of the year. Aggregate euro area economic growth continued to be supported by domestic demand, which benefited from favourable real income developments and financing conditions. The economic recovery has been also buttressed by further reduced macroeconomic uncertainty, with all the different types of uncertainty now below their long-run average despite some pick-up in financial market uncertainty more recently (see Chart 1.1).

The recent slowdown in momentum notwithstanding, the economic recovery in the euro area is expected to continue on a moderate upward path in the medium term. Support stems from an accommodative monetary policy stance (notably including the standard and non-standard

*A loss of economic momentum...*

*... but the recovery continues at a modest pace...*

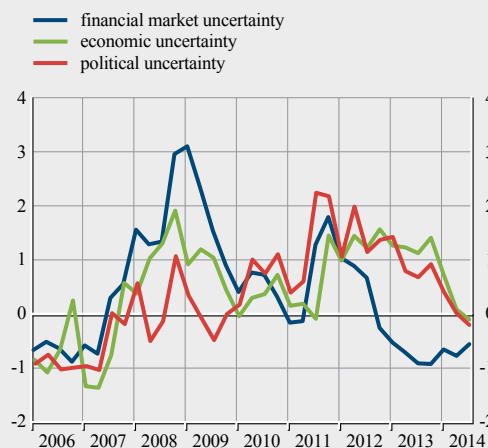
... amid increasing  
downside risks

Eurosystem measures introduced in June and September 2014), favourable financial market conditions, recovering world trade, a depreciation of the euro, gradual improvements in the labour market as well as continued fiscal consolidation and structural reforms in several euro area countries. The September 2014 ECB staff macroeconomic projections for the euro area indicate annual real GDP growth of 0.9% for 2014 – somewhat lower than the 1.1% projected back in June and corresponding to a similar downward revision to the outlook of professional forecasters.

The economic recovery remains fragile going forward in the light of increasing downside risks to the economic outlook (see Chart 1.2). Over the short to medium term, several factors could weigh significantly on the underlying euro area growth momentum, including the heightened geopolitical tensions across the globe, the still ongoing process of balance sheet repair in the financial and non-financial private sectors and the continued need for further fiscal

**Chart 1.1 Economic, political and financial market uncertainty in the euro area**

(Q1 2006 – Q3 2014; standard deviations from average over 1996-2014)



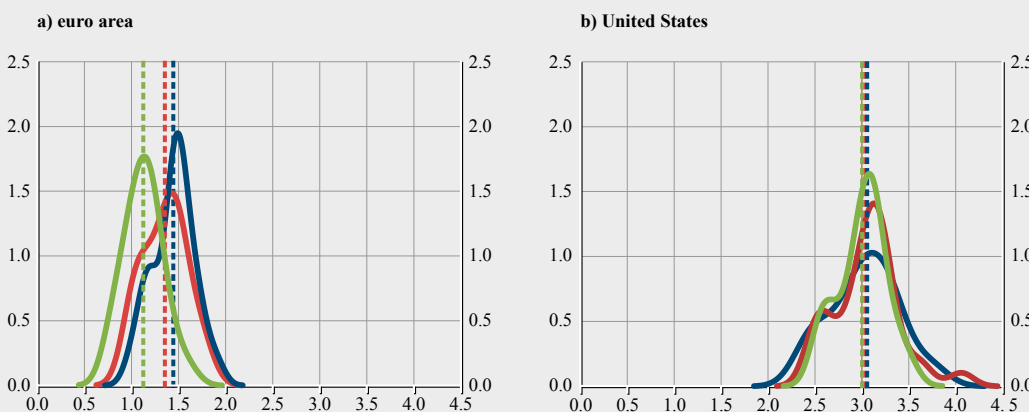
Sources: Consensus Economics, Eurostat, Baker, Bloom and Davis (2013), European Commission and ECB calculations.  
Notes: Based on households' and firms' perceived uncertainty about the future economic situation taken from surveys (*economic*), various financial market indicators (*financial market*) and economic policies (*political*). For further details on the methodology, see "How has macroeconomic uncertainty in the euro area evolved recently?", *Monthly Bulletin*, ECB, October 2013.

**Chart 1.2 Distribution of the 2015 real GDP growth forecasts for the euro area and the United States**

(probability density)

x-axis: real GDP growth rate

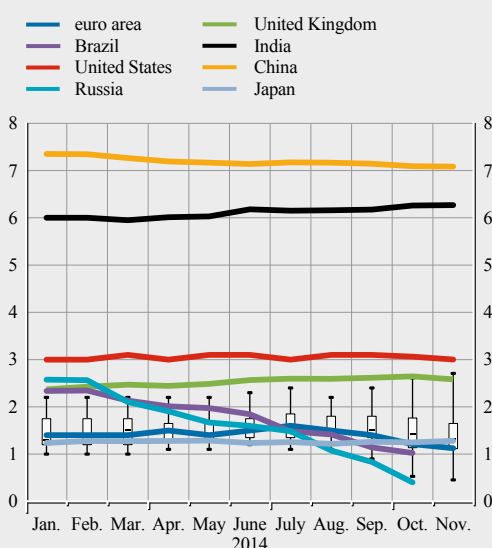
— Jan. 2014 forecast for 2015  
— May 2014 forecast for 2015  
— Nov. 2014 forecast for 2015



Sources: Consensus Economics and ECB calculations.

**Chart 1.3 Evolution of forecasts for real GDP growth in selected advanced and emerging economies for 2015**

(Jan. 2014 – Nov. 2014; percentage change per annum)

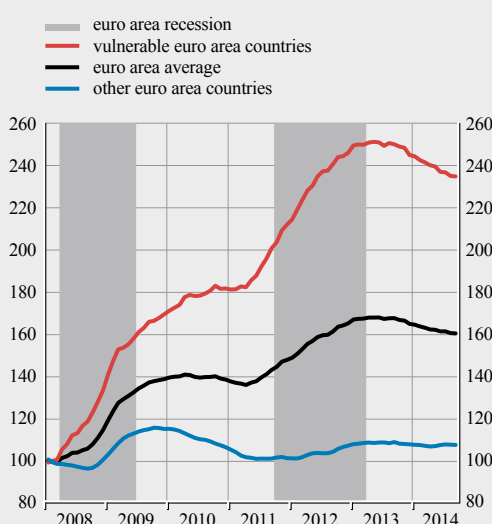


Sources: Consensus Economics and ECB.

Note: The chart shows the minimum, maximum, median and interquartile distribution across the 11 euro area countries surveyed by Consensus Economics (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain).

**Chart 1.4 Developments in the number of unemployed across the euro area**

(Jan. 2008 – Sep. 2014; index: Q1 2008 = 100)



Sources: Eurostat and ECB.

Note: Vulnerable euro area countries include Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain.

consolidation in some countries. That said, the economic outlook for the euro area remains subdued in comparison to the growth prospects of other major advanced and emerging market economies (see Chart 1.3).

At the euro area country level, real fragmentation – albeit significantly lower than during the euro area sovereign debt crisis – remains a cause for concern, with more recently some signs of a renewed widening in the cross-country dispersion of growth rates. Moreover, labour market conditions are still very divergent within the euro area, as high unemployment in more vulnerable countries contrasts with relatively benign labour market conditions in other euro area economies (see Chart 1.4). This heterogeneity continues to highlight the need for employment-enhancing structural reforms with a view to fostering an inclusive economic recovery.

Efforts to restore competitiveness are ongoing in a number of euro area countries. The overall competitiveness of more vulnerable euro area countries has improved considerably since the onset of the crisis, as indicated by major current account corrections. A large part of the underlying adjustment has been of a non-cyclical nature and is therefore likely to be sustained (see Chart 1.5). In the context of the ongoing rebalancing, structural reforms have proven decisive for competitiveness gains in several vulnerable euro area countries, as shown by notable improvements in global competitiveness rankings, for example in Greece and Portugal (see Chart 1.6). Still, structural reforms need to continue in order to help further reduce the real and financial fragmentation across the euro area, to enhance the euro area's medium-term growth potential and to further narrow the still sizeable, albeit diminishing, negative output gaps, particularly in vulnerable euro area economies.

*Real fragmentation remains a cause for concern...*

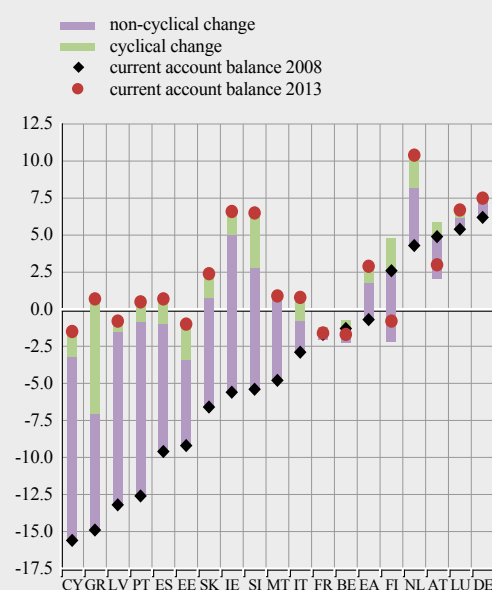
*... despite the ongoing rebalancing in the euro area*

*Global recovery continues along a gradual but uneven growth path*

*Economic momentum in advanced economies is firming slowly...*

**Chart 1.5 Current account rebalancing across the euro area**

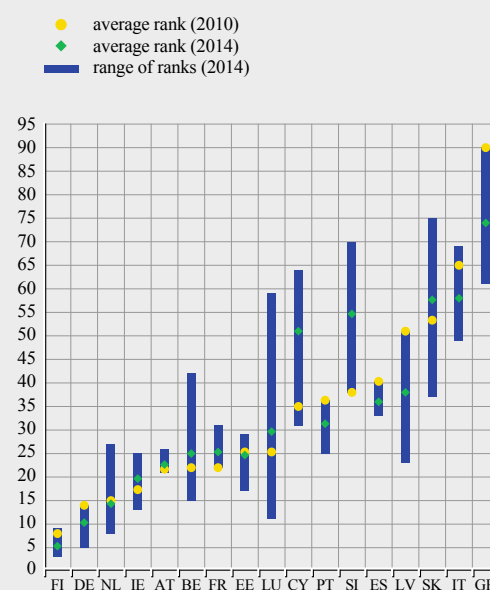
(2008 – 2013; percentage of GDP)



Sources: ECB and ECB calculations.  
Notes: The estimates of cyclical and non-cyclical changes are based on a current account model in the vein of the IMF's External Balance Assessment. For further details see *External Balance Assessment Methodology: Technical Background*, Research Department, IMF, June 2013.

**Chart 1.6 Changes in competitiveness across the euro area**

(2010, 2014; ranks)



Sources: World Bank, International Finance Corporation, World Economic Forum, Transparency International and ECB calculations.  
Notes: The average rank represents the simple average of the country's rank in Transparency International's Corruption Perceptions Index (2013, 2010), the World Economic Forum's Global Competitiveness Report (2014-15, 2010-11) and the World Bank/International Finance Corporation's Ease of Doing Business (2015, 2011) rankings.

A gradual recovery in **global economic activity** has continued. Economic momentum in advanced economies strengthened further, albeit at an uneven pace across regions, while growth in emerging markets has also rebounded after a temporary dip in 2013. The accommodative monetary policy stance in advanced economies – though showing signs of divergence – has continued to provide vital support to a fragile economic recovery. Notwithstanding the recent rise, overall volatility appears to have remained subdued in global financial markets (see Chart 1.7). In particular, emerging markets have witnessed a drop in financial market pressures (see Chart 1.8), as improved global risk sentiment has encouraged capital flows back to emerging markets following intermittent turbulences since mid-2013. While global growth is expected to pick up gradually, risks to the global outlook remain tilted to the downside. Heightened geopolitical risks, persistent macroeconomic and/or financial imbalances, as well as a sharp repricing of risk with ensuing corrections in asset prices and a potential disorderly unwinding of capital flows, could have negative repercussions for the global economy.

Zooming in on the main global economic regions, economic momentum in many **advanced economies** outside the euro area is firming slowly, despite short-term volatility. Recent trends indicate a continued recovery ahead, but the pace of progress varies across countries, as still weak labour market conditions, continued balance sheet adjustments in the financial and non-financial

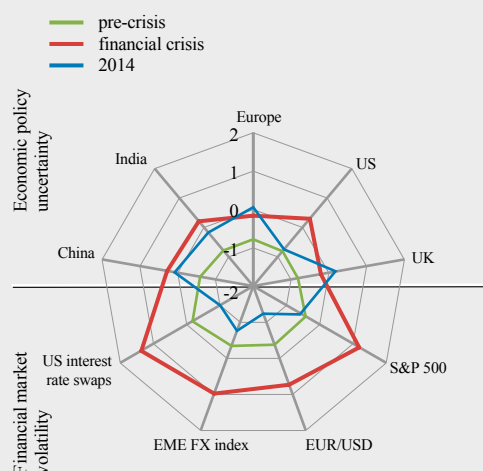
private sectors and a still incomplete process of fiscal consolidation continue to weigh on near-term growth prospects in several countries. Beyond the support of accommodative monetary policies, economic growth in advanced economies will increasingly benefit from waning private sector deleveraging and fiscal drag, enhanced confidence and falling unemployment.

In the **United States**, the economic recovery has gained traction after a weather-related weak start to 2014, supported by favourable housing and labour market developments. Notwithstanding some temporary increase in volatility in October, financial conditions have eased further, with indicators of financial stress at or near all-time lows. In the context of generally improving economic prospects, the Federal Reserve concluded its asset purchase programme in October, while preserving a highly accommodative monetary stance, as reflected by the low target range for the federal funds rate and the expected maintenance of its longer-term securities holdings at sizeable levels. Looking ahead, economic activity should become more sustained due to the ongoing recovery in labour and housing markets, accommodative monetary and financial conditions, as well as fading headwinds from fiscal policy and household deleveraging, with the household debt-to-income ratio now having arguably returned to levels closer to equilibrium.<sup>1</sup>

In **Japan**, the economy contracted strongly in the second quarter of 2014, as demand rebalanced after the VAT hike in April and the frontloaded spending in the first quarter. Growth is expected to resume towards the end of 2014 supported by accommodative monetary policy, including a newly adopted set of measures taken at the end of October. Despite the consumption tax rise, fiscal challenges remain and fiscal consolidation over the medium term remains a necessity to ensure long-term debt sustainability. In addition, banks' sovereign exposure, albeit declining, remains a concern for the profitability and solvency of the

Chart 1.7 Financial market volatility and economic policy uncertainty

(2003 – 2014; number of standard deviations)

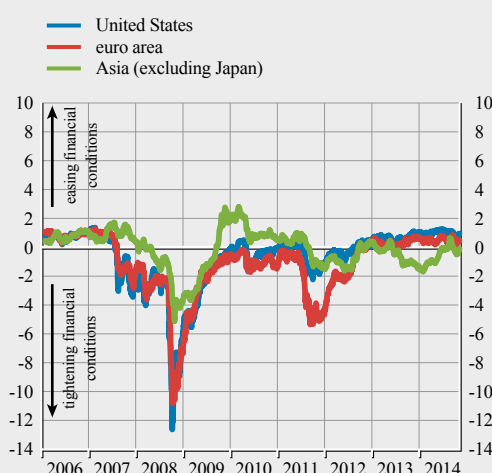


Sources: Haver Analytics, Bloomberg, ECB and Baker, Bloom and Davis (2013).

Notes: The chart shows differences in the number of standard deviations between the values of each indicator over three different periods and the average of 2003–14. The pre-crisis period refers to January 2003 – August 2007. The financial crisis period refers to August 2007 – December 2009, while 2014 refers to available observations this year. Series above the horizontal line are measures of economic policy uncertainty from Baker, S., Bloom, N. and Davis, S., “Measuring Economic Policy Uncertainty”, Chicago Booth Research Paper No 13/02, January 2013. Below the line, implied volatilities on three-month USD/EUR options, the JPMorgan emerging market FX index, the S&P 500 and US interest rate swaps are shown.

Chart 1.8 Financial conditions in selected advanced and emerging market regions

(Jan. 2006 – Nov. 2014; number of standard deviations)



Source: Bloomberg.

<sup>1</sup> For further details, see Albuquerque, B., Baumann, U. and Krustev, G., “Has US household deleveraging ended? A model-based estimate of equilibrium debt”, *Working Paper Series*, No 1643, ECB, March 2014.

... but risks continue  
to be tilted to the  
downside

Japanese banking sector, in case of a repricing of risk in financial markets and the related potential increase in government bond yields.

The **United Kingdom** maintained its strong growth momentum in the first half of 2014, buttressed by rising household confidence, improving labour market conditions and a buoyant housing market. Leading indicators point to a growth moderation in the short run, while structural factors, such as the need for further balance sheet repair in the private and public sectors, will weigh on economic activity over the medium term. Headwinds also relate to ongoing geopolitical risks and the sharp housing market recovery that may provide some relief for highly indebted households, but may also render them more vulnerable to potential corrections in property markets.

*Emerging markets are recovering as financial tensions subside*

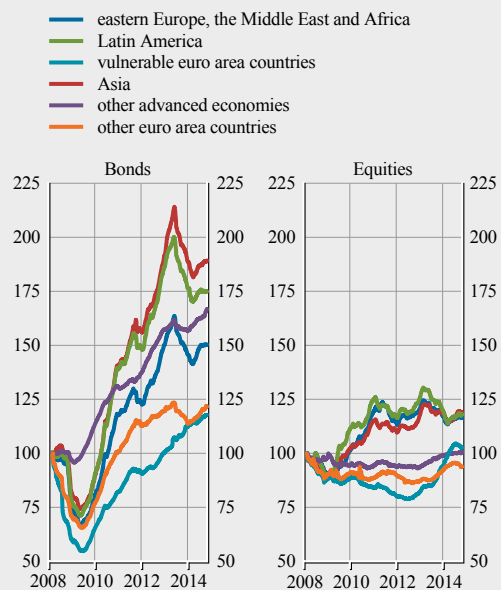
**Emerging markets** have benefited from easing financial market pressures in recent months, as reflected by lower sovereign bond spreads, stabilising equity prices and renewed capital inflows into some of those countries that were more affected by the bouts of volatility in 2013 and early 2014 (see Chart 1.9). This was underpinned by progress in reducing macroeconomic imbalances in some of the more vulnerable economies, also bolstering investor confidence. In tandem with reduced financial stress, economic activity rebounded in several countries, even though remaining rather subdued relative to past years' experience. Going forward, growth in some emerging economies is likely to be restrained by structural factors, such as infrastructure bottlenecks and capacity constraints, while in other countries that were highly dependent on capital inflows, activity is likely to be dampened as economies rebalance and adjust to tighter financial conditions and the expected adjustment of US monetary policy. In the latter context, depleted foreign exchange reserves after the 2013-14 tensions may render some emerging economies with larger external imbalances more vulnerable.

*Growth outlook in emerging Europe benefits from gradual euro area recovery*

The economic recovery continued in most **emerging European economies**, notably the EU countries in central and eastern Europe, supported by strong exports and domestic demand. The impact of the Ukraine-Russia crisis on the region has remained contained to date, given rather limited direct trade linkages and contained financial market spillovers. Still, the main downside risk to the region's economic recovery is related to a further escalation of this conflict, which could also lead to a deepening of sanctions between the EU and Russia. Given strong trade and financial linkages, economic activity in the region is expected to benefit from the ongoing gradual euro area recovery, but also from a further strengthening of domestic demand. However, the outlook for domestic demand in several countries continues to be constrained by a still incomplete process of balance sheet adjustment in the private and public sectors, which in some countries is further complicated by existing currency mismatches. In spite of improved economic activity, credit growth remains subdued in most countries amid a still elevated level of non-performing loans and the ongoing

**Chart 1.9 Equity and bond flows to advanced and emerging market economies**

(Jan. 2008 – Nov. 2014; index: Jan. 2008 = 100)



Source: EPFR.

Note: Bonds include both sovereign and corporate bonds.

deleveraging by foreign banks. At the same time, foreign banks have continued to adjust towards a more self-sustained and domestically funded business model that should help mitigate risks to financial stability in the region.

Following a period of weak growth, economic momentum has strengthened in **emerging Asia**, particularly in India and some other emerging Asian economies, where growth prospects have started to improve following corrections in external imbalances and structural reforms, although growth in China has weakened lately. Looking ahead, a gradual moderation in regional growth dynamics is expected, mainly in China, where high credit growth and leverage, as well as a strongly expanding shadow banking sector, require close monitoring. A slowdown in China would have knock-on effects for other Asian economies with close trade and financial links, but downside risks continue to relate to larger than expected spillovers from capital outflows linked to Federal Reserve tapering. Economic activity in **Latin America** has lost some traction in 2014 and growth has become more uneven across economies. In Brazil, the economy dipped into outright recession following three years of weak growth, while a deeper recession is underway in Argentina, where the outlook has deteriorated further after the debt default in July. The region is expected to undergo a period of subdued growth before gradually benefiting from improved external demand. Risks to the outlook remain tilted to the downside. The main concerns relate to a further tightening of external financing conditions, a more pronounced decline in commodity prices and the risk of a prolonged period of weakness in economic activity in Brazil.

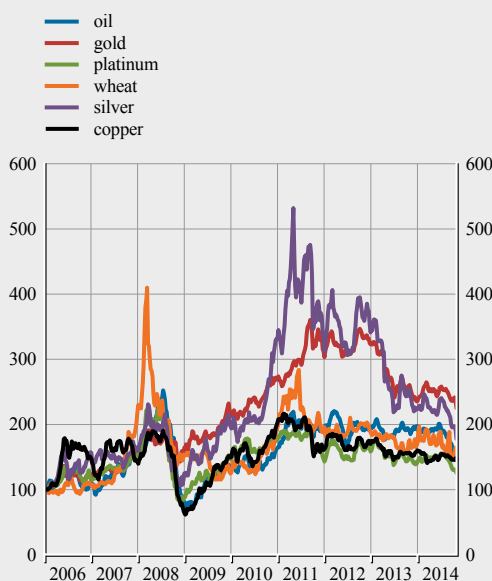
Overall, a moderate but uneven global recovery across countries and regions is expected, with inherent fragilities being somewhat masked by continued benign financial market sentiment. Risks remain tilted to the downside as long-standing and newly emerging underlying vulnerabilities continue to pose a threat to recovery across the globe. Alongside persistent real and financial **global imbalances**, which remain high in a historical context despite having narrowed markedly since the onset of the global crisis, the recent intensification of **geopolitical tensions** represents an increasing cause for concern – this not only in the context of the still ongoing Ukraine-Russia crisis, but also related to other recent incidents in the Middle East. These tensions have the capacity to trigger a spike in commodity prices that may endanger the global recovery and also contribute to preserving global imbalances. This said, intensified geopolitical risks have had a largely muted effect on commodity markets to date (see Chart 1.10), with oil and non-oil commodity prices generally declining over the past months driven by short-run supply-side (e.g. limited disruptions to oil production, emergence of alternative production techniques) and demand-side (e.g. moderate global growth, buoyant risk appetite) fundamentals, which have offset upward pressures related to heightened

*Economic activity has rebounded in Asia, but lost momentum in Latin America*

*Rising geopolitical tensions represent an increasing cause for concern...*

Chart 1.10 Selected commodity price developments

(Jan. 2006 – Nov. 2014; index: Dec. 2005 = 100)



Source: Bloomberg.

geopolitical risks. Lastly, the risk of a disorderly and broad-based **unwinding of global search-for-yield flows** as a result of a faster than expected exit from unconventional monetary policies by some major central banks in advanced economies remains a cause for concern.

In sum, important macro-financial risks to euro area financial stability stem from global factors, including rising geopolitical tensions as well as uncertainties regarding the pace and sustainability of the economic recovery in emerging and advanced economies. Most notably, the risk of possible renewed tensions in global financial markets coupled with a potential unwinding of search-for-yield flows continues to represent a cause for concern. At the same time, macro-financial risks also continue to originate from within the euro area in a fragile, low nominal growth environment. In particular, the still ongoing process of balance sheet adjustment in both the financial and non-financial sectors in several countries and continued (albeit diminishing) real and financial fragmentation still weigh on euro area growth momentum.

#### Box 1

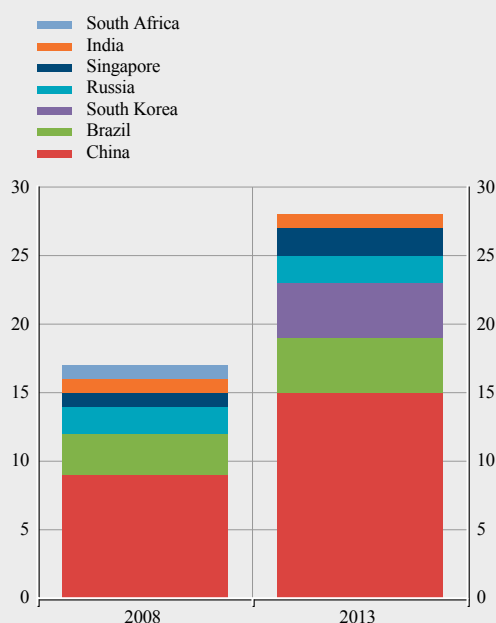
#### DOES THE GROWING IMPORTANCE OF EMERGING MARKET BANKS POSE A SYSTEMIC RISK?

One side effect of the global financial crisis has been strong growth in the weight of emerging market banks in the global financial system. Indeed, financial deepening in emerging markets has accelerated in recent years as the financial crisis has triggered both increased capital flows to these economies, as well as deleveraging of banks in advanced economies. By the end of 2013, 28 of the 100 largest banks globally were headquartered in emerging markets, compared with 17 only five years earlier (see Chart A). As the resulting geographical structure of the global financial system has evolved, the monitoring of risks clearly also needs to be adapted.

Tracking the main regions exhibiting a rapid expansion of financial sector size, banks from six emerging market economies (EMEs) are represented in the set of the 100 largest banking groups worldwide – i.e. China (15), Brazil (4), South Korea (4), Singapore (2), Russia (2) and India (1). Also, the market capitalisation of emerging market banks has almost quadrupled since the peak of the financial crisis and accounted for 35% of global bank market value just before the onset of the “taper tantrum” in May 2013 (see Chart B). Against this background, the purpose of this box is to provide empirical evidence about whether or not, in line with the share of the emerging market financial sector in world markets, their systemic importance for the global financial system has increased over the recent past.

**Chart A** Number of emerging market banks in the world's 100 largest banks by total assets

(number of institutions)



Source: relbanks.com

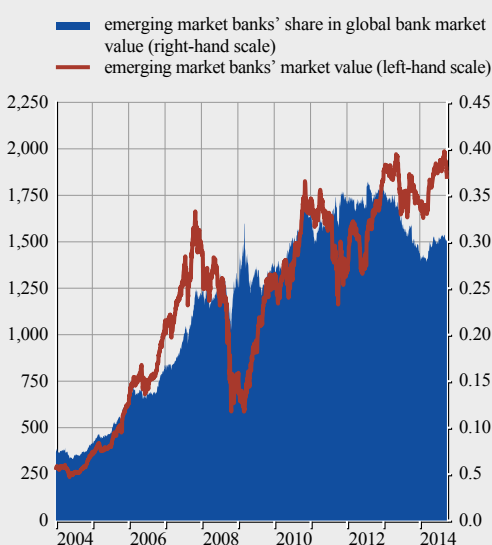
To gauge the systemic importance of emerging market banks, two popular measures of conditional risk (co-risk) can be employed: the conditional value at risk (CoVaR) and the conditional expected shortfall (CoES).<sup>1</sup> These measures capture tail dependence between equity price return distributions of individual institutions and the financial system as a whole. In this application, the two metrics represent, respectively, the value at risk (VaR) and the expected shortfall (ES) of the global banking system conditional on a particular emerging market bank being in distress.<sup>2</sup>

The model estimates suggest that, despite rapid growth in emerging market banks, there has not been a meaningful increase in the systemic importance of emerging market banks for the global banking system.<sup>3</sup> In fact, the two co-risk measures indicate that, at times when emerging market banks were at risk, the global banking sector experienced a median loss in the range of one to two times of the daily standard deviation prevailing in the respective calendar year (see Charts C and D). The evolution of the two co-risk measures over time does not exhibit a downward-sloping trend, i.e. more negative returns for the global banking sector during periods of financial stress among emerging market banks. If anything, the co-risk measures have, in recent years, moderated towards lower conditional losses in global banking sector prices, whereas they peaked in periods of global or euro area market turbulence in 2008, 2009 and 2011.<sup>4</sup>

Overall, the empirical evidence confirms earlier findings in the literature suggesting that tail dependence measures, like standard correlation coefficients, tend to increase globally in periods of global market turbulence. At the same time, the above findings are consistent with recent studies on emerging market banks which find that the global footprint of emerging market banks has remained regionally confined so far.<sup>5</sup> Notwithstanding this finding, a changing geographical importance of global financial institutions requires close monitoring given the prospect that market prices underlying these empirical measures may adapt in ways that cause past empirical

**Chart B Emerging market banks' market capitalisation and share in global bank market value**

(Jan. 2004 – Sep. 2014; USD billions; percentages)

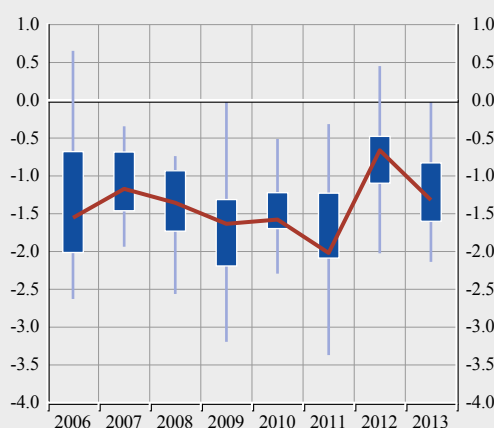


Source: Datastream.

- 1 See Brunnermeier, M. K. and Adrian, T., "CoVaR", *Federal Reserve Bank of New York Staff Reports*, No 348, September 2008 (revised in September 2011).
- 2 CoVaR/CoES are measures of the excess loss of the euro area banking system at the tail of a bank i's return distribution, implied by the bank's individual VaR/ES at the  $q^{\text{th}}$  percentile, relative to its median.
- 3 The sample of emerging market banks is composed of the three largest, non-foreign-owned, listed banks (in terms of total assets) from six EMEs which have systemically relevant financial sectors according to the IMF as well as three advanced Asian economies that exhibit a high degree of integration with the banking sector in emerging Asia.
- 4 A major caveat of this CoVaR/CoES approach is that any interdependence of price movements between emerging market banks and the global financial system may also stem from global factors. At the same time, the presented set-up largely rules out the possibility of reverse causality (i.e. that shocks to the global banking sector determine price movements of emerging market banks).
- 5 See Van Horen, N., "Branching Out: The Rise of Emerging Market Banks", in Reuttner, I. (ed.), *The Financial Development Report 2012*, World Economic Forum, New York, 2012; and BIS, "EME banking systems and regional financial integration", *CGFS Publications*, No 51, Committee on the Global Financial System, March 2014.

**Chart C Daily value at risk of the global financial system conditional on EME banks at risk ( $\Delta\text{CoVaR}_{1\%}^{\text{system}|i}$ )**

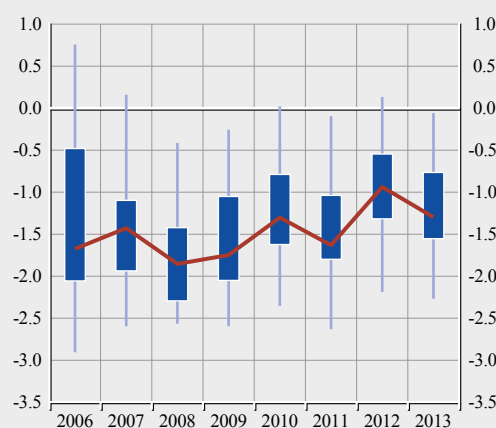
(2006 – 2013; percentage of daily standard deviation)



Sources: Bloomberg and ECB calculations.  
Notes: The charts depict the distribution and the median CoVaR/CoES estimates based on eight non-overlapping annual samples of daily observations from 2006 to 2013. The black line represents the median of the 26 EME banks' daily  $\Delta\text{CoVaR}_{1\%}^{\text{system}|i} / \Delta\text{CoES}_{1\%}^{\text{system}|i}$  in per cent of the daily standard deviation of the global banking sector's return distribution. A negative (positive) value represents a conditional loss (gain). The blue box represents the 25% to 75% quantile of banks. The blue vertical lines represent the minimum and the maximum estimates.

**Chart D Daily expected shortfall of the global financial system conditional on EME banks in distress ( $\Delta\text{CoES}_{1\%}^{\text{system}|i}$ )**

(2006 – 2013; percentage of daily standard deviation)



Sources: Bloomberg and ECB calculations.  
Notes: The charts depict the distribution and the median CoVaR/CoES estimates based on eight non-overlapping annual samples of daily observations from 2006 to 2013. The black line represents the median of the 26 EME banks' daily  $\Delta\text{CoVaR}_{1\%}^{\text{system}|i} / \Delta\text{CoES}_{1\%}^{\text{system}|i}$  in per cent of the daily standard deviation of the global banking sector's return distribution. A negative (positive) value represents a conditional loss (gain). The blue box represents the 25% to 75% quantile of banks. The blue vertical lines represent the minimum and the maximum estimates.

regularities to break down. Moreover, while a mainly regional footprint may limit the prospect of systemic risk at the global level, regional aspects may nonetheless be relevant for euro area financial stability. Emerging market banks located in EU neighbouring countries have recently intensified their financial linkages with the euro area/EU, for instance by setting up offices in the EU and by participating actively in deposit gathering and loan operations in the region. Given that financial stress among emerging market banks can be transmitted to the euro area via both direct and indirect exposures, significant emerging market banks in general can have financial stability repercussions on the euro area financial sector.

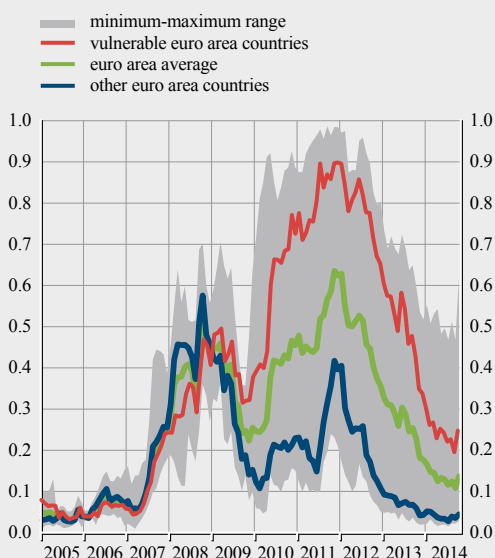
## 1.2 STRUCTURAL REFORM AND FISCAL CONSOLIDATION NEEDS REMAIN HIGH, DESPITE CONTAINED SOVEREIGN STRESS

*Sovereign stress in the euro area has remained contained...*

Sovereign stress in the euro area has remained contained, with the composite indicator of systemic stress in sovereign bond markets being close to levels last seen before the financial crisis despite a small uptick more recently (see Chart 1.11). While fiscal positions are generally on a more solid footing than at the height of the sovereign debt crisis on account of consolidation efforts, gradually strengthening economic growth and favourable financing conditions, further reform progress over the past six months has been uneven across euro area countries. In terms of fiscal adjustment, in some countries (e.g. Cyprus, Ireland and Spain) various reform and administrative measures have started to bear fruit and tax revenues have grown more strongly than initially expected. At the same time, most recent incoming macroeconomic data have shown a loss of economic momentum amid uncertainties surrounding the reform process in some euro area countries.

**Chart 1.11 Composite indicator of systemic stress in euro area sovereign bond markets (SovCISS)**

(Jan. 2005 – Oct. 2014)

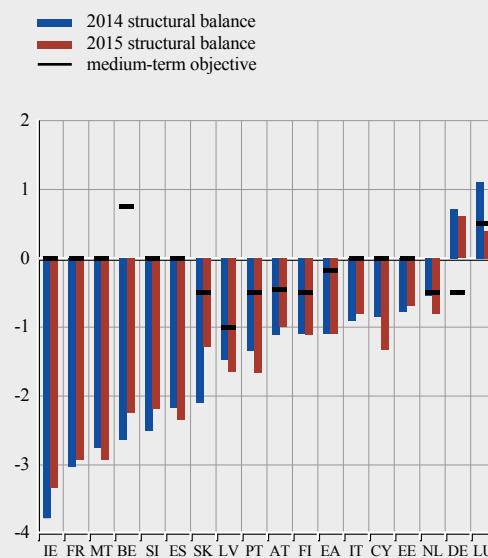


Sources: ECB and ECB calculations.

Notes: Aggregation of country indicators capturing several stress features in the corresponding government bond markets (changing default risk expectations, risk aversion, liquidity risk and uncertainty) for vulnerable (Greece, Ireland, Italy, Portugal and Spain) and other (Austria, Belgium, Germany, Finland, France and the Netherlands) countries. The range reflects the maximum and minimum across the entire set of above-mentioned countries. For further details on the CISS methodology, see Hollo, D., Kremer, M. and Lo Duca, M., "CISS – a composite indicator of systemic stress in the financial system", *Working Paper Series*, No 1426, ECB, March 2012.

**Chart 1.12 Structural balances and medium-term fiscal objectives across the euro area**

(2014, 2015; percentage of GDP)



Sources: European Commission autumn 2014 economic forecasts and 2014 national stability programmes.

Notes: Greece does not have an updated medium-term fiscal objective and is not shown in the chart (its structural surplus is estimated in the European Commission's forecast at 2.0% in 2014 and 1.6% in 2015).

Given the progress made with correcting fiscal imbalances, the focus has increasingly moved towards a more growth-friendly composition of consolidation. In this respect, several governments have recently announced or approved income tax cuts (e.g. Spain and the Netherlands), while planning to stay within their nominal fiscal targets. At the same time, other countries will most likely miss their 2014 fiscal targets mainly on account of weaker than expected macroeconomic developments.

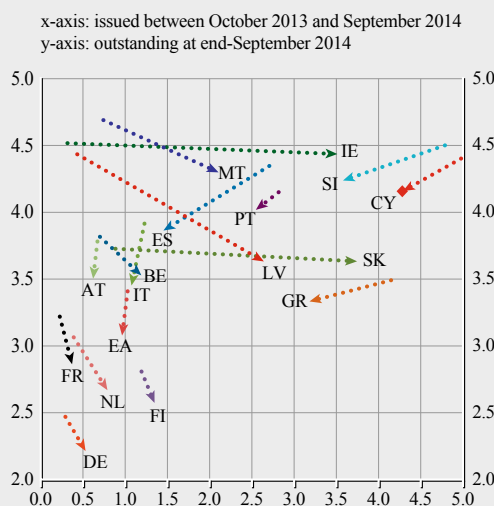
Despite the progress made to date in reducing fiscal and macroeconomic imbalances, sovereign risks remain elevated. *First*, room for fiscal manoeuvre tends to be limited to a small number of euro area countries, as government debt levels continue to be high and still rising in many countries. This limits considerably the scope for fiscal stimulus through cuts in taxes without corresponding compensatory measures on the spending side. Any delay in debt stabilisation can affect countries' creditworthiness, as recently stressed by major rating agencies. Moreover, despite the progress achieved in the past years, many euro area countries are still far away from their medium-term objective of a close-to-balanced structural budget (see Chart 1.12). For the euro area as a whole, the improvement in the structural balance is expected to fall considerably short of the Stability and Growth Pact's requirements, with Germany being the only euro area country that is expected to over-achieve the requirements under the Pact in 2014 and 2015 (see Chart 1.12). *Second*, sizeable reform

... despite continued  
vulnerabilities

commitments remain to be implemented, as highlighted in the past European Semester given only minor advances over the last six months. In line with the country-specific recommendations adopted by the ECOFIN Council in July 2014, several governments have cut the high tax wedge on income to promote employment and long-term growth, but deeper structural reforms, particularly those in the labour and product markets or pension systems, would bring long-term benefits without endangering fiscal solvency. At the same time, even in countries with limited fiscal space, fiscal policy can still support economic recovery by altering the composition of the budget – in particular by simultaneously cutting distortionary taxes and unproductive expenditure. *Third*, while alleviating fiscal costs, the currently low sovereign yields on the outstanding debt in many euro area countries (see Chart 1.13) may expose some countries to sudden flow reversals, especially if macroeconomic developments or reform efforts turn out to be less favourable than currently envisaged.

**Chart 1.13 Average nominal yields on debt securities issued by euro area governments**

(Sep. 2014; percentage per annum)



Source: ECB.

Notes: The connecting dotted lines map the evolution over the past year. Yields are averages, weighted with the amount of outstanding, and respectively, newly issued securities. Issuances over the past year reflect, inter alia, an extension of maturities in several countries with longer-dated securities bearing higher yields.

*Fiscal deficit is forecast to drop further in 2014 and 2015...*

Against this background, under current government plans, the aggregate euro area **fiscal deficit** would continue to fall and stay below the 3% Maastricht threshold. According to the Commission's autumn 2014 forecast, the budget deficit for the euro area (18-country aggregate) will fall from 2.9% of GDP in 2013 (following a positive revision of 0.1 percentage point implied by the transition to the European System of Accounts 2010) to 2.6% in 2014 and 2.4% in 2015. After the incorporation of fiscal measures underlying governments' 2015 draft budgetary plans, structural balances are projected to deteriorate in half of the euro area countries and to remain flat for the euro area aggregate. However, cyclical developments and temporary factors are seen to be supportive to fiscal positions in 2015 so that headline balances follow a more favourable path in most euro area countries. Compared with the Commission's spring 2014 forecasts, the short-term fiscal outlook deteriorated marginally for the euro area aggregate, triggered by larger deteriorations in France, Italy, Portugal and Finland.

*... as support to the financial sector weighs less on public finances*

The unwinding of financial sector support is expected to contribute to the improvement of fiscal balances in 2014 and beyond in many countries. In Greece and Slovenia, the bank recapitalisation costs of 2013 were a one-off. In Portugal, the cash reserves earmarked for potential support to the financial sector were used in mid-2014 as a loan to the Portuguese Resolution Fund for use in the isolated bail-in case of Banco Espírito Santo. Going forward, bail-in and bank resolution arrangements based on the provisions of the Bank Recovery and Resolution Directive and the Single Resolution Mechanism, as well as, more generally, steps taken at the European level towards a banking union, might imply a new paradigm relative to the last years, notably with regard to the sovereign-bank nexus. The explicit and transparent framework for sharing resolution costs with

bank creditors along with a Single Resolution Fund clearly has the potential to reduce prospective contingent liabilities of any given country vis-à-vis its banking sector.

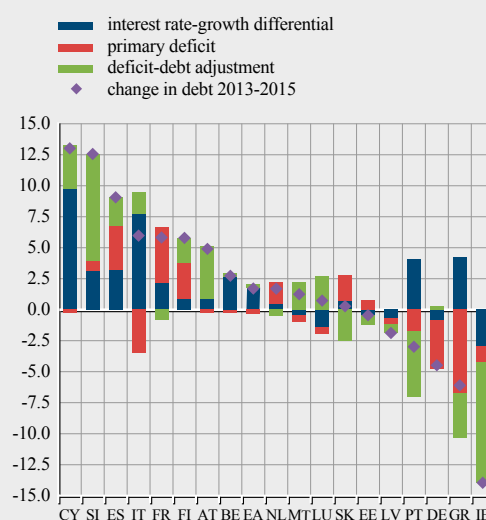
Despite progress in fiscal adjustment, the **public debt**-to-GDP ratio for the euro area (18-country aggregate) is still rising, but is projected in the Commission's autumn 2014 forecast to peak in 2015 at 95% of GDP. This is mainly attributable to adverse interest rate-growth differentials and deficit-debt adjustments, which are expected to exceed the primary surplus projected as of 2014. As these two inhibiting factors are expected to wane, the public debt ratio for the euro area as a whole is projected to decline as of 2016 for the first time since 2008. At the country level, public debt ratios remain on an increasing path in the majority of euro area countries (see Chart 1.14).

Regarding debt sustainability, the most important risks across the euro area relate to the potential complacency in terms of fiscal adjustment and structural reforms, a slowdown in economic growth dynamics and a prolonged period of low inflation.<sup>2</sup> Such developments would impede the debt-servicing abilities of sovereigns, in particular of those which currently face heightened market optimism and downward rigidities in fiscal positions. Simulation results suggest that a combined lasting shock of lower growth, higher yields and worsened structural balances, which could emerge from a lack or reversal of structural reforms and fiscal consolidation efforts, would put debt sustainability at risk (see Chart 1.15). In general, the higher the debt levels and the deeper the economic and institutional rigidities, the less resilient countries are to adverse shocks.

The euro area sovereign debt crisis has illustrated that alongside perceived credit risks liquidity strains in the public sector may also pose a risk to financial stability. In fact, **sovereign**

Chart 1.14 Changes in public debt levels across the euro area between 2013 and 2015

(2013 – 2015; percentage points of GDP)

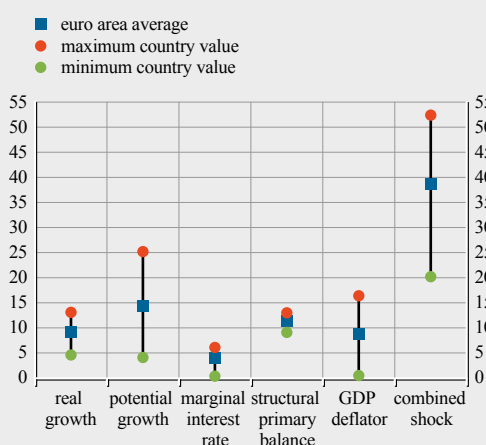


Source: European Commission autumn 2014 economic forecast.

*Public debt is expected to peak in 2015 and decline gradually thereafter...*

Chart 1.15 Reaction of the public debt ratio to standardised macro and fiscal shocks

(percentage points of GDP)



Source: ECB.

Notes: The chart shows the reaction of the debt ratio for the euro area average and the individual countries' range as of 2024 to standardised (1 percentage point) adverse shocks to real growth (for three years), potential growth, the marginal interest rate, the fiscal position (structural primary balance), the GDP deflator, and a combined shock of the above. The shocks are permanent (the three-year real growth shock translates into partial potential shock deterioration) and are applied as of 2015. The deterministic debt simulations are conducted in a partial equilibrium framework, which takes into account feedback effects between fiscal, macro and financial variables.

*... but uncertainties relating to sovereign debt sustainability persist*

*Financing needs remain sizeable in several countries in 2015...*

<sup>2</sup> For more details on the financial stability challenges posed by very low rates of consumer price inflation, see Box 1 in *Financial Stability Review*, ECB, May 2014.

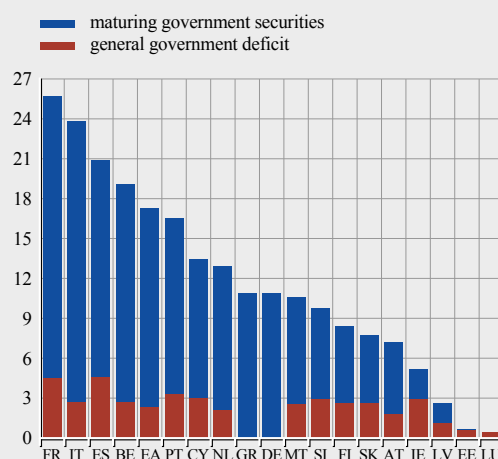
... but available financial assets may mitigate financing needs

**financing** needs for 2015 remain significant in many euro area countries (see Chart 1.16), according to securities redemption data up to September 2014. Maturing sovereign debt in the near-to-medium term remains high in the euro area too, albeit with major cross-country differences. As at end-September 2014, securities with a residual maturity of up to one year accounted for about 20% of total outstanding debt securities in the euro area or 15.5% of GDP. The average residual maturity of outstanding euro area government securities was 6.3 years, with the residual maturities ranging from 3.2 years in Cyprus to 12.0 years in Ireland.

Sovereign financing needs may – to some extent – be alleviated by resorting to existing financial assets. The consolidated financial assets held by euro area general governments averaged some 36.7% of GDP at the end of the first quarter of 2014, with some variation across countries. At the same time, the market value of consolidated general government liabilities in the euro area was 104.3% of GDP, yielding net financial liabilities of 67.6% of GDP.

**Chart 1.16 Maturing government debt securities and projected deficit financing needs of euro area governments in 2015**

(percentage of GDP)



Sources: European Commission autumn 2014 economic forecast, ECB and ECB calculations.

Notes: Gross financing needs are estimates of government debt securities maturing in 2015, based on ECB data as at end-September 2014, and the Commission's government deficit projections for 2015. The estimates are subject to the following caveats. First, they only account for redemptions of debt securities, while maturing loans are not included. Second, estimates disregard that some maturing government securities are held within the government sector. Finally, refinancing needs corresponding to short-term debt issued after September 2014 are assumed to be the same as in the fourth quarter of 2014, which may imply an overestimation for some countries.

### 1.3 GRADUALLY IMPROVING FINANCING CONDITIONS IN THE NON-FINANCIAL PRIVATE SECTOR, BUT VULNERABILITIES REMAIN

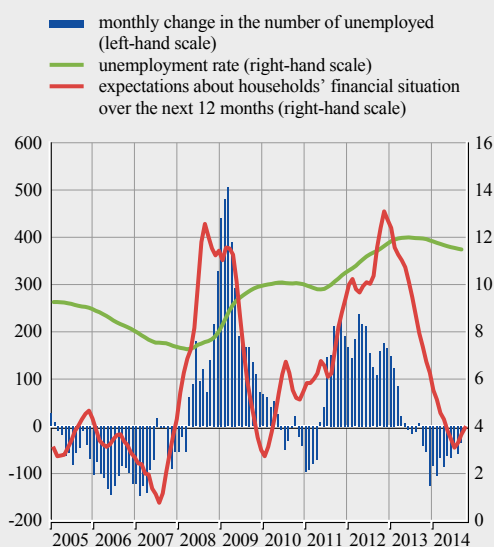
Gradual economic recovery alleviates income and earnings risks somewhat

While recovering somewhat amid moderately improving macroeconomic conditions, **income and earnings** for the euro area non-financial private sector have remained sluggish. The income situation of *households* appears to have stabilised further, but disposable income dynamics have remained muted and households' financial situation expectations have become somewhat less optimistic as the economic recovery has shown signs of losing some of its momentum. While there are tentative signs of improvements in labour market conditions at the aggregate euro area level (see Chart 1.17), the situation continued to be particularly weak in vulnerable euro area countries, thereby further weighing on households' income prospects. As signalled by a distance-to-distress indicator capturing household balance sheet risks, overall credit risks from household balance sheets in the euro area have increased somewhat in the last quarters, but are still much less pronounced than during the stressed conditions of the euro area sovereign debt crisis (see Chart 1.18).

Similar to households, the earnings-generating capacity of euro area *non-financial corporations* has improved somewhat driven by the gradual economic recovery to date, yet corporate profitability has remained muted. Gross operating income has picked up slightly, amid lower negative earnings growth per share and expected default frequencies for listed firms close to pre-crisis lows. Being a function of overall macroeconomic developments, corporate earnings in the euro area are expected to rise as the

**Chart 1.17 Expectations about households' financial situation and changes in the number of unemployed in the euro area**

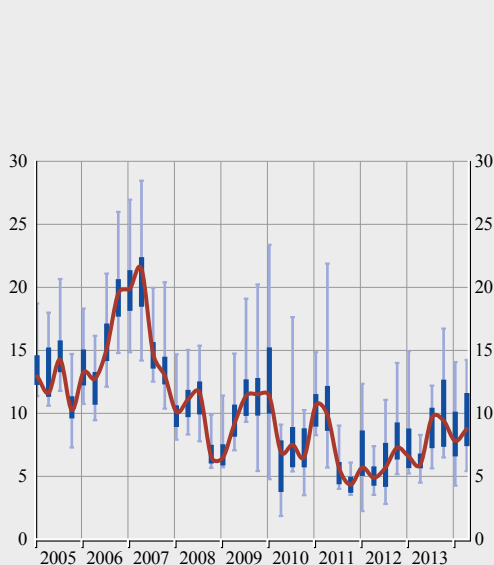
(Jan. 2005 – Oct. 2014; number in thousands, seasonally adjusted; percentages; percentage balances; three-month moving averages)



Sources: European Commission Consumer Survey and Eurostat. Note: Expectations about households' financial situation are presented using an inverted scale, i.e. an increase (decrease) of this indicator corresponds to less (more) optimistic expectations.

**Chart 1.18 Households' distance to distress in the euro area**

(Q1 2005 – Q2 2014; number of standard deviations from mean)



Sources: ECB, Bloomberg, Thomson Reuters Datastream and ECB calculations.

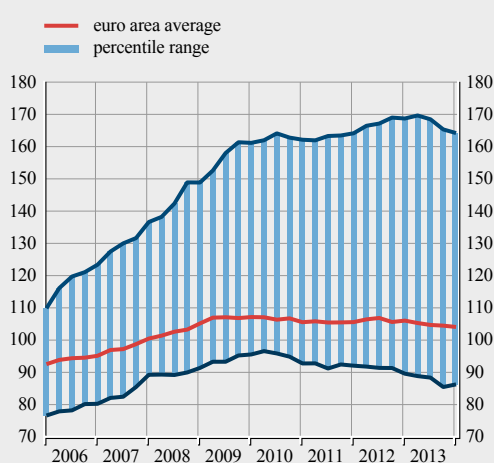
Notes: A lower reading for distance to distress indicates higher credit risk. The chart shows the median, minimum, maximum and interquartile distribution across 11 euro area countries for which historical time series cover more than one business cycle. For details of the indicator, see Box 7 in *Financial Stability Review*, ECB, December 2009.

economic recovery gathers pace, though there is a risk that firms' capacity to retain earnings may remain weak until this materialises.

Despite the projected gradual improvement in income and earnings prospects, legacy balance sheet issues continue to weigh on the aggregate euro area non-financial private sector. On average, euro area households' indebtedness amounted to some 64% of GDP, while for non-financial corporations the number is more elevated, at 104% of GDP (or some 90% of GDP on a consolidated basis). However, a gradual balance sheet adjustment is underway, even if the adjustment to date may seem rather modest at the aggregate euro area level (see Chart 1.19). Indeed, a much more nuanced picture emerges at the level of individual countries or sectors of economic activity. When tracking private sector (in particular corporate) deleveraging at the country level, the pace of adjustment differed considerably across the euro area, with

**Chart 1.19 Indebtedness of the non-financial corporate sector in the euro area**

(Q1 2006 – Q1 2014; percentage of GDP; unconsolidated)



Sources: ECB and ECB calculations.

Notes: Based on ESA 95 standards. Debt includes loans, debt securities and pension fund reserves. The chart shows the average non-financial corporate indebtedness in the euro area and the interquartile distribution (25th and 75th percentile) across individual euro area countries.

*Private sector indebtedness remains elevated amid continued heterogeneity at the country and sector levels*

*Favourable interest rate environment facilitates debt servicing*

*Lending to the non-financial private sector remains muted*

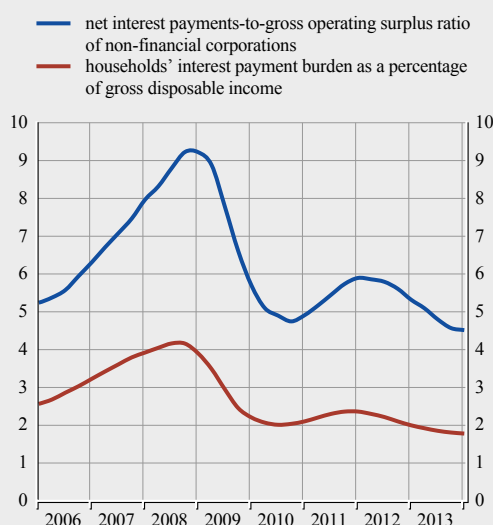
deleveraging being more pronounced in countries which had accumulated large amounts of debt in the run-up to the crisis. The same pattern emerges at the sector level, whereby overindebted sectors, such as the construction and real estate services sector, continue to deleverage more strongly than less indebted ones such as industry or wholesale and retail trade.

In the current environment of low interest rates and a low cost of market-based funding, households' and non-financial firms' interest payment burden has remained at record lows (see Chart 1.20). Borrowers in countries with ongoing relative price adjustments, however, have seen some rise in their real debt burden amid recent low inflation outturns. In terms of risks, the ongoing process of balance sheet repair should help offset the challenges related to an eventual normalisation of interest rates and the ensuing rise in the debt servicing burden. Such challenges might be greatest for those countries where loans with floating rates or rates with rather short fixation periods predominate. That said, a higher debt service burden for borrowers in a rising interest rate environment is likely to be partly offset by the positive impact of an economic recovery on households' and firms' income and earnings situation.

**Bank lending flows** to the non-financial private sector have remained muted, partly reflecting the ongoing balance sheet repair in both the financial and non-financial sectors. On average, bank lending to euro area households has remained subdued, mirroring sluggish dynamics of household income, high levels of unemployment and housing market weakness in some countries. However, rather heterogeneous developments at the country level form the basis of this relatively weak aggregate picture (see Chart 1.21). Looking at the components of bank lending by purpose, modest annual growth in loans for house purchase has been offset by a continued drop in consumer loans and other types of lending. Nonetheless, in line with the gradual economic recovery, the October 2014

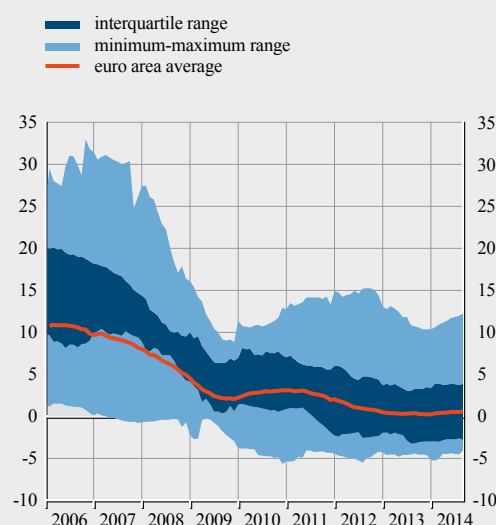
**Chart 1.20 Interest payment burden of the euro area non-financial private sector**

(Q1 2006 – Q1 2014; four-quarter moving sums; percentages)



**Chart 1.21 MFI lending to euro area households**

(Jan. 2006 – Sep. 2014; percentage change per annum)



euro area bank lending survey suggests further improvements in households' financing conditions, as reflected by the continued easing of credit standards on loans to households and the further net increase in demand for such loans.

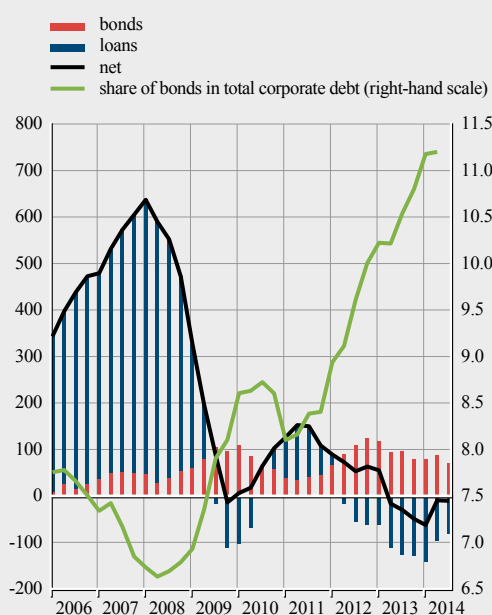
Cross-country disparities in supply conditions fell overall for loans to households, thus pointing to a decrease in financial market fragmentation. Supply-side constraints appear to be easing particularly for consumer loans and other lending to households, and to a lesser extent also for housing loans. Improving supply-side conditions reflect lower pressures from cost of funds and balance sheet constraints, but competition has also contributed to the net easing of credit standards, mainly for loans to households for house purchase. By contrast, a re-emergence of risk concerns had a slightly restrictive impact on credit standards for both housing and consumer loans. At the same time, improving housing market prospects and consumer confidence have translated into a continued net increase in demand for housing loans and consumer credit.

The net external financing of euro area non-financial corporations continued to fall, albeit at a slower pace than in recent quarters (see Chart 1.22). Corporate disintermediation continued, but the issuance of market-based debt still fell short of offsetting the decline in new MFI loans to non-financial corporations. However, funding substitution has remained limited to larger corporations and predominantly those which are domiciled in countries with more developed corporate bond markets (e.g. Germany and France), while small and medium-sized enterprises (SMEs) and large firms located in more vulnerable countries remained more dependent on bank funding. That said, the results of the latest euro area bank lending survey suggest that underwriting terms for corporate loans have continued to improve, as reflected by easing credit standards, in particular for large firms. Similarly to household loans, supply-side conditions for corporate loans point to decreasing fragmentation across countries. Demand for corporate loans in the euro area continued to rise, although cross-country heterogeneity has remained considerable. Increased demand largely reflects higher financing needs, mainly for mergers and acquisitions and debt restructuring, while financing needs related to fixed investment dampened demand for loans to euro area enterprises. Firms' internal financing capacity and the issuance of debt securities by non-financial corporations contributed negatively to loan demand. Alongside improving supply and demand-side conditions, targeted Eurosystem measures to revive lending, i.e. the targeted longer-term refinancing operations or the asset-backed securities and covered bond purchase programmes, should promote the recovery of credit going forward, while at the same time contributing to a further decrease in funding costs for non-financial firms in the euro area.

*A drop in bank lending to non-financial corporations is partly offset by the issuance of market-based debt...*

Chart 1.22 External financing of euro area non-financial corporations

(Q1 2006 – Q3 2014; EUR billions; net annual flows)



Sources: ECB and ECB calculations.

... amid high corporate liquidity

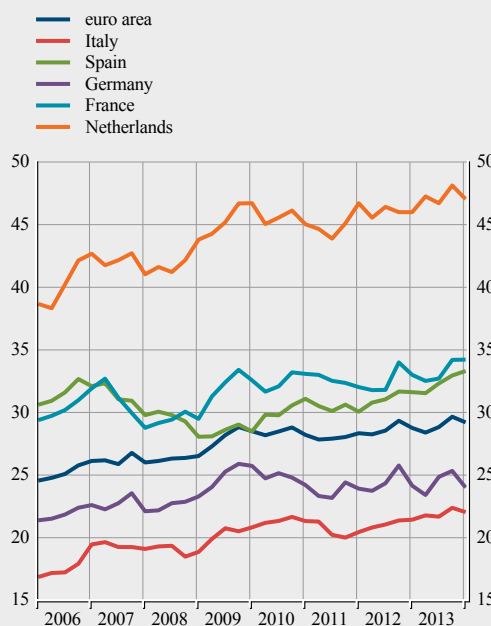
Corporate liquidity has remained at record highs in several euro area countries, suggesting that non-financial firms can also rely on internal funds as a financing source in addition to loans and debt securities. Firms' liquidity holdings reached almost 30% of GDP in early 2014, but amid a large degree of cross-country variation across the euro area (see Chart 1.23). These high liquidity buffers may reflect a lack of investment opportunities, precautionary motives (i.e. mitigating the risk of limited access to external financing in the future) in the context of a low opportunity cost of holding liquid assets and continued credit supply constraints in some countries.

Funding costs have touched record lows on average...

Nominal **funding costs** of the euro area non-financial private sector have continued to decline across most business lines, maturities and funding sources. Nominal financing costs for euro area *households* reached their lowest levels since the start of the reporting of harmonised euro area bank lending rates in 2003 for all categories of lending except consumer credit, while real funding costs have remained broadly unchanged since early 2014 (see Chart 1.24). Likewise,

Chart 1.23 Liquidity position of non-financial corporations in selected euro area countries

(Q1 2006 – Q1 2014; percentage of GDP)



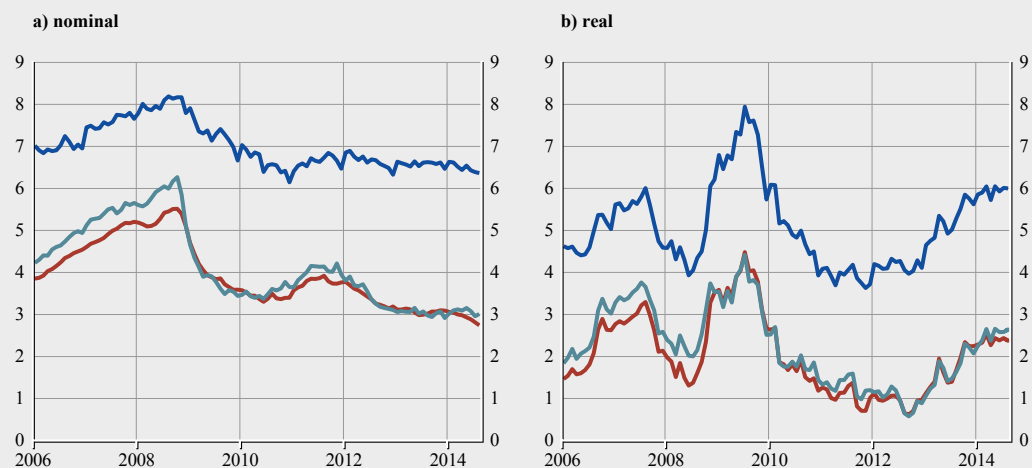
Sources: ECB and ECB calculations.

Notes: Based on ESA 95 standards. Liquidity is defined as the sum of currency and deposits, short-term securities and mutual fund shares.

Chart 1.24 Euro area bank lending rates on new loans to households in nominal and real terms

(Jan. 2006 – Sep. 2014; percentages)

— consumer lending  
— lending for house purchase  
— other lending

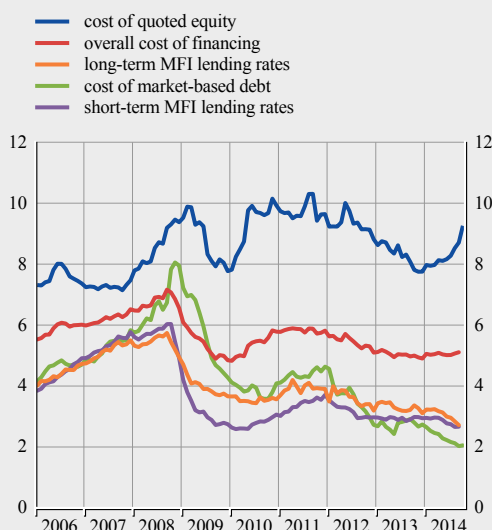


Source: ECB.

Note: Real bank lending rates are calculated by deflating nominal lending rates with the Harmonised Index of Consumer Prices.

**Chart 1.25 Nominal cost of external financing of euro area non-financial corporations**

(Jan. 2006 – Oct. 2014; percentages)

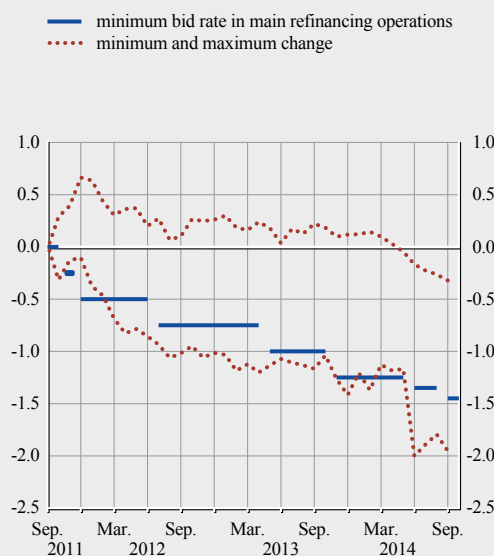


Sources: ECB, Merrill Lynch, Thomson Reuters Datastream and ECB calculations.

Note: The overall cost of financing for non-financial corporations is calculated as a weighted average of the cost of bank lending, the cost of market-based debt and the cost of equity, based on their respective amounts outstanding derived from the euro area accounts.

**Chart 1.26 The ECB policy rate and the composite cost-of-borrowing indicator for non-financial corporations**

(Sep. 2011 – Sep. 2014; cumulative percentage point changes)



Sources: ECB and ECB calculations.

Notes: For methodological details on the construction of the cost-of-borrowing indicator, see "Assessing the retail bank interest rate pass-through in the euro area at times of financial fragmentation", *Monthly Bulletin*, ECB, August 2013.

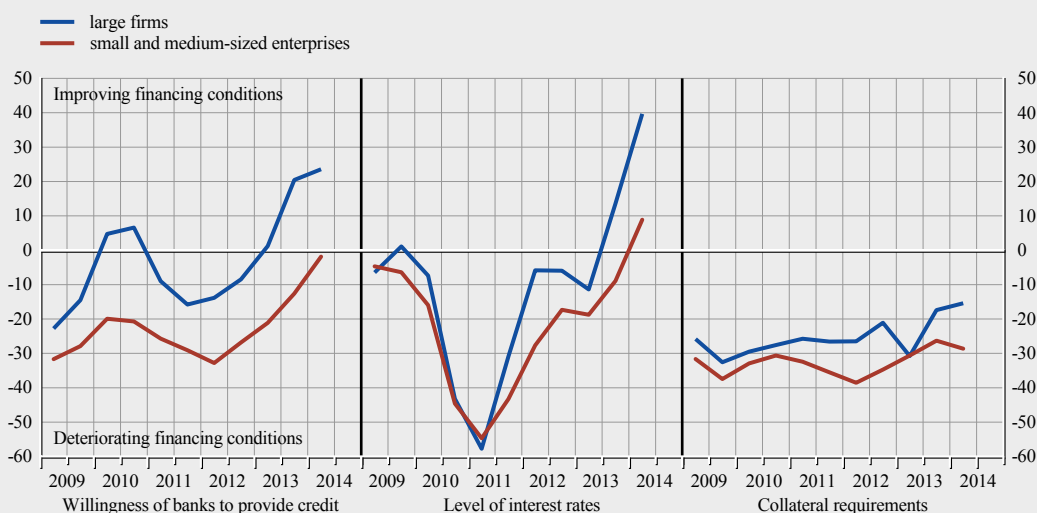
*non-financial corporations'* overall financing costs have continued to fall across most external financing sources (see Chart 1.25), supported by a low interest rate environment and favourable financial market conditions. Bank lending rates have declined further across the maturity spectrum, though the latest easing in monetary policy rates remains yet to be fully passed through (see Chart 1.26). At the same time, the cost of equity has increased since early 2014 amid ebullient equity markets and rising equity risk premia in many countries – a development which contrasts with a continued fall in the cost of market-based debt.

Fragmentation in both nominal and real lending conditions persists, despite having decreased since the height of the euro area sovereign debt crisis. The cross-country heterogeneity in the euro area, as measured by the range between the lowest and highest interest rate charged on loans to households, has remained at elevated levels, reflecting different country-specific risk constellations and persisting fragmentation afflicting some euro area countries. The same holds true for firms, where lending rates continue to vary widely across the euro area. At the same time, developments in firms' financial conditions continue to vary also in terms of *firm size*. The strong difference between the loan pricing conditions for small and large firms, which primarily results from the divergence in firm-specific risks, highlights the still less favourable conditions faced by small firms, particularly in more vulnerable countries. In addition, according to the ECB's latest survey on access to finance of enterprises in the euro area, banks' willingness to grant a loan continues to be higher for large firms (see Chart 1.27). This is also corroborated by the fact that the success of large firms when applying for a bank loan was higher than for SMEs, indicating overall better access to finance of large firms compared with SMEs. Finally, collateral requirements also appear to be less strict for large firms than for SMEs.

*... but fragmentation in lending conditions persists across countries and firm sizes*

**Chart 1.27 Financing conditions of euro area SMEs in comparison with large firms**

(H1 2009 – H1 2014; net percentages of respondents; changes over the past six months)



Source: ECB calculations based on the survey on access to finance of enterprises (SAFE).

Note: The level of interest rates and collateral requirements are presented using an inverted scale.

*Euro area property markets show signs of an incipient recovery...*

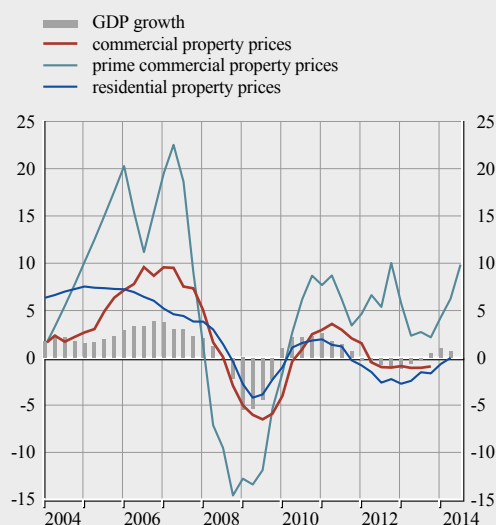
Mirroring overall macroeconomic trends, the overall development of euro area **property markets** remained subdued in the first half of 2014, but with signs of a recovery in some countries. Residential property prices have stabilised on an annual basis at the aggregate euro area level, following a sharp turnaround in some euro area countries that experienced significant price corrections in recent years. Similarly, euro area commercial property markets have shown further signs of stabilisation, but the underlying price dynamics in the prime and non-prime segments continued to diverge strongly (see Chart 1.28).

*... amid a continued ebullience in prime commercial property markets*

Prime commercial property (i.e. modern retail and office buildings in metropolitan areas) continued on its ebullient course in the context of the current low yield environment and the related ongoing search for yield. Accordingly, investment activity in commercial property markets has remained buoyant in recent quarters, with underlying transaction volumes reaching multi-year highs (see Chart 1.29). Activity has been increasingly driven by domestic investors, but foreign – in particular non-European – investors have remained active as well. Increased investor interest went hand in hand with a broad-based decline in yields on prime commercial property. Perhaps most noteworthy, the significant pick-up in demand

**Chart 1.28 Euro area commercial and residential property values and the economic cycle**

(Q1 2004 – Q3 2014; percentage change per annum)



Sources: Eurostat, ECB, experimental ECB estimates based on IPD and national data, and Jones Lang LaSalle.

for commercial property in countries that had previously witnessed pronounced price declines, such as Ireland and Spain, has also contributed to narrowing yield dispersion across the euro area.

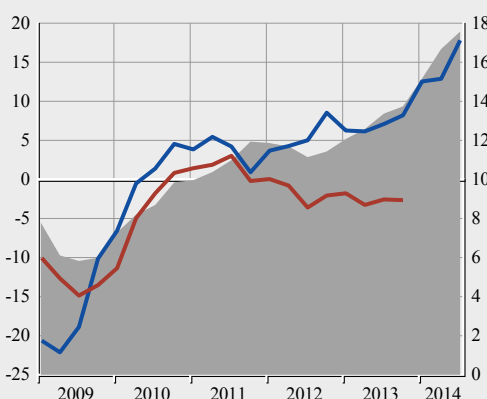
In terms of property price dynamics, fragmentation at the country level has been declining, particularly in the prime commercial segment where most recently almost all euro area countries have seen an increase in prices. By contrast, residential property prices continued to drop – to varying degrees – in countries such as Cyprus, Greece, Italy and Slovenia. This illustrates the high degree of cyclicity of commercial property prices which tend to be more volatile and track the economic cycle with greater amplitude than residential property prices. That said, after a major multi-year adjustment, country-level data suggest a sharp rebound in residential and commercial property markets in some countries, notably Ireland. At the same time, country-level developments often mask underlying regional disparities, with strong house price growth in metropolitan areas and comparably subdued price movements in remaining regions (e.g. Austria, Germany and Ireland), highlighting the risk that strong house price growth could potentially ripple out to surrounding areas. So far there are no signs of the ongoing recovery or the regional buoyancy of euro area residential property markets translating into buoyant housing loan growth (see Chart 1.30), suggesting some transitory phenomena such as pent-up demand from cash buyers and the presence of foreign buyers in certain (mainly high-priced) market segments, especially in some large cities.

In terms of valuations, for the euro area as a whole, residential property prices are broadly in line with fundamentals, but valuation estimates for prime commercial property are still somewhat above their long-term average. However, property markets are inherently local, so that such aggregates belie heterogeneous developments at both the country and regional level. Residential and prime commercial property valuations

**Chart 1.29 Commercial property price changes and investment volumes in the euro area**

(Q1 2009 – Q3 2014; average of price changes in Austria, France, Germany, Ireland, the Netherlands and Spain)

— transaction volumes – overall market (EUR billions; right-hand scale)  
— prices – prime property (percentage change per annum; left-hand scale)  
— prices – overall market (percentage change per annum; left-hand scale)

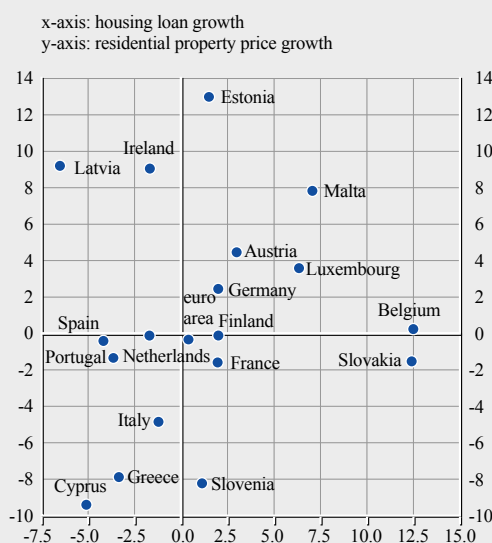


Sources: DTZ Research, ECB, experimental ECB estimates based on IPD and national data, and Jones Lang LaSalle.  
Note: Four-quarter moving average of investment volumes.

*Fragmentation at the country and regional levels persists, although diminishing*

**Chart 1.30 Residential property price and housing loan growth across the euro area**

(H1 2014; percentage change per annum)



Sources: ECB and ECB calculations.  
Notes: Bank lending data are not adjusted for securitisation. Securitisation may play an important role in some countries, for example Belgium, where the time series adjusted for securitisation would result in annual housing loan growth of 3% for the first half of 2014.

*Overvaluation is a concern in some countries...*

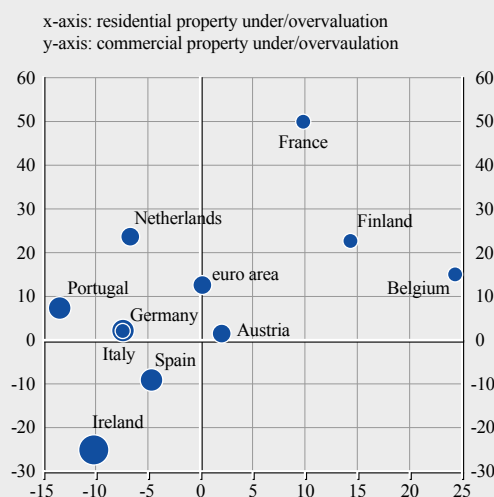
... while risks remain tilted to the downside

have come down considerably from previous peaks in several countries (e.g. Ireland and Spain) as the unwinding of pre-crisis excesses brought prices down to or below the level suggested by underlying values. By contrast, estimated overvaluation has remained high in both market segments in Belgium, Finland and France (see Chart 1.31). Similar disparities may emerge at the regional level, as reflected by the estimated significant overvaluation of residential property in some large cities in Germany and Austria. It is worth emphasising though that valuation estimates are surrounded by a high degree of uncertainty as they do not capture country-level specificities, such as fiscal treatment or various structural property market characteristics.

A key downside risk to euro area property markets relates to a weak or stalling economic recovery, given the high cyclical nature of many property market segments. Indeed, a negative economic shock could create at least three challenges: first, to those commercial property investors who are already confronted with difficulties (e.g. those in negative equity positions due to prices being below previous years' peaks); second, as a trigger for house price corrections in countries with signs of overvaluation (or it could reverse the ongoing recovery in others); and third, for debt servicing in countries with a highly indebted household sector. From a financial perspective, a potential increase in global risk aversion and the related rise in long-term interest rates could affect the debt servicing capacity of both households and commercial property investors via the more limited availability and higher cost of funding, thereby contributing to rising rollover risks and aggravating the interest payment burden. The numerous property-related instruments in the newly acquired macro-prudential toolkit may help alleviate any future cyclical challenges, while also contributing to increasing the resilience of banks and their borrowers.

**Chart 1.31 Estimated over/undervaluation of residential and prime commercial property prices in selected euro area countries**

(Q2 2014; percentages)



Sources: Jones Lang LaSalle, European Commission, ECB and ECB calculations.

Notes: The size of the bubble reflects the projected change in real GDP growth in 2015. Estimates for residential property prices refer to Q1 2014 for Finland, Germany, Ireland, the Netherlands and Portugal and are based on four different valuation methods: price-to-rent ratio, price-to-income ratio and two model-based methods. For details of the methodology, see Box 3 in ECB, *Financial Stability Review*, June 2011. For further details on valuation estimates for prime commercial property, see Box 6 in ECB, *Financial Stability Review*, December 2011.



## 2 FINANCIAL MARKETS

*Supported by historically low risk-free rates and subdued market volatility, a search for yield continues in global financial markets. Despite bouts of volatility – linked to rising geopolitical tensions and weak economic data for the euro area – the price of risk remains low across global market segments and duration exposures have increased.*

*Within the euro area **money market** segment, low and even negative rates have encouraged an increase in interbank activity and a move into slightly longer maturities. In **bond markets**, yields have generally fallen further despite bouts of volatility and some outflows of foreign investment from lower-rated euro area markets. Likewise, credit spreads remain at relatively low levels, though risk premia in credit markets have not been immune to strong outflows from the high-yield segment amid rising global risk aversion and concerns about overheating. Indeed, investors concentrated yield-seeking behaviour on the investment-grade segment of the bond market, which experienced a further increase in duration. **Equity market** rallies have only seen brief interruptions and valuations remain elevated, particularly for US markets.*

*As a broad-based search for yield continues, vulnerabilities are building up in global capital markets. While estimates of prospective asset overvaluations in any individual market segment differ, it is clear that asset price movements are becoming increasingly correlated across segments. In addition, current high valuations are being sustained by historically low levels of risk-free rates and subdued levels of market volatility, which could be tested by a withdrawal of accommodative global monetary policy. At the same time, investor appetite for riskier euro area assets depends on a fragile economic recovery with significant downside risks.*

*A combination of three amplifying factors could disrupt financial stability should the search for yield exhibit a sustained reversal. First, bouts of market volatility have shown that secondary market liquidity in fixed income markets is low. Second, while banking sector leverage continues to decline, use of leverage in securities markets is increasing. Moreover, similar to leverage risk, redemption risk for investment funds embeds the possibility of forced selling leading to prospective fire-sale spirals. Finally, duration risk exposure is elevated, which would also magnify future price corrections.*

### 2.1 INTERBANK ACTIVITY IN EURO AREA MONEY MARKETS CONTINUES TO NORMALISE, BUT FRAGMENTATION REMAINS

Conditions in **euro area money markets** continue to improve, though fragmentation remains a concern. Recent developments include a further decline in market-based measures of stress, a broad-based increase in interbank activity and improved access for banks from vulnerable countries to the secured segment (see Charts 2.1 and 2.2). The decisions of the ECB's Governing Council to lower the deposit facility rate to a negative level in June and cut it further in September have clearly had an impact on money market rates and have contributed to an increase in interbank turnover. However, the rate cuts have had a limited impact on fragmentation. Increased activity has been concentrated largely on transactions involving highly rated counterparties and/or collateral. However, positive rating actions on sovereigns have eased fragmentation by improving access to secured markets for banks from vulnerable countries. In addition, the preliminary results of the latest Euro Money Market Survey indicate that credit policies are no longer exerting a strong contractionary impact on bank lending and banks expect an expansionary impact going forward. This survey also reports an improvement, from low levels, in market functioning across all segments, both in terms of liquidity and efficiency. However, increased activity in certain segments, for example the overnight index swap market, may not reflect improved market functioning but rather an increased need to hedge against falling interest rates.

*Conditions in euro area money markets continue to normalise*

Unsecured segment shows signs of a tentative recovery...

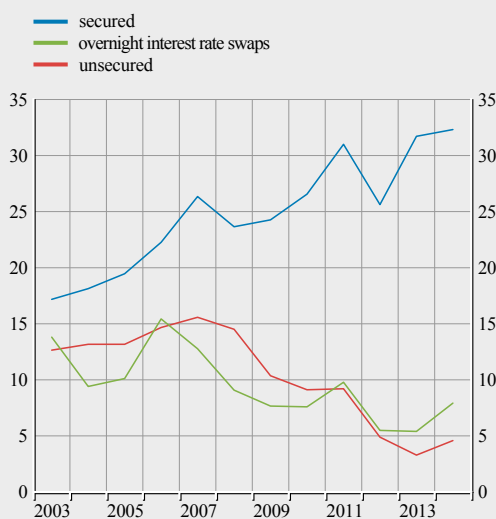
Following a seven-year decline, interbank activity in the **unsecured money market segment** is showing signs of a tentative recovery, although access remains challenging for lower-rated banks. The latest Euro Money Market Survey signals a slight increase in unsecured activity in the second quarter of 2014 which was, according to EONIA volumes, sustained in the months following ECB rate decisions. Unsecured money market interest rates have declined and become negative for a maturity of up to two weeks, but increased activity in the segment remains concentrated among higher-rated entities.<sup>1</sup> Meanwhile, market access for banks from vulnerable euro area countries remains limited to small amounts at overnight maturities.

... but activity remains concentrated in the secured segment

The repayment of three-year longer-term refinancing operations (LTROs), positive rating actions and the increased use of repos

Chart 2.1 Turnover in selected euro area money market segments

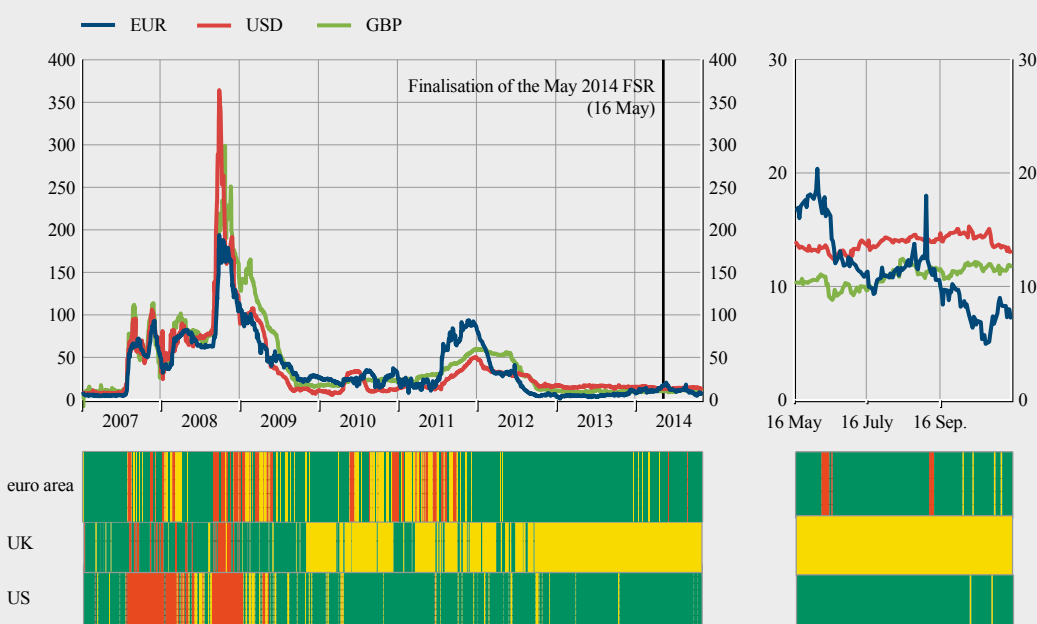
(Q2 2003 – Q2 2014; EUR trillions)



Source: ECB Euro Money Market Survey.

Chart 2.2 Spreads between unsecured interbank lending and overnight index swap rates

(Jan. 2007 – Nov. 2014; basis points; three-month maturities)



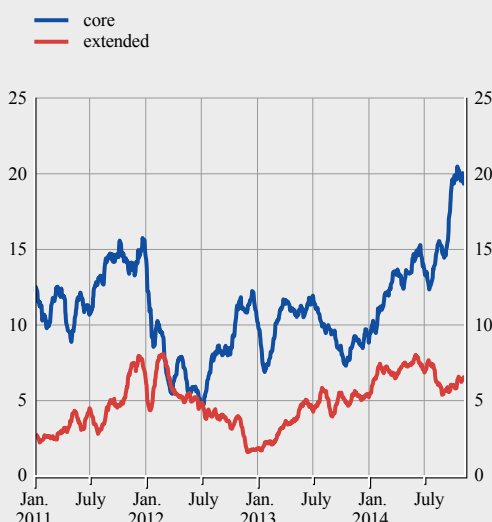
Sources: Bloomberg and ECB calculations.

Notes: Red indicates rising, yellow moderating and green falling pressure in the respective money markets. For more details, see Box 4 entitled "Assessing stress in interbank money markets and the role of unconventional monetary policy measures" in *Financial Stability Review*, ECB, June 2012.

<sup>1</sup> According to the October 2014 Euro Money Market Survey, five institutions account for almost 90% of activity in the unsecured segment.

**Chart 2.3 Daily turnover in the Eurex GC Pooling ECB and ECB Extended Baskets**

(Jan. 2011 – Nov. 2014; EUR billions)

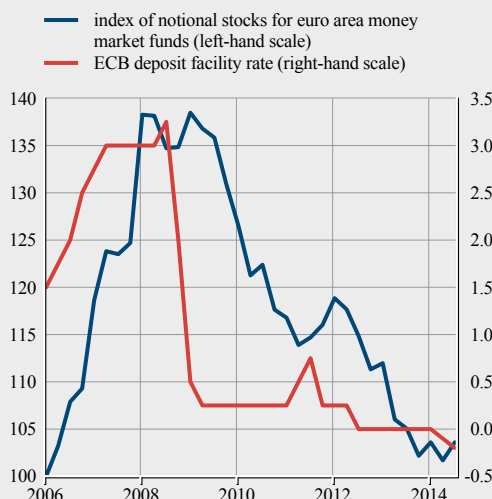


Sources: Bloomberg and ECB calculations.

Notes: The core ECB basket only includes assets rated A-/A3 and above. The extended basket includes assets based on ECB eligibility criteria, currently BBB-/Baa3.

**Chart 2.4 Assets of euro area money market funds and the ECB deposit rate**

(Q1 2006 – Q3 2014; EUR billions; index of notional stocks; percentages)



Sources: ECB and ECB calculations.

by banks' treasuries for liquidity management purposes have contributed to increased activity and less fragmentation in the **secured money market segment**. The rating upgrade/stabilisation of vulnerable euro area sovereigns has resulted in improved access for their banks to repo markets. However, fragmentation and local bias among banks as regards counterparties and collateral persist. Similar to the unsecured segment, increased activity following the introduction of negative policy rates appears concentrated on high credit quality. Repo rates in non-vulnerable countries have fallen and remained at negative levels, while those in vulnerable countries have oscillated around zero. A strong preference for credit quality is evident in repo trading volumes, where transactions backed by high-quality collateral have experienced a steady increase since June 2014 and a sharp increase following the second rate cut in September, while transactions backed by lower-rated collateral are currently close to May 2014 levels.<sup>2</sup> Banks are also continuing to move away from bilateral trading towards the use of central clearing counterparties (CCPs). The latest Euro Money Market Survey shows that the share of transactions conducted via CCPs remained stable at around 73% of bilateral turnover compared with 74% in 2013.

The interest rate environment has proven challenging for **euro area money market funds** (MMFs). Outflows from euro area MMFs continued in the second quarter of 2014, taking assets under management for the industry 36% (€488 billion) below their pre-crisis level (see Chart 2.4). While the average large MMF has some room to absorb the impact of recent rate declines (given a gross average yield of 35 basis points and a net average yield of 18 basis points at end-May 2014), the pressure of negative money market rates has resulted in some fund managers activating reverse distribution mechanisms (to maintain value at par) and temporary "soft closures", while others

*The current interest rate environment is challenging for money market funds*

<sup>2</sup> Average daily turnover for the Eurex GC Pooling ECB Basket (which includes assets rated A-/A3 and above) has been rising since June and increased markedly following the September rate cut (from €14 billion to €20 billion), while turnover for the ECB Extended Basket (where assets are rated according to ECB eligibility criteria, currently BBB-/Baa3) remains close to May levels.

*Investors are rebalancing away from euro area money market funds and instruments...*

*... which has implications for short-term bank funding...*

*... while changes in US regulation have implications for US dollar funding for some large euro area banks*

asked for early repayments of commercial paper by issuers, in order to roll over into longer maturities before rates become negative.<sup>3</sup>

**Money market investors** have responded to falling euro area money market rates by rebalancing portfolios towards longer-dated funds and non-euro area instruments. The aforementioned decline in the assets of MMFs has coincided with a significant expansion of euro area bond funds.<sup>4</sup> Following the introduction of negative policy rates in June, MMFs reported a further rebalancing by investors away from short-term MMFs (with a weighted average maturity of 120 days) towards longer-dated MMFs (with a weighted average maturity of up to one year), euro area bond funds and bank deposits. At the same time, the widening of the spread between euro area money market rates and those of foreign markets may be contributing to a rebalancing away from euro area instruments (see Chart 2.5). Over the past year euro area investors have switched from being net sellers to net purchasers of foreign money market instruments, while foreign investors have become net sellers of euro area money market instruments.

As MMF assets have declined, so too have their **holdings of euro area bank debt securities**. At the same time, Basel III regulation encourages banks to lengthen their funding maturity structure. From their peak in March 2009, the value of MMF holdings of euro area banks' debt securities has fallen by €125 billion, a figure equivalent to 15% of all short-term (with an original maturity of less than two years) bank debt securities outstanding at that time, while loans to banks have declined by €76 billion.<sup>5</sup> However, over this period banks have, in response to regulatory and market pressures, reduced their reliance on market debt funding and lengthened the maturity of debt funding: the outstanding amount of short-term bank debt securities has fallen by a third, while that of longer-term debt securities has fallen by 5%. Moreover, some investment outflows from MMFs may have been diverted directly (via increased bank deposits) or indirectly (via euro area bond funds) to banks.<sup>6</sup>

Changes in the **regulation** of US MMFs will more closely align the structures of the US and European MMF industries and could have important implications for short-term US dollar funding for large euro area banks. The US Securities and Exchange Commission is requiring prime funds

**Chart 2.5 One-year forward overnight index swap rates in one year in the euro area and the United States**

(May 2013 – Nov. 2014; percentages)



Source: Bloomberg.

<sup>3</sup> Large money market fund refers to the 29 large funds rated by S&P. Reverse distribution mechanisms allow fund managers to reduce the number of outstanding shares in proportion to the reduction in value of the fund over a day in which returns were negative. Soft-closing a fund to new investors avoids the returns of existing investors being heavily diluted by a need to buy paper with a zero or even negative yield.

<sup>4</sup> Assets of euro area bond funds have increased by 55% (€1.6 trillion) since June 2008.

<sup>5</sup> Money market funds may also purchase securities with a short-term remaining maturity. The €125 billion figure is equivalent to 3% of all bank debt securities at that time.

<sup>6</sup> Euro area bond funds have increased their holdings of bank debt securities by €25 billion over the crisis period. Meanwhile, the ECB's Money Market Contact Group reports some disintermediation from MMFs towards bank deposits.

(invested in non-government securities) and municipal funds (invested in securities issued by local authorities) held by institutional investors to convert from constant net asset value (CNAV) to variable net asset value (VNAV). Around 40% of the US industry will be affected by the mandatory conversion which will result in a closer alignment of the US and European industries.<sup>7</sup> Potential outflows from US MMFs as a result of regulatory changes might represent a challenge for some large euro area banks. The five euro area banks most active in US commercial paper have around USD 200 billion in outstanding issues that are subscribed by US MMFs which are likely to experience outflows following the change in regulation.

## 2.2 YIELDS AT RECORD LOWS AMID A SLIGHT INCREASE IN CREDIT RISK PREMIA

Global credit markets have been affected by bouts of volatility and an increase in risk aversion amid rising geopolitical tensions and concerns regarding the global growth outlook. Similar to events last summer, high-yield corporate bond and equity markets were hit hardest during bouts of market tensions.<sup>8</sup> In contrast to last year, adjustments in euro area equity and certain sovereign bond markets have been larger than those observed in other regions, a reflection of diverging economic cycles. Although short-lived, these gyrations highlighted four key vulnerabilities in global financial markets. First, there is a growing correlation in global asset price movements. Second, current high valuations are supported by low risk-free rates and subdued market volatility, both of which are sensitive to negative economic news and changing expectations regarding the future path of global monetary policy. Third, concerns regarding stretched valuations for lower-rated corporate bonds make this market segment particularly vulnerable to changing risk sentiment. Finally, low levels of secondary market liquidity in fixed income markets will amplify the price impact of future outflows.

In many ways, current conditions in financial markets echo those of the pre-crisis era: low yields, high correlations across markets and compressed credit spreads sustained by relatively low levels of market volatility and expected default frequencies for corporates (see Chart 2.6). However, while these conditions were conducive to a significant build-up of **financial sector leverage** during the pre-crisis era, the post-crisis environment has been characterised by an ongoing process of bank deleveraging (see Box 2). At the same time, however, investment funds, which embed leverage-like redemption risk, have been growing in size and their role in financial markets and credit intermediation has increased considerably. In addition, use of leverage in securities markets has been increasing, particularly in the US, where growth in leveraged financing, collateralised loan obligations (CLOs), collateralised debt obligations (CDOs) and the use of margin financing has been quite strong.<sup>9</sup>

The **euro area investment fund sector** has doubled in size since 2009, with assets over €10 trillion in September 2014 (see Overview Chart 5 and Box 2). In terms of assets, over 99% of funds are open-ended, while a declining proportion of their assets are liquid (see Chart 2.7). This raises stability concerns as demandable equity in these funds can have the same fire-sale properties as

*Bouts of volatility  
hint at vulnerabilities  
in financial markets*

*While banking sector  
leverage continues  
to fall...*

*... stability concerns  
arise from growing  
leverage-like risks  
in the non-bank  
financial sector...*

<sup>7</sup> European MMFs are about 55% invested in VNAV and 45% in CNAV.

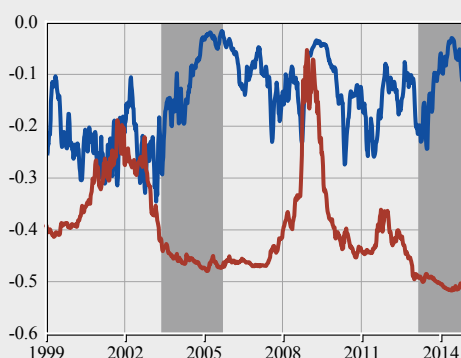
<sup>8</sup> In May and June 2013, a sharp change in market expectations regarding the Federal Reserve's asset purchase programme resulted in market tensions.

<sup>9</sup> Leveraged financing has been increasing and is expected to reach USD 925 billion globally in 2014. Within Europe, issuance looks set to reach a post-crisis peak of €150 billion this year, almost treble the level it was two years ago, if 25% below its 2007 peak. Issuance of CLOs and CDOs has also been increasing. While record levels of CLO issuance in the United States are dominating global developments, signs of a recovery in this market segment are also evident in the euro area. See *Securities Markets Risk Outlook 2014-15*, International Organization of Securities Commissions, October 2014.

**Chart 2.6 Average cross-correlations between CISS sub-indices and yields on high-yield euro area corporate bonds**

(Jan. 1999 – Nov. 2014; cross-correlation; percentages)

— periods of rising correlation and falling yields  
— CISS correlation contribution (left-hand scale)  
— yields on euro area high-yield bonds (right-hand scale)



Sources: Bloomberg, Bank of America Merrill Lynch and ECB calculations.

Note: For further details, see Hollo, D., Kremer, M. and Lo Duca, M., "CISS – a composite indicator of systemic stress in the financial system", *Working Paper Series*, No 1426, ECB, March 2012.

**Chart 2.7 Liquid assets as a percentage of shares/units issued by euro area bond funds**

(Q4 2009 – Q3 2014; percentages; four-quarter moving average)



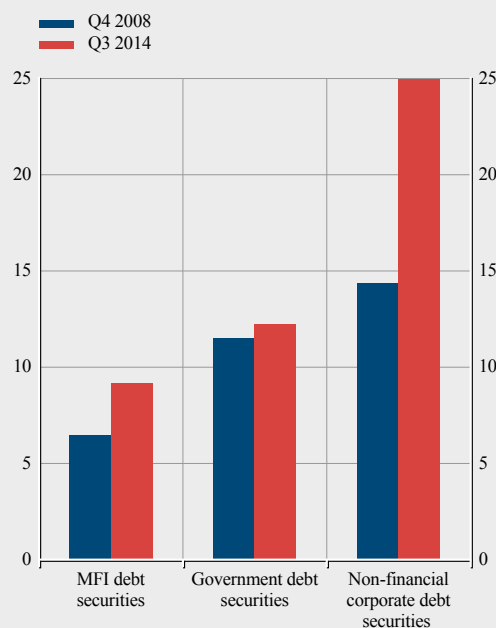
Sources: ECB and ECB calculations.

Note: Liquid assets include all euro area government debt securities, debt securities issued by euro area residents with an original maturity of up to one year, debt securities issued by non-euro area residents with an original maturity of up to one year and equities issued within the European Union, the United States and Japan.

short-term debt funding. Periods of market volatility have shown that investors in these funds, in particular high-yield bond funds and exchange-traded funds, are quite sensitive to price developments and changing expectations regarding the growth outlook or the future path of monetary policy. In addition, certain asset managers report that relatively low cash buffers are being compensated for with credit lines to the banking sector. Funds resident in the euro area are highly interconnected with euro area credit institutions as well as an important and growing source of credit for non-financial corporates and governments (see Chart 2.8). These funds hold 9% of outstanding debt securities issued by euro area credit institutions and provide €370 billion in loans to euro area banks. In addition, they hold a quarter of debt securities issued by euro area non-financial corporates. Therefore, difficulties in the sector can propagate quickly to the banking sector and real economy.

**Chart 2.8 Percentage of debt securities issued by euro area non-financial corporations, MFIs (excluding the Eurosystem) and governments held by euro area investment funds**

(Q4 2008 – Q3 2014; percentages)



Sources: ECB and ECB calculations.

Note: MFIs refer to monetary financial institutions (excluding the Eurosystem) which comprise credit institutions and money market funds.

... and a decline in secondary market liquidity.

The substantial expansion of fixed income markets has coincided with a decline in secondary market liquidity. Changes in

secondary markets following the outbreak of the financial crisis have profoundly altered the supply and demand of market liquidity. Post-crisis regulation and the substantial expansion of the bond market have reduced the ability and willingness of some market participants to provide sufficient liquidity. Credit disintermediation has seen the outstanding stock of euro area non-financial corporate (NFC) debt securities double to reach €1.2 trillion in 2014, while the supply of market-making services by traditional market-makers, in particular banks, has declined.<sup>10</sup> While it cannot be excluded that other market participants may fill the void over time, there is a risk of a shortage in market-making services in the short run. Recent bouts of volatility have highlighted that liquidity problems are not confined to the corporate segment but are broad based across fixed income markets. In addition, other markets that contribute to a smooth functioning of secondary fixed income markets have also declined during the post-crisis era.<sup>11</sup> At the same time, structural changes in the asset management industry – for example, a proliferation of passive trading strategies and liquidity transformation – may have increased the pro-cyclicality of demand for market liquidity during stressed times.

10 While the outstanding stock of NFC debt securities has doubled, euro area banks' holdings of these securities have fallen from €250 billion (over 40% of debt securities outstanding) to €150 billion (less than 13% of debt securities outstanding).

11 For example, since the outbreak of the financial crisis repo volumes have fallen considerably in the euro area and other advanced economy markets.

## Box 2

### STRUCTURAL AND SYSTEMIC RISK FEATURES OF EURO AREA INVESTMENT FUNDS

In addition to remarkable growth in the euro area shadow banking sector over the last years, its structure has also been evolving.<sup>1</sup> By mid-2014, investment funds domiciled in the euro area had grown to a large size – with money market funds (MMFs) and non-MMF investment funds (IFs) representing almost half of the €19.6 trillion euro area shadow banking sector. Clearly, these structural changes require an adaptation of financial stability monitoring, to understand the role of the investment fund sector and its prospective role in originating or transmitting systemic risk. To this end, this box uses granular data for a sub-sample of all euro area investment funds to further characterise the euro area investment fund universe (including MMFs and IFs but excluding hedge funds).<sup>2</sup> This sample excludes hedge funds and covers roughly half of the euro area investment fund population. Within the aggregated assets under management (AuM) of the analysed sample, equity funds represent the largest share of this total (33.1%) followed by bond (29.8%), money market (17.6%) and mixed (14.7%) funds (see Chart A).

The analysis in this box provides evidence of concentration of investment funds managed by individual asset management companies at both the asset class and the aggregate portfolio

1 This approximation follows the Financial Stability Board's broad measure adding together data on the assets of MMFs and other financial intermediaries (OFIs). The ECB's 2014 Banking Structures Report reviews in detail the different components of the euro area non-bank financial sector (including the shadow banking sector) at the aggregate level.

2 The box uses end-June 2014 data from Lipper for Investment Management (LIM) covering 26,392 domiciled investment funds in the euro area and managing approximately €5.4 trillion of assets. By comparison, ECB statistics indicate that IFs (including hedge funds) managed almost €10 trillion of assets as at the second quarter of 2014 (see <http://www.ecb.europa.eu/stats/money/mfi/html/index.en.html>).

levels. This, combined with significant cross-border retail flows, calls for a close financial stability monitoring, not least given the open-ended nature of much of this sector and its associated vulnerability to run risk.

### Euro area investment funds are open-ended funds commonly subject to early redemption claims...

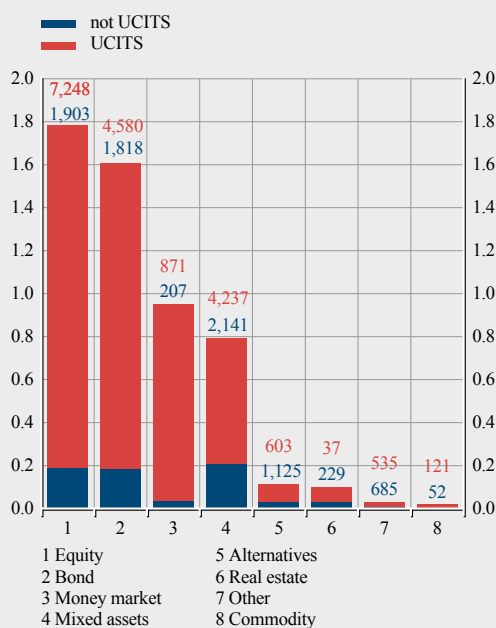
Investment funds invest in assets – equities or debt instruments with predominantly medium to longer-term maturity – while being financed by liabilities (commonly shares/units issued) redeemable at short notice. In a scenario of systemic stress, the structural aspects related to this redeemable-on-demand feature, the use of leverage and knowledge of the ultimate risk bearer are particularly relevant. Within the analysed sample, 69% of funds and 87% of AuM are regulated by the UCITS (Undertakings for Collective Investment in Transferable Securities) Directive.<sup>3</sup> The UCITS label is only applicable to (and hence a proxy for the predominance of) open-ended structures. It implies a primarily EU investor base not necessarily corresponding to the fund domicile. Due to their intra-day tradability and specific liquidity features, the early redemption risks of exchange-traded funds (ETFs) are considered even higher. Within the analysed sample, euro area-domiciled ETFs – 95% of which are regulated as UCITS – account for 5% of funds and 6% of AuM. They predominantly invest in less liquid assets as reflected in a preponderance of structures with an investment policy linked to commodities, other assets and equities. For the analysed sample of euro area investment funds, only 1.4% of AuM and 2.5% of funds are potentially leveraged, a reflection of the high proportion of UCITS funds which face restrictions as regards their use of leverage and the exclusion of hedge funds from the sample.<sup>4</sup>

### ... and are predominantly owned by retail investors not necessarily residing in the fund domicile jurisdiction

From a financial stability perspective, information on the investor base is important to identify the ultimate risk bearer and to assess the likelihood of contagion to other parts of the financial system under stressed conditions. It also provides a gauge for the likely reaction speed of the investor base to market developments. For example, the experience from the period surrounding

**Chart A Size and number of funds in the euro area investment fund universe by investment policy**

(Q2 2014; EUR trillions; number of funds by underlying regulatory framework)



Sources: LIM and ECB calculations.

Note: The UCITS label proxies the predominance of open-ended fund structures within an investment policy category.

<sup>3</sup> Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014.

<sup>4</sup> LIM allocates a leverage flag to investment funds foreseeing as part of their investment mandates to borrow money or to invest based on anticipated future returns.

and including the money fund crisis of September 2008 indicates that, for MMFs, institutional investors tended to react more quickly to deteriorating market conditions and prospects of perceived liquidity shortfalls than retail investors did.<sup>5</sup> Within the analysed sample of euro area investment funds, 80% of assets on average are held by retail investors, compared with 13.8% by institutional investors and 6.2% by other investor types.<sup>6</sup> Only in the MMF category do institutional investors own a relatively higher share of assets (41.5%) compared with retail investors (53.1%) and other investors (5.4%).

#### Large fund size variation with big players in each asset class...

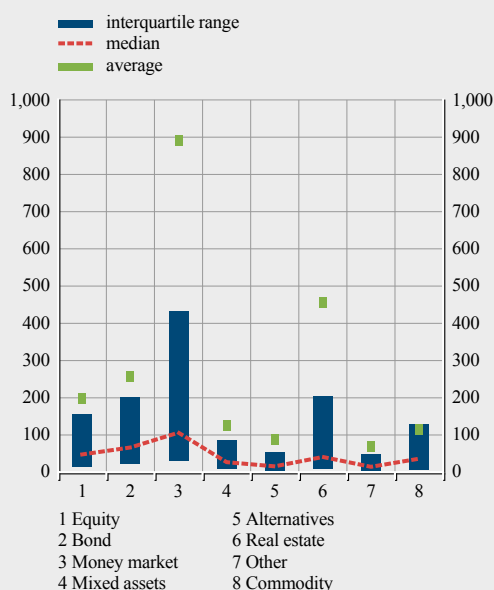
While large investment funds can be economically efficient, their size naturally determines the market impact of any investment decisions they take. The distribution of euro area-domiciled fund sizes points for each investment policy to a concentration of assets managed in a number of bigger funds (see Chart B). This feature is particularly noteworthy for MMFs, where the average size is 8.4 times the median fund size, compared with 3.9 and 4.1 times for bond and equity funds respectively.

#### ... and funds managed by a small number of large management companies shape market developments

The concentration at individual fund level is further augmented by the concentration of assets managed (across investment policies) at the individual management company level. The combination of size, range of funds managed and consequently importance in different market segments leads these institutions – through investment, portfolio allocation or rebalancing decisions – to define or to drive market developments in normal and in stressed conditions. A Lorenz curve representation illustrates the dominance of a limited number of asset management companies (see Chart C). This concentration has potential consequences: (i) developments at an individual fund could have an adverse impact on the reputation of a specific management company as a whole; or (ii) it could drive market developments or spread market shocks in the financial system. The footprint of a small set of large asset management companies in the euro area investment fund sector (representing 40% of AuM and 21% of funds) is particularly noteworthy in this context (see Chart D).

**Chart B Investment fund size distribution by investment policy**

(Q2 2014; EUR millions)



Sources: LIM and ECB calculations.

Notes: Only interquartile ranges, medians and averages are represented. High average figures indicate the presence of very large funds.

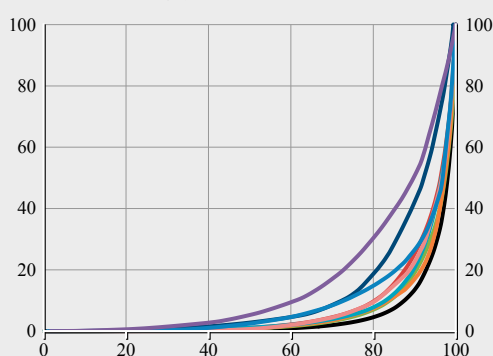
<sup>5</sup> Schmidt, L., Timmermann, A. and Wermers, R., "Runs on Money Market Mutual Funds", working paper, 2 January 2013.

<sup>6</sup> LIM defines institutional funds as funds targeting institutional investors and likely to require a large minimum investment. Other funds are defined as insurance funds (i.e. an insurance product) plus private funds (i.e. a fund with less than 50 investors). Retail funds are approximated by subtracting institutional and other funds from the total number of funds.

**Chart C Lorenz curve for the distribution of assets by management company parent**

(Q2 2014; x-axis: percentage of fund management company parent; y-axis: percentage of assets managed; Gini coefficient (percentage))

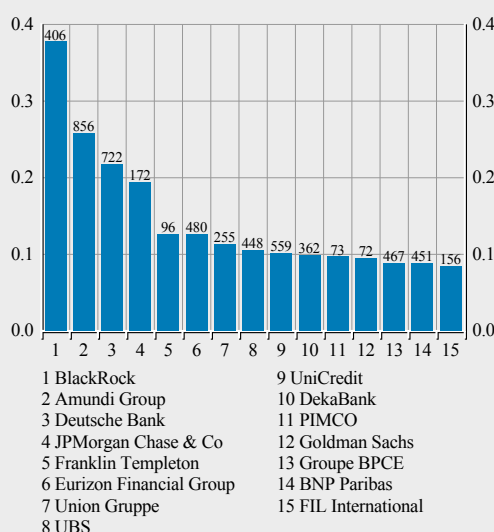
— total (Gini coefficient: 90.5) — equity (87.8)  
 — bond (84.7) — money market (87.8)  
 — mixed assets (86.1) — alternatives (75.4)  
 — real estate (85.5) — other (81.9)  
 — commodity (67.5)



Sources: LIM and ECB calculations.

**Chart D Assets and number of euro area funds managed of the top-15 management company parents**

(Q2 2014; EUR trillions; number of funds)



Sources: LIM and ECB calculations.

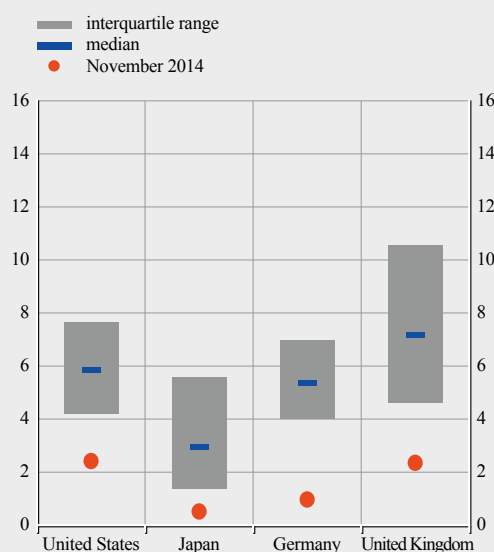
*Yields on higher-rated government bonds are at historical lows*

## GOVERNMENT DEBT MARKETS

Yields on **global government bonds** for advanced regions with safe-haven status have fallen further to historically low levels (see Chart 2.9). Safe-haven assets attracted strong demand during the summer amid rising political tensions and concerns regarding growth and low inflation, particularly in the euro area. As a result, yields on higher-rated government bonds fell to new troughs. The decline in yields on German government bonds amplified the decreases in the yields on other safe-haven assets outside the euro area owing to further monetary policy easing and market expectations of the introduction of further non-standard measures by the ECB. For the first time on record, the yield on the two-year German government bond fell into negative territory and the yield on the Bund declined markedly below 1%. On the other side of the Atlantic, strong economic data and the phasing-out of quantitative easing by the Federal Reserve offset somewhat the

**Chart 2.9 Nominal yields on selected ten-year government bonds compared with historical levels**

(Jan. 1914 – Nov. 2014; percentages; interquartile range)



Source: Global Financial Data.

compression of yield spreads on US Treasuries resulting from safe-haven flows. As a result, the spread between the US and the German ten-year government bond yields widened to over 160 basis points, its highest level since the beginning of the single monetary policy in the euro area.

The broad-based rally within **euro area government bond markets** was briefly interrupted by bouts of market volatility owing to concerns about euro area growth and fiscal debt sustainability for certain countries. Investors appear to be increasingly discriminating among euro area sovereign bonds based on the evolution of fiscal fundamentals. Within the higher-rated segment, yields on ten-year Belgian bonds fell below those of France. These countries stand in contrast as regards fiscal developments this year (see Section 1.2). Within the lower-rated segment, the gap between yields on Spanish and Italian government bonds has widened further (see also Section 1.2). Meanwhile, Greek government bond yields rose sharply amid public debt sustainability concerns.

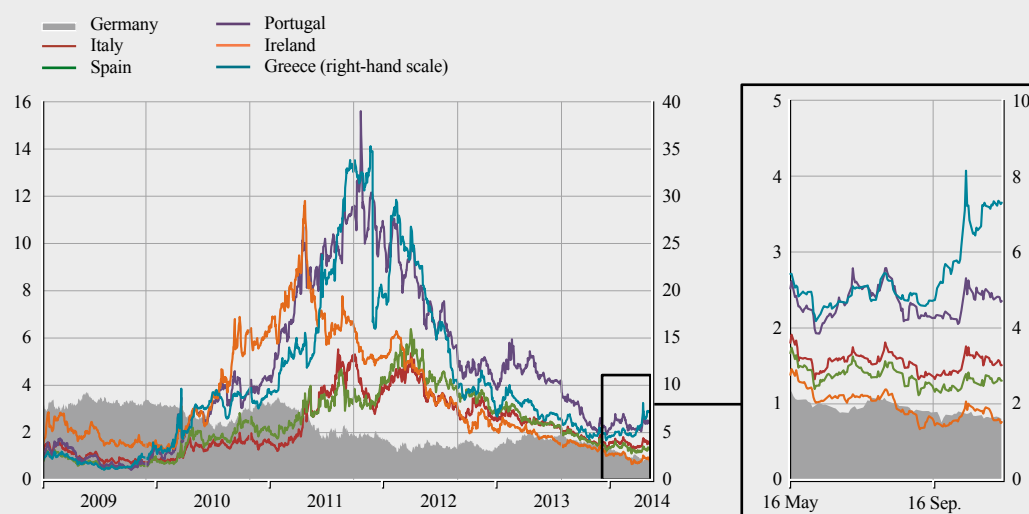
Intra-euro area spreads hit new post-crisis troughs and remain at low levels for most countries despite bouts of market tensions (see Chart 2.10). Yields on lower-rated euro area sovereign bonds have benefited from sovereign rating upgrades and proved resilient to rising geopolitical tensions but vulnerable to negative economic data and concerns regarding fiscal sustainability in one country. Worryingly, market gyrations in October hinted at low levels of secondary market liquidity in certain segments and highlighted the ability for difficulties in one market to quickly propagate to another. Riskier sovereign markets did experience a withdrawal of foreign investment that was offset by demand from euro area investors. Although part of the euro area support appears to have been domestic bank-based, non-domestic institutional investors played an important role as well. While lower-rated sovereigns have taken advantage of benign conditions to improve their fiscal outlook by frontloading issuance, smoothing repayment schedules and lengthening maturities, market conditions are vulnerable to any further signs of weakness in the euro area recovery.

*The broad-based rally in euro area sovereign bond markets continues...*

*... and intra-euro area spreads have fallen further*

**Chart 2.10 Yield on the ten-year German government bond and spreads between it and selected euro area government bonds**

(Jan. 2009 – Nov. 2014; percentage points)



Sources: Bloomberg and ECB calculations.

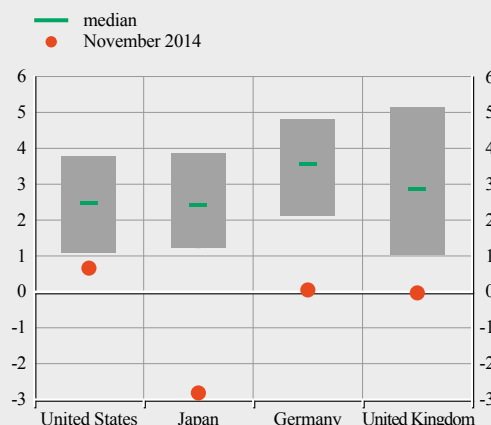
Note: Long-term average refers to the period from 1965 to 2014.

*Real yields are less extreme but still low, despite elevated government debt-to-GDP levels...*

While nominal yields on government bonds are touching record lows, **real yields on government bonds** are less extreme. Real yields on higher-rated government bonds (United States, Germany, Japan and the United Kingdom) are above record lows, but do fall within the lowest quartile of observations over the last century (see Chart 2.11). Meanwhile, real yields on lower-rated euro area bonds (such as those in Italy and Spain) are close to their century medians. The current compressed level of real yields on higher-rated bonds reflects strengthened demand (owing to regulatory considerations) for a reduced pool (owing to rating downgrades) of high-quality liquid assets and – in the case of the United States, the United Kingdom and Japan – large acquisitions by central banks.<sup>12</sup> Indeed, while interest rates on such sovereign paper continue to touch historically low levels, government debt-to-GDP ratios remain elevated and there is a risk of potential sharp adjustments as central banks exit from quantitative easing programmes. Moreover, recent market gyrations indicated that such adjustments could be amplified by lower levels of secondary market liquidity post crisis.

**Chart 2.11 Real yields on selected ten-year government bonds compared with historical levels**

(Jan. 1914 – Oct. 2014; percentages; current, median and interquartile range)



Source: Global Financial Data.

Note: Yields are deflated using the consumer price index measure of inflation.

*... and vulnerable to changing market expectations regarding the growth outlook and the path of global monetary policy.*

One factor that could underpin the current low level of nominal and real yields is that markets are pricing in the potential for a protracted period of low growth, low inflation and therefore accommodative global monetary policy. If borne out, a protracted period of low growth could hamper debt sustainability. The level of public (and private sector) debt-to-GDP ratios is historically high across most regions (see Section 1). If, on the other hand, the recovery in the United States and the United Kingdom endures, monetary tightening could be implemented sooner than expected by markets and, despite ample warnings, substantial corrections could be triggered. Under such a scenario, a sharp adjustment in US term premia is likely. While weaker than expected euro area growth remains the most significant threat to the euro area government bond markets, a sharp increase in US term premia is also a cause for concern. While forward guidance has been successful in containing spillovers from rising US money market rates, the extent to which the long end of the euro area bond yield curve might react to a significant repricing of US term premia is still a worry.

#### CORPORATE CREDIT MARKETS

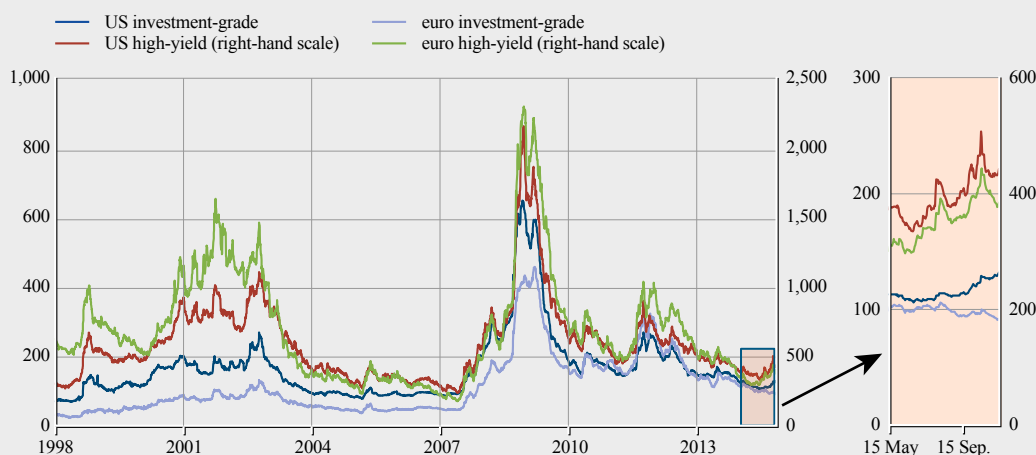
A search for yield continues in **corporate credit markets**. While rising geopolitical tensions and concerns regarding stretched valuations in the high-yield segment temporarily affected investor appetite for credit risk, investors were willing to increase duration exposure (see Charts 2.12 and 2.13). At the same time, credit spreads for both the investment-grade and high-yield segments remain at relatively low levels and the market continues to absorb record levels of corporate bond issuance. In addition, investor demand for higher-yielding complex products – such as corporate hybrids – remains strong.

<sup>12</sup> The Bank of England, the Bank of Japan and the Federal Reserve hold roughly 27%, 24% and 15% of domestic government bonds respectively. The ECB holds less than 3% of euro area government debt securities.

*The search for yield continues in corporate credit markets*

Chart 2.12 Spreads on investment-grade and high-yield corporate bonds

(Jan. 1998 – Nov. 2014; basis points)



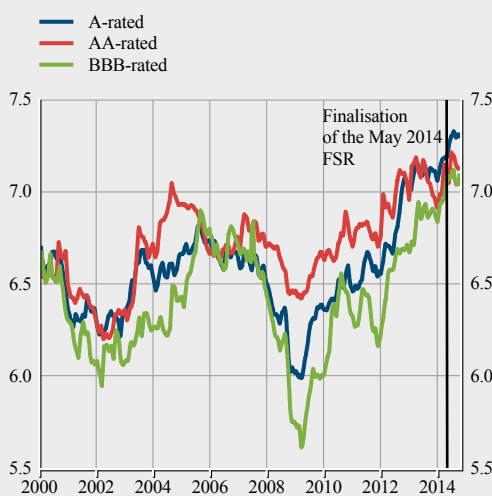
Sources: Bloomberg and ECB calculations.

Prices and average durations for euro area **investment-grade corporate bonds** maintained their steady rise during the summer, although geopolitical tensions temporarily weighed on issuance. Having taken advantage of attractive funding costs in the first half of the year, issuers did not appear willing to test the market over the summer amid increased global risk aversion. As a result, issuance was weak but rebounded in the autumn as geopolitical tensions subsided somewhat.<sup>13</sup> At the same time, credit spreads for investment-grade bonds reached a new post-crisis trough, while average duration rose above pre-crisis levels.

Low risk-free rates have sustained **high-yield corporate bond** yields at historical lows despite a widening of credit spreads amid investor outflows from lower-rated bond funds (see Charts 2.12 and 2.14). Weak returns during the year and concerns regarding stretched valuations, particularly in the US market, made the corporate segment quite vulnerable to the sudden change in market sentiment that occurred during the summer. In the euro area, concerns regarding Banco Espírito Santo and Portugal Telecom temporarily added to negative market sentiment. Weekly outflows from US and European lower-rated bond funds reached a magnitude that surpassed levels observed last summer during the so-called “taper tantrum”.

Chart 2.13 Modified duration of long-term investment-grade euro area corporate bonds by rating category

(Jan. 2000 – Nov. 2014; 30-day moving averages; years)



Sources: Bank of America Merrill Lynch.  
Note: Long-term bonds refer to bonds with maturities of between seven and ten years.

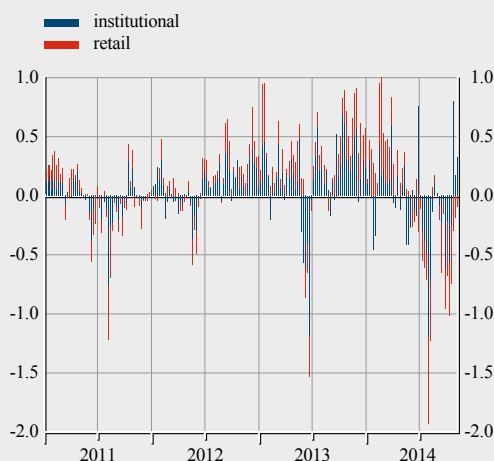
*Investors have increased duration exposure to investment-grade issuers...*

*... and withdrawn from the high-yield segment*

<sup>13</sup> It was the strongest September for euro investment-grade fixed rate issuance since 2012.

**Chart 2.14 Net weekly flows of retail and institutional investors to/from high-yield euro area bond funds**

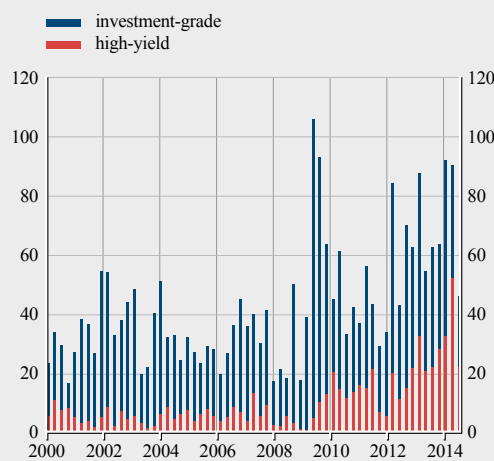
(Jan. 2011–Nov. 2014; USD millions)



Sources: EPFR and ECB calculations.  
Note: Data capture funds located in Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain.

**Chart 2.15 Quarterly issuance of euro area high-yield and investment-grade corporate bonds**

(Q1 2000 – Q3 2014; EUR billions)



Sources: Dealogic and ECB calculations.

*Nonetheless, credit spreads remain at relatively low levels...*

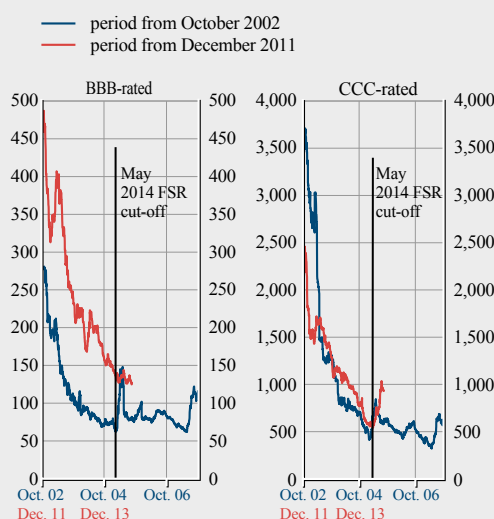
While noteworthy, the recent outflows and increase in credit spreads need to be placed in the context of substantial inflows over the past three years which have pushed credit spreads close to pre-crisis lows, while issuance has reached record levels (see Chart 2.15). High-yield credit spreads have fallen almost 20 percentage points from crisis peaks to within 150 basis points of pre-crisis troughs. While euro area corporate bond issuance slowed in the third quarter of this year owing to weakened demand, it was still the strongest third quarter for deal volumes on record. Moreover, underwriting standards of high-yield issuances continue to weaken, as evidenced by increased growth in covenant-lite loans and payment-in-kind bonds.

*... raising some concerns that investors may not be adequately compensated for risk*

The speed and magnitude of the declines in **corporate credit spreads** (for both investment-grade and high-yield bonds) from sovereign crisis peaks mirror developments during the pre-crisis era (see Chart 2.16). Similar to that period, current low levels of market volatility and expected default frequencies provide some justification for the compressed level of credit spreads. However, levels of corporate indebtedness are much higher now (see Section 1.3). In addition, increases in average maturity and durations raise concerns over whether investors are adequately compensated for the default rates and market

**Chart 2.16 Developments in credit spreads on BBB and CCC-rated euro bonds since 2011 compared with 2002**

(Oct. 2002 – Nov. 2014; basis points)



Sources: Bloomberg, Bank of America Merrill Lynch and ECB calculations.

volatility they could expect over the entire life of the bond.<sup>14</sup> Moreover, past experience teaches us that pervasive low levels of volatility are rare and tend to be short-lived (see Box 3). In addition, current low levels of default are dependent on the endurance of: (i) low market volatility; (ii) the recovery in euro area growth; and perhaps also (iii) low interest rates. Furthermore, the strong correlation between corporate and sovereign bonds (particularly within vulnerable euro area countries) suggests that risk factors affecting sovereign bond markets, mainly a worsening of the still fragile economic recovery and a disorderly repricing in global markets, could propagate quickly to corporate bond sectors.

Euro area **corporate hybrid bonds** exhibited some temporary price and issuance volatility in recent months, owing to geopolitical tensions and a one-off shock to the banking sector. There was a hiatus in bank Additional Tier 1 contingent convertible bond issuance during the summer, as banks were unwilling to test the market following the bail-in of the subordinated bonds of Banco Espírito Santo. However, the impact of the banking sector shock proved short-lived and issuance and prices rebounded strongly in autumn. During this period bank issuance offset a slowdown in NFC hybrid issuance as firms started to fulfil their targeted programme amounts and the large-scale mergers and acquisitions that would warrant hybrid issuance to protect ratings did not materialise.

Demand for **complex high-yielding products** is evident in a resurgence of CLOs, particularly in the United States, and the emergence of capital relief trades (CRTs). While global issuance of securitised products remains flat, issuance of CLOs has grown significantly, surpassing pre-crisis peaks in the United States.<sup>15</sup> CLO issuance in the euro area has been growing, but remains subdued relative to pre-crisis peaks, a reflection perhaps of post-crisis risk-retention rules. However, a rebound in the issuance of other securitised products in the euro area, in particular asset-backed securities (ABSs), is expected over the coming year following the ECB's announcement that it would engage in purchases of senior ABS tranches and mezzanine tranches provided that they are guaranteed.<sup>16</sup> A number of sophisticated CRTs, whereby a bank pays a third party to take on some risk associated with its asset exposures, have been reported over the past year.<sup>17</sup>

*Demand for complex high-yielding products remains strong at the euro area...*

*... and global level*

<sup>14</sup> The average maturity of a euro area corporate bond issued in the third quarter of 2014 was six years.

<sup>15</sup> In 2014, the issuance of securitised products is expected to reach USD 691 billion globally, still well below its peak.

<sup>16</sup> Issuance increased noticeably in September following the ECB announcement. At the same time, a Bloomberg survey among market participants found that they expect the euro area ABS market to grow significantly in the coming year. Nearly 60% of respondents to a Bloomberg survey think that structured finance issuance will increase over the next 12 months, compared with 33% in the previous survey. The Q3 2014 reading is the highest in the survey history and is higher than for any other asset class.

<sup>17</sup> These include the sale of shipping loans by Citigroup to Blackstone, the sale of multiple loan portfolios by Unicredit to Barclays and the sale of trade finance loans by Standard Chartered.

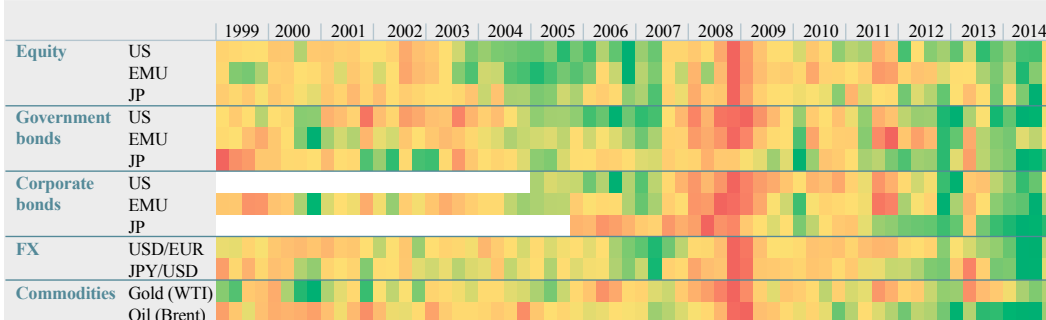
### Box 3

#### FINANCIAL MARKET VOLATILITY AND BANKING SECTOR LEVERAGE

Global asset market volatility remained persistently at historical lows across financial asset classes and economic regions from the third quarter of 2013 up until early October 2014.<sup>1</sup> Low financial market volatility may in many ways reflect fundamentals, including low uncertainty regarding policies, limited surprises in economic releases and the stabilising influence of more

<sup>1</sup> In October 2014, a deterioration of the economic outlook in major advanced and emerging economies, including the United States and China, triggered an episode of market volatility in several asset markets.

Chart A Heat map of levels of volatility across major asset markets



Sources: Thomson Reuters Datastream and ECB calculations.

Notes: Volatility estimates are derived from non-overlapping quarterly samples of daily price data. The colour code is based on the ranking of these quarterly estimates in the respective asset market. A red, yellow and green colour code indicates, respectively, a high, medium and low volatility estimate compared with other periods. Equity markets are represented by the respective MSCI price index at the country or region level. Bond markets are represented by the respective JPMorgan government bond index at the country or region level (local currency/all maturities). The last observation is for 30 September 2014. White indicates non-availability of data.

stringent post-crisis regulation of the financial sector. At the same time, financial stability risks may arise from investor complacency especially during periods of weak returns on financial assets when investors hunt for yield. Such periods have the potential to embed systemic risk, if they lead to an excessive build-up in leverage or maturity extension.

The broad-based nature of this current period of record low volatility is particularly noteworthy. Option-implied stock market volatility (as measured, for instance, by the VIX) and derived measures of uncertainty and risk aversion have approached record low levels.<sup>2</sup> At the same time, realised market volatility has remained at extremely low levels for the past five consecutive quarters (up until the end of the third quarter of 2014) in thirteen major asset markets (G3 equity, government bond, corporate bond and FX markets, as well as two major commodity markets; see Chart A). Indeed, the average annualised daily market volatility of these markets has fallen to a range of 6.3% to 9.5% – even lower than daily volatility of 7.9%–12.8% for global bond and equity markets on the eve of the global financial crisis. Moreover, volatility is touching record lows across a much broader range of asset categories than it did during the pre-crisis era and is proving more persistent (see Chart A). The former may reflect the growing correlation of global asset markets in the post-2008 period.

According to the *volatility paradox* hypothesis<sup>3</sup>, an environment of low yields and volatility could invite excessive risk-taking by financial investors. First, risk aversion tends to decline during prolonged periods of low volatility as suggested by estimates of the volatility risk premium (see Section 2.2). A lower premium amounts to investors demanding less compensation for holding risky assets. Such a fall in the price of risk changes the relative price of assets with a given risk/return trade-off and may lead to portfolio rebalancing in favour of riskier assets. Second, low volatility mechanically compresses backward-looking risk measures, such as the value at risk (VaR), which shape investors' risk management decisions. In fact, the unit VaR – calculated as the VaR per unit of assets – of a sample of large euro area banks lags a measure

<sup>2</sup> For further details, see *Financial Stability Review*, ECB, May 2014, pp. 55–56 and *BIS Quarterly Review*, September 2014, pp.10–11.

<sup>3</sup> Adrian, T. and Shin, H., "Procyclical Leverage and Value-at-Risk", *NBER Working Paper Series*, No 18943, 2013; Adrian, T. and Boyarchenko, N., "Intermediary Leverage Cycles and Financial Stability", Federal Reserve Bank of New York Staff Report No 567, 2013; and Brunnermeier, M. and Sannikov, Y., "A Macroeconomic Model with a Financial Sector", *American Economic Review*, Vol. 104(2), pp. 379–421, 2014.

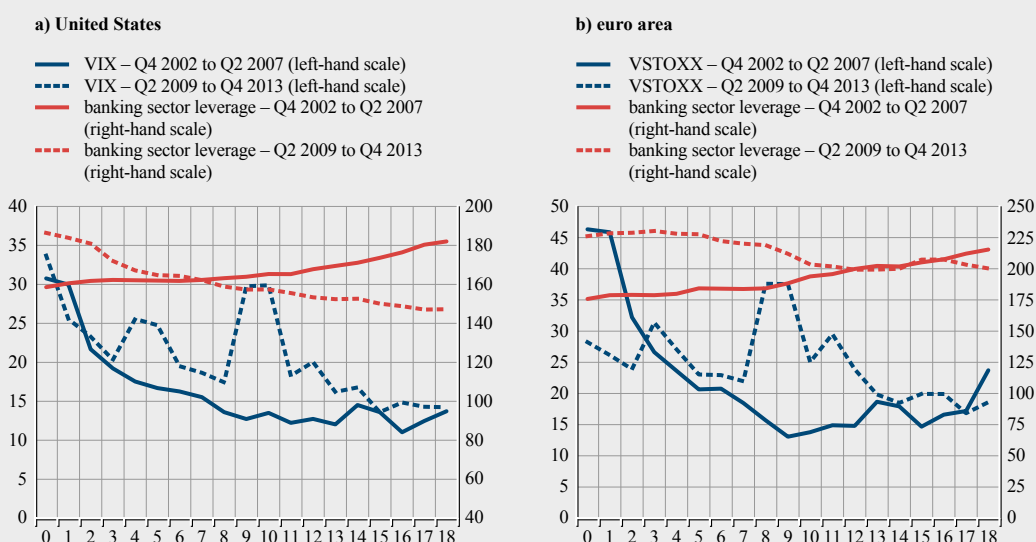
of stock market volatility in the euro area by about a year. This pro-cyclical behaviour of the VaR allows investors to increase their exposure to assets which are prone to bursts of volatility for a given risk threshold. Finally, cheap funding and subdued risk measures allow investors to increase their leverage, thereby reinforcing the vulnerability of the financial sector at large.

The period of low volatility leading up to the global financial crisis commencing in 2007 is illustrative of such risks via *leverage*. In that episode, the build-up of banking sector leverage was certainly a side-effect of low market volatility. From 2002 to 2007 banking sector leverage in the United States and the euro area rose considerably (see Chart B). During this period, financial market volatility as measured by the VIX, which is often also interpreted as a yardstick of global risk aversion, was at very low levels. By contrast, the decline in market volatility since mid-2009 has so far not been associated with a renewed increase in banking sector leverage (see Chart B).

There are a number of reasons why the mechanical link between market volatility, risk appetite and banking sector leverage observed ahead of the last crisis does not hold for current developments. Between 2002 and 2007 the pro-cyclical nature of the leverage cycle appeared to follow an empirical regularity whereby in periods of low volatility and low measured market risk, lower risk weights for banks to meet capital adequacy requirements enabled them to build up leverage. Since mid-2009, this mechanism has not yet started to operate for two reasons. First, capital and liquidity requirements for regulated banks have been tightened in the context of more stringent regulatory requirements. Second, the legacy of the crisis has led to a prolonged period of low economic growth. As a result, low credit growth has partly been driven by subdued demand for loans. Finally, the reasons for low market volatility during the leverage cycle between 2002 and 2007 might have been different from those in recent years.

**Chart B Banking sector leverage and financial market volatility in the United States and the euro area**

(percentages)



Sources: Bloomberg, ECB and ECB calculations.

Notes: Data on banking sector leverage (debt/equity) in the United States and the euro area are based on partly consolidated data for comparability purposes. Banking sector debt includes total loans given to banks by non-banks, money deposited by non-banks, total debt securities issued and money market fund shares.

*Weak economic growth and rising geopolitical tensions temporarily impacted global stock markets*

*There are no clear signs of overvaluation in euro area stock markets...*

Nevertheless, the current period of low volatility may be contributing to rising leverage outside the regulated banking sector (see Section 2.2).

Ultimately, the elusive and time-varying nature of many of these explanatory factors implies a need for monitoring persistently low financial market volatility for financial stability risks. Indeed, given the profound impact of the global financial crisis on both the financial system and the economy, the nature of systemic risks may too be evolving – requiring a broad-based monitoring of low volatility with various measures of leverage including leverage *outside* the regulated banking sector (for example, embedded in financial market transactions of certain market segments such as derivatives, securities financing or repo markets) as well as any prospect of broad-based liquidity or maturity mismatch that could cause system-wide stress.

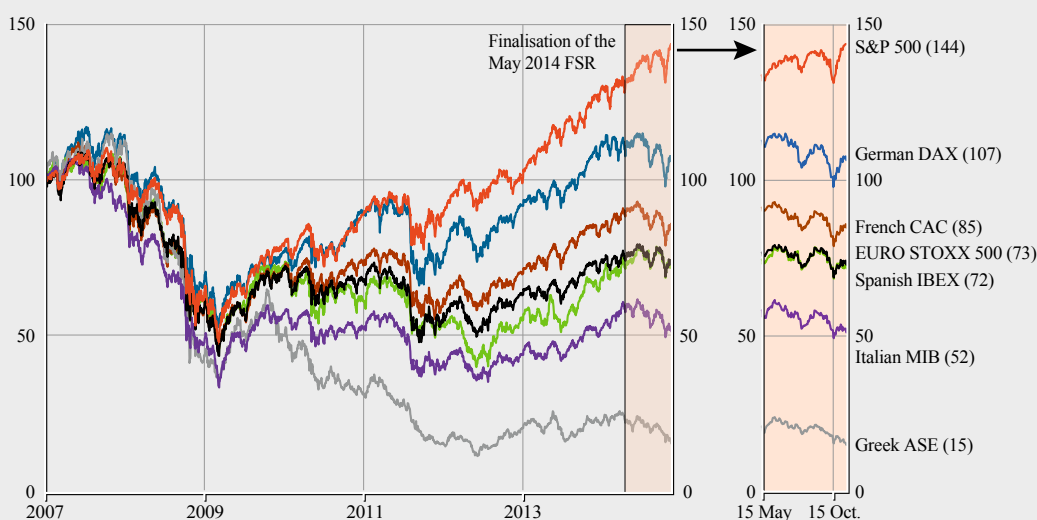
## EQUITY MARKETS

The broad-based rally in **global stock markets** was interrupted by bouts of volatility amid growing global risk aversion owing to concerns regarding rising geopolitical tensions and the global growth outlook (see Chart 2.17). Price corrections in **euro area stock markets** amplified those in the US market for three key reasons. First and foremost, weaker than expected economic data releases for the euro area weighed on earnings expectations. Second, geopolitical tensions weighed more heavily on euro area stocks as the macro-financial consequences of the Ukraine-Russia conflict were considered more severe for the euro area (see Section 1). Finally, certain euro area financial stocks were affected by one-off country and sector-specific shocks.

While there are no clear signs of overvaluation in aggregate euro area stock price indices, price/earnings ratios for some national markets are significantly above their long-run averages. Although the recovery in euro area stock markets has been remarkable in recent years, the EURO STOXX index still remains 27% below its level in 2007 (see Chart 2.17). Moreover, metrics such as the

**Chart 2.17 Developments in US and euro area stock markets**

(Jan. 2007 – Nov. 2014; index: Jan. 2007 = 100)



Sources: Bloomberg and ECB calculations.

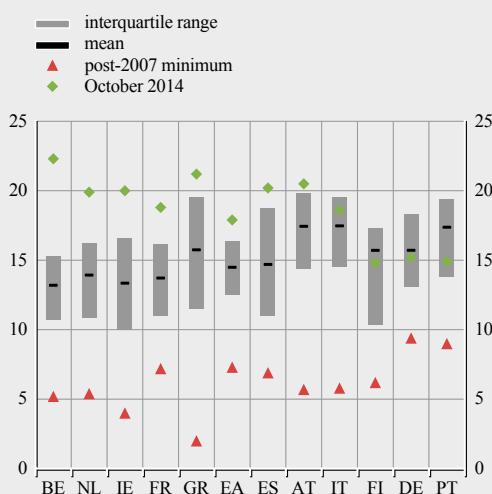
cyclically adjusted price/earnings (CAPE) ratio and Tobin's Q (the ratio of a firm's market value to its replacement costs) suggest valuations are still in check, with both measures close to long-run averages. However, recent price adjustments, in particular for German and French stock markets, have shown that current valuations depend on a fragile economic recovery with increasing downside risks. Indeed, current valuations are supported by expectations of robust (double-digit) earnings growth for euro area firms over the next year. Moreover, the rally in euro area markets and strong earnings expectations seem to contrast with the growing share of loss-making firms within the region (up from 15% in 2011 to 22% in 2014).<sup>18</sup> In addition, at the national level, the trailing price/earnings ratios for stocks in Belgium, Ireland, Spain, the Netherlands and France now deviate substantially from their long-run means and lie outside their interquartile ranges (see Chart 2.18).

As US stock prices enter their fourth year of increase, commonly used metrics of overvaluation signal that valuations are becoming stretched. Both the CAPE ratio for the S&P 500 index and Tobin's Q for US firms are well above their long-run averages (see Chart 2.19). The CAPE for the S&P 500 is 60% above its long-run average, having reached a level that has only been surpassed on three other occasions in its 188-year history: 1929, 1999 and 2007 (years which preceded significant stock price collapses). Meanwhile Tobin's Q has risen above 1 for US non-financial firms for the second time in its 69-year history, the only other occasion being the period ahead of the dot-com collapse. As these valuations have grown, the use of leverage also appears to be on the rise. Data on margin financing indicate a large increase in the use of leverage to fund US securities purchases. The rally in the S&P 500 has coincided with a sharp increase in margin financing, which has grown by 350% in the past year to reach record levels in real terms.

<sup>18</sup> See Société Générale Cross Asset Research factsheet.

**Chart 2.18 Price/earnings ratios for selected EU countries and the United States**

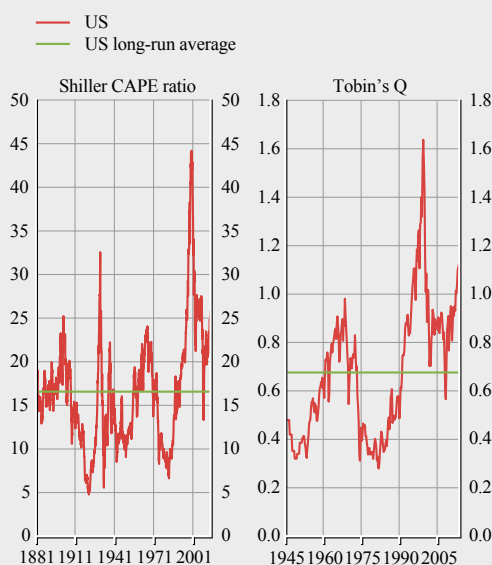
(Jan. 1980 – Oct. 2014; ratios; maximum, minimum and interquartile range)



Sources: Thomson Reuters Datastream, ECB and ECB calculations.  
Notes: Unbalanced panel with series starting between 1980 and 1990.

**Chart 2.19 Cyclically adjusted price/earnings ratio and Tobin's Q for the US stock market**

(ratios)



Sources: R. Shiller (Yale University), Federal Reserve Board and ECB calculations.

*... but some signs of stretched valuations are evident in US markets*





### 3 EURO AREA FINANCIAL INSTITUTIONS

*Euro area financial institutions have continued to make steady progress in tackling legacy issues from the financial crisis, while adapting to an evolving regulatory and prudential environment. **Bank balance sheets** have been strengthened further, with a clear shift towards capital increases in 2014, from deleveraging and de-risking in previous years. While some asset quality concerns remain, the pace of deterioration has slowed considerably. The comprehensive assessment has brought much-needed transparency and confirms that a large majority of the most significant euro area banks is well equipped to withstand a severe economic downturn.<sup>1</sup>*

*Notwithstanding these efforts to strengthen balance sheets, a combination of cyclical and structural headwinds has implied weak **profitability** in many parts of the euro area banking sector. In particular, elevated loan loss provisions and subdued revenues remain a drag on profits in an environment of low growth and flat yield curves. While cyclical headwinds should abate as economic conditions improve, there is a clear need to continue to adapt bank strategies and business models so as to sustainably improve profitability in a post-crisis environment, notably to foster internal capital generation. In this context, bank lending activity remains subdued – with loans to non-financial corporations developing particularly sluggishly, mainly on account of anaemic credit demand and persistent fragmentation of credit conditions. Over time, further progress in removing impediments to the supply of bank credit – also including disposals of non-performing loans – should help improve credit conditions, as should, in particular, the ECB’s targeted measures to improve access to finance essential for economic growth.*

*Not only banks, but also **insurers**, for whom a prolonged period of low yields remains a key concern, have been adapting their business models to the prevailing macro-financial environment. While low yields have placed pressure on earnings in the latter sector, the financial performance and capital positions of large euro area insurers have remained sound.*

*On the **policy** front, progress continues apace in the regulatory and prudential domains. In the regulatory field, further advances have been made, in particular, in weakening the links between sovereigns and banks, and in building a more resilient banking sector. Since the publication of the last issue of the Financial Stability Review (FSR), much has been achieved to put in place central elements of an integrated financial framework in Europe, especially the euro area, namely (i) the Single Supervisory Mechanism, (ii) a common resolution framework, (iii) a Single Resolution Mechanism and (iv) harmonised deposit insurance. In line with a new and reinforced prudential mandate, a number of euro area Member States have announced specific macro-prudential measures. These include systemic risk measures in order to mitigate systemic risks originating from the significant size, high concentration and interconnectedness in their banking sectors. Different types of property-related measures have been adopted as well, with the aim of addressing unfavourable developments in the property market (see Section 3.3 for a description of measures taken).*

#### 3.1 BALANCE SHEET REPAIR CONTINUES, BUT WEAK PROFITABILITY PERSISTS IN THE EURO AREA BANKING SECTOR

##### FINANCIAL CONDITION OF EURO AREA BANKS

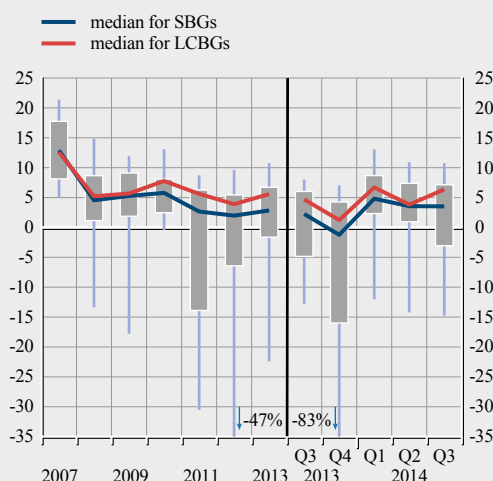
Euro area banks’ **profitability** remained weak in the first three quarters of 2014, given a confluence of both cyclical and structural factors. In the third quarter of 2014, the median return on equity (ROE) of significant banking groups (SBGs) in the euro area remained broadly unchanged from three months earlier, at around 4%, and showed only a slight improvement on a year-on-year basis (see Chart 3.1). Elevated loan loss provisions remained the most important cyclical drag on bank

*Bank profitability remains under pressure...*

<sup>1</sup> Given the broad nature of the comprehensive assessment, including a bottom-up stress-test exercise, and the forthcoming stress test by EIOPA on insurers, sensitivity analyses for financial institutions are not presented in this issue of the FSR.

**Chart 3.1 Euro area banks' return on equity**

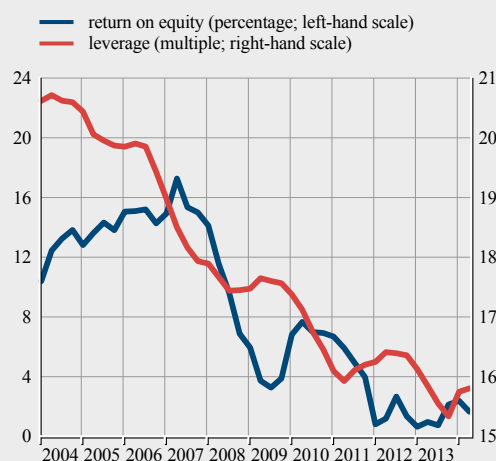
(2007 – Q3 2014; percentages; 10th and 90th percentiles and interquartile range distribution across SBGs)



Source: SNL Financial.  
Note: Based on publicly available data on SBGs that report annual financial statements and on data on a sub-set of those banks that report on a quarterly basis.

**Chart 3.2 Return on equity and leverage for large euro area banks**

(Q1 2004 – Q2 2014; median values for SBGs)



Sources: Bloomberg and ECB calculations.  
Note: Based on publicly available data on a sub-sample of listed SBGs that report quarterly financial statements.

performance, even if these provisions have fallen somewhat over the last half year. Furthermore, banks are also struggling to boost revenues in an environment of low growth and flat yield curves. In addition to cyclical factors, one-off factors also affected some banks, mainly in the form of large non-recurring expenses related to litigation charges or goodwill write-downs that depressed profits.

At the same time, the de-risking and deleveraging of bank balance sheets (see Chart 3.2) as well as some structural factors – such as strong domestic competition or remaining cost inefficiencies in some parts of the euro area banking sector – have also contributed to lower profitability. This combination of both cyclical and structural headwinds has pushed banks' ROE well below their cost of equity in the past few years. As the impact of cyclical factors eventually fades away, any weak structural profitability remaining could limit banks' internal capital generation and provide incentives for banks to take on more risks. Moreover, for some banks, persistently weak profitability also raises questions about the viability of their business models. In this respect, while a number of euro area banks have made progress in restructuring their operations since the start of the crisis, driven by continued pressure to contain costs and reduce non-core activities, the advances have been uneven across different parts of the banking sector. Therefore, further measures need to be taken in parts of the banking sector to adapt business models to new realities, for instance, by refocusing activities on profitable core business, diversifying income sources or further improving cost efficiency.

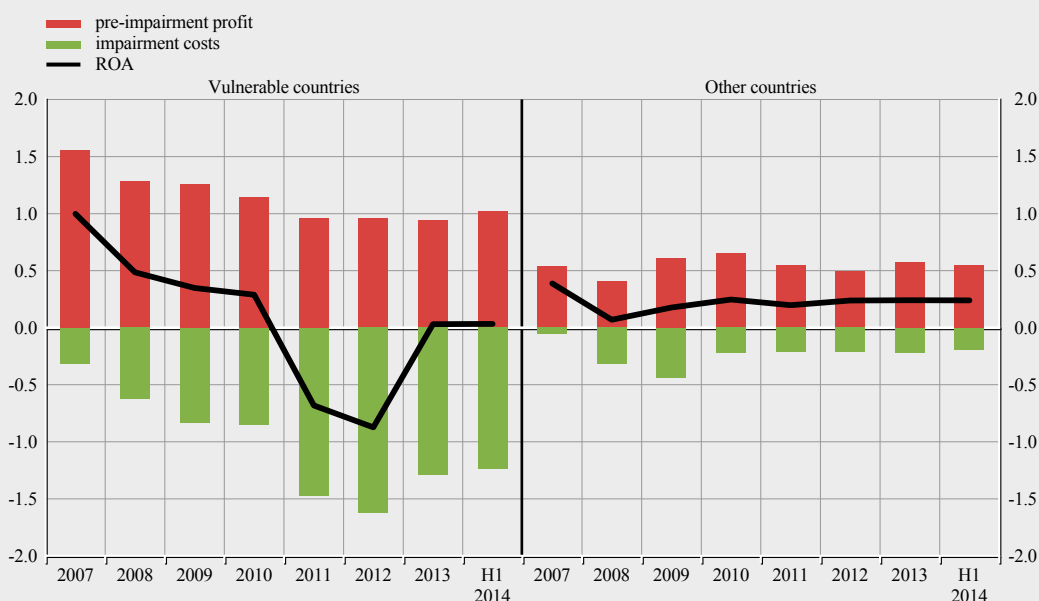
Low profitability remains a concern for most euro area banks, although the main drivers have differed somewhat across banks and countries in recent years. In countries that experienced a recession in the last few years and where economic recovery remains weak, low or negative bank profitability has been driven primarily by high loan loss provisions (see Chart 3.3). More generally, over the past few years, pre-impairment operating profits remained rather subdued, or showed a decline, on account of a combination of narrowing net interest margins and weak loan volume

... given a combination of cyclical and structural headwinds...

... due to elevated credit risk costs and compressed interest margins...

**Chart 3.3 Euro area banks' return on assets, pre-impairment profits and impairment costs in vulnerable and other countries**

(2007 – H1 2014; percentage of total assets; median values for SBGs)



Source: SNL Financial.

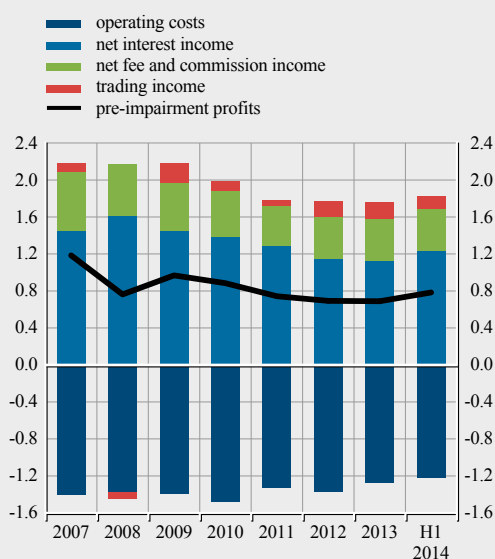
Notes: Based on publicly available data on SBGs that report on a semi-annual basis. Two-period averages for the first half of 2014. "Vulnerable countries" refer to Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain.

growth. For banks in vulnerable countries, net interest income had been negatively affected by higher funding costs as a consequence of the sovereign crisis, while interest margins in some core countries (notably in Germany) have been structurally low for a long time, mainly on account of intense bank competition, a situation that has recently also been exacerbated by low interest rates.

More recently, however, euro area banks' operating performance showed signs of a moderate improvement – with median pre-impairment profits for SBGs increasing somewhat in the first half of 2014 (see Chart 3.4). This mainly reflected a modest overall increase in net interest income as average funding costs declined more than asset yields (see Chart 3.5), albeit with significant cross-country heterogeneity. In particular, many banks from vulnerable countries recorded an improvement – contrasting with flat or even declining patterns for a number of banks in other countries.

**Chart 3.4 Euro area banks' pre-impairment profits and their main components**

(2007 – H1 2014; percentage of total assets; median values for SBGs)

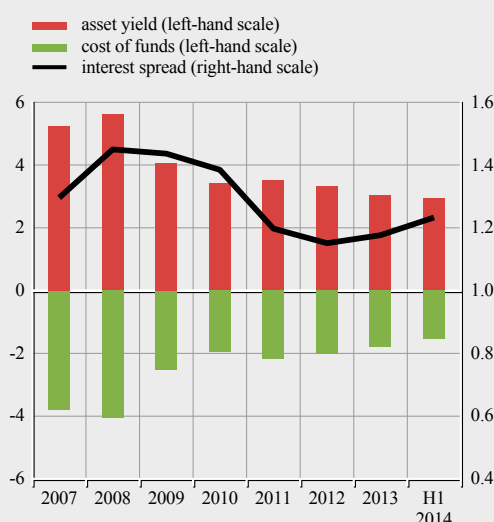


Source: SNL Financial.

Notes: Based on publicly available data on SBGs that report on a semi-annual basis. Two-period averages for the first half of 2014.

**Chart 3.5 Interest spread and its components for significant banking groups in the euro area**

(2007 – H1 2014; percentages; median values for SBGs)

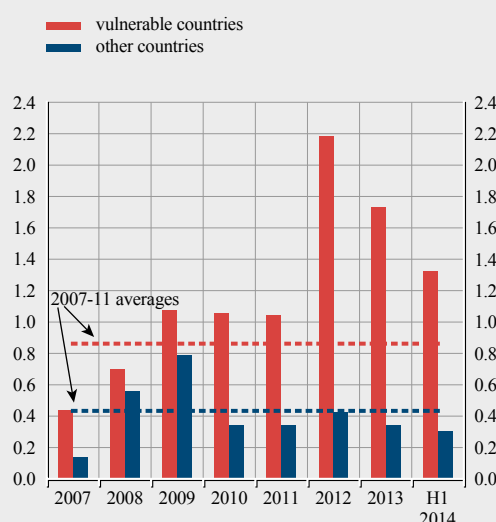


Source: SNL Financial.

Note: Based on publicly available data on SBGs that report on a semi-annual basis.

**Chart 3.6 Loan loss provisions of banks in vulnerable and other euro area countries**

(2007 – H1 2014; percentage of total loans; median values)



Source: SNL Financial.

Notes: Based on publicly available data on SBGs that report on a semi-annual basis. "Vulnerable countries" refer to Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain.

These cross-country differences in funding costs mainly reflect the marked fall in sovereign yields in vulnerable countries. In these countries, a median decline of 21% in interest costs in the first half of 2014 – resulting from a spillover of lower sovereign yields to both deposit and wholesale funding costs – contrasted with a more moderate decrease in interest costs for banks in other countries (median decline of 9%). Mirroring these patterns, banks in vulnerable countries registered a median increase of 4% in net interest income in the first half of 2014, as compared with a year earlier, compared with a median increase of 2% for banks in other countries.

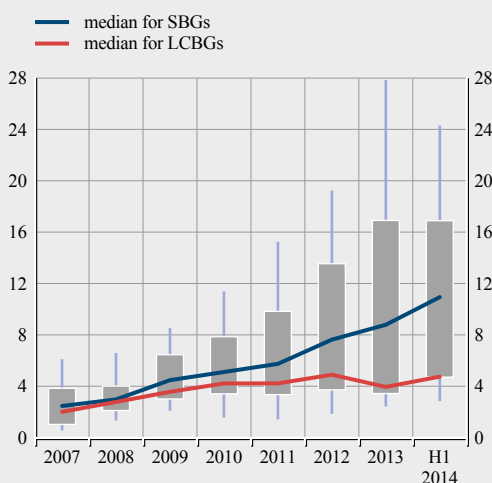
At the same time, non-interest income decreased slightly in the first half of 2014 due to lower trading income, while fee and commission income remained stable. In the same period operating costs, expressed as a percentage of total assets, decreased somewhat on average reflecting banks' continued efforts to cut costs (see Chart 3.4). That said, the progress in improving cost efficiency remains uneven across banks with more than one-fifth of SBGs maintaining cost-to-income ratios above 70%, suggesting that for several banks there is scope for further cost containment.

... with high  
impairment costs  
affecting mainly  
banks in vulnerable  
countries...

Despite some easing of cyclical headwinds, banks' financial results have continued to be heavily affected by high impairment costs, albeit to a lesser extent than six months earlier. Stark differences in impairment costs across banks persisted, with smaller banks from vulnerable countries bearing much of the negative impact on results. In the first half of 2014, the median value of loan loss provisions (the bulk of impairment costs) for SBGs in vulnerable countries was still above the average over the five years preceding the sovereign debt crisis (2007-11). By contrast, average loan loss provisions for banks in other countries remained at moderate levels (see Chart 3.6). Furthermore, additional provisioning needs identified by the asset quality review (AQR) are likely to be recognised mostly in banks' fourth-quarter or full-year 2014 results.

**Chart 3.7 Impaired loan ratios of euro area banks**

(2007 – H1 2014; percentages; 10th and 90th percentiles and interquartile range distribution across SBGs)

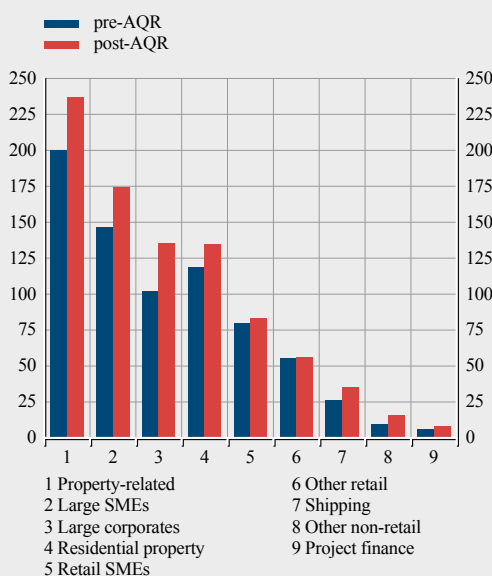


Source: SNL Financial.

Note: Based on publicly available data on SBGs that report semi-annual financial statements.

**Chart 3.8 Impact of the AQR on non-performing exposures by asset class**

(EUR billions)



Source: ECB.

Note: The AQR-related changes reflect the impact of the application of the EBA's simplified NPE approach and the credit file review.

Divergent reported **asset quality** trends across banks continued into the first half of 2014 (see Chart 3.7), with banks in vulnerable countries experiencing a further deterioration, albeit at a slowing rate. This development was mainly linked to weak macroeconomic conditions in these countries, although some of the increase in non-performing loan (NPL) ratios may also have been related to a reclassification of restructured loans in anticipation of the future implementation of harmonised European Banking Authority (EBA) standards for NPLs.

Moreover, for the 130 banks subject to the comprehensive assessment, the AQR resulted in an increase of €136 billion, or 18%, in non-performing exposures (NPEs) with respect to figures reported for end-2013 (see also Box 4). By asset class, AQR-related increases in NPEs in absolute terms were largest for property-related and large corporate exposures, followed by large SMEs (see Chart 3.8).

Looking ahead, banks with a large stock of NPLs on their balance sheets still face the challenge of dealing with their problem assets, even if banks in some vulnerable countries have made some progress in writing off or disposing of bad loans (over and above the transfer of assets to bad banks/asset management companies). Further significant progress in this area is all the more important as a slow resolution of NPLs could limit banks' potential for new (profitable) lending.

Despite higher provisioning by a number of banks, **coverage** of impaired (non-performing) loans by reserves remained broadly stable in the first half of 2014, with the median coverage ratio for SBGs standing at 54% at end-June (see Chart 3.9). Loan loss reserves of large and complex banking groups (LCBGs) remained considerably higher than those of smaller SBGs, with the median value for the largest banks reaching 61% in mid-2014.

... on account of  
a further increase  
in non-performing  
loans...

... while coverage  
ratios remained  
broadly stable

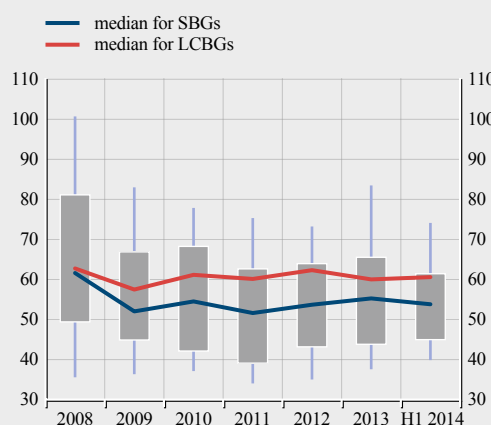
*Banks improved risk-weighted capital ratios further...*

Overall, following the ECB's comprehensive assessment exercise, long-lingering concerns about the asset and collateral valuation of significant banks in the euro area, NPL recognition as well as provisioning practices have largely dissipated. While the asset quality review, in the case of some banks, has led to higher provisions and reported NPLs in the short term, it should help strengthen confidence in the sector.

While banks' subdued earnings performance continued to limit internal capital generation, a steady across-the-board increase in euro area banks' **risk-weighted capital ratios** continued in the first half of 2014. Core Tier 1 (CT1) capital ratios increased only slightly in comparison with the levels at end-2013, and even decreased for LCBGs, given the one-off increase in risk-weighted assets following the implementation of the Capital Requirements Directive IV (CRD IV) (see left-hand panel of Chart 3.10). This affected both credit and counterparty risk-related and market risk-related risk-weighted assets due to, among other things, the new calculation of risk-weighted assets for the credit valuation adjustment (CVA) and the inclusion of former capital deduction items for higher risk securitisation positions.

**Chart 3.9 Coverage ratios of euro area banks**

(2008 – H1 2014; loan loss reserves as a percentage of impaired loans; 10th and 90th percentiles and interquartile range distribution across SBGs)

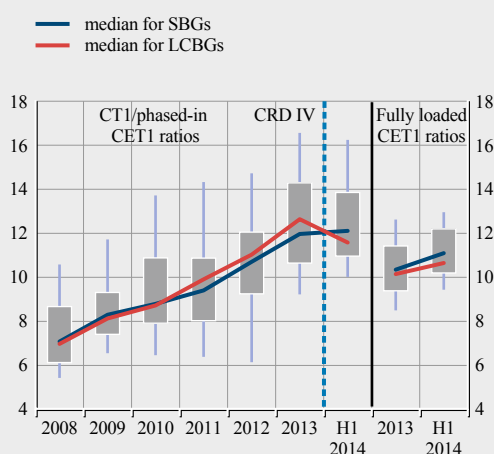


Source: SNL Financial.

Note: Based on publicly available data on SBGs that report annual financial statements and on data on a sub-set of those banks that report at least on a semi-annual basis.

**Chart 3.10 Core Tier 1 (CT1)/common equity Tier 1 (CET1) capital ratios of euro area banks**

(2008 – H1 2014; percentages; 10th and 90th percentiles and interquartile range distribution across SBGs)

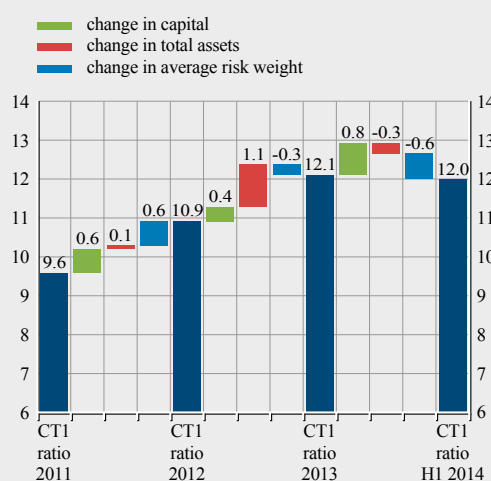


Source: SNL Financial.

Note: Based on publicly available data on SBGs that report annual financial statements and on data on a sub-set of those banks that report on a semi-annual basis.

**Chart 3.11 Decomposition of changes in euro area banks' aggregate Core Tier 1 capital ratio**

(2011 – H1 2014; percentages and percentage points)



Sources: SNL Financial and ECB calculations.

Notes: Based on publicly available data for a sample of 65 SBGs that report at least on a semi-annual basis. The increase in the average risk weight in the first half of 2014 was mostly due to the implementation of CRD IV.

Based on a fully loaded common equity Tier 1 (CET1) definition, the median CET 1 ratio for banks participating in the comprehensive assessment exercise was 11.1% at 1 January 2014 (pre-AQR). Public disclosures by a sub-sample of SBGs suggest that fully loaded CET1 ratios may have improved further in the first six months of this year, with the median ratio for 45 reporting SBGs rising by nearly 80 basis points (see right-hand panel of Chart 3.10).

A decomposition of changes in banks' aggregate risk-weighted capital ratio over the last two and a half years shows a shift towards capital increases in the first half of 2014 (see Chart 3.11). Recent increases in CET1 capital have mainly resulted from a further expansion of equity capital, which has amounted to over €50 billion for SBGs since end-2013. Furthermore, some banks completed or announced capital increases in the third quarter of 2014, partly in preparation for the comprehensive assessment to address capital shortfalls. By contrast, increasing risk-weighted assets contributed to lower capital ratios on account of both increasing average risk weights (due mainly to the implementation of CRD IV) and the reversal of asset deleveraging for a number of banks.

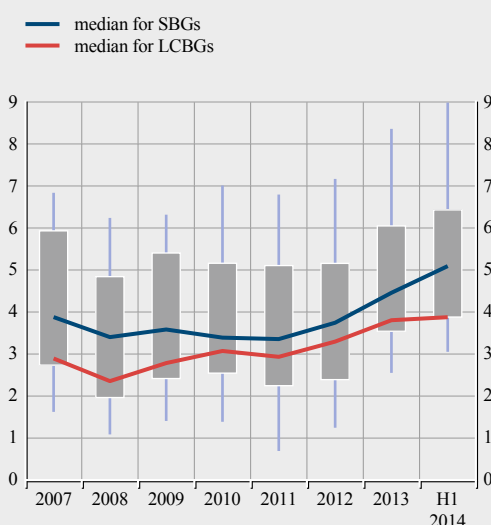
Thanks to a significant pick-up in banks' equity issuance, euro area SBGs also continued to improve their balance sheet-based **leverage** ratios, with the median ratio of tangible common equity to tangible assets rising to 5.1% in mid-2014, from 4.5% at end-2013 (see Chart 3.12). However, the improvement of leverage ratios was more muted for LCBGs, with some of the largest banks remaining in the lowest quartile of the SBG distribution. In fact, despite recent improvements, large euro area banks continue to lag behind their global peers in terms of their leverage ratios when measured by adjusted tangible equity over adjusted tangible assets on a comparable basis (see Chart 3.13).

... mainly through  
capital increases...

... while large  
banks lag behind  
their global peers  
in improving  
leverage ratios

**Chart 3.12 Euro area banks' leverage ratios (tangible common equity to tangible assets)**

(2007 – H1 2014; percentages; 10th and 90th percentiles and interquartile range distribution across SBGs)

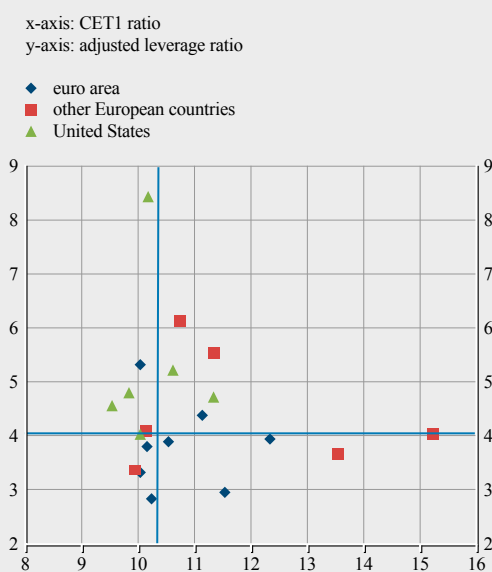


Source: SNL Financial.

Note: Based on publicly available data on SBGs, including LCBGs, that report annual financial statements and on data on a sub-set of those banks that report on a semi-annual basis.

**Chart 3.13 CET1 ratio and adjusted leverage ratio for large banks in the euro area, other European countries and the United States**

(H1 2014; percentages)



Sources: Federal Deposit Insurance Corporation and SNL Financial.

Notes: The adjusted leverage ratio is calculated as adjusted tangible common equity to adjusted tangible assets. Horizontal and vertical lines show median values.

## Box 4

### THE ECB'S COMPREHENSIVE ASSESSMENT EXERCISE

The results of the ECB's comprehensive assessment, a thorough and unprecedented examination of 130 euro area banks, were published on 26 October 2014. This box presents the scope, main findings and conclusions of the comprehensive assessment exercise.

#### Scope of the comprehensive assessment

The exercise was undertaken as part of the preparations for the ECB's assumption of supervisory responsibilities on 4 November 2014. The 130 banks participating in the exercise had total assets of €22 trillion at the end of 2013, accounting for more than 80% of total assets of the euro area banking system.

The comprehensive assessment exercise had two components:

- An asset quality review (AQR) of the assets held by banks at end-2013, in the course of which banks' accounting models, policies and practices were checked on the basis of a common methodology<sup>1</sup> and harmonised definitions across all participating countries.
- A constrained bottom-up stress test, in the course of which banks were requested to project the impact of hypothetical baseline and adverse macro-financial scenarios on their balance sheets and income statements.

The results of both components were joined together using a methodology that adjusted the stress-test results to reflect the findings of the AQR,<sup>2</sup> a unique feature of the comprehensive assessment in comparison with similar stress-testing exercises.

Both components of the comprehensive assessment exercise were subject to a rigorous quality assurance process, comprising banks, national supervisors and the ECB, in order to ensure the appropriate degree of conservatism and a level playing field for all participating banks. The adverse macro-financial scenario for the stress test was designed by the European Systemic Risk Board. It captured the most relevant threats to the stability of the EU banking system that were identified in the spring of 2014, including an increase in global bond yields, a deterioration in credit quality, stalling policy reforms that lead to a re-emergence of sovereign risk and a lack of the balance sheet repair necessary to sustain market funding at affordable rates. Overall, these risks still remain relevant to date. The comprehensive assessment was a prudential exercise. By design, its scope did not include some of the macro-prudential risks related to, for example, the interconnectedness of participating banks or second-round effects arising from banks' endogenous response to macro-financial stress.

#### Main findings

The comprehensive assessment concluded that most of the euro area banks would be resilient under the adverse macro-financial scenario in spite of a significant depletion of their capital.

1 See *Asset quality review – Phase 2 Manual*, ECB, March 2014.

2 See *Comprehensive assessment stress test manual*, ECB, August 2014.

The Common Equity Tier 1 (CET1) capital of the participating euro area banks would be reduced by €216 billion (see Chart A), €34 billion of which is due to the adjustment made in the course of the AQR, and €182 billion to the losses projected in the adverse scenario of the stress test.<sup>3</sup> In addition, the minimum capital requirements would rise by €47 billion as a result of the increase in risk-weighted assets.

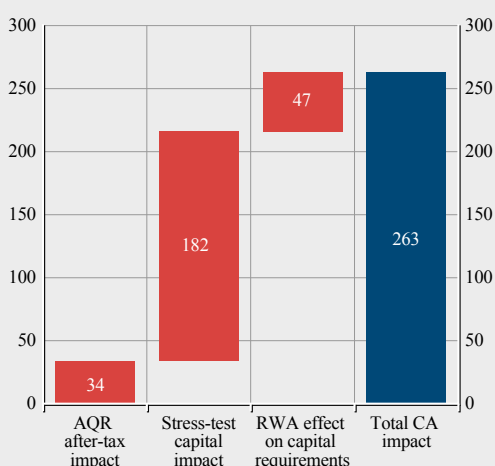
It was found that 25 euro area banks did not have sufficient capital to meet the CET1 capital ratio requirements specified for the comprehensive assessment exercise of 8% for the baseline and 5.5% for the adverse scenario. The total capital shortfall amounts to €24.6 billion prior to mitigating actions taken after the end-2013 reference date.

The AQR concluded that, under the common methodology and harmonised definitions, the non-performing exposures (NPEs) of participating banks should increase by €136 billion, or 18%, with respect to the stock of NPEs reported at the end of 2013. The review of impairment provisions related to both NPEs and other assets found that banks would mark down their assets by a further €43 billion on a pre-tax basis.

The baseline scenario of the stress test entailed an only slight increase in the CET1 capital ratio, reflecting the subdued operating profitability of participating banks. Under the adverse scenario, loan losses would nearly double with respect to the baseline case, and net interest income would contract by about 10%. A somewhat less material contribution to aggregate losses came from

**Chart A Total impact of the adverse scenario of the comprehensive assessment on capital**

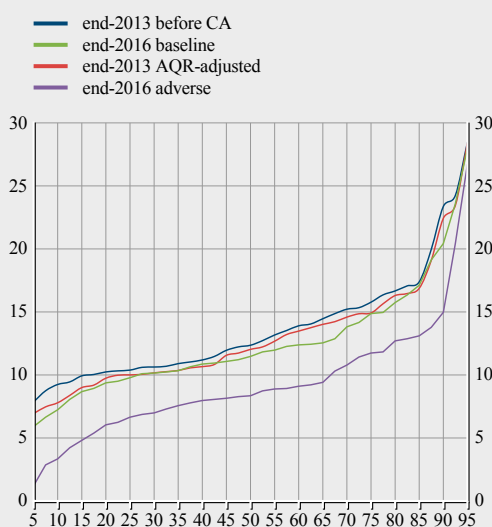
(EUR billions)



Source: ECB.

**Chart B Distribution of the CET1 capital ratios of banks participating in the comprehensive assessment**

(x-axis: percentile of the distribution, y-axis: CET1 capital as a percentage of risk-weighted assets)



Source: ECB.

Note: Distribution censored at 5th and 95th percentile to remove outliers.

<sup>3</sup> See *Aggregate report on the comprehensive assessment*, ECB, October 2014.

a downward revaluation of trading assets and sovereign bonds, as well as from non-interest income. Overall, the capital ratio of the median bank would be reduced by around 4 percentage points, to about 8.3% (see Chart B).

### Conclusions

The comprehensive assessment has caused euro area banks to take extensive action that has raised capital and reduced risk to mitigate potential capital shortfalls. In addition to capital measures taken prior to the end-2013 cut-off date of the comprehensive assessment exercise, banks continued to strengthen their balance sheets in 2014 (see Section 3.1 for more details). Twelve of the banks that were found to have a capital shortfall had already covered these shortfalls prior to the end of the exercise. The remaining 13 banks, with a combined capital shortfall of €9.5 billion, are implementing capital plans and are expected to reinforce their capital buffers. The capital actions should be completed within six months of the end of the assessment<sup>4</sup> if shortfalls result from the AQR or the baseline scenario, or within nine months in case of shortfalls resulting from the adverse scenario.

From a forward-looking perspective, the results of the comprehensive assessment represent a major step towards balance sheet repair and strengthening the euro area banking sector, which in turn is key to enable the sector to support the economic recovery in the euro area. The results have shown that the vast majority of significant euro area banks are able to withstand a major adverse macro-financial shock without breaching the 5.5% CET1 ratio threshold. The findings of the ECB's latest bank lending survey, which indicate that banks have begun to ease their lending standards, corroborate the conclusion reached in the comprehensive assessment that the importance of supply-side constraints in euro area credit markets has diminished.

4 These results include two banks which are implementing restructuring plans agreed with the European Commission, under which one bank would have a zero shortfall and one bank would have a small shortfall.

## BANKING SECTOR OUTLOOK AND RISKS

### Outlook for the banking sector on the basis of market indicators

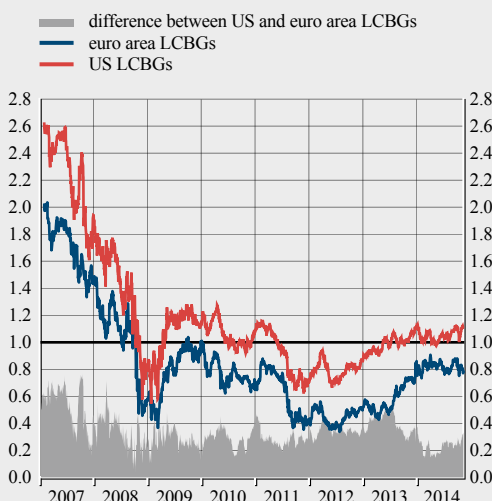
*Market-based indicators point to a stabilisation of banks' outlook*

Market-based indicators suggest an unchanged outlook for euro area banks over the last few months. In particular, the improving trend in euro area LCBGs' price-to-book ratios that started around mid-2013 appears to have come to a halt in the second quarter of 2014 (see Chart 3.14). On the one hand, this mirrors similar developments for other global banks, including US LCBGs. On the other hand, the latest reading of this ratio suggests a weaker outlook for euro area banks compared with US peers, possibly reflecting concerns about the profit-generating capacity of euro area banks in an environment of low nominal growth.

Indeed, market expectations suggest a weak earnings outlook for euro area banks, with many banks expected to achieve returns below their cost of equity. In fact, while the latest earnings forecasts for euro area banks signal an improvement for 2015, market expectations of profitability remain at rather moderate levels (see Chart 7 of the Overview). Similarly, a frequently cited market-based measure of systemic banking sector stress suggests that, following the significant decline since mid-2013, systemic risk within euro area banks has stabilised at a low level (see Chart 3.15).

**Chart 3.14 Price-to-book ratios of large and complex banking groups in the euro area and the United States**

(Jan. 2007 – Nov. 2014; ratio)

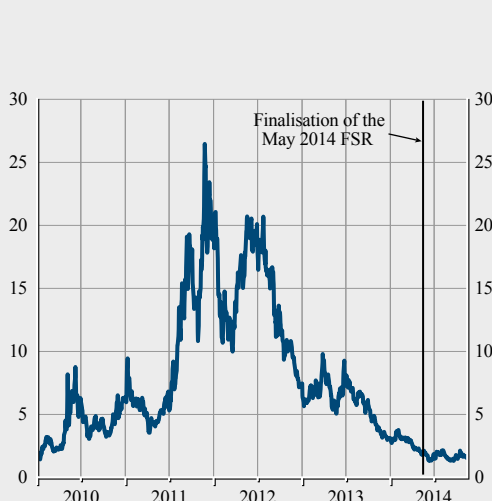


Sources: Bloomberg, SNL and ECB calculations

Note: Median values for LCBGs in the United States and the euro area.

**Chart 3.15 Measure of euro area banking sector stress**

(Jan. 2010 – Nov. 2014; probability; percentages)



Sources: Bloomberg and ECB calculations.

Notes: The measure contains the credit default swap implied probability of two or more of a sample of 15 banks defaulting simultaneously over a one-year horizon. See Box 8 in *Financial Stability Review*, ECB, June 2012, for further details.**Credit risks emanating from banks' loan books**

The level of credit risk in the loan book of the euro area banking sector remains elevated against the background of a tenuous economic recovery and legacy balance sheet issues that still represent a challenge in several countries. Bank lending has remained weak, particularly lending to the corporate sector, while lending to households has declined only slightly (see Chart 3.16). Although the effects of this are mitigated or offset by financial disintermediation in the case of larger firms with access to international bond markets, small and medium-sized firms that are reliant on bank-based finance continue to bear the negative consequences.

This challenge for the euro area banking sector is, however, part of a broader phenomenon of non-financial sector deleveraging in many advanced economies. Indeed, credit conditions across OECD economies have remained relatively weak by historical standards, with the global credit gap for OECD countries remaining well below its early warning threshold for costly asset price booms, despite some further improvement up to the first quarter of 2014 (see Chart 3.17).

These aggregate developments, however, conceal major differences in lending conditions across regions and countries as economic recoveries proceed at different speeds. Within the euro area, credit developments differed significantly across countries (see Chart S.1.14), with continued sharp declines in lending to non-financial corporations in more vulnerable countries contrasting with flat lending volumes in core countries, thereby raising concerns regarding a credit-less recovery.

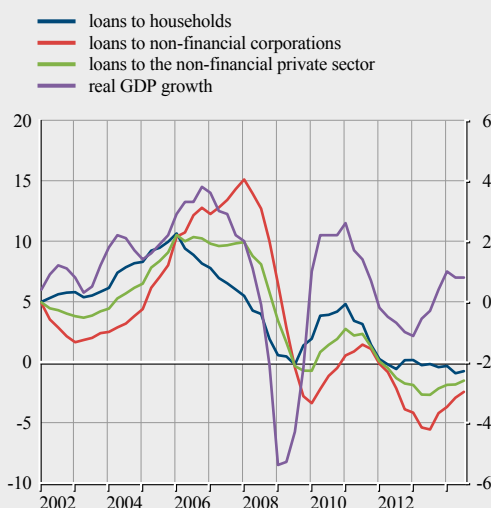
Bank lending survey information suggests that much of the observed weakness in credit flows over the past year or so has been more closely linked to anaemic credit demand, with credit supply constraints playing a diminished role. In this vein, the results of the October 2014 euro area bank lending survey reveal some signs of easing credit standards for loans to both non-financial

*Credit risk  
remains  
elevated...*

*... while credit  
standards show  
some signs of  
easing...*

**Chart 3.16 GDP growth and growth in credit to households and non-financial corporations in the euro area**

(Q1 2002 – Q2 2014; percentage change per annum)

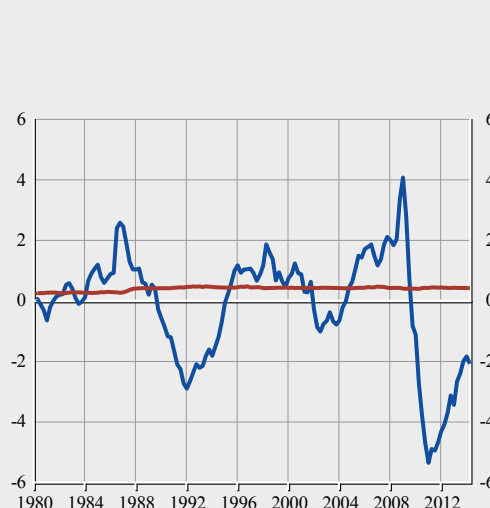


Sources: ECB and Eurostat.

Note: The Q3 2014 GDP growth figure is based on the flash estimate by Eurostat.

**Chart 3.17 Global credit gap and optimal early warning threshold**

(Q1 1980 – Q2 2014; percentages)



Sources: ECB and ECB calculations.

Note: Index for 18 OECD countries – see Alessi, L. and Detken, C., “Quasi real time early warning indicators for costly asset price boom/bust cycles: A role for global liquidity”, *European Journal of Political Economy*, Vol. 27(3), September 2011.

corporations (NFCs) and households. They also point to a recovery in credit demand not only by households, irrespective of the purpose of the loan, but also by NFCs, regardless of the firm size (see Chart 3.18).

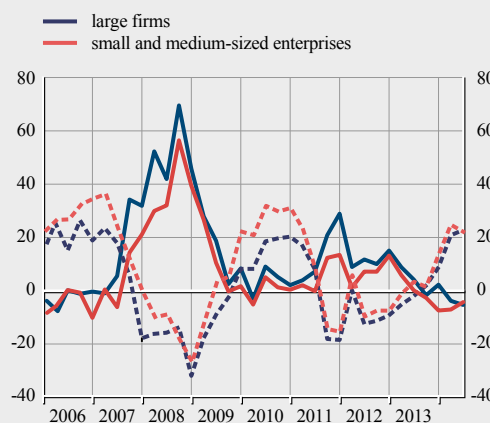
While these signs could indicate a turning point in credit flows, they are closely tied to the pace of economic expansion and its impact on income and earnings risks for households and NFCs in a context of ongoing challenging balance sheet adjustment.

Notwithstanding the importance of demand conditions, legacy asset quality problems in vulnerable countries also weigh on new lending. At the country level, a continued expansion of NPLs is particularly visible in the most vulnerable euro area countries, although there are some tentative signs of a slowdown in new NPLs in some countries, or even of a reversal of worsening asset quality trends, most notably in Spain.

While a further expansion of NPLs is likely in countries with weak macroeconomic conditions in the coming quarters, there are some tentative

**Chart 3.18 Credit standards and demand conditions in the non-financial corporation sector**

(Q1 2006 – Q4 2014; weighted net percentages)

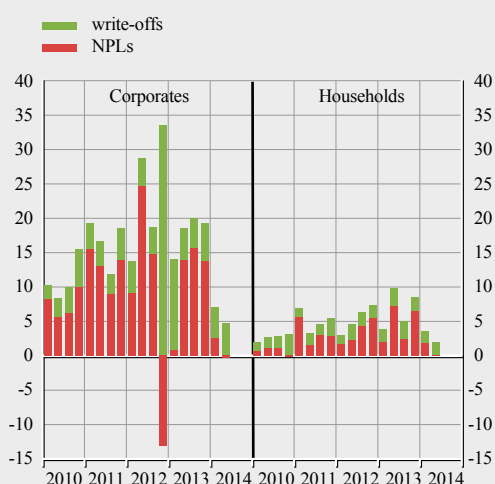


Source: ECB.

Notes: The solid lines denote credit standards, while the dotted lines represent credit demand. Credit standards refer to the net percentage of banks contributing to a tightening of credit standards, while credit demand indicates the net percentage of banks reporting a positive contribution to demand.

**Chart 3.19 Quarterly change in non-performing loans and loan write-offs in Spain, Italy and Portugal**

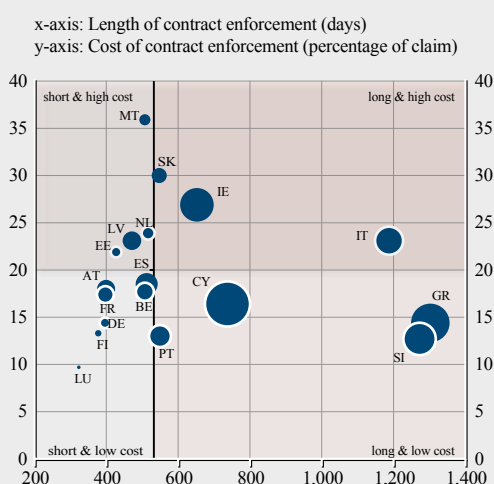
(Q1 2010 – Q2 2014; EUR billions)



Source: National central banks.

**Chart 3.20 Length and cost of contract enforcement and non-performing loan ratios across the euro area**

(2014)



Sources: World Bank Doing Business 2014 and ECB.

Note: The size of the bubble represents the NPL ratio at year-end 2013.

signs that the pace of credit quality deterioration could slow in an increasing number of countries as the economic recovery gains momentum. In fact, the combined quarterly change in corporate NPLs in three of the vulnerable countries where sectoral NPL data are available (Spain, Italy and Portugal) shows a decline in the first two quarters of 2014, although it was driven mainly by developments in Spain (see Chart 3.19). At the same time, there is little sign of a pick-up in loan write-offs, suggesting that banks in these countries still need to make further progress in resolving the issue of NPLs.

The comprehensive assessment exercise accelerated the process of bank balance sheet repair, ensuring prudent asset valuation and stricter loan loss recognition, as well as providing more transparency on asset quality. Complementing this, the cleaning-up of bank balance sheets should be fostered at the national level by removing legal and judicial obstacles to timely NPL resolution (see Chart 3.20).

Finally, for some euro area banks, credit risks also emanate from their significant cross-border exposures. Indeed, some SBGs remain highly exposed to emerging market economies (EMEs), based on the ratios of their exposure at default (EAD) to common equity, in particular to countries in “developing Europe”.<sup>2</sup> A few banks with exposures to the most vulnerable EMEs (including Russia and Ukraine) have incurred higher credit losses in the first half of 2014, and face the risk of asset quality deterioration in the event of geopolitical tensions persisting for longer and/or the macroeconomic environment in some EMEs deteriorating further. The SBGs exposed most to those EMEs could face higher loan losses on these portfolios in the period ahead.

### Funding liquidity risk

**Market-based bank funding conditions** remained very favourable, with average spreads on bank debt stabilising below the levels seen in early 2010, i.e. before the start of the sovereign debt crisis. Spreads on different debt instruments have diverged somewhat since mid-2014, with a further

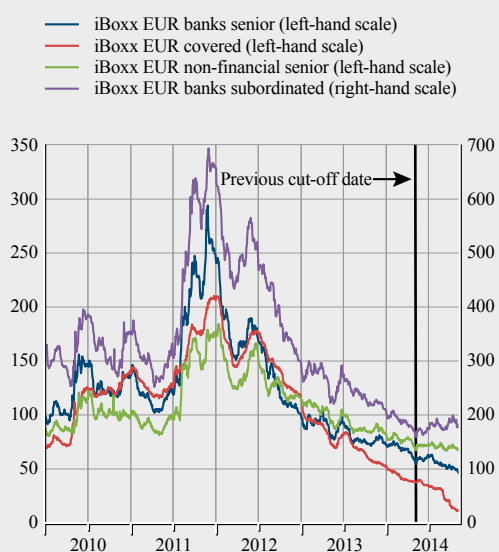
...with further progress needed in the disposal of NPLs

Funding conditions remained very favourable...

<sup>2</sup> See *Financial Stability Review*, ECB, May 2014.

**Chart 3.21 Spreads on banks' senior debt, subordinated debt and covered bonds**

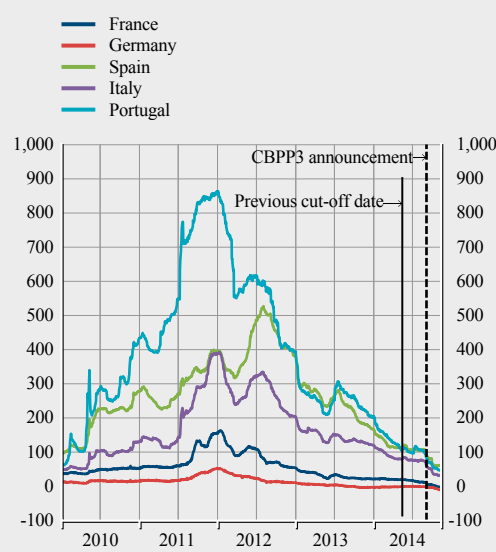
(Jan. 2010 – Nov. 2014; basis points)



Sources: ECB and Markit.

**Chart 3.22 Covered bond spreads in vulnerable and other euro area countries**

(Jan. 2010 – Nov. 2014; basis points)



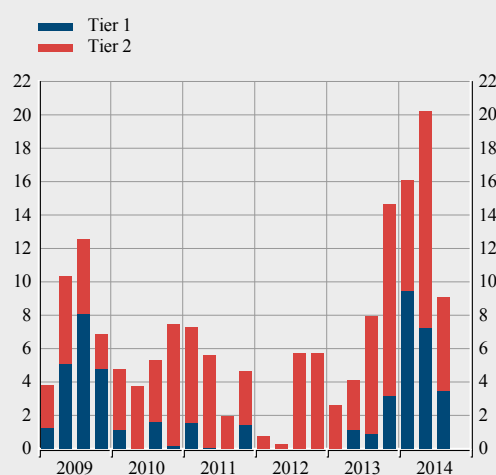
Sources: ECB and Markit.

tightening of those on covered bonds and, to a lesser extent, senior unsecured debt contrasting with some widening of spreads on subordinated debt (see Chart 3.21). Fragmentation in the pricing of bank debt declined further, as reflected, for instance, in the narrowing differential between spreads on covered bonds issued by banks in vulnerable and other countries, which recently also benefited from the ECB's announcement of a third covered bond purchase programme (CBPP3) (see Chart 3.22). Market-based funding remained widely available, although debt issuance by euro area banks in recent months was below last year's levels, including for banks in vulnerable countries, on the back of increased volatility in credit markets.

**Debt issuance** patterns reflected banks' efforts to adapt their debt and capital structures to new regulatory requirements, as well as continued strong investor demand for higher-yielding bank debt. As a result, subordinated debt issuance has seen the most significant increase in the year to date, including both additional Tier 1 and Tier 2 instruments (see Chart 3.23), as banks continued to build up their subordinated debt buffers in preparation of meeting the CRR/CRD IV total capital/Tier 1 capital ratio, as well as minimum bail-in requirements. Despite a recent slowdown, issuance of junior

**Chart 3.23 Issuance of subordinated debt by euro area banks**

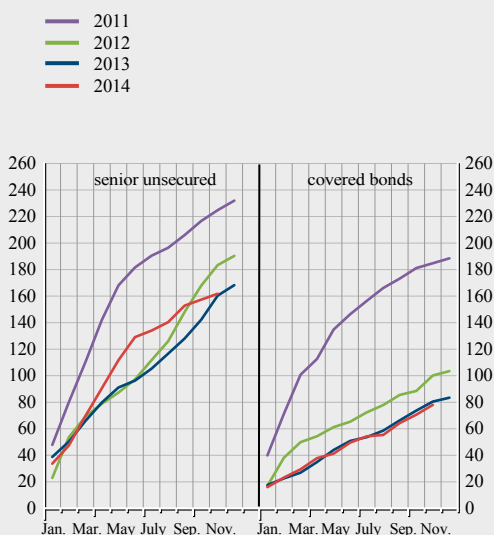
(Q1 2009 – Q3 2014; EUR billions)



Source: Dealogic.  
Note: Excludes retained deals and government-guaranteed issuance.

**Chart 3.24 Cumulative yearly issuance of senior unsecured debt and covered bonds by euro area banks**

(Jan. 2011 – Nov. 2014; EUR billions)

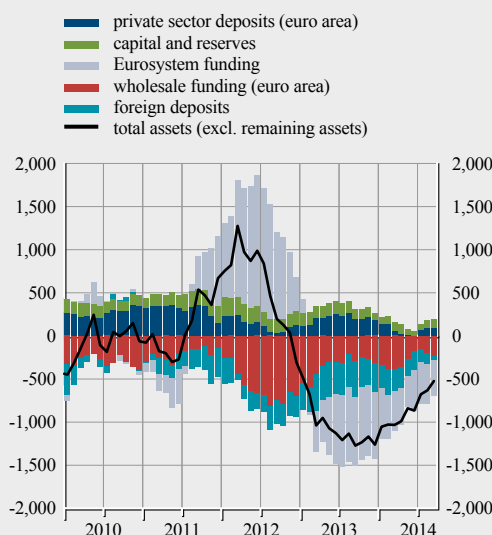


Source: Dealogic.

Notes: Excludes retained deals and government-guaranteed issuance. November 2014 includes data up to the middle of the month.

**Chart 3.25 Twelve-month flows in the main liabilities of the euro area banking sector**

(Jan. 2010 – Sep. 2014; 12-month flows; EUR billions)



Source: ECB.

Notes: Total assets are adjusted for remaining assets, which consist largely of derivatives. Wholesale funding comprises interbank liabilities and debt securities.

debt by euro area banks in the first nine months of 2014 more than tripled in comparison with a year earlier. Issuance activity in the senior unsecured debt market has slowed since mid-2014, partly also reflecting reduced funding needs following robust issuance in the first half of 2014 (see Chart 3.24). Meanwhile, covered bond issuance up to October remained slightly below last year's level, although it started to show some signs of a pick-up in November, also thanks to the implementation of the ECB's CBPP3.

At the same time, issuance of asset-backed securities (ABSs) by euro area banks remains moderate. In fact, in 2014 thus far, euro area banks have placed less than €30 billion of ABSs with investors, around 30% less than a year earlier. Going forward, however, the ABS market and euro area banks' off-balance-sheet financing are likely to benefit from the ECB's ABS purchase programme.

Turning to structural changes in bank funding, deposit flows slowed in the first nine months of 2014, with further negative net flows of wholesale funding – consistent with continued deleveraging – while the share of customer deposits increased further (see Chart 3.25). As a result, the median ratio of customer deposits to total liabilities for SBGs reached 53% in mid-2014, up from 46% at the end of 2012 (see Chart 3.26). Providing yet another sign of declining euro area fragmentation, banks in both vulnerable and other countries benefited from a shift towards deposit funding (as a share of total funding), even if this was due more to shrinking reliance on other funding sources such as wholesale and Eurosystem funding than to deposit growth.

Similarly, banks' loan-to-deposit ratios (a proxy of their reliance on wholesale funding) continued to decline gradually in the first half of 2014, with the median ratio for SBGs reaching 115% at the end of June, representing a significant fall from its pre-crisis peak of 143% in 2007. Nevertheless, the dispersion of loan-to-deposit ratios remains wide, and some institutions continue to be dependent

... and the shift  
towards deposit  
funding continued

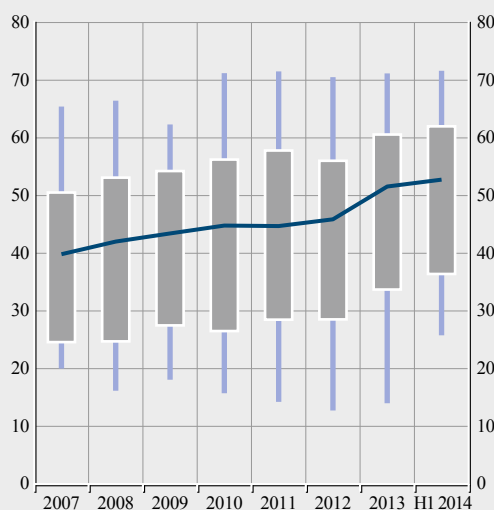
on wholesale funding. These banks need to make further adjustments in their funding profiles, with some business models (e.g. those of some German Landesbanken) facing particular challenges in this regard.

Looking at funding challenges beyond the short term, banks' changing debt/capital structures – characterised by the rising share of loss-absorbing and bail-inable instruments – should contribute to a safer system and more efficient resolution mechanisms. However, these changes also create challenges of their own. The fast-growing market for contingent convertible capital instruments (CoCos) remains untested, with no investor loss event (trigger or coupon deferral) having occurred thus far, creating some uncertainty as to whether such an event would be seen as idiosyncratic or could affect the asset class more profoundly. This highlights the need for investors to gain a better understanding of how different features of CoCos impact on the risk profile of these investments (see Box 5).

Regarding potential implications of bail-ins, the subordinated debt market remained resilient to recent bail-ins (Banco Espirito Santo and Hypo Alpe Adria), although this may also reflect the relatively small size of the bailed-in debt involved. Looking ahead, however, as some countries are planning to bring forward senior debt bail-in rules as of 2015, rating agencies have indicated that they would review ratings on the basis of how the bail-in legislation is expected to affect government support. This could cause rating agencies to reduce or eliminate systemic support in the ratings, which would put pressure on senior debt ratings, in particular for those banks that currently enjoy a multi-notch uplift through implied government support.

**Chart 3.26 Share of customer deposits in total liabilities for euro area banks**

(2007 – H1 2014; percentage of total liabilities; 10th and 90th percentiles and interquartile range distribution across SBGs)



Source: SNL Financial.

Note: Based on publicly available data on SBGs that report annual financial statements and on data on a sub-set of those banks that report on a semi-annual basis.

#### Box 5

##### DO CONTINGENT CONVERTIBLE CAPITAL INSTRUMENTS AFFECT THE RISK PERCEPTIONS OF SENIOR DEBT HOLDERS?

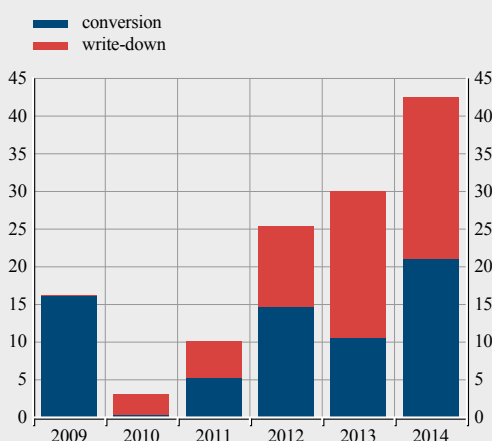
Contingent convertible capital instruments or bonds (CoCos) are hybrid instruments that are automatically transformed into equity or are written off in the event of a capital shortfall. CoCos thus contain built-in mechanisms for absorbing losses when trigger points are reached. CoCos are flexible instruments that are able to boost regulatory CET1 capital ratios when necessary, while preserving the respective debt status if the pre-specified trigger level is not reached. They have grown in popularity in recent years, not least on account of their state-contingent nature, their distinct accounting treatment and the fact that they combine elements of debt and equity.

The attractive features of CoCo instruments for issuers and investors have led to marked growth in this market. But as the importance of this nascent market for the structure of banks' liabilities increases, the risks involved may rise as well. The market has experienced dramatic growth over the last few years, with an increasing share of write-down instruments.<sup>1</sup> The supply of such hybrids appears closely related to a need of banks to increase their capital ratios in line with the new Basel III standards. On the demand side, the higher coupons paid to investors in CoCos in comparison with those of many other financial assets have proven to be very attractive in the current low-yield environment (see Chart A). The market is quite important in Europe, which has seen greater use of CoCos than the rest of the world (see Chart B).

One factor obfuscating an aggregate view of risk related to the growing market for these instruments is that contingent convertible bonds are complex in structure and, as a result, no two such hybrid instruments are identical. That said, the underlying loss-absorption mechanism is a key channel through which risk may arise, as this conduit for risk-taking incentives for holders of equity can create externalities.<sup>2</sup> The theoretical literature on hybrid debt is closely related to whether such instruments contain "write-down" or "conversion" clauses. Since write-down instruments imply that losses at the trigger point are first borne by CoCo investors, this could increase the risk-taking incentives for bank owners. By contrast, instruments with a conversion-to-equity clause imply that, if triggered, current equity holders suffer from the dilution of their shares. This aligns the interests of CoCo investors and shareholders, incentivising the latter to limit risk-taking in order to avoid triggering the CoCos. Hilscher and Raviv analyse the stabilising effect of CoCos on the issuing bank, conditional on the features of the instrument, concluding that a high conversion ratio significantly reduces the risk-taking incentives of stock-holders.<sup>3</sup> Berg and Kaserer show that a significant reliance on CoCos can lead to more

**Chart A Contingent convertible bond issuance: write-down versus conversion**

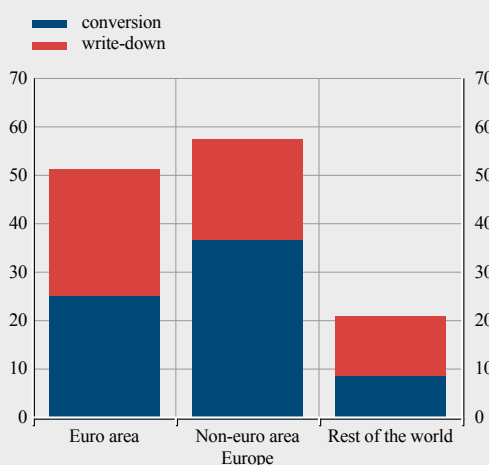
(July 2009 – Aug. 2014; EUR billions)



Sources: Dealogic, Bloomberg and ECB calculations.

**Chart B Cumulated amounts of contingent convertible bonds issued, broken down by region**

(Aug. 2014; EUR billions)



Sources: Dealogic, Bloomberg and ECB calculations.

1 See also Box 9 in *Financial Stability Review*, ECB, May 2014.

2 It should be noted that shareholders may be reluctant to allow capital levels to reach the trigger point as that could lead to restrictions on dividend payments.

3 See Hilscher, J. and Raviv, A., "Bank stability and market discipline: The effect of contingent capital on risk taking and default probability", *Journal of Corporate Finance*, 2014.

risk-taking, especially when capital ratios approach the trigger level.<sup>4</sup> Such behaviour could be amplified further by write-down clauses, as they imply only losses for holders when the trigger is reached. A significant level of dilution can hence help align the incentives of shareholders and those of the bondholders and reduce endogenous risk. These considerations raise the question as to whether different CoCo features create incentives for risk-taking by issuing banks.

An analysis of the effect of CoCo issuance on the pricing of senior unsecured debt (five-year credit default swap (CDS) spreads) suggests that the risk perception of senior bond holders depends crucially on the risk-taking incentives that CoCos may create for equity holders. The sample covers quarterly panel data for the period from the third quarter of 2009 to the first quarter of 2014 and for 60 banks (20 CoCo issuers and 40 non-issuers) from 19 countries.<sup>5</sup> First, the analysis aims at disentangling the effect of conversion/write-down CoCo dummies on CDS spreads. In a second step, the explanatory power of the quantity of CoCos as a percentage of equity is analysed. Since the control group is represented by non-issuers, the coefficients in the second column of the table below represent the effect of adding one more percentage point of CoCos relative to equity.

The point estimates in the first column of the table below show that the effect of the write-down dummy is positive and significant. Hence, a bank with write-down CoCos is perceived by senior bond holders to be riskier when compared with non-issuers, and this is reflected in a significantly larger increase in CDS spreads. Moving to the second column of the table of results, the effect of write-down instruments as a proportion of total equity is also positive. This implies that higher costs for protection against default are associated with a stronger reliance on write-down instruments in the capital structure. These results are quite illustrative, as empirical work on CoCo instruments and their impact on risk perceptions and incentives has remained limited, despite the recent surge in theoretical research.

Such results are consistent with the notion that issuing CoCos with a write-down clause appears to increase the perceived risk of a bank. On the other hand, the results suggest that holding instruments that are converted to equity if triggered has a negative impact on the change in bank CDS spreads, although that impact is insignificant in terms of quantities. As the prevalence of these instruments increases, a better understanding of their characteristics and behavioural implications in stressed market conditions is crucial for understanding their prospective impact on financial stability.

#### Impact of contingent convertible bonds on the change in banks' CDS spreads

| Variables                           | ACDS     | ACDS   |
|-------------------------------------|----------|--------|
| Conversion dummy                    | -31.62*  |        |
| Write-down dummy                    | 28.21*** |        |
| Conversion quantity in total equity |          | -2.97  |
| Write-down quantity in total equity |          | 2.83** |
| R2                                  | 0.471    | 0.470  |

Notes: The analysis is performed using a panel fixed effects estimator, with bank individual effects, quarter dummies and bank-clustered standard errors. The regressions are augmented with bank balance sheet variables (bank balance sheet and regulatory indicators, size) and country risk (sovereign CDS spread), but their effect is not shown.  
\*\*\*, \*\*, \* indicates significance at the 1, 5 and 10% levels.

4 See Berg, T. and Kaserer, C., forthcoming.

5 For further details on the empirical analysis, see Bicu, A., Stolz, S. and Wedow, M., "Layer cake: Risk incentive effects of CoCos".

*Interest rate  
risk remains  
material...*

*... with some  
banks still exposed  
to lower-rated  
sovereign debt...*

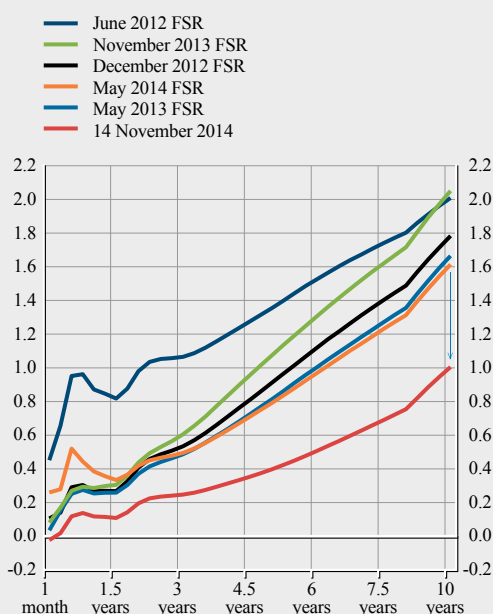
### Market-related risks

Banks' interest rate risk has remained material against the background of both still high sovereign exposures in some parts of the euro area and the continued flattening of the euro area yield curve, which has adverse implications for the profits banks garner from maturity transformation activities (see above). Since the finalisation of the May 2014 FSR, there has been a further substantial decline in sovereign yields, particularly at the long end of the yield curve (see Chart 3.27), with continued yield compression also extending to bonds of lower-rated sovereigns. Against this backdrop, euro area banks remain vulnerable to a potential reassessment of risk premia in global markets, in particular through their direct exposures to higher-yielding debt instruments, via possible valuation losses on their sovereign bond exposures, depending on the duration of these portfolios and on the extent to which their positions are hedged.

In this regard, data on the holdings of government debt by monetary financial institutions (MFIs) in the euro area show a continuation of home bias in sovereign debt holdings for banks in most euro area countries (see Chart 3.28). Despite recent declines, sovereign bond holdings as a percentage of total assets remain well above pre-crisis levels in some countries. Furthermore, some banks attempted to offset declining yields by extending the duration of their bond portfolios. As confirmed by bank-level data from the comprehensive assessment exercise, mid-sized SBGs have higher exposures, on average, to lower-rated sovereigns in their respective countries, leaving them more vulnerable than larger banks to adverse yield movements.

**Chart 3.27 Developments in the euro area yield curve**

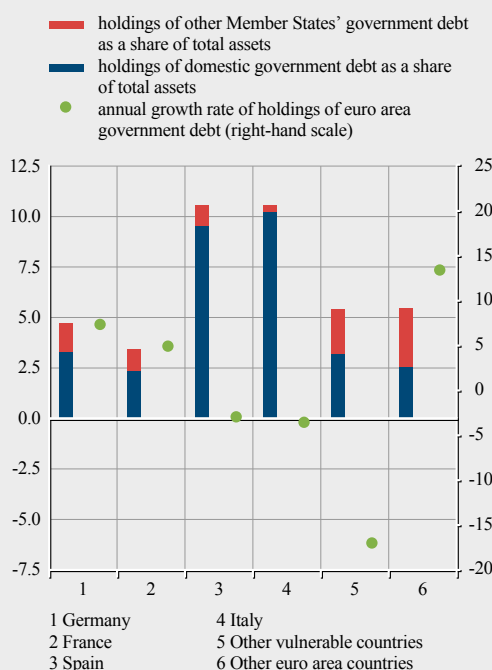
(percentages)



Sources: ECB and Thomson Reuters.

**Chart 3.28 MFIs' holdings of sovereign debt, broken down by country**

(Sep. 2013 – Sep. 2014; percentage of total assets; annual growth rate)



Source: ECB.  
Note: "Other vulnerable countries" refer to Cyprus, Greece, Ireland, Portugal and Slovenia.

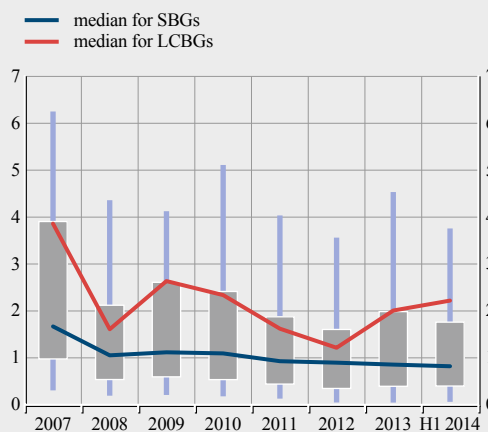
... while corporate bond exposures remain limited

With respect to other fixed-income exposures, euro area MFIs' holdings of euro area non-financial corporate debt were stable in the first two quarters of 2014, with the share of these securities in banks' balance sheets remaining limited at around 0.5%. This suggests that the direct impact of a sharp adjustment of risk premia on euro area corporate bonds would be contained at the aggregate level. However, some banks with material exposures to high-yield or EME corporate bonds could be more negatively affected in such a scenario.

Finally, euro area banks' exposure to equity markets remained, on average, broadly unchanged in the first half of 2014, but with significant heterogeneity across banks of different sizes (see Chart 3.29). In particular, LCBGs have increased their exposure to this asset class since end-2012. This could be related in part to the fact that low equity market volatility tends to compress backward-looking risk measures, such as the value at risk (VaR), thereby inducing some banks to increase their exposure.

**Chart 3.29 Euro area banks' holdings of equity instruments**

(2007 – H1 2014; percentage of total assets; 10th and 90th percentiles and interquartile range distribution across SBGs)



Source: SNL Financial.

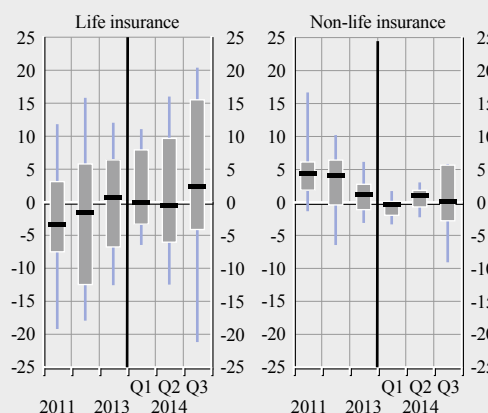
### 3.2 THE EURO AREA INSURANCE SECTOR: RESILIENCE AMID CONTINUED HEADWINDS

#### FINANCIAL CONDITION OF LARGE INSURERS<sup>3</sup>

The performance of large euro area insurers remained stable, despite headwinds from a low interest rate environment and only moderate economic growth. Overall, the sector exhibited modest growth in premiums written during the second and third quarters of 2014 (see Chart S.3.22 in the Statistical Annex), although median growth was relatively muted in the life insurance sub-sector during the first half of the year (see Chart 3.30). Life insurers appear to be particularly affected by the low interest rate environment – especially those offering guaranteed products. Nevertheless, this segment appears to be weathering the headwinds, given continued significant cost savings and an optimised product mix. Overall, combined ratios (i.e. incurred losses and expenses as a proportion of premiums earned) were somewhat

**Chart 3.30 Gross-premium-written growth for a sample of large euro area insurers**

(2011 – Q3 2014; percentages; 10th and 90th percentiles, interquartile distribution and median)



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

Insurers resilient so far...

3 The analysis is based on a varying sample of 21 listed insurers and reinsurers with total combined assets of about €4.9 trillion in 2013, which represent around 80% of the assets in the euro area insurance sector. Quarterly data were only available for a sub-sample of these insurers.

higher in the second quarter of 2014, impacted by higher loss ratios (see Chart S.3.23). Still solid investment income and the absence of any major global natural catastrophe have both been crucial factors underpinning the stable profitability of large euro area insurers (see Chart S.3.21). Moreover, the heterogeneity of investment income performance, which previously had exhibited a strong cross-country dimension, seems to have subsided considerably, mainly on account of a convergence of the yields on benchmark euro area government bonds.

The capital base of large euro area insurers remained stable at comfortable levels (see Chart 3.31), supported by falling yields on government bonds, which form the bulk of insurers' assets. While this signals an average underlying resilience of these large insurers, regulatory factors may be playing a role as well, since fair value accounting of assets, but not of liabilities, as is applied in most jurisdictions, implies accounting benefits from the decline in most sovereign yields.<sup>4</sup>

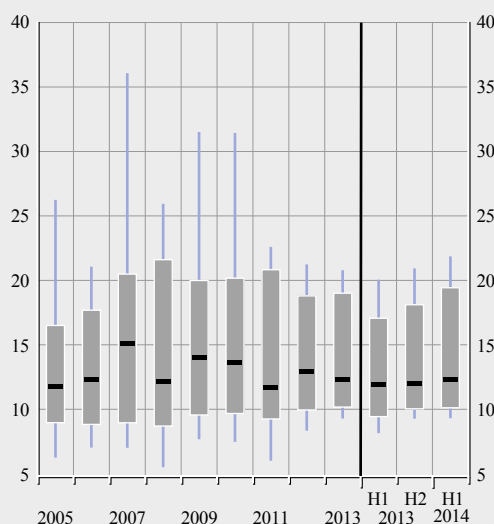
### INSURANCE SECTOR OUTLOOK: MARKET INDICATORS AND ANALYSTS' VIEWS

Market-based indicators suggest a relatively stable outlook for the euro area insurance sector next year. The share prices of the most important euro area insurance companies showed some volatility in the summer and, most notably, in September when, following a change in management at PIMCO, turbulence relating to the share price of Allianz created some volatility in fixed-income markets, in which insurers are very active players (see Chart S.3.30). In addition, the downward trend in credit default swap (CDS) spreads across large insurers stabilised somewhat at relatively low levels in the last months (see Chart S.3.28).

Analysts also expect euro area insurance earnings to remain relatively stable in 2014 and 2015, although subdued economic growth may pose additional challenges to profitability (see Chart 3.32). Given historically

**Chart 3.31 Capital positions of large euro area insurers**

(2005 – H1 2014; percentage of total assets; 10th and 90th percentiles, interquartile distribution and median)



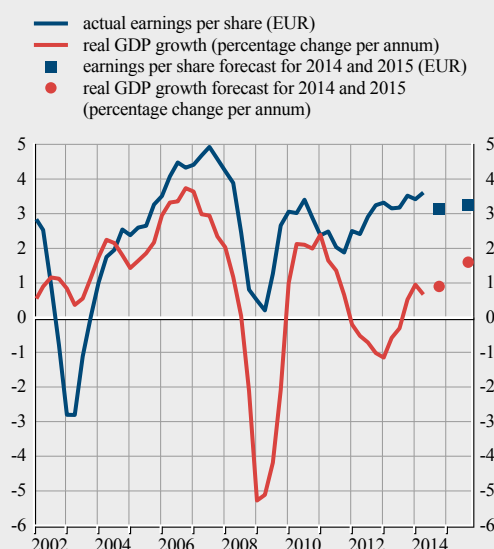
Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

Note: Capital is the sum of borrowings, preferred equity, minority interests, policyholders' equity and total common equity.

... despite low yields in all euro area jurisdictions

**Chart 3.32 Earnings per share of selected large euro area insurers and real GDP growth**

(Q1 2002 – 2015)



Sources: ECB, Thomson Reuters and ECB calculations.

Market indicators show some volatility

Analysts expect stable earnings

4 Upon the implementation of Solvency II in 2016, valuation of assets and liabilities will shift to a market-based approach.

low interest rates in all jurisdictions, there is considerable pressure on insurance companies to seek higher returns on their investments. At the same time, analysts generally expect most euro area insurers to be able to meet their guarantees for a prolonged period, even in the case of low investment returns, as other sources of income from new business should be supported by product innovations and a temporary revival of demand for traditional life insurance products in core markets. In addition, cost-cutting appears to be a common trend throughout the industry.

Analysts have also noted an increase, at an industry level, in risk appetite in terms of longer duration and increasing demand for corporate debt within fixed-income portfolios. Thus far, this appears to be still relatively contained for large euro area insurers, as aggregate volumes of high-yield bonds and other more risky investments remain stable. High levels of capitalisation, in particular in the reinsurance sector, have increased expectations of higher dividends.

Despite the generally stable outlook for the euro area insurance sector, challenges persist in the months ahead. In the reinsurance sub-sector, an abundant supply and stagnant demand are expected to fuel further declines in prices in 2015, making it challenging for reinsurers to earn their cost of capital. In addition, analysts expect the low-yield environment to have a negative impact on investment income, hampering profitability throughout the insurance sector in the euro area and testing the long-run viability of some life insurers' business models. Finally, individual insurers in some euro area jurisdictions may be confronted with higher than expected litigation costs.

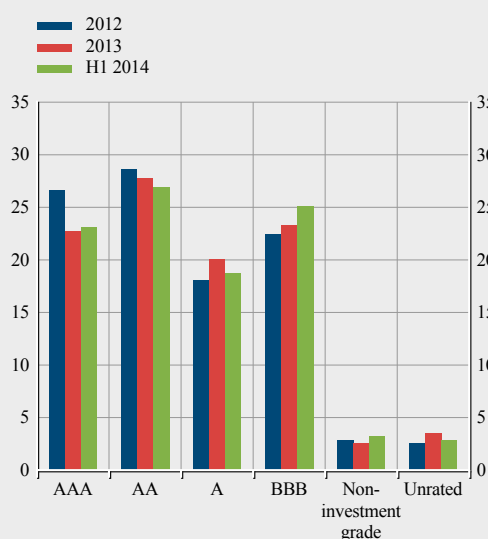
### INVESTMENT RISK

Investment activity remains highly concentrated on traditional fixed-income segments, such as government and corporate bond markets (see Chart S.3.25). However, given the crucial role that investment income plays in insurers' business models and the expected persistence of currently low yields in fixed-income markets, insurance companies have been seeking higher returns in alternative investments. Some signs of portfolio adjustments were visible in some large euro area insurers, with investment in equities increasing since 2013 and investment in structured credit and commercial property declining slightly over the same period. In addition, although fixed-income portfolios are clearly dominated by highly rated bonds, there was a very slight increase in the proportion of higher-yield bonds (see Chart 3.33).

In terms of geographical orientation, long-term investors have further increased their exposure towards emerging economies' bond markets. Emerging market debt accounts for an increasing share of the return-seeking portfolios of both life and non-life insurers. Although the proportion of emerging market bonds in the fixed-income portfolios of most euro area large insurers is currently relatively low, sizeable future increases would create concerns about currency risk on their books. On the one hand,

**Chart 3.33 Bond investments of selected large euro area insurers split by rating categories**

(percentage of total bond investments; weighted averages)



Sources: Company reports, JPMorgan Cazenove and ECB calculations.  
Note: Based on the available data for 12 large euro area insurers.

with Solvency II, 25% of capital will be required to be held against assets held in any currency other than that used to prepare the insurer's financial statements. On the other hand, hedging currency risk – for instance, by means of a deliverable forward contract – is also expensive, which might act as a pecuniary deterrent for insurance companies.

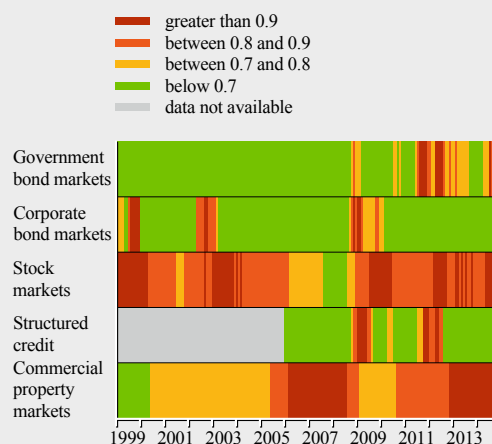
An investment uncertainty map signals stress in several markets (see Chart 3.34). With government bond yields reaching historical lows in almost all jurisdictions during the summer and investors expecting rates to remain low, challenges to economic solvency and investment income persist. If sustained, this environment – together with weak economic growth – could potentially impact profitability further, eroding capital positions, in particular of small and medium-sized life insurers in jurisdictions where fixed guarantees are offered to policyholders. Naturally, given the weight of fixed-income securities in insurers' assets, a major concern remains the potential for a sudden rise of risk-free rates.<sup>5</sup> On the one hand, in the medium and long term, the impact of a rise is deemed to be mainly positive in terms of higher investment income, economic solvency and embedded value. Life insurers would benefit most, given the longer duration of their liabilities relative to assets. On the other hand, in the short term, the impact thereof on stated equity and price-to-book ratios may also be a concern, leading to an abrupt temporary increase in market volatility with a potential short-term risk to share prices. This could affect insurers with short-duration assets, particularly

*Widespread low yields are a real threat...*

*... although the industry is prepared for sudden-rise scenarios*

**Chart 3.34 Investment uncertainty map for the euro area**

(Jan. 1999 – Oct. 2014)

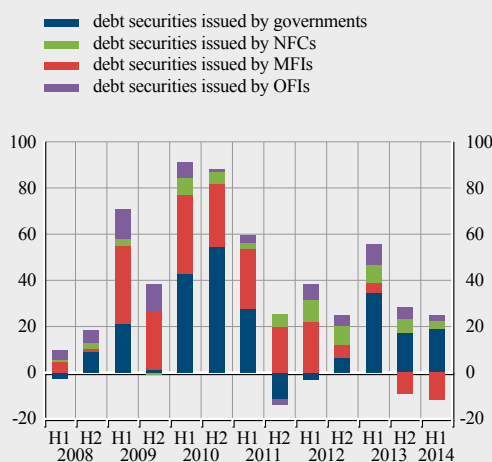


Sources: ECB, Bloomberg, JPMorgan Chase & Co., Moody's, Jones Lang LaSalle and ECB calculations.

Notes: Each indicator is compared with its "worst" level since January 1999. "Government bond markets" represent the euro area ten-year government bond yield and the option-implied volatility of German ten-year government bond yields, "Corporate bond markets" A-rated corporate bond spreads and speculative-grade corporate default rates, "Stock markets" the level and the price/earnings ratio of the Dow Jones EURO STOXX 50 index, "Structured credit" the spreads of residential and commercial mortgage-backed securities, and "Commercial property markets" commercial property values and value-to-rent ratios.

**Chart 3.35 Portfolio transactions of euro area insurance companies**

(H1 2008 – H1 2014; EUR billions)



Source: ECB.

Notes: Data availability varies across countries and investment categories. "MFIs" refer to monetary financial institutions, "NFCs" to non-financial corporations and "OFIs" to other financial intermediaries. Counterparties reside in the euro area.

<sup>5</sup> The impact of rising or falling interest rates is only relevant if there is a duration mismatch between assets and liabilities. If an insurer is short duration (i.e. lower asset duration than the liability duration), a rising interest rate is beneficial as the fall in asset value is lower than the fall in liability value, i.e. the capital position improves. This is normally the case for the majority of the life insurers. Very rarely, insurers are long duration (i.e. asset duration higher than the liability duration) although technically non-life insurers could be so.

if they offer attractive dividends. In addition, non-life insurers might be tempted to use higher investment incomes to cut prices and reduce underwriting margins. At a global level, the desire to remain flexible in the face of possibly rising interest rates is inducing more insurance companies to consider absolute-return investment approaches, ahead of other approaches, such as book yield, relative return and liability matching.<sup>6</sup>

*Slow portfolio adjustment...*

Euro area insurers have increased their holdings of government bonds in almost all jurisdictions (see Chart 3.35) – in some cases with a high domestic sovereign focus – according to transactional data, which exclude valuation changes. Holdings of debt issued by euro area corporates appears to also be on the rise. At the same time, insurers in the euro area have decreased their holdings of debt issued by euro area monetary financial institutions, although some analysts expect this trend to reverse in the near future.

*... with limited non-traditional activities thus far...*

While the insurance sector is increasing its non-traditional activities in an endeavour to boost income, their use remains limited thus far, on aggregate. Although evidence of such activities (mainly sales of credit risk protection and direct lending to counterparties) exists, levels at an aggregate euro area level remain low, and even declined slightly within the euro area in the first half of 2014.

*... despite the increase in captive activities by insurance companies*

The use of captives<sup>7</sup> by insurance companies raises concerns about capital arbitrage and financial soundness. The sharp increase in captive insurance entities (in particular, in the United States) and their weak disclosure obligations have recently gained the attention of the international financial stability community. Most concerns come from the use of captive life reinsurers for life insurance reserve financing and the use of inter-company loans, activities sometimes called “shadow insurance”. Although currently only limited signs of such activities exist in the euro area, an expected increase in formations of captives in Europe (which currently accounts for an estimated 28% of all captives worldwide) warrants close monitoring.

#### UNDERWRITING RISK

*Increased exposure to emerging markets*

Expectations of depressed top-line growth in life insurance markets in the future and a continued softening of reinsurance pricing pose challenges to the reinsurance and life insurance business models. Both life and non-life companies have further increased their amounts of premiums written in emerging markets. Such expansion brings diversification benefits in markets that are highly profitable and relatively underpenetrated at the moment. However, new challenges emerge in terms of risk management, currency risk, new product developments and group supervision.

*Manageable insured catastrophe losses...*

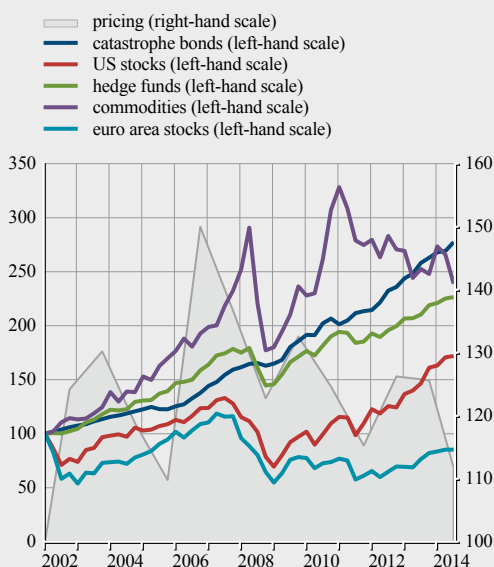
The reinsurance industry recorded manageable and below-average natural catastrophe losses in 2014 (see Chart 3.36). However, Europe was the only region to have above-average insured losses in the first half of the year. Severe thunderstorms and hail in early June caused significant damage in France, Germany and the Netherlands, with total insured losses estimated at USD 2.5 billion. In addition, aviation disasters in 2014 thus far could cost the insurance industry as much as USD 1.5 billion.

6 A relative-return approach rates the performance of the fixed-income portfolio relative to that of a public benchmark. An absolute or total-return approach considers performance relative to zero-risk assets. Relative return gives asset managers a yield target above the market average, but this may not be enough to provide the cash-flow matching and yield that insurers are seeking.

7 “Captives” are insurance companies established with the objective of financing specific risks borne by their respective owner, affiliated businesses or a designated set of companies. In the case of non-financial companies, use of captives is motivated by sound risk management and a cost-efficient pooling of risks. However, the use of captives by insurance companies might be driven by the ability to effectively move assets (and their associated liabilities) off the balance sheet in order to reduce regulatory capital requirements.

**Chart 3.36 Cumulative return profiles, broken down by market asset class and reinsurance pricing**

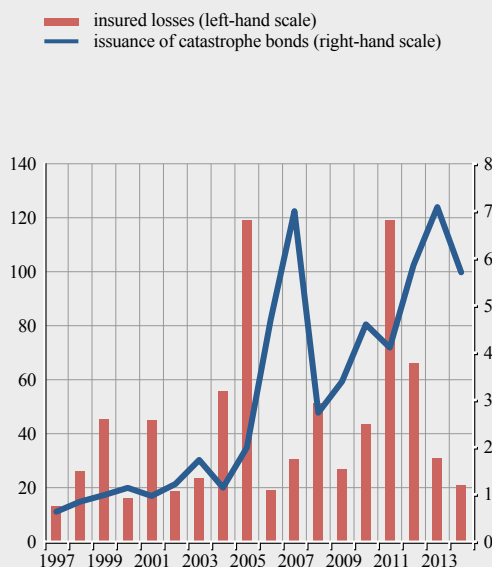
(Q1 2002 – Q3 2014; index: Q1 2002 =100)



Sources: Bloomberg, Guy Carpenter and ECB calculations.  
Notes: S&P 500 and EURO STOXX are used as benchmark indices for US and euro area stocks respectively. The Guy Carpenter World Property Catastrophe RoL Index tracks changes in property catastrophe reinsurance premium rates on a worldwide basis.

**Chart 3.37 Insured catastrophe losses and catastrophe bond issuance**

(1997 – H1 2014; USD billions)



Sources: EQECAT, Munich Re, Swiss Re, Guy Carpenter and ECB calculations.  
Note: Data for 2014 refer to the first six months of the year.

Over the past two years, the reinsurance industry has seen an inflow of approximately USD 20 billion of new capital from an ever-broadening investor base,<sup>8</sup> precipitating the most marked change to the sector's capital structure in recent times. Capital has entered the market through investment in insurance-linked securities (mainly catastrophe bonds), funds and "sidecars", as well as through the formation of hedge fund-related reinsurance companies and collateralised reinsurance vehicles.

These investors have been drawn to (re)insurance on account of the advantages the sector offers in terms of being a non-correlating asset class, as well as the absence of attractive investments given the current level of interest rates. Indeed, the performance of catastrophe bonds relative to other traditional asset classes through different financial market cycles demonstrates the value of this asset class and its non-correlative basis (see Chart 3.36). Consequently, the first half of 2014 saw the highest issuance of catastrophe bonds in any six-month period, with a record high of USD 5.7 billion. These trends are expected to continue for the full year 2014 (see Chart 3.37).

This excess of capital and capacity, combined with benign developments in natural catastrophe insured losses since 2013, has been reflected in a significant decline in prices of reinsurance policies (see Chart 3.36). In addition, new premiums written are continuing to decline as ceding companies use less reinsurance (increasing retention ratios via consolidation) as a means of stabilising profitability levels. Given these developments – weakening fundamentals and a challenging market environment – the European reinsurance sector was given a negative outlook by all rating agencies in the course of 2014. In an attempt to change the dynamics of the market, some European reinsurers have been

... combined with an excess of capital and supply...

... driven by the good non-correlative performance of insurance-linked securities...

... with stagnant demand in a soft market...

<sup>8</sup> Including hedge funds, pension funds, endowments, sovereign wealth funds and asset managers.

*... create a  
challenging outlook  
for the reinsurance  
sector*

releasing their excess capital, via share buy-backs, higher than expected dividend payments or capital injections into direct insurance business lines, placing increased pressure on primary insurance pricing. Further cost-cutting and some consolidation are expected in the sector. As positive trends, selected lines (aviation) and countries (Germany) may enjoy slight pricing gains due to recent loss developments. Product innovation, such as protection against cyber risks, has also been pursued by some reinsurers. However, cyber risk has been poorly defined in reinsurance coverage thus far, and the market is at an incipient stage, with rather customised policies dominated by a few large providers.

*Life business model  
tested by low yields*

The investment guarantees that life insurers can offer new customers are driven by the yields on the bonds they can invest in. Low yields reduce the level (or increase the price) of guarantees that insurers can offer, making guaranteed savings products unattractive to customers, hampering volumes of new premiums written and potentially making the business unviable for small, not well-diversified institutions that were unable or unwilling to mitigate the risk in advance through a close matching of cash flows or hedging activities.

### 3.3 MACRO-PRUDENTIAL POLICY MEASURES ANNOUNCED IN SEVERAL COUNTRIES

This section considers the macro-prudential measures that have been implemented, or proposed, in a number of euro area countries since November 2013. It draws on a quarterly update provided by Member States. The measures introduced by the countries concerned can be grouped into two categories, depending on the risks being addressed: real estate measures and systemic risk measures. They are summarised in Table 3.1.

#### SYSTEMIC RISK MEASURES

*Systemic risk  
measures were  
introduced in  
a number of  
countries...*

A number of member countries recently introduced measures to mitigate systemic risks originating from the significant size, high concentration and interconnectedness of their banking sectors. The measures ranged from the instruments provided for in the Capital Requirements Regulation/Capital Requirements Directive IV (CRR/CRD IV) to country-specific measures. For instance, Estonia put a systemic risk buffer (SRB) in place, while the Netherlands decided to introduce both an SRB and a buffer for other systemically important institutions (O-SII buffer), with phase-in arrangements. Belgium and Slovenia introduced ad hoc measures to address country-specific aspects of systemic risk, namely excessive trading activities of banks (Belgium) and funding liquidity (Slovenia).

*... including  
Belgium...*

In December 2013, **Belgium** decided to apply targeted Pillar 2 capital surcharges to banks' trading activities above a certain threshold. Prior to the recent crisis, a number of Belgian banks' trading activities were undesirably high. Although banks have since reduced their trading activities, the purpose of the surcharge is to deter banks from engaging in an undesirable level of trading activity, such as that observed prior to the crisis, and to ensure that trading activities do not become a significant obstacle to banks' solvency. The surcharge is to be applied if a bank exceeds the threshold set for either of two indicators, a volume-based indicator and a risk-based indicator. The volume-based indicator consists of all held-for-trading assets that are not used for hedging the banks' own positions. If the volume-based indicator exceeds the mark of 15% of the bank's total assets, a capital surcharge equal to the amount by which the indicator exceeds the threshold will be applied. The risk-based indicator consists of the regulatory capital requirements for market risk (excluding foreign exchange risk). A capital surcharge will be applied if the "adjusted" market risk capital requirement exceeds 10% of total regulatory capital requirements, and the surcharge will equal three times the amount by which market risk capital requirements exceed the threshold. The thresholds of the indicators were determined on the basis of banks' trading activities in the pre-crisis period. The measure is not subject to any predefined time limit.

... the  
Netherlands...

The **Netherlands** decided in April 2014 to require an O-SII buffer of 1-2% for the most systemically important banks in the country, and an SRB of 3% for all Dutch banks with a balance sheet size (on and off-balance-sheet items) equal to at least 50% of the country's annual gross domestic product (GDP), with the higher of the two requirements applying to each of the credit institutions concerned. As a result, a capital buffer of 3% of the respective risk-weighted assets (CET1 capital) was imposed for ING Bank, Rabobank and ABN AMRO, while one of 1% was required of SNS Bank. Banks are able to phase in these buffers between 2016 and 2019. This will raise future CET1 capital levels required of the three major banks to at least 10% of their risk-weighted assets, and that required of SNS Bank to 8%. The reasons for the imposition of these requirements are to be found in the relatively large size of the Dutch banking sector, in terms of GDP, and its level of concentration. To determine which banks are systemically important, De Nederlandsche Bank (DNB) assessed banks against a number of criteria such as the size of a bank relative to Dutch GDP, a bank's interconnectedness with other financial institutions and the substitutability of certain crucial functions performed by a bank. On the basis of these criteria, DNB determined that ING Bank, Rabobank and ABN AMRO are the systemically most important banks. The size of the balance sheet of each individual major bank is in excess of 50% of Dutch GDP – in the case of ING Bank and Rabobank, the size actually exceeds 100% of GDP. The three major banks are also strongly interconnected, and are interwoven with other Dutch and international financial institutions. Finally, taken together, they are responsible for most lending to Dutch households (85%) and companies (60%). Although SNS Bank is far smaller and has a smaller share in the services provided to the real economy, it is likewise systemically important: it holds a relatively large proportion of Dutch consumers' savings, and part of these savings is guaranteed under the deposit guarantee scheme. In addition, SNS Bank is an important player in the domestic mortgage loan market.

... Slovenia...

**Slovenia** decided in April 2014 to introduce minimum requirements on changes in loans to the non-banking sector relative to changes in non-banking sector deposits. The ratio is calculated on changes in stocks before considering impairments (gross loan-to-deposit flows). The measure was introduced to counter the observed acceleration of the decline in banks' loan-to-deposit ratios in recent years (from a peak of 162% in 2008 to 130% in 2012, and further to 109% at the end of 2013), which was in turn accompanied by a decline in commercial wholesale funding and the contraction of the banking system's total assets. By way of this measure, Banka Slovenije aims to stabilise the funding structure of the banking system and mitigate system-wide funding liquidity risk, as well as to restrict negative feedback between the condition of banks, real sector activity, system-wide liquidity and loan quality. Banka Slovenije expects the measure to reduce the migration of, and competition for, deposits. The calibration of gross loan-to-deposit flows was based on historical experience and simulations for individual banks. The minimum requirements set the floor for the measure as follows: 0% in the first year, and 40% in the second year. The instrument is being introduced on a temporary basis, until the banks' funding structure has been stabilised successfully, and until system-wide funding liquidity risk has been reduced. Since the measure is to apply solely to banks in Slovenia, scope for cross-border spillover effects is very limited.

... and Estonia

**Estonia** decided in May 2014 to set up a systemic risk buffer requirement of 2%, starting on 1 August 2014. The systemic risk buffer applies to all credit institutions licensed in Estonia. In Eesti Pank's assessment, the main reasons for introducing the systemic risk buffer were the structural vulnerabilities of both the Estonian economy and its financial sector. The former stems primarily from the small size and from the openness of the Estonian economy. The ongoing convergence and build-up of a capital stock make the development of the economy more volatile than that of most other EU countries. Moreover, in Eesti Pank's view, the financial buffers of the real economy,

although growing, are still relatively small and provide only limited protection against sudden shocks, particularly external shocks. The structural vulnerabilities of the financial sector include the high concentration of the banking sector and the exposures of institutions to the same set of economies and economic sectors, which include exposures via other subsidiaries of parent banking groups. Although the direct exposures of credit institutions in Estonia to one another may be considered to be fairly limited, the structure of their credit portfolios indicate either that they have significant direct exposures to the domestic real sector or that they are likely to be significantly affected through second-round effects if a bank with a significant market share should fail to provide services. As the total capital requirement in Estonia was set at 10% from 1997 to 2013, and as all banks there fulfilled the requirement with a sufficient excess at the end of 2013, the introduction of the measure is expected to have an only limited impact both on the capitalisation of banks and on the financing conditions of the real economy.

#### REAL ESTATE MEASURES

Different types of real estate measures have been adopted, with the aim of addressing unfavourable developments in property markets. Real estate typically represents a large proportion of banks' credit exposures, and of households' assets, thus making imbalances in this sector particularly important in terms of financial stability. In this regard, Belgium, Slovakia, Ireland and Estonia decided to introduce national measures to address specific risks in the property markets.

*Real estate measures introduced in...*

*... Belgium...*

In November 2013, **Belgium** decided to increase banks' risk weights for certain exposures through a modification of the Belgian Own Funds Regulation. This decision was a result of an analysis both of the risks to the Belgian banking sector as a result of Belgian residential mortgages and of the adequacy of the capital requirements applicable to Belgian credit institutions (in Belgium, mortgage lending is undertaken primarily by Belgian credit institutions). The analysis was motivated by the significant increase in residential mortgage lending, as well as by the potential risk of an overvaluation of real estate in Belgium in recent years. Before the change, the capital requirements applicable to residential mortgages were relatively low for credit institutions relying on internal risk models (i.e. those using internal ratings-based (IRB) approaches) in Belgium (on average, 9.6% of the respective asset value), and were (and continue to be) significantly lower, on average, than those applied under the Basel II framework (35%). This is due to the fact that internal risk models are calibrated on historical credit loss data, and to the absence of a major crisis in the Belgian housing market in the past. Considering the findings of the analysis, the Nationale Bank van België/Banque Nationale de Belgique (NBB/BNB) increased the capital requirements applicable to exposures secured by mortgages on residential property in Belgium through the Basel II Pillar I framework. For IRB banks, the increase was 5 percentage points, while nothing changed for banks using the standardised approach. Once this macro-prudential measure has been implemented, the average risk weight for domestic mortgage loans for Belgian IRB banks will increase to around 14.6%, which is closer to the average risk weight observed in other core European countries. The NBB/BNB decided in March 2014 to uphold the increase in the capital requirements.

*... Slovakia...*

In October 2014, **Slovakia** decided to issue a non-binding recommendation on risks related to market developments in retail lending. The measure is to be introduced to counter the rapid pace of credit growth, the significant proportion of loans with high loan-to-value ratios (LTVs) and the high proportion of housing loans used to refinance other loans which do not involve any verification of the borrower's income and which are not subject to any interest rate stress tests. The aim of the recommendation is to keep the parameters of new retail housing loans at sustainable levels, avoiding any underestimation of risks due to a higher level of competition. It provides for the share of high LTV loans (currently between 90% and 100%) to be limited to 25% in June 2015, to 20%

in March 2016, to 15% in December 2016 and to 10% in 2017. In addition, it stipulates that no new loans with LTV ratios of more than 100% should be extended. Slovakia moreover recommends that the banks impose own limits on their debt-to-income ratios and that they verify the income generated. Banks are also asked to implement interest rate testing when granting individual loans, as well as to perform portfolio stress testing for increases in interest rates and unemployment. Lending at long maturities, with progressive or deferred repayment, is not significant, but Národná banka Slovenska advises that such lending be avoided altogether. It recommends that banks take a prudential approach to loan refinancing and lending through intermediaries. The recommendation is considered a preventive step. Slovakia believes a non-binding measure to be proportionate to the current situation. Binding measures are regarded as unnecessary since the level of risks is not high. The need for additional measures will be assessed via regular follow-up procedures and reporting. The recommendation will enter into force in November 2014 (in case of LTV limits) and March 2015 (for other issues).

In October 2014, **Ireland** proposed that regulations placing ceilings on the share of mortgage lending at both high loan-to-value (LTV) ratios and high loan-to-income (LTI) ratios be introduced. The reason for the proposed regulation is the need to increase the resilience of Irish households and banks to residential property, in the context of high exposure of these sectors to property, and given the fact that a significant share of new lending is taking place at high LTV ratios and there have been sharp movements in house prices. Moreover, property lending tends to be subject to cyclical fluctuations which are amplified if lending standards are eased. The preceding crisis has shown the need for a policy overlay that would restrict imprudent lending throughout the credit cycle. The Central Bank of Ireland has acknowledged that loans at higher LTV and LTI rates can be appropriate in certain circumstances. For this reason, instead of imposing absolute limits, Ireland has proposed proportionate limits. The proposed measures will require banks to restrict lending for principal dwelling houses (PDHs) at rates above 80% LTV to no more than 15% of the value of all new PDH loans, and to restrict lending for PDHs at rates above 3.5 times LTI to no more than 20% of that aggregate value. Furthermore, the proposed regulation provides for a lower threshold for buy-to-let (BTL) property, requiring banks to limit BTL housing loans at rates above 70% LTV to 10% of all BTL housing loans. The rationale behind adopting limits on LTV and LTI together is to be found in the fact that both measures complement each other, with the LTI addressing the borrower's loan affordability and the LTV lender's losses in the event of default. Such thresholds are aimed at ensuring a greater degree of safety around the mortgage business. The objectives of the proposed regulations are to increase the resilience of the banking and household sectors with respect to the property market and to dampen the risk of self-reinforcing dynamics between property lending and house prices. While the regulations are not yet in place, regulated lenders have been instructed to take account of the probable introduction of such a regime and to already start adapting their lending practices in anticipation of its introduction.

... Ireland...

In October 2014, **Estonia** announced plans to set limits on the granting of housing loans as from 2015. Eesti Pank plans to introduce three requirements targeted at the housing market: LTV ratios, debt service-to-income ratio (DSTI) limits and a maximum maturity. The LTV will be limited to 85% (90% in the case of housing loans guaranteed by the state foundation KredEx). The DSTI limit will restrict the total amount of monthly loan, lease principal and interest payments to below 50% of the borrower's net monthly income. Finally, the maximum maturity of housing loans will be set at 30 years. The requirements are to be introduced as a precautionary measure to address the potential risk of an overvaluation of the property market. Eesti Pank does not expect the new limits to tighten prevailing lending conditions. The measures will affect all banks operating in Estonia, including branches of foreign banks.

... and Estonia

**Table 3.1 Overview of macro-prudential policy measures implemented and proposed in euro area countries since November 2013**

| Country                        | Measure                                                                                            | Summary description                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Date of entry into force                    | Reasons for implementation                                                                                                                                   |
|--------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Systemic risk measures</b>  |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |                                                                                                                                                              |
| Belgium                        | Capital surcharge for excessive trading activities                                                 | The capital surcharge will be applied as a Pillar 2 add-on if a bank exceeds the threshold set for either of two indicators, a volume-based indicator or a risk-based indicator.                                                                                                                                                                                                                                                                                      | December 2013                               | Prevent a build-up of systemic risk                                                                                                                          |
| Netherlands                    | Systemic risk buffer (SRB) and buffer for other systemically important institutions (O-SII buffer) | An O-SII buffer of 1-2% for the most systemically important banks and an SRB set at 3% of the total risk exposure (consolidated basis) for all Dutch banks with a balance sheet size equal to at least 50% of Dutch GDP. For each credit institution, the higher of the two requirements applies.                                                                                                                                                                     | Phased in from January 2016 to January 2019 | Mitigate the long-term non-cyclical systemic risk emanating from the large and concentrated banking sector in the Netherlands                                |
| Slovenia                       | Liquidity requirements                                                                             | The measure is based on the gross loan-to-deposit flows ratio. The ratio required has been set at 0% in the first year and at 40% in the second year. It is a temporary measure.                                                                                                                                                                                                                                                                                      | June 2014                                   | Prevent and mitigate systemic risk emanating from an excessive maturity mismatch and from funding illiquidity                                                |
| Estonia                        | Systemic risk buffer                                                                               | An SRB set at 2% of the total risk exposure (consolidated and individual basis).                                                                                                                                                                                                                                                                                                                                                                                      | August 2014                                 | Structural vulnerabilities of the economy and financial sector                                                                                               |
| <b>Real estate instruments</b> |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |                                                                                                                                                              |
| Belgium                        | Risk weights                                                                                       | Five percentage point add-on to risk weights of Belgian residential mortgage loans calculated by banks that use an internal ratings-based approach.                                                                                                                                                                                                                                                                                                                   | November 2013                               | Increase in residential mortgage lending                                                                                                                     |
| Slovakia                       | Recommendation on lending criteria                                                                 | Non-binding recommendation related to the risks in the housing lending market.                                                                                                                                                                                                                                                                                                                                                                                        | First phase November 2014                   | Excessive credit growth and significant proportion of loans with high LTV                                                                                    |
| Ireland                        | LTV and LTI limits                                                                                 | Proposal for proportionate limits on LTI and LTV ratios currently under consultation: new principal dwelling house (PDH) loans at rates above 80% LTV may not exceed 15% of the total value of all new PDH lending, and new PDH loans at rates above 3.5 times LTI may not exceed 20% of the total value of new PDH lending. Buy-to-let (BTL) housing property loans at rates above 70% LTV restricted to 10% of the total value of all BTL housing property lending. | To be announced                             | Increase resilience of households and banks to property, given large share of high LTV loans and sharp movements in house prices.                            |
| Estonia                        | Requirements for housing loans                                                                     | Introduction of requirements for housing market: LTV limits (85% and 90% in case of loans guaranteed by KredEx), debt service-to-income (DSTI) limits (50%), maximum maturity of housing loans (30 years)                                                                                                                                                                                                                                                             | Early 2015                                  | Address the potential risk of an overvaluation of real estate market and protect financial system against the excessive risk-taking by banks in credit booms |

### 3.4 RESHAPING THE REGULATORY FRAMEWORK FOR FINANCIAL INSTITUTIONS, MARKETS AND INFRASTRUCTURES

This section provides an overview of a number of regulatory initiatives in the banking, insurance and market spheres that are of primary importance for enhancing financial stability in the European Union (EU).

#### REGULATORY INITIATIVES FOR THE BANKING SECTOR

The key elements of the regulatory requirements for financial institutions operating in the EU, as well as the framework for the supervisory review and evaluation process and the mechanism for coordinating the activities of national and EU authorities, are set out in the **Capital Requirements Regulation/Capital Requirements Directive IV** (CRR/CRD IV). This prudential framework is complemented by the **Single Supervisory Mechanism Regulation** (SSM Regulation) that provides the ECB with strong powers for the supervision of all banks in participating Member States, as well as with additional tasks and responsibilities in the area of macro-prudential policy. While many elements of the CRR/CRD IV package are already in force, some remaining elements are still subject to finalisation and calibration, including the liquidity regulation, the leverage ratio provisions and the securitisation rules.

*Work on the finalisation and calibration of certain key elements of the CRR/CRD IV is continuing*

The international framework for **liquidity regulation** includes two policy instruments, namely the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). The LCR is aimed at promoting the short-term resilience of the liquidity risk profile of banks, while the NSFR is aimed at diminishing maturity mismatches between assets and liabilities, thereby reducing funding risks of banks. Since the publication of the final definition of the LCR by the Basel Committee in January 2013, the European Commission has made significant progress with respect to the implementation of this liquidity standard in the EU. A key element of this process was the publication of the final delegated act on the LCR in October 2014.<sup>9</sup> The remaining work primarily concerns the scope of supervisory reporting before the LCR is phased in next year, with an initial minimum requirement of 60%.

As regards the NSFR, the Basel Committee published a consultative document on a revised calibration of the measure in January 2014, also aligning the NSFR with the LCR in terms of the treatment of high-quality liquid assets. In the European context, the European Banking Authority (EBA) has set up a team to assess the impact and appropriate calibration of the NSFR. A final report by the EBA is expected to be delivered to the European Commission by the end of 2015.

The ECB actively supports the ongoing work on the **leverage ratio** that is aimed at preventing the build-up of excessive leverage in the financial system. Following the endorsement of the revised definition of the leverage ratio by the governing body of the Basel Committee in January 2014, the Group of Central Bank Governors and Heads of Supervision (GHOS), the European Commission issued a delegated act that broadly aligns the CRR/CRD IV definition with the revised international standard. As regards the implementation of the leverage ratio as a supervisory tool, banks will be required to publicly disclose their leverage ratios as from January 2015.<sup>10</sup>

<sup>9</sup> See the Commission Delegated Regulation of 10 October 2014 (available at: <http://ec.europa.eu>).

<sup>10</sup> See Special Feature C in this issue of the FSR for further details on the NSFR.

*The concept of “simple and transparent securitisation” is spreading ever faster at both the global and the EU level*

In the area of **securitisation**, significant work is underway at the global and EU levels. This stems from the policy objective of reviving securitisation markets in a sustainable manner, and reflects the positive effects that sound securitisation practices can have on the financing of the real economy.

At the international level, the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) set up a Task Force on Securitisation Markets earlier this year, with the aim of (i) identifying factors that may be hindering the development of sustainable securitisation markets and the participation of certain types of investors, and (ii) defining criteria to identify and assist in the development of simple and transparent securitisation structures.<sup>11</sup> These criteria could inform future regulatory actions, such as those of the BCBS, which pledged, at its meeting in September 2014, to consider in 2015 how to incorporate the BCBS-IOSCO criteria, once finalised, into the securitisation capital framework.<sup>12</sup>

In the EU in October, the European Commission adopted two delegated acts under the Solvency II Directive and – for the LCR – the CRR that establish a differentiated regulatory treatment of securitisations that meet certain criteria in terms of simplicity and transparency. In addition, following a call for advice from the European Commission on the appropriateness of the prudential requirements provided for in the CRR/CRD IV in relation to long-term financing and, in particular, securitisations, the EBA determined that certain simple, standard and transparent securitisations merit differentiated capital treatment, developed draft criteria to identify such securitisations and launched a public consultation that is to be closed in mid-January 2015.<sup>13</sup>

Notwithstanding the ongoing work on the above-mentioned prudential requirements, several policy tools are already available for also macro-prudential purposes. Subject to strict notification and coordination mechanisms between national and EU authorities, including the ECB under the SSM Regulation, the CRR/CRD IV defines a set of instruments that can be applied by macro-prudential authorities to address risks to financial stability.

As required by the CRR, the revision by the European Commission of the **macro-prudential rules** is an ongoing process. The revision is focusing on the assessment of the effectiveness, efficiency and transparency of the policy framework and on the adequacy of the coverage of, and possible overlap between, tools, as well as on the interaction between internationally agreed standards and the provisions of the CRR/CRD IV.

The European Systemic Risk Board (ESRB) and the EBA have already provided the Commission with their assessment of the adequacy of the macro-prudential policy framework and have set out a number of proposals with regard to possible ways of improving the framework. The ECB, too, is currently assessing the adequacy of the macro-prudential rules in the CRR/CRD IV, with a specific focus on identifying the main issues arising from the establishment of the SSM and on ensuring consistency between the SSM Regulation and the CRR/CRD IV.

With regard to recently passed legislation or ongoing regulatory initiatives, Tables 3.2 to 3.4 provide an update of the major strands of work in the EU, followed by a short overview of selected policy measures from the perspective of financial stability and macro-prudential policy.

11 See the BCBS-IOSCO press release of 3 July 2014 (available at: <http://www.bis.org/press/p140703.htm>).

12 See BCBS press release (available at: <http://www.bis.org/press/p140925.htm>).

13 See EBA, “EBA Discussion Paper on simple, standard and transparent securitisations”, 14 October 2014.

**Table 3.2 Selected new legislation and proposals for legislative provisions on the banking sector in the EU**

| Initiative                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                              | Current status                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Single Supervisory Mechanism Regulation (SSM Regulation) | The SSM Regulation establishes a Single Supervisory Mechanism (SSM) with strong powers for the ECB (in cooperation with national competent authorities) for the supervision of all banks in participating Member States (euro area countries and non-euro area Member States which join the system).                                                                                                                     | The SSM came into force on 4 November 2014, and the ECB took up its new role of supervisor. The results of the comprehensive assessment of all banks that are under its direct supervision were published on 26 October 2014.                                                                                                                                                                                              |
| Bank Recovery and Resolution Directive (BRRD)            | The BRRD sets out a framework for the resolution of credit institutions and investment firms, with harmonised tools and powers relating to prevention, early intervention and resolution for all EU Member States.                                                                                                                                                                                                       | The BRRD entered into force on 2 July 2014. Member States have to transpose the BRRD into national legislation by 31 December 2014, and to apply it as from 1 January 2015. However, the bail-in provisions will only be applicable as of 1 January 2016, at the latest.                                                                                                                                                   |
| Deposit Guarantee Scheme Directive (DGS Directive)       | The DGS Directive deals mainly with the harmonisation and simplification of rules and criteria applicable to deposit guarantees, a faster pay-out, and an improved financing of schemes for all EU Member States.                                                                                                                                                                                                        | The DGS Directive entered into force on 2 July 2014. Member States will have to transpose most provisions into national legislation by 3 July 2015, and in full by 31 May 2016.                                                                                                                                                                                                                                            |
| Single Resolution Mechanism Regulation (SRM Regulation)  | The SRM Regulation establishes a single system, with a single resolution board and single resolution fund, for an efficient and harmonised resolution of banks within the SSM.<br>The SRM would be governed by two main legal texts: the SRM Regulation, which covers the main aspects of the mechanism, and an Intergovernmental Agreement (IGA) relating to some specific aspects of the Single Resolution Fund (SRF). | The SRM Regulation entered into force on 19 August 2014. It will be partly applicable as of 1 January 2015, whereas most resolution functions (including the SRF) will apply as from 1 January 2016 (or when the IGA becomes applicable, if later). The IGA on the SRF was signed by all Member States (except the United Kingdom and Sweden) on 21 May 2014, and its ratification by national parliaments is now pending. |
| Regulation on structural measures                        | The Regulation introduces restrictions on certain activities and sets out rules on structural separation, with the aim of improving the resilience of EU credit institutions.                                                                                                                                                                                                                                            | The European Commission's proposal was published on 29 January 2014. Preliminary discussions have started in the European Council. The ECB's legal opinion on the proposal was published on 21 November 2014.                                                                                                                                                                                                              |

Another key area of significant progress comprises steps taken towards a banking union in Europe, namely the establishment of (i) a single supervisory mechanism, (ii) a single resolution framework, (iii) a single resolution mechanism and (iv) harmonised deposit insurance. The first pillar of the banking union, the **Single Supervisory Mechanism** became operational on 4 November.

Important complementary elements of single supervisory arrangements are a common EU framework for bank recovery and resolution, as well as a single resolution mechanism. As of 1 January 2015, the **Bank Recovery and Resolution Directive** (BRRD) will be implemented by all Member States.<sup>14</sup> The BRRD establishes common and efficient tools and powers for addressing a banking crisis pre-emptively, and for managing failures of credit institutions and investment firms in an orderly manner throughout the EU.

*Significant progress made in the establishment of the banking union*

*The BRRD will provide common and efficient tools and powers for addressing a banking crisis*

14 With the exception of the bail-in tool, which will follow by 1 January 2016 at the latest.

*The SRM will create a single system for resolution*

The **Single Resolution Mechanism (SRM)** will establish a single system, with a Single Resolution Board (SRB) and a Single Resolution Fund (SRF) at its centre, for the resolution of banks in Member States participating in the SSM. The SRM is a necessary complement to the SSM in order to achieve a well-functioning banking union and to sever the link between banks and their sovereigns. Thus, the SRM will apply to all banks supervised within the scope of the SSM, and accordingly, any Member State outside the euro area which opts to join the SSM will automatically also fall under the SRM. The SRM will ensure that in the event of a bank failing, and if it is in the public interest to resolve it, its resolution can be managed efficiently, jointly and in the common interest. The SRM will be better placed to take due account of contagion and spillovers when making resolution decisions. It will also ensure a consistent application of resolution principles and tools throughout the banking union, also for banks with no cross-border activity.

The SRM will be governed by two main legal texts: (i) the SRM Regulation, which covers the main aspects of the mechanism and is based on the BRRD, and (ii) an Intergovernmental Agreement (IGA), which covers some specific aspects of the SRF. Whereas most of the provisions of the SRM Regulation will apply as from 1 January 2016, the SRB will become operational on 1 January 2015. This will allow the SRB to engage in recovery and resolution planning during 2015.<sup>15</sup> The European Commission is responsible for the establishment of the SRB, and a dedicated Commission Task Force has been set up for this purpose.

The IGA on the transfer and mutualisation of contributions to the SRF was signed by 26 Member States.<sup>16</sup> All signatories of the IGA are to complete its ratification according to their national procedures before 1 January 2016. This is expected to take place soon, given that the Commission has recently adopted a delegated act and a proposal for a Council implementing act on the risk-based bank contributions to national resolution funds and the SRF, as required by the BRRD and the SRM Regulation respectively.

<sup>15</sup> This may include, for example, the examination of recovery plans received from the ECB or national competent authorities in order to identify any actions which may adversely impact the resolvability of the institutions, and the drafting and adoption of resolution plans, including the assessment of resolvability, the application of simplified obligations for certain institutions and the determination of the minimum requirements of eligible liabilities and own funds for bail-ins, for all covered institutions.

<sup>16</sup> The IGA was signed by all Member States except the United Kingdom and Sweden.

#### Box 6

##### REGULATORY INITIATIVES TO ENHANCE OVERALL LOSS-ABSORPTION CAPACITY

One of the key objectives of the resolution frameworks introduced in response to the recent crisis, such as the Bank Recovery and Resolution Directive (BRRD) in the EU, is the shifting of the cost of bank failures from the taxpayer to, first and foremost, the shareholders and creditors of the failing bank. This is important for many reasons, not least that of solving the too-big-to-fail problem of large banks, which – unless there is a credible resolution option – often have to be bailed out by the public at huge cost. These banks have often been perceived by markets as having an implicit state guarantee, which creates not only a moral hazard problem, but also an uneven playing field among banks, in that large banks in fiscally strong countries can fund themselves far more cheaply than smaller banks or banks in countries with weaker public finances. Thus, the introduction of a credible resolution framework contributes to weakening the link between banks and their sovereigns, which proved to be both costly and destabilising in the recent crisis.

An important tool for attaining this objective is the bail-in tool, which enables the resolution authority to write down, or convert into equity, the claims of a broad range of creditors. However, some types of liabilities are excluded from the scope of a bail-in, such as secured liabilities and covered deposits. Furthermore, in exceptional circumstances, other liabilities may also have to be excluded on a case-by-case basis, either because it is not possible to bail them in quickly enough or because this is necessary in order to attain the resolution objectives. Consequently, in order to ensure that the bail-in tool will still be efficient in resolution, there is a need to make sure that there are sufficient own funds and liabilities in banks for bail-ins, when needed.

Under the BRRD, Member States are required to ensure that institutions meet a minimum requirement for own funds and eligible liabilities (MREL) for bail-ins.<sup>1</sup> An adequate level of own funds and eligible liabilities will be key to ensure that there is sufficient loss-absorbing capacity within institutions when they fail, thereby underpinning the efficient application of the bail-in tool. It will also protect the resolution funds, including the Single Resolution Fund, as own funds and eligible liabilities, as defined by the MREL, and other bail-inable liabilities will be used before a resolution fund may contribute to the funding of any resolution.

Some technical details on the MREL remain to be finalised before it becomes operational along with the bail-in tool in 2016. In particular, the European Banking Authority will draft regulatory technical standards by July 2015 which will specify how the MREL is to be determined for each institution. By December 2016, the European Commission will submit a legislative proposal on the harmonised application of the MREL. Such a proposal may include the introduction of an appropriate number of different MRELs that take account of the different business models of institutions and groups, as well as possible adjustments to ensure consistency with any international standards that have been developed by international fora in this area.

Currently, an international standard is also under discussion within the G20 and the Financial Stability Board (FSB) so as to end the too-big-to-fail problem of the global systemically important banks (G-SIBs). The FSB, in consultation with the Basel Committee on Banking Supervision, has developed proposals on the adequacy of loss-absorbing capacity of G-SIBs in resolution, in response to a call by G20 leaders at the 2013 St Petersburg summit. The proposal is subject to public consultation and a quantitative impact study, before being finalised by the FSB in 2015. This proposal would be the international equivalent of the MREL in the BRRD, applicable to G-SIBs only. Although similar, the draft FSB proposal for G-SIBs' total loss-absorbing capacity (TLAC) in resolution differs from the MREL in some key areas (see the table below).

#### Key features of the MREL and the TLAC

|        | MREL                                                                                                                                                                       | TLAC                                                                                                                   |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Scope  | All banks in scope of the BRRD                                                                                                                                             | G-SIBs only                                                                                                            |
| Set-up | A minimum requirement in parallel to Basel III minimum capital requirements for banks, calculated as the amount of own funds (including buffers) and eligible liabilities. | A minimum requirement incorporating Basel III minimum capital requirements and excluding Basel III buffers for G-SIBs. |

<sup>1</sup> Within the SRM, the SRB will be the authority, after consulting competent authorities, including the ECB, which determines the MREL for all entities under direct ECB supervision and for all cross-border groups.

## Key features of the MREL and the TLAC (cont'd)

|                         | MREL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | TLAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Determination           | Determined on an individual basis for each institution.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A common minimum Pillar 1 requirement set within the range of 16-20% of RWAs and at least twice the Basel III Tier 1 leverage ratio requirement <sup>1</sup> as a floor for all G-SIBs, with the possibility for authorities to top it up on an individual basis through a Pillar 2 component. Also sets out how TLAC is distributed among material institutions within a group when the whole group is resolved or when various sub-sets of the group are resolved together.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Eligible instruments    | Capital instruments can simultaneously satisfy both minimum regulatory capital requirements (including buffers) and the MREL. To be eligible, liabilities need to fall within the scope of bail-in. This will exclude e.g. covered deposits and, in principle, secured liabilities. Additionally, eligible liabilities must satisfy certain criteria, such as issued and fully paid up, not owed to, secured or guaranteed by the institution itself, not arise from a derivative or from a preferred deposit, and have a remaining maturity of at least one year. | Capital instruments can simultaneously satisfy both minimum regulatory capital requirements and TLAC, but only CET1 capital in excess of that required to satisfy these requirements may count towards the capital buffers. Certain liabilities are excluded from consideration for TLAC, e.g. liabilities arising from derivatives, insured deposits and liabilities which are preferred to normal senior unsecured creditors under the relevant insolvency law. Eligible external TLAC must be unsecured, must have a minimum remaining maturity of at least one year and must not be subject to set off or netting rights. Credible ex ante commitments by authorities to recapitalise a G-SIB, which may be required to contribute to resolution funding, may count towards a firm's Pillar 1 minimum TLAC, subject to certain strict conditions (e.g. the commitments must be pre-funded by industry contributions). |
| Priority                | Priority is not a precondition in the BRRD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Eligible external TLAC must absorb losses prior to excluded liabilities in insolvency or in resolution without giving rise to material risk of successful legal challenge or compensation claims.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Regulation of investors | Without prejudice to the existing large exposure regime Member States have to ensure that in order to provide for resolvability of institutions/groups, resolution authorities limit the extent to which other institutions hold liabilities eligible for the bail-in tool, save for liabilities that are held at entities that are part of the same group.                                                                                                                                                                                                        | G-SIBs must deduct from their own TLAC or regulatory capital exposures to eligible external TLAC liabilities issued by other G-SIBs in a manner generally parallel to the existing provisions in Basel III that require a bank to deduct from its own regulatory capital certain investments in the regulatory capital of other banks. Further provisions, also for non G-SIBs, are envisaged.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

1) The calibration is subject to a quantitative impact study and market survey which will be carried out in early 2015.

## Improved depositor protection in the EU

A final element of the banking union is the establishment, in the medium term, of a common deposit guarantee fund in the EU. A first step in this direction was the entry into force of the recast **Deposit Guarantee Scheme Directive** (DGS Directive) on 2 July 2014.<sup>17</sup>

<sup>17</sup> By 3 July 2019, the Commission must submit a report and, if appropriate, a legislative proposal to the European Parliament and the Council, setting out how deposit guarantee schemes operating in the EU may cooperate through a European scheme so as to prevent risks from arising from cross-border activities and to protect deposits against such risks.

The DGS Directive will ensure that deposits in all Member States will continue to be guaranteed up to an amount of €100,000 per depositor and bank. It will also ensure faster pay-outs with specific repayment deadlines, which will gradually be reduced from 20 to 7 working days by 2024. It will also ensure a strengthened financing of deposit guarantee schemes, notably by requiring a significant level of ex ante funding (0.8% of covered deposits) which is to be met within ten years. At most 30% of the funding could be made up of payment commitments. In case of insufficient ex ante funds, the deposit guarantee scheme would collect immediate ex post contributions from the banking sector and, as a last resort, the scheme would have access to alternative funding arrangements, such as loans from public or private third parties. In addition, a voluntary mechanism for mutual borrowing between national deposit guarantee schemes in the EU is also provided for.

On 29 January 2014, the European Commission presented its proposal for a **Regulation on structural measures for EU credit institutions**. The proposal aims at improving the resilience of European banks by preventing contagion from banks' trading activities to traditional banking activities. This would be done by prohibiting banks from carrying out proprietary trading, i.e. securities trading not related to client activity or hedging, and only for the purpose of making a profit for their own account. Furthermore, it is proposed that supervisors can require a bank to shift other trading activities to trading entities, which are legally, economically and operationally separated from the deposit-taking entity of the bank. Importantly, trading in government bonds issued by Member States will be exempted from the prohibition, as well as from the separation requirements. Likewise, the deposit-taking entity will still be able to use financial instruments aimed at hedging its own risks. The regulation will cover all global systemically important banks in the EU, as well as other banks with sufficiently large trading activities.

*The proposal for a Regulation on structural measures aims at improving the resilience of European banks*

Another key objective of this proposal is to reduce banks' incentives to take excessive risks on the back of the safety net (resolution funds, deposit insurance funds and, ultimately, governments), and to make banks less complex to resolve. In ensuring that, the proposal can complement the BRRD and may, at the same time, contribute to enhancing systemic stability in Europe. Also, by harmonising rules on structural regulation, the proposal seeks to create a level playing field for banks inside the EU.

The ECB supports this proposal in principle. It will contribute towards ensuring a harmonised EU framework that addresses concerns related to banks that are "too big to fail" and "too interconnected to fail". Nevertheless, the ECB considers it important to sufficiently preserve the market-making activities of banks in order to maintain or increase asset and market liquidity, to moderate price volatility and to increase securities markets' resilience to shocks.

#### REGULATORY INITIATIVES FOR FINANCIAL MARKETS AND INFRASTRUCTURES

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

The **ECB Regulation on oversight requirements for systemically important payment systems** came into force on 12 August 2014. The Regulation aims to ensure the efficient management of legal, credit, liquidity, operational, general business, custody, investment and other risks, as well as sound governance arrangements, objective and open access and the efficiency and effectiveness of systemically important payment systems (SIPs). It implements the principles for financial market infrastructures (PFMIs) developed jointly by the Committee on Payments and Market Infrastructures and IOSCO in a legally binding way, and covers both large-value and retail payment systems of systemic importance, irrespective of whether they are operated by Eurosystem national central

*Adoption of an ECB Regulation on oversight requirements for systemically important payment systems*

banks or private entities. Four SIPSs have been identified: TARGET2 (operated by the Eurosystem), EURO1 and STEP2 (both operated by EBA Clearing), and CORE (FR) (operated by STET). The Eurosystem will review this list on the basis of updated statistical data each year. For consistency with international practices, and to take account of the increased integration of retail payment systems in the Single Euro Payments Area (SEPA), the Eurosystem has also undertaken a comprehensive review of the oversight standards for euro retail payment systems that are not SIPSs. As a result of this review, the ECB published the “Revised Oversight Framework for Retail Payment Systems” on 21 August 2014.

**Table 3.3 Selected new legislation and legislative proposals for financial markets and infrastructures in the EU**

| Initiative                                                                                                                                   | Description                                                                                                                                                                                                                                                                                                                                                                                      | Current status                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECB Regulation on oversight requirements for systemically important payment systems                                                          | The Regulation aims at ensuring the efficient management of all types of risk that systemically important payment systems (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 over-the-counter derivatives market and sets out rules for, inter alia, central counterparties and trade repositories.                                                                                                                                                                                                          | The Regulation entered into force in August 2012. Implementation is in progress.                                                                                                                                               |
| Regulation on improving the safety and efficiency of securities settlement in the EU and on central securities depositories (CSD Regulation) | The Regulation 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. Implementation is in progress.                                                                                                                                         |
| Review of the Markets in Financial Instruments Directive and Regulation (MiFID II/MiFIR)                                                     | The legislation will apply 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. | The Directive 2014/65/EU on markets in financial instruments (MiFID II) and the 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. |
| Proposal for a Money Market Fund Regulation (MMF Regulation)                                                                                 | The proposal addresses the systemic risks posed by this type of investment entity by introducing new rules aimed at strengthening their liquidity profile and stability. It also sets out provisions that seek, inter alia, to enhance their management and transparency, as well as to standardise supervisory reporting obligations.                                                           | The European Commission’s proposal was published in September 2013 and has since been subject to discussions at the trialogue level by the European Parliament and, lately, by the European Council.                           |
| Proposal for a Regulation on reporting and transparency of securities financing transactions                                                 | The proposal 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.                                                                    | The European Commission’s draft proposal was published in January 2014. The ECB expressed its support, in principle, of the proposal in its legal opinion of 24 June 2014.                                                     |

Implementation of the **European Market Infrastructure Regulation** (EMIR) has continued to make progress. The Regulation seeks to bring more stability, transparency and efficiency to derivatives markets by requiring, inter alia, standard derivative contracts to be cleared through central counterparties (CCPs), and all European derivative transactions to be reported to trade repositories. CCPs that were previously authorised in a Member State had to apply for authorisation under EMIR by 15 September 2013. On 18 March 2014, the first EU CCP was authorised under EMIR. In the meantime, further EU CCPs that had filed an application have been authorised to offer services and conduct activities in the EU.<sup>18</sup> The first authorisations of CCPs under EMIR have set in motion the process of determining the classes of derivatives subject to the mandatory clearing obligation. The European Securities and Markets Authority (ESMA) submitted final draft regulatory standards on the clearing obligation to the European Commission in October 2014, covering several classes of over-the-counter (OTC) interest rate derivatives. Mandatory clearing of these products will enter into force gradually as from 2015. The Eurosystem complements EMIR and uses the PFMI as its oversight standards for CCPs.

The Regulation on improving securities settlement in the EU and on **central securities depositories** (the CSD Regulation) entered into force on 17 September 2014. The aim of the Regulation is to increase the safety and efficiency of securities settlement and settlement infrastructures (i.e. central securities depositories – CSDs) in the EU. It introduces, inter alia, an obligation of dematerialisation for most securities, harmonised settlement periods for most transactions in such securities, settlement discipline measures and common rules for CSDs. The CSD Regulation enhances the legal and operational conditions for cross-border settlement in the EU. It delegates to ESMA and the EBA the drafting, in close cooperation with the members of the ESCB, of technical standards within nine months of its entry into force (i.e. before end-June 2015). The PFMI complements the provisions of the CSD Regulation with respect to the Eurosystem's oversight standards.

In the field of **shadow banking**, the FSB carried on with the deliverables agreed at the G20 Summit in St Petersburg in 2013, with a view to presenting an updated roadmap in time for the Brisbane Summit on 15-16 November 2014. Milestones attained in the last six months include:<sup>19</sup>

*The FSB makes further progress with its shadow banking agenda*

- (i) The publication in October of a revised regulatory framework on haircuts for non-centrally cleared short-term financing transactions to limit the build-up of excessive leverage outside the banking system and help reduce pro-cyclicality.<sup>20</sup> The framework includes a consultative proposal on the application of numerical haircut floors to transactions between non-banks.
- (ii) The review of standards and processes for global securities financing data collection and aggregation ahead of their planned public consultation.
- (iii) The approval of a work plan to examine a possible harmonisation of regulatory approaches to re-hypothecation of client assets and possible financial stability issues related to collateral re-use.

<sup>18</sup> An up-to-date list of authorised CCPs can be found on ESMA's website at: <http://www.esma.europa.eu/content/Registries-and-Databases>.

<sup>19</sup> See the FSB press release issued following the FSB Plenary Meeting on 17 and 18 September 2014 in Cairns, Australia (available at: [https://www.financialstabilityboard.org/press/pr\\_140918.htm](https://www.financialstabilityboard.org/press/pr_140918.htm)).

<sup>20</sup> See the FSB press release of 14 October 2014 (available at: [https://www.financialstabilityboard.org/press/pr\\_141013.htm](https://www.financialstabilityboard.org/press/pr_141013.htm)).

The FSB intends, in 2015, to launch a peer review of the jurisdictional implementation of the high-level policy framework for strengthening oversight and regulation of shadow banking entities (other than MMFs).

#### REGULATORY INITIATIVES FOR THE INSURANCE SECTOR

The **Solvency II Directive** will harmonise the different regulatory regimes for insurance corporations in the European Economic Area and will introduce risk-based capital requirements for the first time. After the adoption by the Council of the Omnibus II Directive, which amends the Solvency II Directive, the European Commission and the European Insurance and Occupational Pensions Authority (EIOPA) are working on rules and guidelines to specify more detailed requirements for individual undertakings, as well as for groups. In October, the Commission published the Solvency II Delegated Act, which covers the scope of the valuation of assets, capital requirements, governance, group supervision, third country equivalence, and reporting and public disclosure. The Delegated Act also sets out the details on the favourable treatment of long-term guarantee activities as agreed in the Omnibus II Directive, as well as details on the preferential regulatory treatment of high-quality securitisations. EIOPA is working on Implementing Technical Standards (ITSs) and Guidelines on Solvency II to ensure its uniform application. EIOPA has divided the ITSs and Guidelines into two sets. A first set of ITSs and Guidelines was submitted to the Commission on 31 October. A second set is scheduled to be published for consultation in December 2014, and is expected to be finalised by the middle of next year, before Solvency II is applied in 2016.

At the international level, the International Association of Insurance Supervisors (IAIS) has decided to identify, for 2014, the nine **global systemically important insurers** (G-SIIs) identified in 2013. A set of policy measures, such as higher loss absorbency (HLA), will apply to those insurers. As a basis for the HLA, the basic capital requirements (BCRs) for G-SIIs are currently being developed by the IAIS. The simple, factor-based BCRs will be replaced by a risk-sensitive global insurance capital standard (ICS) from 2019. The ICS will be applied not only to G-SIIs, but also to the wider group of internationally active insurance groups.

Table 3.4 Selected legislative proposals for the insurance sector in the EU

| Initiative                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Current status                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solvency II Directive/Omnibus II Directive | The Solvency II Directive is the framework directive that aims to harmonise the different regulatory regimes for insurance corporations in the European Economic Area. Solvency II includes capital requirements, supervision principles and disclosure requirements. The Omnibus II Directive aligns the Solvency II Directive with the legislative methods introduced by the Lisbon Treaty, incorporates new supervisory measures given to the European Insurance and Occupational Pensions Authority (EIOPA) and makes technical modifications. | The Solvency II Directive was adopted by the EU Council and the European Parliament in November 2009. It is now scheduled to come into effect on 1 January 2016. The European Commission has published the Delegated Act on Solvency II. EIOPA has submitted a first set of Implementing Technical Standards (ITSs) on approval processes and “Guidelines” relevant for approval processes, including Pillar I (quantitative basis) and internal models. |

#### OTHER INITIATIVES

Finally, an issue closely related to financial regulation is the proposal published by the European Commission on 14 February 2013 for implementing a financial transaction tax (FTT) in 11 euro area Member States via enhanced cooperation. The European Parliament adopted a legislative resolution on the proposal, in which it supports the Commission's proposal but calls for several amendments. The negotiations among Member States are continuing in the meantime. On 6 May 2014, new political impetus was given in a joint statement by ten ministers, issued in the context of the ECOFIN Council meeting. The statement envisages a staged approach (first equities and some derivatives, followed by other instruments at a later stage) and foresees that a first step of FTT implementation will enter into force in 2016.

Legislative proposals on tax policies do not fall within the fields of competence of the ECB. However, the ECB is monitoring the legislative process closely in view of the possible impact of the FTT on financial markets, financial market infrastructures, monetary policy implementation and financial stability.





## SPECIAL FEATURES

### A FIRE-SALE EXTERNALITIES IN THE EURO AREA BANKING SECTOR<sup>1</sup>

*This special feature studies the effects of fire-sale externalities in the euro area banking sector. Using individual bank balance sheet data and a framework developed by Greenwood et al. (forthcoming), an indicator is constructed to quantify the effects of fire-sale spillovers in terms of losses in equity capital in the banking system. For some countries, loans to monetary financial institutions are the most systemic assets, while for others loans to households can pose systemic risks. Thanks to the fine granularity of the background data and monthly updates, the index can be used as an early warning indicator and a measure of systemic risk.*

#### INTRODUCTION

The recent financial crisis has shown that a shock affecting a financial institution can propagate to other financial firms and jeopardise the stability of the whole financial system. One channel through which such contamination can spread is fire-sale spillovers.

The mechanics of such spillovers can be described as follows. As documented in a number of studies, financial firms often target leverage.<sup>2</sup> When a bank experiences an adverse shock to its equity capital which increases its leverage, one way for the bank to return to the target leverage is to shed assets and pay off debt. At times when market liquidity is scarce or an asset is illiquid, a financial institution which is forced to liquidate that asset may depress its price. As a consequence, other financial institutions holding the same asset (or assets of the same asset class) will suffer a loss, even if they do not have direct links with the firms initiating the (fire) sale. Affected financial institutions may, in turn, sell other assets to bolster their balance sheets. Therefore, common asset exposures can result in contagion, even between seemingly unrelated assets and banks.

Fire sales and the ensuing liquidation spirals have received extensive attention in the literature and are believed to have contributed significantly to systemic risk in the financial system.<sup>3</sup> The paper of Greenwood, Landier and Thesmar (Greenwood et al. (forthcoming)) proposes a framework to quantify such fire-sale externalities.<sup>4</sup>

By using individual bank balance sheet data, this special feature provides an aggregate vulnerability (AV) indicator for euro area banks which is based on the framework developed by Greenwood et al. This vulnerability indicator measures how much equity capital in the banking system is wiped out after a shock and when liquidation spirals occur.

The results of the analysis show that losses arising from asset fire sales can be large. The average value of fire-sale externalities after a 1% shock to assets throughout the sample is 37% of total euro area banking system equity. The AV index reaches its peak in autumn 2008, coinciding with the intensification of the financial crisis after the failure of Lehman Brothers. The outbreak of the euro area sovereign debt crisis in 2010 is also captured. Importantly, it is found that for some countries the

*The mechanics of fire sales*

*Losses arising from asset fire sales can be large*

<sup>1</sup> Prepared by Lorenzo Cappiello and Dominik Supera.

<sup>2</sup> See, for instance, Adrian, T. and Shin, H., "Liquidity and Leverage", *Journal of Financial Intermediation*, Vol. 19, No 3, July 2010, pp. 418-437.

<sup>3</sup> See, for example, Shleifer, A. and Vishny, R., "Liquidation Values and Debt Capacity: A Market Equilibrium Approach", *Journal of Finance*, Vol. 47, No 4, 1992, pp. 1343-1366; Shleifer, A. and Vishny, R., "Fire Sales in Finance and Macroeconomics", *Journal of Economic Perspectives*, Vol. 25, No 1, 2011, pp. 29-48; Brunnermeier, M. and Pedersen, L., "Market Liquidity and Funding Liquidity", *The Review of Financial Studies*, Vol. 22, Issue 6, June 2009, pp. 2201-2238; and Allen, F., Babus, A. and Carletti, E., "Asset commonality, debt maturity and systemic risk", *Journal of Financial Economics*, Vol. 104, Issue 3, 2012, pp. 519-534.

<sup>4</sup> Greenwood, R., Landier, A. and Thesmar, D., "Vulnerable Banks", *Journal of Financial Economics*, forthcoming.

### Policy implications

most systemic assets in the banking system are loans to monetary financial institutions (MFIs), while for others loans to households can pose systemic risks. However, asset “systemicness” differs across countries. The framework applied in this study can also be used to analyse the systemicness of specific assets. For example, when assuming a 25% write-off on a given set of countries’ government bonds, the AV index increases well before the outbreak of the sovereign debt crisis.

The findings have important policy implications. First, the analysis sheds light on the importance of monitoring leverage as a complement to capital requirements. Second, it shows that systemic risk can build up when certain assets in the banking system keep on growing, even if leverage remains approximately constant.<sup>5</sup> This suggests that in some cases a mere (relatively rapid) expansion of assets can pose risks to financial stability. Third, the study shows that banks in different countries can be vulnerable to different asset classes. This indicates that policy measures aimed at guaranteeing financial stability should be calibrated to the specific characteristics of different jurisdictions, a lesson which is very relevant for the euro area. Finally, since fire-sale spillovers can propagate across countries, it is essential that policy measures are coordinated internationally.

Greenwood et al. apply their framework to produce measures of the contribution of each bank to systemic risk, the interconnectedness between two banks and an AV indicator. In particular, using commercial bank exposures provided by the European Banking Authority’s July 2011 stress test, Greenwood et al. analyse the 2010-11 sovereign debt crisis and estimate the potential spillovers following the significant haircuts experienced by a set of European sovereigns. Furthermore, they evaluate the outcome of various policies aimed at reducing fire-sale spillovers during the crisis, i.e. forced mergers among the most exposed banks and equity injections.<sup>6</sup>

In a related work, Duarte and Eisenbach (2014) implement the Greenwood et al. framework<sup>7</sup> to construct the time series of a systemic risk measure that quantifies vulnerability owing to fire-sale spillovers using the regulatory balance sheet data for US commercial banks. Not surprisingly, their measure reaches a peak in Q4 2007 and spikes again in Q3 2008 but, interestingly, it starts to increase already in 2004, showing its relevance as an early warning indicator.

5 In this case equity capital grows at the same pace as assets.

6 While forced mergers would not have substantially reduced systemic risk, equity injections can significantly decrease banking sector vulnerability.

7 For more details on the methodology, see Greenwood et al., op. cit.; Duarte, F. and Eisenbach, T., “Fire-Sale Spillovers and Systemic Risk”, *Federal Reserve Bank of New York Staff Reports*, No 645, 2014.

#### Box A.1

##### THEORETICAL FRAMEWORK

To evaluate spillover losses, this special feature adopts the framework proposed by Greenwood et al. and assumes that banks are hit by a hypothetical shock, which either erodes their returns on assets or their equity capital. This will give rise to the liquidation spirals discussed in the Introduction above. In line with Greenwood et al., the framework is based on three hypotheses. First, it is assumed that banks target a given leverage and that, after a shock, they will sell assets in order to return to that target leverage. This leverage-targeting hypothesis is in line with

empirical evidence from, for example, Adrian and Shin (2010),<sup>1</sup> who show that banks manage book leverage to offset shocks to asset values. Second, it is assumed that banks, after the initial shock, will sell assets proportionally to their existing holdings. The third assumption is that asset sales generate a price impact of 10 basis points per €10 billion worth of assets sold. This assumption is in line with Amihud (2002),<sup>2</sup> who shows that this figure is close to the liquidity of a broad spectrum of stocks. Since most of the assets considered are less liquid than stocks, the price impact generated by the model is likely to be at a lower bound.

To understand the intuition of the model, it is useful to consider the following steps in the sequence of events occurring in a fire sale. The framework adopted quantifies each of those steps. The algebra is worked out in Greenwood et al. and Duarte and Eisenbach (2014).<sup>3</sup>

### 1) Initial stage (bank $j$ )

A population of  $N$  banks and  $K$  assets is considered. For simplicity, it is assumed that  $N = 2$  (indexed by  $j$  and  $h$ ) and  $K = 3$  (indexed by  $X$ ,  $Y$  and  $Z$ ). At time  $t = 0$ , bank  $j$  has total assets  $A_{j,0}$ , total liabilities (excluding capital)  $L_{j,0}$  and total capital  $E_{j,0}$ . It is also assumed that at time  $t = 0$ , bank  $j$ 's asset holding is given by  $X_{j,0}$ ,  $Y_{j,0}$ , and  $Z_{j,0}$ . Part 1 of the table below shows the balance sheet of bank  $j$  at time  $t = 0$ . For illustrative purposes, throughout the time periods of the exercise, we assume that bank  $h$  holds only assets  $Y$  and  $Z$ .

### 2) Initial shock and direct losses (bank $j$ )

At time  $t = 1$ , a shock occurs that wipes out 50% of asset  $X$  value. As a result, bank  $j$  incurs direct losses since the value of asset  $X$  decreases from  $X_{j,0} = €50$  billion to  $X_{j,1} = €25$  billion. At the same time, its capital is eroded by the same amount from  $E_{j,0} = €50$  billion to  $E_{j,1} = €25$  billion. Part 2 of the table presents the balance sheet of bank  $j$  at time  $t = 1$ , after the shock. As a result of the haircut, the leverage of bank  $j$  increases from  $Lev_{j,0} = L_{j,0}/E_{j,0} = 3$  at time  $t = 0$  to  $Lev_{j,1} = 6$  at time  $t = 1$ . To keep leverage constant at the level prevailing before the shock, bank  $j$  sells  $SO_{j,1} = Lev_{j,0} * (E_{j,0} - E_{j,1}) = €75$  billion. Since it is assumed that bank  $h$  does not hold asset  $X$ , it will not be subject to the direct losses stemming from the initial shock.

### 3) Asset sales (bank $j$ )

At time  $t = 2$ , bank  $j$  sells its assets proportionally to its holding at time  $t = 1$ :

$$- \text{Asset } X: SO_{j,1} * X_{j,1} / A_{j,1} = €10.71 \text{ billion}$$

$$- \text{Asset } Y: SO_{j,1} * Y_{j,1} / A_{j,1} = €21.42 \text{ billion}$$

$$- \text{Asset } Z: SO_{j,1} * Z_{j,1} / A_{j,1} = €42.86 \text{ billion}$$

Part 3 of the table reports the balance sheet of bank  $j$  at time  $t = 2$ .

1 Adrian and Shin (2010), op. cit.

2 Amihud, Y., "Illiquidity and stock returns: cross-section and time-series effects", *Journal of Financial Markets*, Vol. 5, Issue 1, 2002, pp. 31-56.

3 Op. cit.

#### 4) Price impact (bank $j$ )

Bank  $j$ 's asset sell-off affects the prices of assets at time  $t = 3$ . Assuming that the price impact is 10 basis points per €10 billion worth of assets sold, the liquidation of assets by bank  $j$  has the following price impact:

- Asset  $X$ : 14.29 basis points = 0.1429%
- Asset  $Y$ : 28.58 basis points = 0.2858%
- Asset  $Z$ : 57.14 basis points = 0.5714%

Therefore, bank  $j$  incurs additional losses stemming from the adverse price impact. The value of assets in the balance sheet of bank  $j$  decreases accordingly (as in step 2):

- Asset  $X$ :  $X_{j,3} = X_{j,2} * (1 - 0.5714\%) = €14.27$  billion
- Asset  $Y$ :  $Y_{j,3} = Y_{j,2} * (1 - 0.2858\%) = €28.50$  billion
- Asset  $Z$ :  $Z_{j,3} = Z_{j,2} * (1 - 0.5714\%) = €56.81$  billion

Part 4 of the table reports bank  $j$ 's balance sheet at the end of time  $t = 3$ . The decrease in the value of assets – which takes into account the effects stemming from the price impact – triggers a second-round sell-off of assets (as in step 3).

#### Balance sheet of banks $j$ and $h$ throughout the sample

| 1. Initial stage, $t = 0$ , bank $j$ |                 | 2. Initial shock and direct losses, $t = 1$ , bank $j$ |                   |
|--------------------------------------|-----------------|--------------------------------------------------------|-------------------|
| Assets:                              | Liabilities:    | Assets:                                                | Liabilities:      |
| $X_{j,0} = 50$                       | $L_{j,0} = 150$ | $X_{j,1} = 25$                                         | $L_{j,1} = 150$   |
| $Y_{j,0} = 50$                       | Capital:        | $Y_{j,1} = 50$                                         | Capital:          |
| $Z_{j,0} = 100$                      | $E_{j,0} = 50$  | $Z_{j,1} = 100$                                        | $E_{j,1} = 25$    |
| 3. Asset sales, $t = 2$ , bank $j$   |                 | 4. Price impact, $t = 3$ , bank $j$                    |                   |
| Assets:                              | Liabilities:    | Assets:                                                | Liabilities:      |
| $X_{j,2} = 14.29$                    | $L_{j,2} = 75$  | $X_{j,3} = 14.27$                                      | $L_{j,3} = 75$    |
| $Y_{j,2} = 28.58$                    | Capital:        | $Y_{j,3} = 28.5$                                       | Capital:          |
| $Z_{j,2} = 57.14$                    | $E_{j,2} = 25$  | $Z_{j,3} = 56.81$                                      | $E_{j,3} = 24.86$ |
| 5. Initial stage, $t = 2$ , bank $h$ |                 | 6. Spillover losses, $t = 3$ , bank $h$                |                   |
| Assets:                              | Liabilities:    | Assets:                                                | Liabilities:      |
| $Y_{h,2} = 75$                       | $L_{h,2} = 100$ | $Y_{h,3} = 74.79$                                      | $L_{h,2} = 100$   |
| $Z_{h,2} = 50$                       | Capital:        | $Z_{h,3} = 49.71$                                      | Capital:          |
|                                      | $E_{h,2} = 25$  |                                                        | $E_{h,3} = 24.5$  |

### 5) Initial stage (bank $h$ )

Since it is assumed that bank  $h$  holds only assets  $Y$  and  $Z$ , it will not be affected by the initial shock to asset  $X$ . However, bank  $j$ 's asset sell-off determines a price impact which affects bank  $h$  because of the decline in the value of assets  $Y$  and  $Z$  observed in step 4. In this example, the target leverage of bank  $h$  is assumed to be equal to 4. Therefore, the price impact on assets  $Y$  and  $Z$  triggers a sale of assets by bank  $h$  as well. Part 5 of the table shows bank  $h$ 's balance sheet at time  $t = 2$ .

### 6) Spillover losses (bank $h$ )

The price impact determines the spillover losses to all banks holding assets of the same asset class as those sold. In this example, in order to keep leverage constant, bank  $h$  needs to sell a share of its assets (as in step 3). This action decreases the price of those assets which are sold off and triggers a liquidation spiral in the banking system. The result of the price impact through bank  $j$ 's sales is that the value of bank  $h$ 's assets will decrease as shown in the calculations for step 4:

$$\text{– Asset } Y: Y_{h,3} = Y_{h,2} * (1 - 0.2858\%) = \text{€}74.79 \text{ billion}$$

$$\text{– Asset } Z: Z_{h,3} = Z_{h,2} * (1 - 0.5714\%) = \text{€}49.71 \text{ billion}$$

Part 6 of the table shows bank  $h$ 's balance sheet after spillover losses. To keep leverage constant at the level prevailing before the shock (i.e.  $Lev_{h,1} = 4$ ), bank  $h$  needs to sell €2 billion worth of assets as described in step 3.

## APPLICATION OF THE MODEL TO EURO AREA BANKS

A framework based on that proposed by Greenwood et al. is implemented using granular balance sheet data for a large sample of euro area banks.<sup>8</sup> Observations span from July 2007 until May 2014 at monthly frequency. The total AV index is computed at each point in time. Assuming an initial shock such that all assets decrease in value by 1%, the AV index is defined as the fraction of total banking system equity capital which would be wiped out owing to direct and second-round effects of fire-sale spillovers<sup>9</sup> (see Chart A.1).

The index increases steadily from around 39% of banking system equity capital in July 2007 until it reaches its peak in September 2008 at 52.5%, at the time of the Lehman Brothers failure.

Chart A.1 Aggregate vulnerability index

(July 2007 – May 2014; fraction of total banking system equity)



Sources: ECB and ECB calculations.

*The vulnerability index reaches its peak in September 2008 and decreases thereafter*

<sup>8</sup> For the purpose of this special feature, we use confidential balance sheet panel data for the 177 largest euro area credit institutions.

<sup>9</sup> The purpose of the exercise is not to identify the shock but to show the effects of the decrease in the value of the assets on equity.

*Systemic risk can build up when assets keep on growing, even if leverage remains constant...*

*... but it decreases when banking system leverage falls and assets grow at a slower pace*

The AV index then follows a downward sloping trend, with a spike in May 2010 capturing the outbreak of the sovereign debt crisis in the euro area. From September 2011 until May 2012 this trend comes to a halt and the index stabilises at around 35%, most likely reflecting the spread of the sovereign debt crisis within the euro area. Thereafter the index decreases almost continuously.

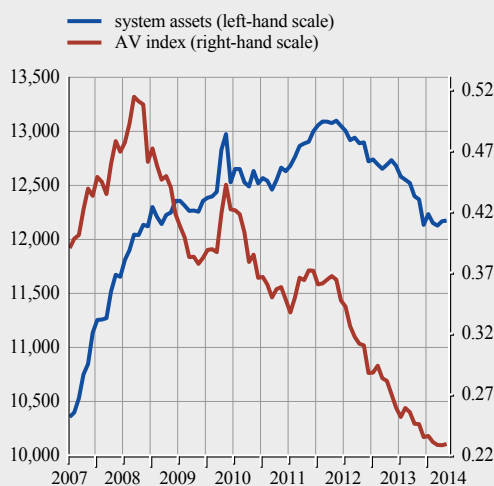
## DECOMPOSITION OF THE AGGREGATE VULNERABILITY INDICATOR

To understand the factors determining the extent of the spillover losses and how they vary over time, the AV index is decomposed into three components: the system assets (i.e. the total size of the assets in the banking system), the system leverage (i.e. the average leverage weighted by total liabilities), and the illiquidity concentration. The first factor is a relevant determinant of the AV index since the larger the size of the assets in the system, the larger the overall price effects. The system leverage contributes more than proportionately to the AV indicator because, for a given shock, the more highly leveraged the system, the larger the fire sales and, for a given fire sale, the larger the spillover losses in terms of equity capital. The illiquidity concentration denotes a modified Herfindahl-Hirschman index for asset classes. This factor indicates that if a given asset is widely held in banks' balance sheets and has a large aggregate share, if it is illiquid and concentrated in banks which are large, relatively highly leveraged and exposed to the initial shock, then that asset will contribute significantly to the vulnerability of the system (see Duarte and Eisenbach (2014)). Charts A.2 to A.4 plot the evolution of total assets, system-wide leverage and illiquidity concentration against the AV index.

This set of charts suggests that it is mainly the increase in asset size and, to a lesser extent, the rise in system leverage that drive the increase of the AV index from July 2007 to September 2008. In particular, a hypothetical shock would have its largest effect on the AV index when assets grow very rapidly (at around 1.1% on average per month) between July 2007 and September 2008. The

**Chart A.2 System assets and aggregate vulnerability index**

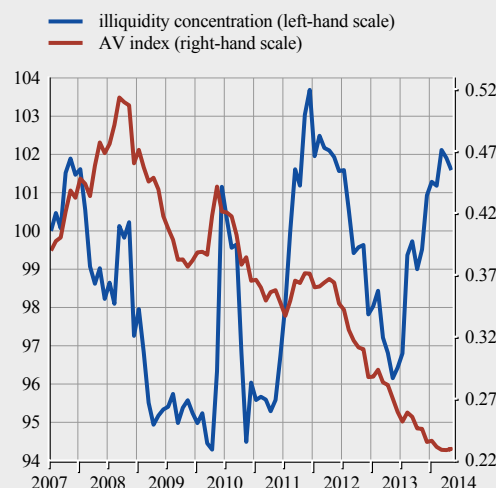
(July 2007 – May 2014; EUR billions (left-hand scale); fraction of total banking system equity (right-hand scale))



Sources: ECB and ECB calculations.

**Chart A.3 Illiquidity concentration and aggregate vulnerability index**

(July 2007 – May 2014; index: July 2007 = 100 (left-hand scale); fraction of total banking system equity (right-hand scale))



Sources: ECB and ECB calculations.

effect is smaller when assets grow at a slower pace (on average 0.27% per month) between October 2008 and March 2012. On the other hand, the substantial decrease in system leverage (from 16.5 in September 2008 to around 11.0 in May 2014) is largely responsible for the downward sloping trend of the AV index observed from September 2008. The illiquidity concentration is likely to contribute to the spike in the index observed in May 2010 and the interruption of the downward trend between September 2011 and May 2012, when the AV index tends to stabilise.

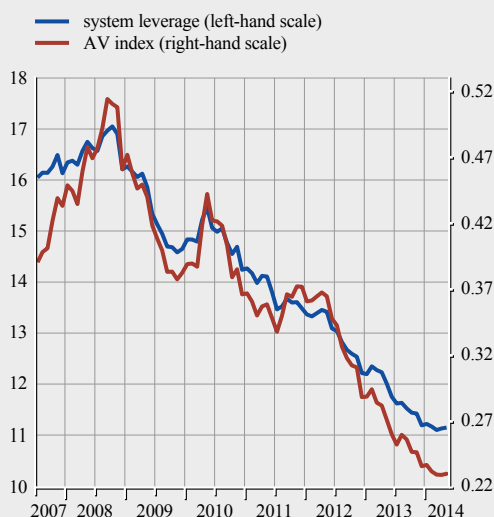
#### ASSET “SYSTEMICNESS”

The AV index is also decomposed according to the “systemicness” of each asset type – computing the contribution of an asset category to the aggregate vulnerability. Specifically, we consider the following question: how much equity capital would be lost owing to fire sales if a particular asset class were the only one that suffered a shock? Chart A.5 shows that the most systemic asset classes (with the average share in the index in parentheses) throughout our sample are loans to MFIs (31.3%), loans to households (18.5%) and loans to non-financial corporations with a maturity of over one year (13.3%). It should be pointed out that the contribution of each of these three asset classes to the index is different from their respective share in banks’ portfolios, namely 25.3%, 20.4% and 14.9%. This indicates that, besides the size of an asset class, it is its systemicness that plays an important role (i.e. the fact that the asset is held by systemic banks which are defined as those banks that are large and leveraged and, in turn, hold large proportions of other illiquid assets). It should be noted that the framework of fire-sale spillovers applies well to tradable assets, while less to loans. However, after an adverse shock to a given class of loan extended to a given sector, banks might reduce their lending to that sector. This increases the risk associated with that class of loan, which may trigger a further reduction in lending (or a tightening of lending standards, including an increase in loan interest rates). This can have a negative impact on the sector and backfire on the banks themselves in a self-reinforcing spiral. As a result, banks could further reduce lending and fire-sale (tradable) assets in their portfolio. Following this reasoning, even though loans are relatively illiquid assets, the framework of Greenwood et al. could still be applied to a bank’s entire balance sheet.<sup>10</sup>

Furthermore, the AV index is decomposed according to the “systemicness” of the banking sector of each euro area Member State. This enables the estimation of the contribution of each country’s banking sector to euro area banking sector fragility. As shown in Chart A.6, banks in group 1 countries – Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands and Slovenia – contribute the most to the AV index (70.7%), while the contribution to the index of banks in group 2 countries – Greece, Ireland, Italy, Portugal and Spain – is on average smaller (20.3%).<sup>11</sup>

**Chart A.4 System leverage and aggregate vulnerability index**

(July 2007 – May 2014; fraction of total banking system equity)



Sources: ECB and ECB calculations.

*Certain asset classes are more systemic than others*

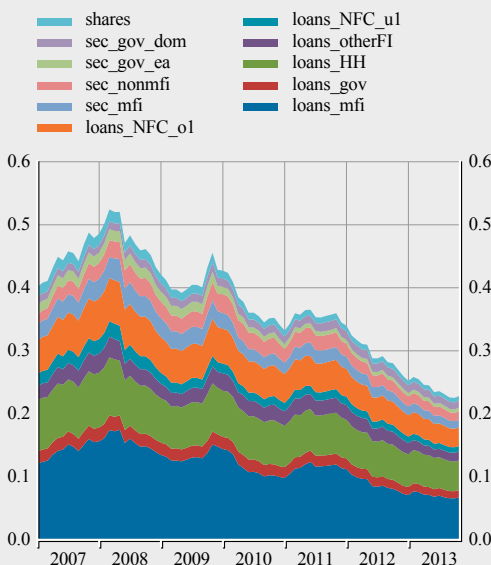
*Group 1 countries make the largest contribution to the AV index*

<sup>10</sup> Indeed Greenwood et al. and Duarte and Eisenbach (2014) also apply the framework to loans. See also Ramcharan, R. and Rajan, R. “Financial Fire Sales: Evidence from Bank Failures”, *Finance and Economics Discussion Series*, Federal Reserve Board, June 2014.

<sup>11</sup> Data for banks in Cyprus, Estonia, Malta and Slovakia were not available for the whole sample. Those banks are therefore excluded from the analysis.

**Chart A.5 Contribution of each asset to the aggregate vulnerability index**

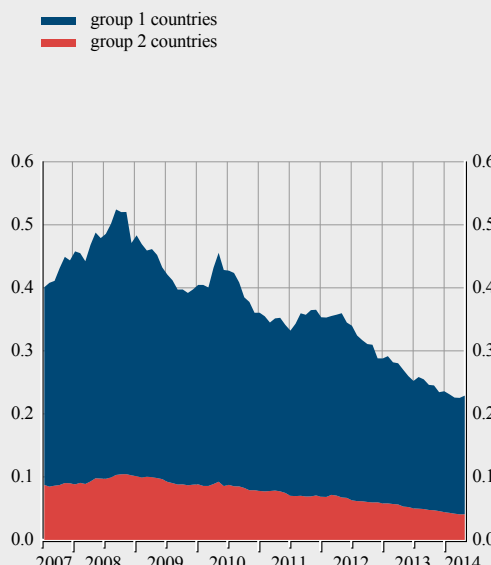
(July 2007 – May 2014; fraction of total banking system equity)



Sources: ECB and ECB calculations.  
Notes: loans\_mfi: loans to MFIs; loans\_HH: loans to households; loans\_NFC\_o1: loans to non-financial corporations with maturity over one year; loans\_gov: loans to general government; loans\_otherFI: loans to other financial institutions, pension funds and insurance corporations; loans\_NFC\_u1: loans to non-financial corporations with maturity up to one year; sec\_mfi: securities of MFIs; sec\_nonmfi: securities of non-MFIs (excluding general government); sec\_gov\_ea: securities of euro area governments (excluding the reference area); sec\_gov\_dom: securities of domestic government; shares: shares and other equities.

**Chart A.6 Aggregate vulnerability index – country breakdown**

(July 2007 – May 2014; fraction of total banking system equity)



Sources: ECB and ECB calculations.  
Notes: Group 1 countries refers to Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands and Slovenia. Group 2 countries refers to Greece, Ireland, Italy, Portugal and Spain. Data for banks in Cyprus, Estonia, Malta and Slovakia were not available for the whole sample. Those banks are therefore excluded from the analysis.

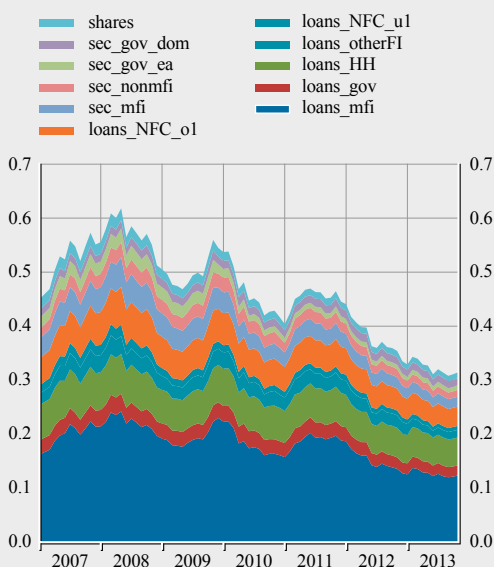
It is worth mentioning that the contribution of the banking sector of each country group is different from the share of that group's banking sector, as the share is computed as a fraction of the total euro area banking sector assets. The share of the group 1 countries is 59.6%, while that of the group 2 countries is 31.2%. Thus, the group 1 countries' banks are more systemic than banks in group 2 countries, not only because they have the largest share of assets but also because they hold a large proportion of illiquid assets.

*The countries mostly exposed to loans to MFIs are mainly group 1 countries, while the countries mostly exposed to loans to households are mainly group 2 countries*

The framework also enables vulnerability indices to be constructed grouping those countries' banking sectors that share similar sources of fragility. As shown from the breakdown into asset classes of the AV index, the most systemic assets are loans to MFIs and households. The analysis shows that the countries mostly exposed to loans to MFIs are mainly group 1 countries, while the countries mostly exposed to loans to households are mainly group 2 countries. The share of loans to MFIs in the AV index for the first group of countries is on average equal to 39.3%, while the share of loans to households in the AV index for the second group is on average equal to 30%. The indices for both groups of countries are reported in Charts A.7 and A.8 and are characterised by a similar pattern.

**Chart A.7 Aggregate vulnerability index  
specific to countries with loans to MFIs  
being the most systemic asset**

(July 2007 – May 2014; fraction of total banking system equity)

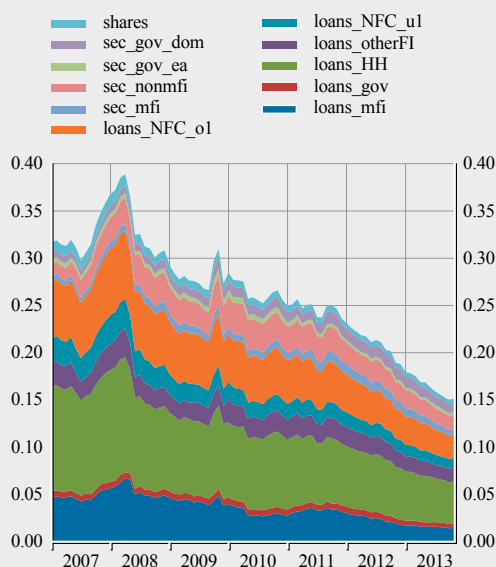


Sources: ECB and ECB calculations.

Notes: loans\_mfi: loans to MFIs; loans\_HH: loans to households; loans\_NFC\_o1: loans to non-financial corporations with maturity over one year; loans\_gov: loans to general government; loans\_otherFI: loans to other financial institutions, pension funds and insurance corporations; loans\_NFC\_u1: loans to non-financial corporations with maturity up to one year; sec\_mfi: securities of MFIs; sec\_nonmfi: securities of non-MFIs (excluding general government); sec\_gov\_ea: securities of euro area governments (excluding the reference area); sec\_gov\_dom: securities of domestic government; shares: shares and other equities.

**Chart A.8 Aggregate vulnerability index  
specific to countries with loans to  
households being the most systemic asset**

(July 2007 – May 2014; fraction of total banking system equity)



Sources: ECB and ECB calculations.

Notes: loans\_mfi: loans to MFIs; loans\_HH: loans to households; loans\_NFC\_o1: loans to non-financial corporations with maturity over one year; loans\_gov: loans to general government; loans\_otherFI: loans to other financial institutions, pension funds and insurance corporations; loans\_NFC\_u1: loans to non-financial corporations with maturity up to one year; sec\_mfi: securities of MFIs; sec\_nonmfi: securities of non-MFIs (excluding general government); sec\_gov\_ea: securities of euro area governments (excluding the reference area); sec\_gov\_dom: securities of domestic government; shares: shares and other equities.

The AV indices plotted in Charts A.7 and A.8 both reach a peak in autumn 2008 and then show a downward sloping trend. The difference between the indices for the two country groups mainly stems from the size of the fire-sale externalities. In the case of the first group (consisting mostly of group 1 countries), a 1% reduction in the value of all assets in the banking system would have wiped out around 62% of total equity capital at its peak in autumn 2008 and 46% on average throughout the sample. In the case of the second group (consisting mostly of group 2 countries), the direct effects and fire-sale externalities are of a lower magnitude – 39% at the peak and 26% on average.

### EFFECTS OF AN ADVERSE SHOCK TO SOVEREIGN BONDS

Finally, the last experiment studies a bank's susceptibility to the deleveraging cycle caused by a potential write-down of sovereign bonds. Echoing a similar exercise carried out by Greenwood et al., a 25% write-off in the value of Greek, Irish, Italian, Portuguese and Spanish government debt is considered.<sup>12</sup> The data used provide information on banks' exposure to the sovereign debt

*Assuming a substantial write-off of group 2 countries' government bonds, the AV index increases well before the outbreak of the sovereign debt crisis*

12 The size of the assumed write-off is in line with the maximum drop in price observed for Spanish and Italian government bonds between August 2010 and November 2011, which was 21.8% and 29.5% respectively. By way of comparison, the price of Greek and Portuguese government bonds fell by 97.6% and 61.1% respectively between November 2009 and February 2012. The value of Irish government bonds decreased by 48.7% between November 2009 and June 2011.

of their own country of residence. However, the dataset only shows the banks' holdings of aggregate foreign sovereign debt. For example, one cannot observe how much German or French sovereign debt is held by an Italian bank; only the total foreign euro area debt held by the Italian bank can be observed. To circumvent this data limitation, it is assumed that banks in the group 1 countries hold a share of group 2 countries' government bonds equal to the share of outstanding public debt of group 2 countries in the total public debt of all of the euro area countries considered in this study.<sup>13</sup> Chart A.9 plots the vulnerability indices after a 25% drop in the value of group 2 countries' government bonds for i) the group 1 countries' banks and ii) the group 2 countries' banks only.<sup>14</sup>

The AV index for the banking system for group 1 countries remains stable at around 20-25% until May 2010. The index thereafter exhibits a downward sloping trend, which stabilises at about 10%. On the other hand, the AV index for the banks in group 2 countries increases well before the outbreak of the sovereign debt crisis – from 13% in July 2007 and reaching a peak of 31% in May 2010. It then decreases before rising again in April 2012 with the second wave of the sovereign debt crisis. The index has decreased since April 2013 as confidence in the group 2 countries improves.

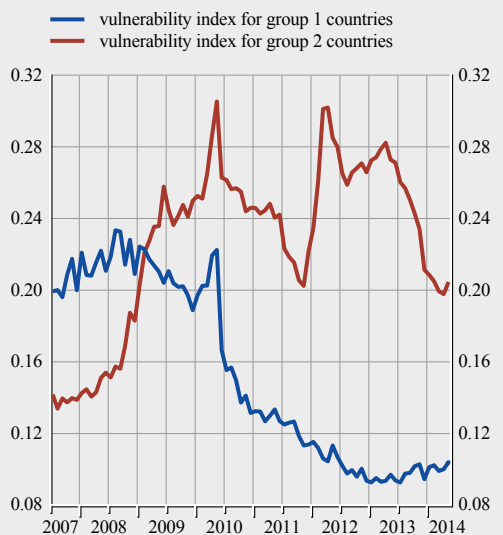
## CONCLUDING REMARKS

Using a simple framework and detailed balance sheet data for euro area banks, this special feature finds that spillover losses from fire sales can be large. The average value of fire-sale externalities throughout the sample from July 2007 until June 2014 is 37% of the total euro area banking system equity capital. Loans to MFIs, loans to households, and loans to firms with a maturity of over one year are the most systemic assets.

The AV index proposed can be used as a systemic risk measure and an early warning indicator. Its main advantage is that it is based on individual banks' balance sheet data. The fine granularity offered by balance sheet data provides a detailed overview of the evolution, composition and determinants of fire-sale vulnerability in the euro area banking sector. Furthermore, since the dataset underlying the analysis can be updated at a monthly frequency, the AV index is well suited for timely monitoring.

**Chart A.9 Vulnerability indices after a 25% drop in the value of group 2 countries' government bonds**

(July 2007 – May 2014; fraction of total banking system equity)



Sources: ECB and ECB calculations.

Notes: Group 1 countries refers to Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands and Slovenia. Group 2 countries refers to Greece, Ireland, Italy, Portugal and Spain. Data for banks in Cyprus, Estonia, Malta and Slovakia were not available for the whole sample. Those banks are therefore excluded from the analysis.

<sup>13</sup> It should be noted that this assumption can affect the results of the exercise. The conclusions should therefore be interpreted with caution.

<sup>14</sup> The two AV indices are computed as the fraction of group 1 and group 2 countries' banking system equity capital respectively.

B CAPTURING THE FINANCIAL CYCLE IN EURO AREA COUNTRIES<sup>1</sup>

*This special feature discusses ways of measuring financial cycles for macro-prudential policy-making. It presents some estimates and empirical characteristics of financial cycles. Existing studies on financial cycle measurement remain quite nascent in comparison with the voluminous literature on business cycles. In this context, two approaches – turning point and spectral analysis – are used to capture financial and business cycles at the country level. The results of the empirical analysis suggest that financial cycles tend to be more volatile than business cycles in the euro area, albeit with strong cross-country heterogeneity. Both aspects underscore the relevance of robust financial cycle estimates for macro-prudential policy design in euro area countries.*

## INTRODUCTION

Attenuating financial cycles is one of two fundamental goals of macro-prudential policy.<sup>2</sup> Indeed, the recent global financial crisis provided a vivid illustration of the time series dimension of systemic risk – namely, that recessions associated with the build-up of financial sector disruptions exhibit much higher output losses than “normal” recessions.

Despite the prominence of this goal in macro-prudential policy, there is no generally agreed definition of the financial cycle<sup>3</sup>, and existing measurement methods yield only preliminary and incomplete results. Existing analysis on characterising financial cycles remains scarce and is in many ways not yet suitable for policy use in the euro area. Measurement limitations include the geographic coverage of the analysis (in that it tends to focus on a limited number of countries) and a lack of consensus on the mechanics of measurement, such as the choice of indicators and the method used to construct them. Ideally, a unique synthetic measure of the financial cycle would summarise the (co-)movements over time of a range of financial sector variables, covering quantities and prices. In practice, however, over-reliance on a single composite measure is not advisable as each constituent variable contains relevant information for macro-prudential policy-making.

Measuring financial cycles for euro area countries has become more important in the context of ECB macro-prudential oversight and the launch of the Single Supervisory Mechanism (SSM). There is an urgent need to obtain a robust view on capturing financial cycles – balancing cross-country consistency with individual country relevance. This special feature presents the results of two different methodologies aimed at furthering the basis for country-specific macro-prudential policy-making in the euro area. One employs spectral methods for cycle extraction and characterisation for euro area countries, and the other characterises financial cycles on the basis of turning point analysis. Both approaches incorporate information from several macro-financial variables typically used in the growing body of literature to robustly capture the financial cycle across a diverse set of countries, and present relationships with business cycles extracted on a comparable methodological basis. In so doing, they provide information on differing properties of financial cycles across euro area countries, including their amplitude and persistence.

*Need for measures of the financial cycle...*

*... to support macro-prudential policy-making*

<sup>1</sup> Prepared by Paul Hiebert, Benjamin Klaus, Tuomas Peltonen, Yves S. Schüller and Peter Welz.

<sup>2</sup> The two commonly thought of goals are (i) attenuating the financial cycle and (ii) enhancing resilience of the financial system. See, for instance, the Group of Thirty, *Enhancing Financial Stability and Resilience: Macroprudential Policy, Tools, and Systems for the Future*, Working Group on Macroprudential Policy, October 2010 ([http://www.group30.org/images/PDF/Macroprudential\\_Report\\_Final.pdf](http://www.group30.org/images/PDF/Macroprudential_Report_Final.pdf)).

<sup>3</sup> One appealing characterisation of financial cycles relates to the pro-cyclicality of the financial system inherent in “self-reinforcing interactions between perceptions of value and risk, attitudes towards risk and financing constraints, which translate into booms followed by busts”. See Borio, C., “The financial cycle and macroeconomics: What have we learnt?”, *Journal of Banking and Finance*, Vol. 45, August 2014, pp. 182-198.

Nascent literature on financial cycles (in contrast to business cycles)...

... including turning point analysis...

... and spectral analysis

No single indicator can capture the financial cycle...

## EXISTING STUDIES ON THE FINANCIAL CYCLE: POINT OF DEPARTURE

Whereas the business cycle has been studied extensively, the comparable body of literature on financial cycles remains nascent. In general, cycles can be measured as *classical cycles* considering the level of the underlying time series, as *growth cycles* by removing a permanent component from the series under study, and as *cycles in growth rates* where the underlying time series is first transformed into growth rates.<sup>4</sup> Of the studies which have been seminal in laying the ground work for a better understanding of financial cycles across major economies, two strands stand out as representative.

The first consists of turning point analysis applied to cycle extraction – examining key descriptive characteristics such as duration, amplitude and slope. An influential study in this respect is Claessens et al. (2012),<sup>5</sup> which examines the phases of business and financial cycles and the resulting impact on macroeconomic performance for a broad range of advanced and emerging economies. Their findings suggest that, while financial variables tend to exhibit more variability than those related to the business cycle, this differs across financial assets such as equity (which has the longest upturn duration) and real estate variables (with housing exhibiting the longest downturn duration). Furthermore, their findings show that there is a close link between business and financial cycles.

The second strand focuses on frequency-based filters, in some cases complemented by turning point analysis. A widely cited study in this respect is Drehmann et al. (2012),<sup>6</sup> which uses both frequency-based filters and turning point analysis to identify financial cycles for several advanced economies and compares them with business cycles. The study finds that financial cycles are considerably longer than business cycles and that financial cycle peaks tend to be associated with financial crises.<sup>7</sup> Looking specifically at credit, Aikman et al. (forthcoming) apply a frequency-based filter to extract cyclical dynamics using very long time series and find that financial cycles tend to be longer than their economic analogue.<sup>8</sup>

While the available literature has greatly contributed to developing key methodologies, there is less consensus regarding which variables best help to capture the cycle and how to combine multiple variables. Moreover, systematic analysis has been limited for euro area countries.

## WHICH VARIABLES COULD CAPTURE THE FINANCIAL CYCLE?

Absent a single summary measure for the state of the financial sector, a multivariate approach that relies on a range of macro-financial indicators seems to provide the best-suited method for obtaining a financial cycle estimate. Such an approach would map the methodology used in a large body of business cycle research that goes beyond using real GDP as a summary indicator and instead

4 For a classification of cycle measurement approaches, see Harding, D. and Pagan, A., “A suggested framework for classifying the modes of cycle research”, *Journal of Applied Econometrics*, Vol. 20, Issue 2, 2005, pp. 151-159.

5 See Claessens, S., Kose, M. and Terrones, M., “How do business and financial cycles interact?”, *Journal of International Economics*, Vol. 87, Issue 1, 2012, pp. 178-190.

6 See Drehmann, M., Borio, C. and Tsatsaronis, K., “Characterising the financial cycle: don’t lose sight of the medium term!”, *BIS Working Paper*, No 380, June 2012.

7 See Stremmel, H. and Zsámboki, B., “The relationship between structural and cyclical features of the EU financial sector”, *Banking Structures Report*, ECB, October 2014, where a frequency-based filter set up by Drehmann et al. (ibid.) is used to conduct a turning point analysis on the filtered series and map structural features of the banking sector on the financial cycle for EU Member States. Their findings suggest that structural banking sector characteristics influence the amplitude of the financial cycle.

8 See Aikman, D., Haldane, A. and Nelson, B., “Curbing the credit cycle”, *The Economic Journal* (forthcoming).

employs a broad set of indicators on economic activity.<sup>9</sup> For instance, additional variables such as prices of goods and services (*consumer price inflation*) and the price of intertemporal substitution of consumption and investment (*interest rates*) should contain important information for a more accurate measurement of business cycles than reliance on any single variable such as GDP.

In conceptualising the determinants of the financial cycle, studies to date have focused predominantly on a combination of various measures of *credit*, e.g. transformations of total or bank-based credit, either in growth rates or credit to GDP ratios, as well as *asset prices*, especially real estate and equity prices. Measures of credit can give an impression of financial flows that form a conceptual analogue to flows of goods and services in business cycle research.

According to Schularick and Taylor (2012), the entire bank balance sheet and its decomposition may have macroeconomic implications.<sup>10</sup> Notably, variation in leverage (proxied by credit) is related to asset price developments.<sup>11</sup> With regard to the latter, while there are numerous possible proxies to capture asset price movements, a combination of residential property price indices, equity price indices and a measure of benchmark bond yields can provide a basis for capturing all main asset market segments.

Ultimately, it could be argued that a good starting point is an analysis of a parsimonious set of three or four variables for the financial cycle (credit, house prices, equity prices – as is standard in the literature to date – complemented by a country-specific benchmark interest rate as a proxy for bond market pricing) and three for the business cycle (GDP, consumer price inflation and the interest rate). Table B.1 summarises the key characteristics of these quarterly series in real terms for ten euro area countries since 1970.<sup>12</sup>

When looking at the characteristics of the series on a cross-country basis, it is clear that the indicators for the financial cycle tend to be more volatile than the indicators for the business cycle. This applies broadly to credit growth, house price growth and – in particular – equity price growth. By contrast, the mean growth rates of real GDP and inflation have been less volatile over approximately the last 40 years, albeit less stable in the early years for which data are available, mainly the 1970s.

Another important stylised fact relates to the considerable cross-country heterogeneity – arguably stronger for variables characterising the financial cycle (such as credit and asset prices) than those characterising the business cycle (such as GDP). Average total real *credit growth*, for instance, has been in the range of 4-5% per annum in most countries in the euro area since 1970, but rather low in Germany (at around 2.5%) and rather high in Ireland (in excess of 7%) over the same period. Similarly, while average real *house price growth* in these ten euro area countries has been around 1.5% since 1970, real house prices have actually fallen on average in Germany and nearly stagnated in Portugal. Likewise, average cross-country real *equity price growth* has been

... but credit and asset prices are key ingredients for financial cycle estimation

Key variables for euro area countries...

... suggest financial cycle determinants are relatively volatile...

... as well as considerable cross-country heterogeneity

9 For arguments in favour of using a variety of measures in the business cycle context, see, for example, Boehm, E., “A review of some methodological issues in identifying and analysing business cycles”, *Melbourne Institute Working Paper*, No 26/98, November 1998. See also Stock, J. and Watson, M.W., “Estimating Turning Points Using Large Data Sets”, *Journal of Econometrics*, Vol. 178, 2014, pp. 368-381.

10 See Schularick, M. and Taylor, A., “Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870–2008”, *American Economic Review*, Vol. 102, Issue 2, 2012, pp. 1029–1061.

11 Clearly, these variables represent a compromise to the ideal information set for financial cycle extraction. For example, it would be preferable to include key propagation mechanisms of systemic risk, such as actual *leverage* and *maturity mismatch*, but long time series at the country level for these series is unfortunately scarce for euro area countries.

12 Standard unit root tests suggest most variables in levels are integrated of order one in individual countries.



**Table B.1 Summary of data for selected euro area countries**

(annual percentage changes and percentage point changes)

|                 | Total credit              | House prices               | Equity prices                 | Interest rates            | GDP                       | Inflation                  |
|-----------------|---------------------------|----------------------------|-------------------------------|---------------------------|---------------------------|----------------------------|
| AT              | 4.9 (3.6)<br>[-2.4,13.9]  | 2.5 (7.5)<br>[-8.2,27.8]   | 1.6 (25.4)<br>[-88.9,88.6]    | -0.1 (1.3)<br>[-3.5,3.1]  | 2.4 (2.0)<br>[-5.2,8.9]   | -0.0 (0.5)<br>[-1.6,1.9]   |
| BE              | 4.5 (4.3)<br>[-10.7,12.2] | 2.3 (5.5)<br>[-14.3,11.5]  | 1.8 (20.5)<br>[-71.8,44.8]    | -0.1 (1.9)<br>[-7.7,6.0]  | 2.1 (2.0)<br>[-4.4,7.0]   | -0.0 (0.7)<br>[-2.0,2.8]   |
| DE              | 2.6 (2.6)<br>[-3.7,9.1]   | -0.2 (2.8)<br>[-5.8,7.9]   | 2.3 (20.9)<br>[-61.6,51.0]    | -0.1 (1.2)<br>[-3.7,3.4]  | 2.0 (2.2)<br>[-7.0,7.2]   | -0.0 (0.5)<br>[-1.5,1.3]   |
| ES              | 4.6 (6.2)<br>[-9.1,18.3]  | 2.3 (9.7)<br>[-14.0,31.0]  | -1.0 (26.4)<br>[-71.5,74.6]   | 0.0 (2.7)<br>[-9.7,10.2]  | 0.7 (5.0)<br>[-23.7,10.5] | -0.0 (1.0)<br>[-3.4,5.1]   |
| FI              | 4.3 (4.6)<br>[-12.1,13.6] | 1.3 (8.8)<br>[-22.2,30.1]  | 4.5 (32.0)<br>[-76.5,92.4]    | -0.1 (2.3)<br>[-8.3,6.4]  | 2.4 (3.4)<br>[-10.2,10.1] | -0.0 (0.8)<br>[-2.4,3.3]   |
| FR              | 3.9 (3.2)<br>[-2.1,11.9]  | 2.0 (5.2)<br>[-9.3,13.0]   | 2.0 (22.7)<br>[-56.3,51.3]    | -0.0 (1.4)<br>[-4.7,3.9]  | 2.1 (1.7)<br>[-4.0,5.6]   | -0.0 (0.6)<br>[-2.4,2.8]   |
| IE              | 7.5 (8.0)<br>[-8.9,30.5]  | 2.0 (9.3)<br>[-20.9,25.6]  | 1.8 (28.7)<br>[-104.1,50.6]   | 0.1 (3.0)<br>[-8.7,10.8]  | 1.7 (4.7)<br>[-16.8,12.7] | -0.1 (1.3)<br>[-4.9,3.8]   |
| IT              | 3.3 (4.6)<br>[-6.9,11.9]  | 1.6 (10.1)<br>[-20.2,48.4] | -1.3 (29.0)<br>[-66.6,89.2]   | -0.0 (3.0)<br>[-8.7,12.9] | 1.7 (2.6)<br>[-7.2,9.4]   | -0.0 (1.0)<br>[-3.9,3.5]   |
| NL              | 5.5 (4.5)<br>[-3.5,16.9]  | 1.9 (8.7)<br>[-24.7,31.3]  | 1.7 (20.9)<br>[-70.7,49.3]    | -0.1 (1.4)<br>[-6.2,3.2]  | 2.2 (2.2)<br>[-4.8,7.9]   | -0.0 (0.5)<br>[-1.4,1.1]   |
| PT              | 4.4 (6.2)<br>[-13.1,18.3] | 0.1 (3.0)<br>[-5.6,8.2]    | -0.6 (46.9)<br>[-198.2,127.6] | 0.2 (6.0)<br>[-34.7,34.3] | 2.5 (3.4)<br>[-6.5,11.3]  | -0.0 (2.4)<br>[-11.8,14.2] |
| Avg. (Std.dev.) | 4.6 (1.3)                 | 1.6 (0.9)                  | 1.3 (1.8)                     | -0.0 (0.1)                | 2.0 (0.5)                 | -0.0 (0.0)                 |

Sources: Eurostat and ECB calculations.

Notes: The table reports the mean, standard deviation (round brackets) and minimum as well as maximum value (square brackets). Quarterly variables are transformed to year-on-year changes and are in real terms, except for inflation. Real total credit, real house prices, real equity prices and real GDP are in annual percentage changes. Real interest rates and inflation reflect percentage point changes. Real interest rates represent deflated rates of long-term government bond yields. "Avg." refers to the average of the country means and "Std.dev." to the standard deviation of means across countries. The sample covers the period Q2 1972 – Q1 2014 (real total credit: Q2 1972 – Q4 2013). Exceptions are real house prices in the case of AT (starting Q3 1987), ES (starting Q1 1972), PT (starting Q1 1981), and BE/DE/DK/IT (ending Q4 2013). BE and FI (starting Q4 1971) and IE (starting Q2 1972) are the exceptions for real total credit. Real GDP ends in Q4 2013 for FI and IE. For ES and IE, industrial production (excluding construction) is used rather than GDP given the unit root properties of the latter series, likely associated with the services sector (starting Q1 1975 and Q1 1980 respectively).

of a similar magnitude at 1.3%, but has declined in Spain, Italy and Portugal over the period. *Real interest rate changes* across the ten countries have been around zero on average since 1970, with less cross-country variation in averages, but a vast difference in terms of volatility or extremes. By contrast, real GDP growth and consumer price inflation rates have tended to be more homogeneous across the euro area countries over the past few decades.

## METHODS TO CAPTURE FINANCIAL CYCLES FOR SELECTED EURO AREA COUNTRIES

As financial cycles are not directly observable, they must be inferred. This gives rise to a potential for both data and model uncertainty and so the use of complementary analytical perspectives can enhance measurement and policy-making. Against this background, two commonly used types of methodology are presented below, which together provide a conceptually distinct but complementary means of cycle extraction.

### Spectral analysis

A widely applied method of extracting cycles is spectral analysis, which, simply put, means applying filters that exploit information on dominant frequencies in variables that capture respective cycles. To account for specification uncertainty, a rich set of alternatives is proposed in the literature, ranging from univariate analysis (of a single series) through to extracting cycles based on commonality across several variables ("cohesion").

*Results from two methods to infer financial cycles*

*Multivariate spectral analysis...*

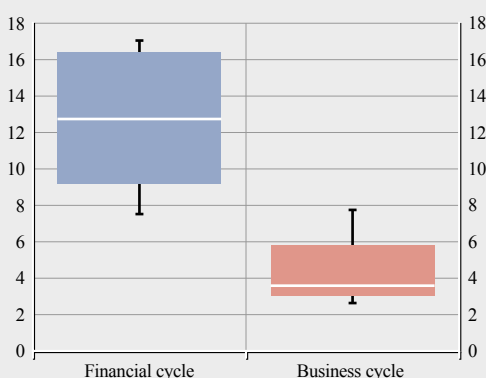
The results from a multivariate spectral approach for characterising financial cycles at the country level are presented below. The cycles are extracted using a three-step procedure combining spectral analysis with principal component analysis.<sup>13</sup> First, a cohesion measure capturing common movement regardless of the phase differences across variables is applied to capture the frequency range (or the length of cycles) with the highest co-movement across the set of indicators. Second, these country-specific frequency bands are used as an input into a band-pass filter to yield a continuous representation of country-specific cycles for each constituent indicator.<sup>14</sup> Third, these cycles constructed for each individual indicator are aggregated into a common country-specific financial cycle through principal component analysis, with normalised indicators rebased to an average volatility across all series.

A key finding from the first step of this analysis is that, while providing further evidence to support the finding that financial cycles tend to be longer than business cycles, there is considerable heterogeneity across euro area countries. As indicated in Chart B.1, financial cycles measured on this basis indeed appear to be just under three times as long as the average business cycle of the ten euro area countries analysed – around 13 years as opposed to five years.<sup>15</sup> But the dispersion of dominant country frequencies around this cross-country average is stark – with financial cycles lasting between seven and 17 years in contrast to business cycles lasting between three and eight years. Interestingly, the distribution of business cycle lengths seems to be skewed downwards compared with a relatively symmetric distribution for the financial cycle lengths, indicating a rather homogeneous cycle length for the business cycle. Clearly, there are some limitations to these data given structural changes over the last 40 years in many of the countries analysed, but the results are nonetheless illustrative.

Applying these dominant country frequencies can yield a composite estimate of a financial cycle for individual euro area countries, with a type of “concordance” across constituent explanatory variables around this principal signal. Specifically, filtering country credit, asset price (house and equity) and interest rate data using country-specific dominant frequencies yields a range for variables that are key underlying forces for the financial cycle – while the first principal component of these four variables yields a sort of “average financial cycle”, in the form of a linear combination of these individual cycles. Chart B.2 contains a representation of this output for an illustrative euro area country. The black line, representing the combination of cycles in individual variables at a given point in time, moves around a zero line representing deviations from a long-term historic average. The range of

**Chart B.1 Estimated length of financial and business cycles for selected euro area economies**

(years; maximum; minimum; inter-quartile range and median)



Source: ECB calculations.

Notes: Length of cycles refers to the point of maximum average cohesion across financial and real indicators along different frequencies. The sample includes data for ten euro area countries over Q1 1970 – Q1 2014, where available.

... as a basis for a three-step procedure to capture country financial cycles...

... suggesting relatively long (but heterogeneous) financial cycles...

... and enabling estimation of country-specific financial cycles...

<sup>13</sup> For details, see Schuler, Y., Hiebert, P. and Peltonen, T., “Characterising financial cycles across Europe: one size does not fit all”, *Working Paper Series*, ECB (forthcoming).

<sup>14</sup> See Christiano, L. and Fitzgerald, T., “The band-pass filter”, *International Economic Review*, Vol. 44, Issue 2, May 2003, pp. 435-465.

<sup>15</sup> This broadly confirms the finding of Drehmann et al. (2012), who argue that the duration of the financial cycle is, on average, around 16 years, or 20 years when considering only cycles that peaked after 1998.

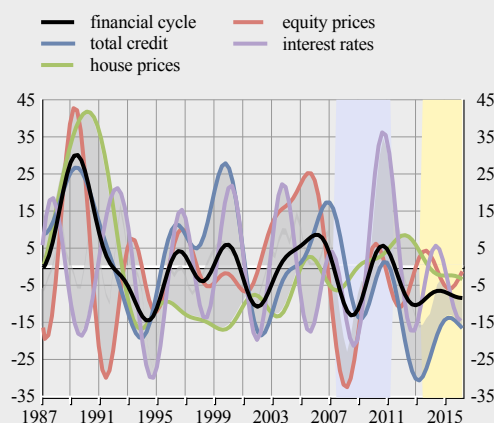
... with strong  
cross-country  
differences

cycles around this dominant signal then provides information on the concordance, or agreement, of these individual cycles. Clearly, this tends to differ across time. From a policy perspective, such a signal can be important to understand both where one may stand in a financial cycle at a given point in time and the level of uncertainty attached to such a signal.

Mirroring heterogeneity in the source data across the euro area countries, the ability of a dominant principal component to capture movement across those variables meant to capture the financial cycle varies considerably across countries. Indeed, financial cycle determinants across countries appear to be more heterogeneous than modelled business cycle determinants. As shown in Chart B.3, credit and house prices appear to be dominant explanatory factors in many but not all countries, while equity prices and interest rates appear to be, in all but one case, less important. Clearly, country-specific lead/lag relationships across variables may affect the degree to which contemporaneous low frequency co-movement is present.

**Chart B.2 Illustrative financial cycle and cycles of constituent indicators**

(quarterly data, standard deviation units from mean; rebased to series' variance)

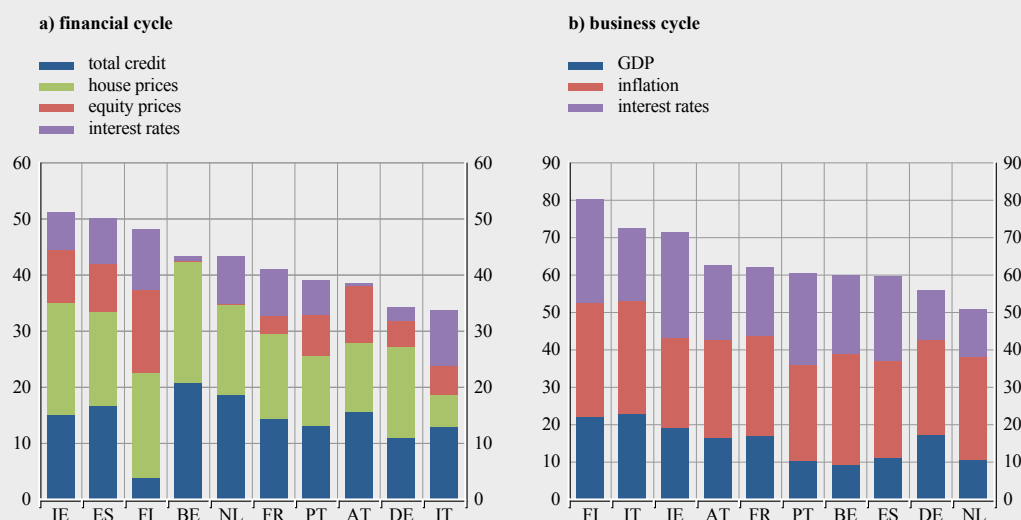


Source: ECB calculations.

Notes: The financial cycle is the first principal component of the four underlying smoothed and standardised indicators (coloured lines), namely interest rates, equity prices, residential property prices and total credit. Underlying indicators are smoothed using country-specific frequency windows as an input into a band-pass filter. The frequency window is determined via cohesion of indicators across cycle periods. The blue shaded area refers to banking crisis dates as specified in European Systemic Risk Board, "Operationalising the countercyclical capital buffer: indicator selection, threshold identification and calibration options", *Occasional Papers*, No 5, June 2014. The yellow shaded area refers to forecasted cycles. Dates refer to the third quarter of the indicated year.

**Chart B.3 Contributions to cyclical fluctuations across selected euro area countries**

(percentage of total variance)



Source: ECB calculations.

Notes: Figures reflect variance explained by a first principal component and the respective contributions of input variables. For the definitions and transformations of variables, see Table B.1. Variables have been standardised before obtaining the principal component.

### Turning point analysis

The second type of methodology for cycle inference is turning point analysis. The approach followed in this special feature applies classical cycle measurement focusing on the level of the series as in Bry and Boschan (1971) and Harding and Pagan (2002).<sup>16</sup> This type of turning point analysis has been mostly used to study the business cycle, but it has also been applied to financial series. Pagan and Sossounov (2003)<sup>17</sup>, for example, characterise the bull and bear market phases in equity prices; Claessens et al. (2012) analyse cycles in credit, house prices and equity prices; Drehmann et al. (2012) apply the algorithm to identify peaks and troughs in short-term and medium-term cycles of both GDP and financial series; and Bracke (2013) studies cycles in house prices.<sup>18</sup>

While a key advantage of turning point analysis is that it identifies the local minima and maxima in the levels of a series of interest, which is simple, transparent and robust to the inclusion of newly available data, a few parameters still need to be chosen. To ensure comparability with other studies, the analysis here uses for all series the common parameter settings as in Claessens et al. (2012). In particular, the initial turning points are searched within a window of two quarters and thereafter censoring rules of a minimum phase (complete cycle) length of two (five) quarters are applied.

The method is applied to investigate real credit, real residential property prices and real equity prices as the variables that may best capture information about the financial cycle from a macroeconomic perspective. In addition, turning points for the level of real GDP are determined to capture the business cycle. The sample includes the same ten euro area countries used in the spectral analysis.

Table B.2 summarises the results across the euro area countries of phase characteristics from turning point analysis, such as amplitude, duration and slope. The results reveal that, while the amplitude in the credit cycle is about twice as high as in the business cycle, they are roughly equally long. Property and equity price upturns tend to be shorter than those in credit and GDP. There is large country heterogeneity in real property price cycles, probably reflecting differing and complex

*Turning point analysis of financial variables in levels takes alternative view*

*Real credit, equity and housing prices are analysed separately and then compared*

**Table B.2 Summary of turning point analysis**

(number of years; percentage changes; percentage changes per year)

|                                  | Downturn         |                  |           |       | Upturn           |                  |           |       |
|----------------------------------|------------------|------------------|-----------|-------|------------------|------------------|-----------|-------|
|                                  | Number of phases | Duration (years) | Amplitude | Slope | Number of phases | Duration (years) | Amplitude | Slope |
| Real total credit                | 51               | 1.3              | -4.0      | -0.8  | 50               | 5.7              | 34.9      | 1.3   |
| Real equity prices               | 106              | 1.6              | -40.9     | -6.8  | 103              | 1.8              | 48.3      | 7.0   |
| Real residential property prices | 65               | 2.0              | -12.1     | -1.4  | 66               | 3.3              | 22.2      | 1.8   |
| Real GDP                         | 64               | 1.0              | -2.8      | -0.6  | 56               | 5.6              | 18.1      | 0.7   |

Sources: BIS, OECD, Eurostat and ECB calculations.

Notes: All statistics are computed over all countries included in the sample and separately for both cycle phases. Downturns (upturns) are defined as the phases between peak and trough (trough and peak). Duration measures the average length of a cycle phase in years. Amplitude refers to the average percentage change in a variable over upturns and downturns respectively. Slope refers to the ratio of amplitude to duration.

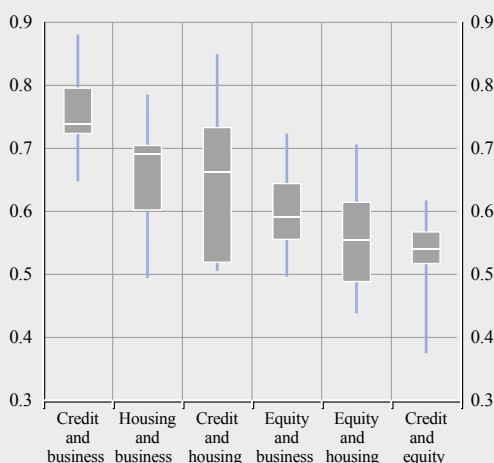
16 See Bry, G. and Boschan, C., *Cyclical analysis of time series: Selected procedures and computer programs*, National Bureau of Economic Research, Inc., 1971; and Harding, D. and Pagan, A., "Dissecting the cycle: a methodological investigation", *Journal of Monetary Economics*, Vol. 49, Issue 2, 2002, pp. 365-381, where the former developed the methodology for monthly data and the latter adapted it to quarterly data.

17 See Pagan, A. and Sossounov, K., "A simple framework for analysing bull and bear markets", *Journal of Applied Econometrics*, Vol. 18, Issue 1, 2003, pp. 23-46.

18 See Bracke, P., "How long do housing cycles last? A duration analysis for 19 OECD countries", *Journal of Housing Economics*, Vol. 22, Issue 3, 2013, pp. 213-230.

**Chart B.4 Synchronisation of cycles within countries**

(share of quarters; maximum; minimum; inter-quartile range and median)



Sources: BIS, OECD, Eurostat and ECB calculations.

Notes: The chart shows the degree of synchronisation of cycles within countries. Synchronisation is measured as the concordance between two series (e.g. real credit and real GDP) in each country.

**Chart B.5 Synchronisation of cycles across countries**

(share of quarters; maximum; minimum; inter-quartile range and median)



Sources: BIS, OECD, Eurostat and ECB calculations.

Notes: The chart shows the degree of synchronisation of cycles across countries. Synchronisation is measured as the concordance using a particular series (e.g. real credit) for two countries.

structural characteristics in regional housing markets, such as tax treatment of housing, macro-prudential and mortgage market features, and land and rental regulation.<sup>19</sup>

Based on the identified turning points, the extent to which cycles are synchronised, both within a given country and across countries, can also be determined. In particular, a useful measure is the concordance index proposed by Harding and Pagan (2002), which measures the fraction of quarters that two cycles are in the same phase.

Within countries, credit, business and housing cycles are the most strongly correlated, while equity cycles are much less synchronised with the other cycles (see Chart B.4), partly reflecting the close relationship observed between the business cycle and loans to the non-financial private sector. Specifically, this seems to be in line with the stylised fact observed for euro area aggregates that growth in loans to households, of which loans for house purchase constitute the largest fraction, is roughly coincident with growth in real GDP.<sup>20</sup> As shown in Chart B.5, business, credit and equity cycles are more strongly correlated across countries than housing cycles, which also display a substantial variation in the degree of synchronisation, again owing to the diverse structure of housing markets across countries.

## CONCLUDING REMARKS

One of the key goals of the new macro-prudential mandates around the world is to attenuate financial cycles. In the euro area, there is a need for *country-level* financial cycle estimates to provide a clear and consistent yardstick to guide forward-looking macro-prudential policy.

<sup>19</sup> See, for example, “Institutional features and regulation of housing and mortgage markets” in European Commission, *Quarterly report on the euro area*, Vol. 13, Issue 2, June 2014.

<sup>20</sup> See, for example, the box entitled “Stylised facts of money and credit over the business cycle” *Monthly Bulletin*, ECB, October 2013.

*Strong correlation between credit, housing and business cycles within countries*

*Estimating financial cycles for euro area countries...*

This special feature presented two methodologies to measure financial cycles for euro area countries and benchmarked these against business cycles obtained on a comparable basis. The methodologies are in many ways complementary – the turning point analysis considered in this special feature focuses on the levels of the underlying series, while spectral analysis looks at growth rates, thereby incorporating important information contained in stocks and flows.

Results suggest that the features of financial cycles tend to differ considerably from their business cycle counterparts. Both methodologies confirm the higher amplitude in the cycles of financial variables compared with the business cycle. The findings differ with regard to the length of the financial cycle, however, which can be attributed to the different definitions of cycles inherent to both methodologies. The relevance of measures of credit and asset prices in effectively capturing a synthetic financial cycle appears to vary at the country level, reflecting cross-country heterogeneity and idiosyncrasies in underlying driving forces.

*... suggests financial  
and business cycles  
differ strongly*

## C INITIAL CONSIDERATIONS REGARDING A MACRO-PRUDENTIAL INSTRUMENT BASED ON THE NET STABLE FUNDING RATIO<sup>1</sup>

*The financial crisis led to a broad consensus among policy-makers and regulators that macro-prudential frameworks, in addition to micro-prudential policy, must be part of the solution to ensure the resilience of the financial system. The counter-cyclical capital buffer represents the first step in this direction taken by the Basel Committee on Banking Supervision. Regarding liquidity issues, two micro-prudential standards have been designed. The delegated act implementing the liquidity coverage ratio (LCR) at the European level has recently been adopted by the European Commission and the net stable funding ratio (NSFR) standard has just been finalised by the Basel Committee on Banking Supervision and was published on 31 October. After implementing these new standards, it will be necessary to monitor their impact on banks' behaviour, market liquidity, monetary policy and financial stability before considering introducing any additional instruments. At this stage, the need for a liquidity-based macro-prudential tool is in the early stages of identification and discussion. Therefore, this special feature aims to provide some initial technical considerations regarding the macro-prudential use of the NSFR. The discussion considers two broad perspectives. The first is the need for a counter-cyclical NSFR to complement the counter-cyclical capital buffer. While capital and liquidity standards pursue different objectives, the two can also be used in conjunction depending on the specific risk to financial stability being targeted. The second perspective regards the use of the NSFR as a stand-alone macro-prudential tool, together with its potential trigger mechanism and its use in the current low yield environment.*

### INTRODUCTION

*The NSFR is intended to increase the resilience of banks confronted with liquidity shocks...*

The financial crisis highlighted the risks of unstable funding mixes and maturity mismatches on banks' balance sheets. As a result, a series of micro-prudential standards have been developed, aimed at strengthening the resilience of banks confronted with liquidity shocks. One of the two instruments adopted by the Basel Committee on Banking Supervision in December 2010, together with the liquidity coverage ratio (LCR), is the net stable funding ratio (NSFR).<sup>2</sup> The purpose of the NSFR is to ensure banks achieve a "stable funding profile" by limiting their excessive reliance on short-term wholesale funding relative to the liquidity risk characteristics of their assets and off-balance-sheet exposures (see Box C.1 for more detailed information on the composition of the NSFR). It supplements the LCR – which promotes banks' short-term resilience to severe idiosyncratic and market-wide liquidity stress – by reducing the funding risk of institutions over a longer-term horizon.

*... but as a micro-prudential tool, it might not be sufficient*

Micro-prudential policy applies the same standards across banks, regardless of the impact of an institution's failure on the financial system. Consequently, the micro-prudential approach assumes that the sources of risk are independent and exogenous to the collective behaviour of financial institutions. This shortcoming is addressed by the macro-prudential approach, which takes a systemic view rather than focusing on individual institutions. By considering both the systemic impact of financial institutions (the cross-sectional dimension) and the evolution of system-wide risk (the time dimension), the macro-prudential approach addresses the negative feedback loop that may emerge between the financial system and the real economy.

There has been significant progress in the design of macro-prudential tools, most notably the counter-cyclical capital buffer<sup>3</sup> and the additional capital requirements for systemically important

<sup>1</sup> Prepared by Andreea Bicu, Daniela Bunea and Michael Wedow.

<sup>2</sup> Basel Committee on Banking Supervision, *Basel III: the Net Stable Funding Ratio*, 2014.

<sup>3</sup> Basel Committee on Banking Supervision, *Basel III: A global regulatory framework for more resilient banks and banking systems*, 2011.

banks.<sup>4</sup> Both tools require banks to hold greater amounts of capital, either in particular states of the economy (credit boom) or, in the case of systemically important institutions, at all times. However, in its discussions, the European Systemic Risk Board (ESRB)<sup>5</sup> has highlighted that capital regulation may not be sufficient to limit systemic risk. Four sources of banking sector systemic risk have been identified: i) excessive credit growth and leverage; ii) excessive maturity mismatch and market illiquidity; iii) direct and indirect exposure concentrations; and iv) misaligned incentives with a view to reducing moral hazard. A combination of macro-prudential tools designed to address systemic risks posed by all of these four sources is hence needed.

Despite the significant progress made in understanding liquidity cycles, a framework that identifies systemic liquidity risks and guides the implementation of macro-prudential liquidity tools is still missing. Since the NSFR is by construction a micro-prudential tool, there is a debate regarding how the NSFR could be used as a macro-prudential instrument and, if necessary, how it should be modified for this purpose. The NSFR is a new liquidity metric and is yet to be implemented. Therefore, it must be kept in mind that a monitoring period for the ratio as well as more data and analysis are necessary in order to assess its practical use and shortcomings. While further adjustments to the NSFR may be premature at this stage, this special feature seeks to put forward some initial considerations regarding the potential use of the NSFR as a macro-prudential tool.

4 Basel Committee on Banking Supervision, *Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement*, 2013; Financial Stability Board, *2013 update of group of global systemically important banks (G-SIBs)*, 2013.

5 European Systemic Risk Board, *Flagship report on macro-prudential policy in the banking sector*, 2014; European Systemic Risk Board, *The ESRB handbook on operationalising macro-prudential policy in the banking sector*, 2014.

## Box C.1

### WHAT IS THE NET STABLE FUNDING RATIO?

The purpose of the net stable funding ratio (NSFR), as a structural liquidity risk metric, is to reduce maturity mismatches between assets and liabilities over a one-year time horizon and, thereby, to reduce funding risk.

Under this standard, banks are required to hold a minimum amount of stable funding relative to the maturity/liquidity profile of their assets in order to limit their structural liquidity mismatch. It complements the liquidity coverage ratio (LCR) and is intended to limit the proportion of banks' less liquid assets, such as long-term loans with maturities of over one year that are funded by short-term funding of less than one year, or funding sources considered less reliable and stable. In addition, the NSFR is intended to encourage a better assessment of funding risk across all on- and off-balance-sheet items and, overall, to promote funding stability.

The NSFR measures the ratio between the available amount of stable funding (ASF) and the required amount of stable funding (RSF). The ASF consists of weighted liabilities reflecting their contractual maturity or expected behavioural stability. The RSF consists of assets weighted by factors to reflect their contractual maturity or their expected market liquidity. The weights for assets and liabilities range from 100% to 0%. The ASF is the portion of a bank's funding structure that is a reliable source of funding over a one-year time horizon, while the RSF is the portion of a bank's assets and off-balance-sheet exposures viewed as illiquid over a one-year horizon and should thus be backed by stable funding sources.

The design of the NSFR underwent some changes in January 2014 compared with its initial design proposed in December 2010. These changes included greater granular differentiation in terms of maturity and sought to reflect that the NSFR is a structural liquidity risk metric rather than a ratio calculated for stress scenarios. Overall, the revisions have made the tool more suited to detecting outlier banks with excessive maturity mismatches and thus fragile funding structures, as well as brought it more into line with the LCR in terms of the treatment of high-quality liquid assets. The final calibration of the NSFR was published in October 2014 and its implementation is foreseen for 2018.

## LIQUIDITY AS A COMPLEMENT TO OTHER PRUDENTIAL MEASURES

The primary objective of micro-prudential regulation is “the promotion of safety and soundness of banks and the banking system”.<sup>6</sup> The main regulatory standards which aim to fulfil this goal are based on capital and liquidity requirements. It is thus important to better understand the different objectives of and interactions between capital and liquidity requirements.

*Adequate buffers for both capital and liquidity are necessary*

Capital and liquidity holdings are both important for increasing the resilience of banks. However, the nature of the shocks that capital regulation helps mitigate is different from the types of shock that liquidity regulation helps mitigate. The purpose of capital regulation is to limit the risk of insolvency, given the loss-absorbing capacity of this form of funding. By contrast, liquidity rules are intended to limit the maturity mismatch between liabilities and assets and, as a result, minimise funding liquidity risk (i.e. the inability to settle payment obligations) and market liquidity risk (i.e. the inability to sell or use assets without a significant impact on prices). Insufficient balance sheet liquidity can also lead to cash-flow insolvency<sup>7</sup>, even if a bank is still considered solvent from a capital perspective.<sup>8</sup> Liquidity and solvency are closely interrelated. On the one hand, higher capital holdings reduce the need for liquidity buffers, all else being equal. Banks, however, still need to maintain adequate liquidity regardless of their capital levels since the two cannot perfectly substitute for one another. Therefore, strengthening capital buffers is not sufficient by itself to address liquidity risks affecting both sides of the balance sheet.<sup>9</sup> Moreover, even a highly rated bank can have difficulties accessing private sources of funding, as the recent financial crisis has shown.<sup>10</sup> Conversely, liquidity buffers can compensate to some extent for low capital levels and protect the bank when faced with a confidence shock. The importance of maintaining adequate capital *and* liquidity levels supports the need for liquidity standards to complement capital regulation.

*Interactions between liquidity and other regulatory measures should be taken into account*

According to the Bank of England,<sup>11</sup> there are a number of channels through which the newly introduced liquidity standards interact with a bank’s capital position and vice versa. For instance, higher levels of capital give confidence to depositors and investors to provide or roll over funding to banks. Alternatively, increasing the NSFR/LCR by replacing illiquid loans with liquid assets leads to an improvement in capital ratios by decreasing risk-weighted assets. In addition, building capital and NSFR buffers is likely to be less costly for the bank when done in parallel, since an improvement in the NSFR will be accompanied by an increase in the capital ratio and vice

6 See Basel Committee on Banking Supervision, *Core principles for effective banking supervision*, 2012.

7 Cash flow insolvency is defined as the inability of a bank to repay its debts when they become due.

8 Farag, M., Harland, D. and Nixon, D., “Bank capital and liquidity”, *Quarterly Bulletin*, Bank of England, 2013.

9 European Systemic Risk Board, *The ESRB handbook on operationalising macro-prudential policy in the banking sector*, op. cit.

10 See van Rixtel, A. and Gasperini, G., “Financial crises and bank funding: recent experience in the euro area”, *BIS Working Paper*, No 406, 2013.

11 Farag, M., Harland, D. and Nixon, D., op. cit.

versa.<sup>12</sup> Moreover, the cost of increasing the NSFR gradually declines when more capital is raised, highlighting the synergies between the two standards.

In sum, prudential regulation should ensure that banks have sufficient capital and liquidity in order to avoid disrupting their financial intermediation function. The optimal combination should minimise the probability of distress, while balancing the benefits and costs of holding liquidity and capital.<sup>13</sup>

### WHAT HAPPENS TO THE NSFR WHEN THE COUNTER-CYCLICAL CAPITAL BUFFER IS BUILT UP?

Against the background of the link between the liquidity and capital standards, this section explores the relationship between the counter-cyclical capital buffer and the NSFR. It is important to understand how the two standards interact when the counter-cyclical capital buffer is activated. The starting point of the analysis is a stylised bank balance sheet with an initial NSFR close to the weighted average of the banks assessed under the Basel Committee's Quantitative Impact Study (NSFR = 115%). Moreover, under all scenarios, the bank fulfils the minimum Basel III requirements for the risk-based capital and leverage ratios. The effect of implementing the full counter-cyclical capital buffer (2.5% of risk-weighted assets) on the NSFR for different starting bank capital ratios (8%, 9% and 10%) is considered. Under a first scenario, the bank maintains its entire existing capital buffer, even if it is above the minimum requirement. However, if the bank already has a capital buffer above the minimum requirement before the counter-cyclical capital buffer is built up, it could also choose to reduce this buffer to limit the potential impact on income and costs. Hence, the second scenario considers the case where the bank meets the higher minimum requirement by relying on the existing capital buffer. These two scenarios define a range for banks' decisions when capital ratios need to be adjusted.

In order to estimate the effect on the NSFR of the build-up of capital, two broad benchmark cases are assessed, as illustrated in Chart C.1: (1) portfolio rebalancing via a shift towards assets with lower risk weights; and (2) balance sheet expansion resulting from an increase in capital.

#### Case 1 – Portfolio rebalancing

As an alternative to raising new equity, the bank may choose to decrease its risk-weighted assets while keeping the total size of the balance sheet unchanged. Under this scenario, replacing riskier assets by less risky assets is also likely to improve the NSFR, given that less risky assets are typically also more liquid and may thus also result in a lower required amount of stable funding (RSF).

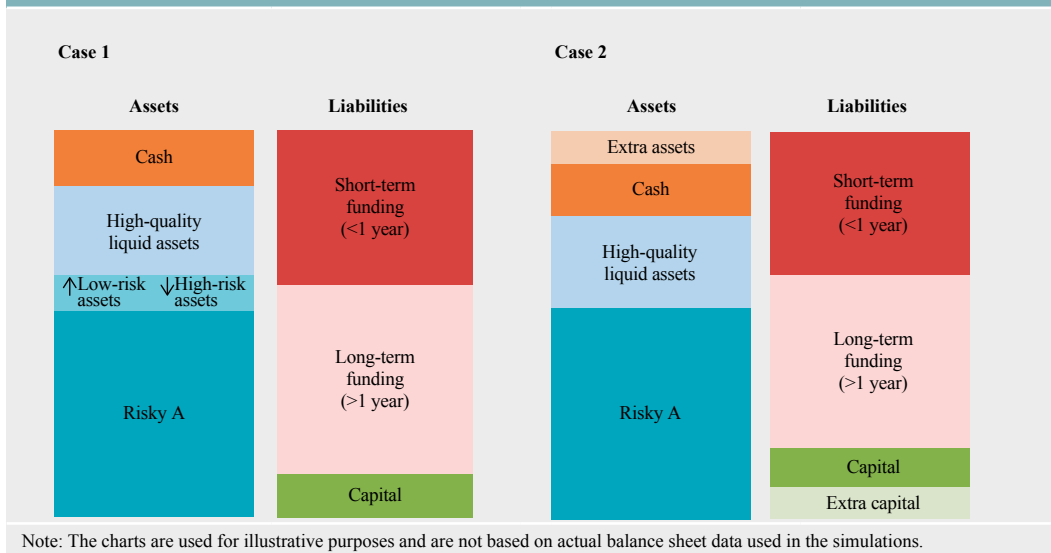
#### Case 2 – Balance sheet expansion

Under this scenario, the bank raises its capital ratio by issuing capital and/or retaining earnings, leading to an expansion of the balance sheet. Moreover, it is assumed that the bank invests the proceeds in assets requiring less regulatory capital. With regard to the NSFR, on the liability side, the increase in capital will lead to an improvement in the available amount of stable funding (ASF) of the same magnitude (100% factor). On the asset side, the investment will lead to a relatively smaller increase in the RSF for the majority of asset categories. As a consequence, the bank will see an improvement in its NSFR. The overall impact on the NSFR will be maximised by investing in assets with the lowest RSF, such as cash and sovereign bonds.

<sup>12</sup> See King, M.R., "Mapping capital and liquidity requirements to bank lending spreads", *BIS Working Paper*, No 324, 2010, and Basel Committee on Banking Supervision, *An assessment of the long-term economic impact of stronger capital and liquidity requirements*, 2010.

<sup>13</sup> There are potentially also further interactions between the NSFR and the possible requirements for "bail-inable" debt for resolution purposes. These interactions are not considered in this special feature given that the work on resolution requirements is still ongoing.

**Chart C.1 Possible strategies for meeting the counter-cyclical capital buffer requirement**

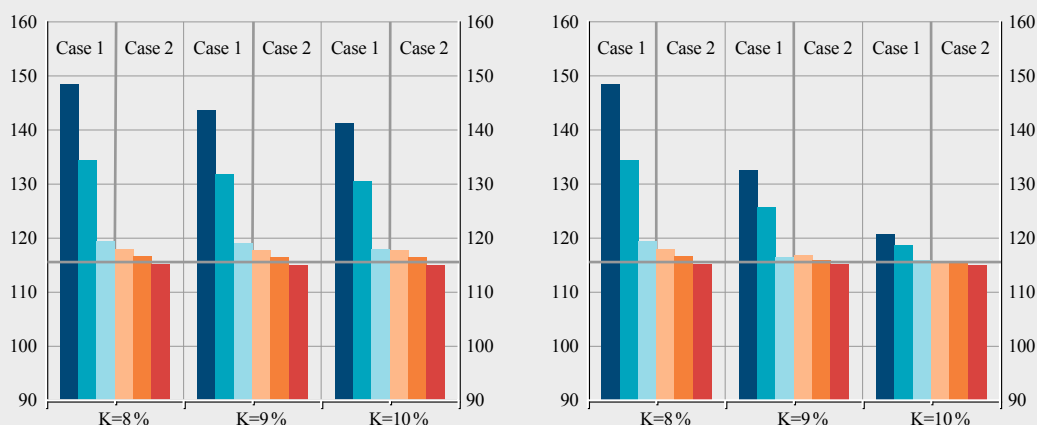


*Implementing the counter-cyclical capital buffer can also improve NSFR levels...*

NSFR levels following the balance sheet adjustments described in the two cases above are computed for different initial levels of capital. Chart C.2 shows the results obtained from implementing the two strategies to different degrees in order to visualise the range of possible NSFR changes. The horizontal line represents the starting NSFR level and is included as a benchmark. The most significant improvement in the NSFR is obtained from a reduction in risk-weighted assets following a rebalancing of the portfolio (Case 1). Balance sheet expansions (Case 2) have a weaker effect on the NSFR. Note, however, that the bank may also experience a slight decline in its NSFR

**Chart C.2 Impact of the counter-cyclical capital buffer on the NSFR: maintaining a constant capital buffer (left) and including the existing capital buffer in the counter-cyclical capital buffer (right)**

(percentages)



Source: ECB calculations.

Notes: The vertical bars represent the NSFR following a range of balance sheet adjustments belonging to Case 1 (blue bars) or Case 2 (reddish orange bars) respectively. The capital level below each set of bars (labelled "K") indicates the starting risk-based capital ratio prior to activating the counter-cyclical capital buffer.

if it increases its holdings of assets with a very high RSF factor.<sup>14</sup> Overall, the simulations suggest an improvement in the NSFR as a result of implementing the counter-cyclical capital buffer. The rise in the NSFR is particularly pronounced for banks with low initial capital ratios which pursue adjustment strategies on the asset side and is largely muted for better capitalised banks.

Some caveats of our analysis should be noted. The mechanical scenarios do not take into account the potential offsetting behaviour of banks. Typically, a bank that follows one of the scenarios will try to offset the higher cost or the reduced income. Given that a bank cannot raise revenue by investing in riskier assets because of the impact on its risk-based capital ratio, it could compensate the increase in costs by shortening the term of its funding sources subject to any leeway obtained under the NSFR. Naturally, both cases are artificial in nature and banks typically use a combination of adjustments on both the asset and the liability sides. Moreover, given that the counter-cyclical capital buffer is likely to be implemented in buoyant times, raising capital appears the more likely scenario.

The analysis above has highlighted a positive relationship between the capital ratio and the NSFR, i.e. an increase in capital is also likely to increase the NSFR. This endogenous interaction can be desirable when there is a simultaneous need to build up resilience in terms of capital and the NSFR during a boom in the credit cycle. Under this assumption, macro-prudential policy could take this interaction between capital and the NSFR into account and, possibly, require a simultaneous build-up of an NSFR buffer. If, however, this is deemed unnecessary, banks should be allowed to flexibly use the additional stable funding resources. The subsequent section further discusses the potential use of the NSFR as a stand-alone macro-prudential instrument.

## LIQUIDITY AS AN INDEPENDENT MACRO-PRUDENTIAL MEASURE

In addition to micro-prudential rules, systemic liquidity risks need to be addressed by appropriately designed macro-prudential regulation. Systemic liquidity stress is defined by the ESRB as the failure of banks' normal funding channels, leading to the central bank intervening as the lender of last resort.<sup>15</sup> The recent crisis has highlighted that solvency regulation alone cannot fully address these risks and that macro-prudential liquidity instruments are necessary. The ESRB has identified the prevention of excessive maturity mismatch and market illiquidity as an intermediate macro-prudential objective.<sup>16</sup> Considering that the aim of the NSFR is to prevent such mismatches, a well-designed and targeted (possibly time-varying) ratio could therefore help mitigate systemic liquidity risks.<sup>17</sup>

Acharya et al.<sup>18</sup> discuss the counter-cyclical behaviour of liquidity in banks' asset holdings, i.e. it tends to be inefficiently low during the business cycle upturn and excessively high during downturns. During boom periods, this behaviour is supported by the ease of obtaining funding owing to banks' profitability as well as by a benign view on asset quality and liquidity, as reflected in the pledgeability of assets and low collateral haircuts. During downturns, by contrast, banks tend to have higher liquidity holdings as this acts as a form of insurance when facing uncertain liquidity withdrawals. Another reason is that they can then take advantage of fire sales if financial

*... however, banks may further adjust their balance sheets*

*NSFR adjustments may be necessary...*

*... considering the dynamics of banks' (asset) liquidity*

14 The upper and lower bounds for the NSFR are obtained following very extreme balance sheet rebalancing and expansion strategies. The resulting interactions are hence relatively unlikely.

15 European Systemic Risk Board, *The ESRB handbook on operationalising macro-prudential policy in the banking sector*, op. cit.

16 *ibid.*

17 The LCR supplements the NSFR by promoting the short-term resilience of banks to severe liquidity shocks. Owing to the NSFR's structural nature, the longer horizon it targets and the intermediate systemic risk objectives it addresses, this special feature focuses on the macro-prudential use of the NSFR. The potential use of the LCR as a macro-prudential tool is not discussed in this special feature.

18 Acharya, V., Shin, H.S. and Yorulmazer, T., "Crisis resolution and bank liquidity", *The Review of Financial Studies*, Vol. 24, No 6, 2011, pp. 2166-2205.

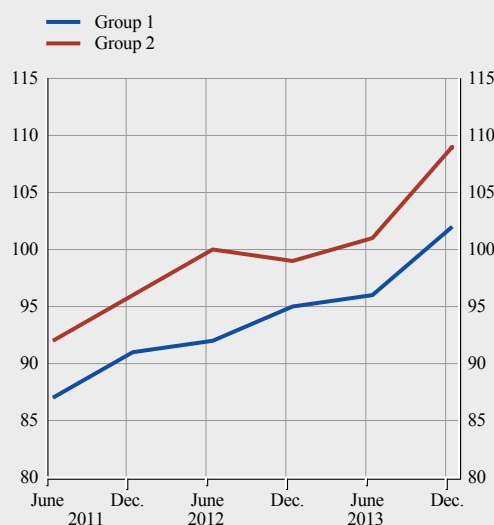
distress intensifies. From a financial stability perspective, this pattern raises a series of concerns. First, this counter-cyclical behaviour could support excessive credit growth during a boom and aggravate the economic downturn if banks hoard excessive liquidity during a bust. Second, the simultaneous large-scale sale of assets when financial distress intensifies leads to a vicious cycle of declining asset prices and losses on banks' balance sheets, possibly precipitating further sales. Since the magnitude of fire sales is directly related to the balance sheet liquidity of the overall system, the counter-cyclical behaviour of liquidity across many market participants reinforces systemic stress during downturns. In addition, banks with insufficient cash and cash-like holdings may want to avoid selling other (less liquid) assets at discounted prices when financial stress is escalating, and rather increase their demand for additional funding. A system-wide increase in the demand for liquidity can precipitate funding liquidity stress, leading to spikes in funding costs and a breakdown in markets. This market failure may subsequently make central bank liquidity interventions necessary. As vividly demonstrated during the financial crisis, if banks fail to adequately manage liquidity and funding risk, this creates significant systemic vulnerabilities and threatens financial stability. The recent crisis has highlighted that capital regulation alone cannot fully address such vulnerabilities and that both micro-prudential and macro-prudential liquidity standards and instruments are necessary.<sup>19</sup>

The liquidity dynamics highlighted above are likely to be muted by the implementation of the new minimum standards for liquidity. However, this counter-cyclical behaviour could potentially persist even after the introduction of the liquidity standard. This would, in turn, be reflected in the NSFR, leading to relatively low NSFRs during booms and rising NSFRs during stress periods. As highlighted in this special feature, building up the capital buffer may already help increase the level of the NSFR during a boom. Nevertheless, liquidity and funding risks fluctuate over time and may not be sufficiently reflected in the NSFR given the static factors applied in its calculation. If the NSFR and the counter-cyclical capital buffer prove to be insufficient for limiting these risks, there will be some grounds for considering an additional liquidity macro-prudential tool to help address procyclical risk-taking behaviour and to increase the resilience of banks.

As regards real NSFR figures, EU banks have experienced a continuous improvement in their NSFR since 2011, mainly owing to readjustments in their balance sheets and changes in the calibration of the NSFR.<sup>20</sup> Chart C.3 illustrates the dynamics of the average NSFR for Group 1 and Group 2 banks<sup>21</sup> during the six quarters covered by the Basel III monitoring exercise. At this point in time, it is still premature to assess the existence and

**Chart C.3 NSFR levels for Group 1 and Group 2 EU banks**

(June 2011 – Dec. 2013; percentages, weighted averages)



Source: EBA Basel III monitoring exercise.

<sup>19</sup> European Systemic Risk Board, *The ESRB handbook on operationalising macro-prudential policy in the banking sector*, op. cit.

<sup>20</sup> European Banking Authority, *Basel III monitoring exercise*, September 2014.

<sup>21</sup> The banks covered by the Basel III monitoring exercise are divided into two groups, with Group 1 made up of internationally active banks with Tier 1 capital of more than €3 billion and Group 2 representing all other banks.

magnitude of any cyclical behaviour in the NSFR. In December 2013, which is the latest date for which public figures are available, the weighted average NSFR was above 100% for both groups of EU banks, at 109% and 102% respectively.

Despite these relatively comfortable NSFR levels, some current risks to financial stability have been highlighted. More specifically, the search for yield has contributed to asset price misalignments, as highlighted in the Overview and Section 2 of this issue of the FSR. In the current environment of high funding liquidity but subdued credit and economic growth, the counter-cyclical capital buffer may not be fully adequate to mitigate this risk to financial stability. Given that the NSFR explicitly incorporates securities at market prices, analysis needs to be carried out to establish whether these fluctuations in the NSFR are beneficial from a macro-prudential perspective. Depending on the conclusions of this analysis, an exploration of the scope for using an additional liquidity tool to address this risk may thus be appropriate. An understanding of the elements most likely to affect the NSFR could help in designing the counter-cyclical features of this instrument. As a macro-prudential tool aimed at preventing the build-up of systemic risk, a well-designed buffer could impose prudence in activities where financial stress would create significant negative effects. This seems particularly warranted when the financial cycle and the liquidity cycle are disconnected and may help to overcome the “inaction bias”.

*High NSFR levels  
may mask the build-  
up of risk*

#### WHAT FORM COULD A COUNTER-CYCLICAL NSFR TAKE?

Imposing a *higher minimum threshold for the NSFR* when appropriate conditions are met would represent the most direct solution from an operational point of view. Similar to the counter-cyclical buffer, this would require the implementation of a trigger mechanism to signal when the NSFR minimum requirement is to be raised. While this is intuitively the most straightforward approach, it could have unintended consequences. For example, in the current environment, if banks increase their NSFR through even higher holdings of high-quality liquid assets, this could further aggravate asset price misalignments. A more targeted approach might therefore be warranted. In its current form, the NSFR relies on static RSF and ASF factors for assets and liabilities. Adjusting factors for particular asset classes, funding sources and/or sectors might therefore be preferable to imposing an overall higher NSFR requirement. Such an approach may, however, raise further complications in terms of implementation. Any deviation from internationally agreed standards should be subject to coordination and disclosure mechanisms across jurisdictions. Harmonisation is needed in order to ensure comparability and legal certainty within the Single Market.

*Banks could be  
required to maintain  
higher NSFR  
levels...*

With regard to assets, the RSF factors have been calibrated to reflect the need for stable funding sources. A possible avenue to address the risk of asset price misalignments could be to adjust the RSF factors upwards for those assets most affected, reflecting future risks of downward price adjustments, while leaving the overall minimum requirement of 100% unchanged. It should be noted that a rise in securities' prices would, *ceteris paribus*, already lead to a decline in the NSFR. Therefore, any change in the RSF factors would further dis-incentivise demand and reduce the upward pressure on prices. This may be warranted during times when easy access to funding more than compensates for any inflationary effect on the RSF. It should be noted that the factors currently applied, particularly for high-quality liquid assets, have already been set at relatively conservative levels. Securities and certain equities that have been included as high-quality liquid assets in the LCR also have lower funding requirements under the NSFR, given the view that they can be used quickly to obtain stable funding either by outright sales or by using them in secured operations.

*... or individual  
ASF/ RSF factors  
could be adjusted*

Considering the overlaps, any adjustment in the RSF factors within the NSFR may thus also require further adjustments of the targeted assets included in the LCR. More generally, consistency across these two ratios may also be required in the broader context if either of the two ratios is used as a macro-prudential tool.

With regard to liabilities, a counter-cyclical NSFR could also be implemented by reducing *ASF factors* to reflect the (time-varying) stability of different funding sources. Revisions to ASF factors could be triggered by behavioural changes among depositors, by changes in the functioning of markets or if excessive reliance on certain funding sources emerges.

In the light of the discussion above, a set of trigger variables for the aggregate NSFR or for components of the ratio may be useful in the design of a counter-cyclical NSFR. This set of trigger variables could be based on volume and price-based indicators for liquidity risk. Cross-checking and combining information from multiple indicators may further improve accuracy when a warning signal is detected,<sup>22</sup> but may also further complicate the trigger mechanism.

In addition to the LCR and NSFR, the Basel Committee on Banking Supervision also proposes that banks should report a series of *additional liquidity monitoring metrics*.<sup>23</sup> These monitoring metrics may be particularly useful for identifying a systemic build-up of excessive funding risks. For example, the maturity ladder incorporates a broader set of maturity buckets going beyond the one-year horizon of the NSFR. Therefore, a counter-cyclical buffer could be activated when there is a build-up of maturing debt beyond the one-year horizon. This may be desirable when the maturity ladder across a wider part of the banking system indicates a future refinancing glut that could create strains in funding markets. By looking beyond a one-year horizon, mismatches could signal possible imbalances not yet captured by current NSFR levels. Regarding the monitoring metrics for the concentration of funding by counterparty/product, the NSFR could also target risk by reducing banks' over-reliance on specific liquidity providers and instruments rather than simply raising the minimum requirement. In this context, however, the NSFR would pursue structural rather than cyclical policy objectives. Moreover, other tools may be more effective at addressing some of these issues, such as the large exposure requirements. A number of important sectors could be monitored and, if a build-up of risk in a specific sector (e.g. mortgages) is detected, the factors assigned to assets or liabilities related to these sectors could be adjusted. Finally, there is also scope to apply the NSFR as a tool for detecting excessive mismatches in the currency composition of assets and liabilities. This could be implemented by setting currency-specific NSFR requirements. The build-up of currency mismatches between assets and liabilities captured by the liquidity monitoring metrics could therefore be addressed by currency-specific NSFR requirements.<sup>24</sup>

According to the ESRB,<sup>25</sup> simpler structural liquidity ratios such as the *loan-to-deposit ratio* and the *core funding ratio* are promising both in their role as indicators and as instruments addressing maturity mismatches and market illiquidity. The International Monetary Fund<sup>26</sup> finds that higher

22 European Systemic Risk Board, *The ESRB handbook on operationalising macro-prudential policy in the banking sector*, op. cit.

23 These metrics are: a maturity ladder, the concentration of funding by counterparty, the concentration of funding by product type, the concentration of counterbalancing capacity by issuer/counterparty, prices for various lengths of funding and the rollover of funding. See <http://www.bis.org/publ/bcb238.pdf> for details.

24 Such an application would require taking into account banks' currency risk management, e.g. whether they hedge these risks with appropriate financial instruments.

25 European Systemic Risk Board, *The ESRB handbook on operationalising macro-prudential policy in the banking sector*, op. cit.

26 See International Monetary Fund, *Global financial stability report*, October 2013.

loan-to-deposit ratios are associated with greater bank distress,<sup>27</sup> both in advanced and emerging economies. Bologna<sup>28</sup> also investigates the predictive power of the loan-to-deposit ratio for bank failures and finds that high loan-to-deposit levels increase the likelihood of a bank failure occurring two to three years later. The level of loan-to-deposit ratios one year prior to a failure is, however, not statistically significant, a pattern also highlighted by Marino and Bennett,<sup>29</sup> who attribute this effect to a change in deposit composition and portfolio rebalancing at incipient signs of distress. Empirical research therefore suggests that the loan-to-deposit ratio is able to detect a build-up of risk with a substantial lead and it may thus be useful to include it in the design of the counter-cyclical NSFR as an early warning indicator. Moreover, considering the challenges associated with the operationalisation of a counter-cyclical NSFR, a time-varying loan-to-deposit ratio or core funding ratio may be easier to calibrate and implement.

The *liquidity mismatch index* proposed by Brunnermeier et al.<sup>30</sup> represents an alternative measure of mismatch between bank assets and liabilities.<sup>31</sup> It mirrors to some extent the NSFR design by assigning weights to balance sheet elements according to their ease of being sold (positive weights) as well as to the stability of funds and ease of rolling over debt (negative weights). Bai et al.<sup>32</sup> implement the liquidity mismatch index and connect the liquidity premium on issuing liabilities and, hence, the time-varying stability and ease of obtaining funding to the spread between overnight index swaps and Treasury bills. More negative weights, indicating an increase in the volatility of funding sources, are assigned across all maturities during periods when there is a significant widening in the spread. The rationale behind this is that if the liquidity stress episode is severe and, hence, possibly long lasting, the stability of funding, even with a term beyond one year, becomes uncertain. When compared with its static design, the liquidity mismatch index calculated using time-varying weights was thus better able to capture the build-up of mismatches before 2008 when applied to a large sample of US bank holding companies. While an aggregate liquidity mismatch index has potential as a monitoring tool and could be used in the design of a counter-cyclical NSFR, its appropriateness has not yet been explored in the context of the European banking sector.

As highlighted by Bai et al.,<sup>33</sup> the *spread between overnight index swaps and Treasury bills* contains important information regarding the stability of funding over the cycle. Moreover, the time-varying liability component is shown to be the main driving factor for liquidity mismatch dynamics. When spreads are compressed during boom periods, easing the access to funding, banks could be required to build up buffers since obtaining funding by issuing capital or liabilities can be achieved more easily and at lower cost. In a similar vein, Bloor et al.<sup>34</sup> consider *long-term funding costs* as a natural trigger for the counter-cyclical NSFR buffer. The NSFR incentivises banks' reliance on longer-term funding. Since the cost of accessing higher volumes of liquidity increases more steeply in long-term (less liquid) markets, meeting the requirement creates costs. This non-linear price-quantity relationship is further amplified in a crisis owing to high risk aversion and the drying-up of liquidity, especially at longer maturities. As a result, greater exposure to longer-term markets can lead to more adverse macroeconomic outcomes in the event of systemic market stress

27 A distressed bank is characterised by a low z-score, a low price-to-book ratio and a "sell" recommendation rating by bank equity analysts.

28 Bologna, P., "Structural funding and bank failures: Does Basel 3 net stable funding ratio target the right problem?", *Journal of Financial Services Research*, September 2013.

29 Marino, J.A. and Bennett, R.L., "The consequences of national depositor preference", *FDIC Banking Review*, Vol. 12, No 2, 1999, pp.19-38.

30 Brunnermeier, M., Gorton, G. and Krishnamurthy, A., "Liquidity mismatch measurement", in Brunnermeier, M. and Krishnamurthy, A. (eds.), *Risk Topography: Systemic Risk and Macro Modelling*, NBER Books, 2014.

31  $LMIP = \sum_i \lambda_i^a A^i - \sum_j \lambda_j^l L^j$ , where  $\lambda_i^a/\lambda_j^l$  are weights applied to each asset and liability class  $i/j$  and are indexed by the state of the world  $\omega$ . The lower the index value, the higher the liquidity risk.

32 Bai, J., Krishnamurthy, A. and Weymuller, C.H., *Measuring liquidity mismatch in the banking sector*, 2013.

33 *ibid.*

34 Bloor, C., Craugie, R. and Munro, A., "The macroeconomic effects of a stable funding requirement", *Discussion Paper Series*, DP2012/05, Reserve Bank of New Zealand, 2012.

and the pro-cyclical effect of funding spreads is amplified.<sup>35</sup> In periods of high funding liquidity and low long-term funding spreads, banks should thus be required to build up a buffer of long-term funding. Additionally, the buffer could be released during periods of stress to dampen adverse macroeconomic outcomes.

#### BROADER CONSIDERATIONS REGARDING THE MACRO-PRUDENTIAL USE OF LIQUIDITY STANDARDS

The design of a counter-cyclical NSFR needs to take into account the possibility that the buffer, similarly to the LCR, can be used during periods of stress. There are two possible complementary options for the implementation of the counter-cyclical NSFR in this respect: requiring a positive add-on for the NSFR while keeping the 100% as a lower, binding constraint, or allowing the NSFR to drop below 100% when liquidity conditions deteriorate. To the extent that the market allows banks to fall below the minimum requirement of 100%, the added flexibility should be reflected in the build-up phase of a counter-cyclical NSFR. If a level below 100% is indeed tolerated by the market and a jump in the risk perception of the bank is not a constraining factor, a lower required add-on for the NSFR could be designed, limiting the negative effects of too stringent an upper bound. On the other hand, dropping below 100% could still be perceived negatively by the market, limiting access to funding and sharply increasing borrowing costs. The relationship between the demand for long-term funding and the associated costs could thus be reinforced when the market perceives a NSFR below 100% as a negative signal, especially during times of financial stress. Building an additional buffer during boom periods might therefore minimise the risk of liquidity shortages and reduce uncertainty. Moreover, considering that one aim of a higher requirement is to “lean against the wind” during a cyclical upswing, a high add-on might still be preferable, independently of the possibility to go below 100% during times of crisis.

*Liquidity regulation that is too stringent may have unintended consequences*

Well-designed macro-prudential tools should achieve maximum benefits with minimum costs. Additional changes to existing rules should be considered very carefully, taking into account that regulation that is too stringent might benefit other, less regulated parts of the financial sector and shift activity further towards the shadow banking sector. This would simply push the risks into these less regulated parts of the financial system and could even lead to an increase in systemic risk. On the other hand, the NSFR could contribute to the resilience of the financial system by dis-incentivising interlinkages between banks and non-bank financial institutions.

#### CONCLUDING REMARKS

This special feature highlights some initial considerations on the design and use of a counter-cyclical NSFR. Interactions with the counter-cyclical capital buffer show a positive relationship between the two. The counter-cyclical behaviour of bank liquidity indicates that an increase in the NSFR during a boom would be beneficial from a financial stability perspective. Therefore, the special feature highlights that the improvement in the NSFR arising from this interaction could be preserved and, possibly, further built on. Additional analysis should thus be carried out to determine whether the new standards designed by the Basel Committee on Banking Supervision are sufficient to address the counter-cyclical behaviour of banks.

<sup>35</sup> The funding spread is the difference between long-term funding costs and the rollover of short-term funding. In good times, these spreads are compressed, while they increase in periods of stress. Costs of long-term funding may be further pushed upwards if demand is very high.

In designing the counter-cyclical features of the NSFR, various possible options have been highlighted. A higher minimum threshold would offer flexibility to banks in adjusting their balance sheet, while also being operationally easier to implement. On the other hand, a more targeted approach involving adjustments to individual ASF and RSF factors may be more appropriate if a build-up of risk in specific sectors or over different maturity horizons is detected.

Further work will be required to quantify the impact of the new Basel ratios after they are introduced. Second, the need for an additional instrument and its potential benefits and drawbacks have to be carefully assessed. Third, further work needs to be carried out on suitable trigger variables as well as on identifying appropriate buffer levels to be built up during upturns and released during downturns. Finally, it also remains to be analysed and discussed how other available macro-prudential instruments, such as the systemic risk buffer, might interact with a potential counter-cyclical NSFR, given the possible overlaps in the risk that these instruments address. The benefits of any mix of macro-prudential tools need to be assessed against the specific costs of implementation, including any distortions to the financial system or potential leakages.

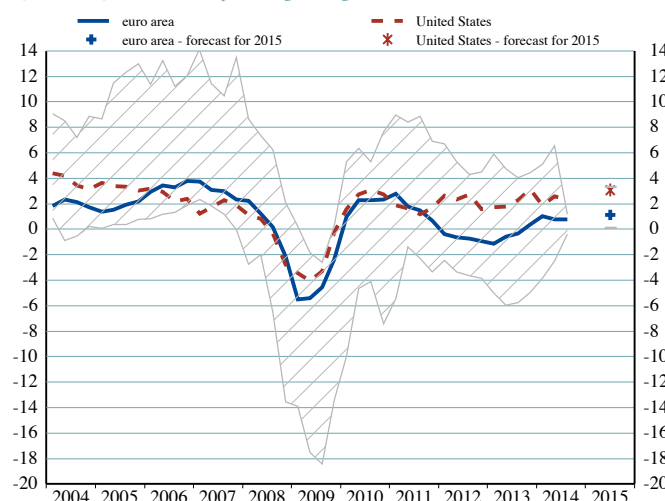


# STATISTICAL ANNEX

## I MACRO-FINANCIAL AND CREDIT ENVIRONMENT

### S.1.1 Actual and forecast real GDP growth

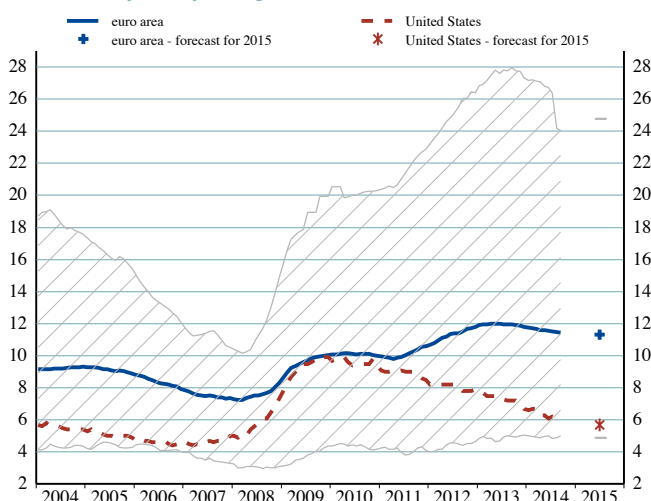
(Q1 2004 - Q3 2014; annual percentage changes)



Sources: Eurostat and European Commission (AMECO, Autumn 2014 forecast).  
Note: Data for GR, ES, CY and SK according to ESA95. The hatched area indicates the minimum-maximum range across euro area countries.

### S.1.2 Actual and forecast unemployment rates

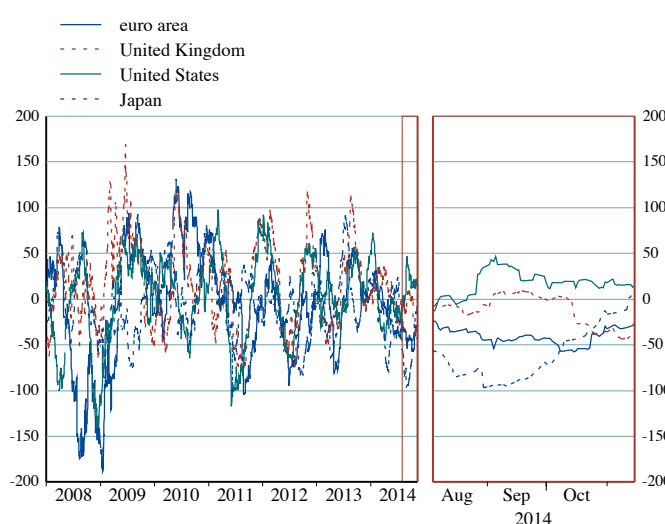
(Jan. 2004 - Sep. 2014; percentage of the labour force)



Sources: Eurostat and European Commission (AMECO, Autumn 2014 forecast).  
Note: The hatched area indicates the minimum-maximum range across euro area countries.

### S.1.3 Citigroup Economic Surprise Index

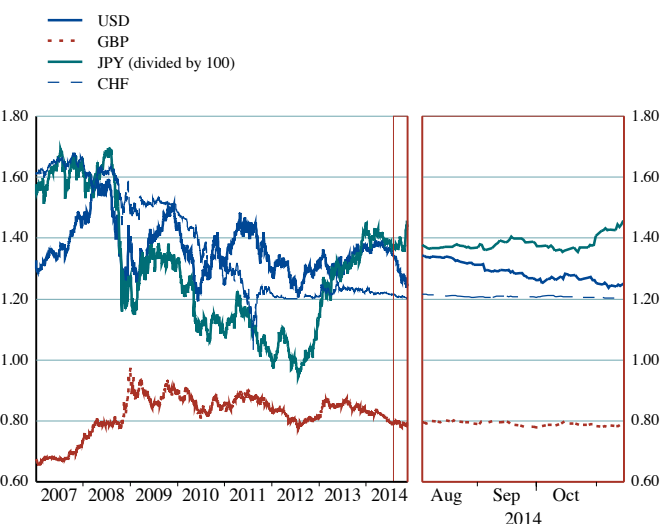
(1 Jan. 2008 - 14 Nov 2014)



Source: Bloomberg.  
Note: A positive reading of the index suggests that economic releases have, on balance, been more positive than consensus expectations.

### S.1.4 Exchange rates

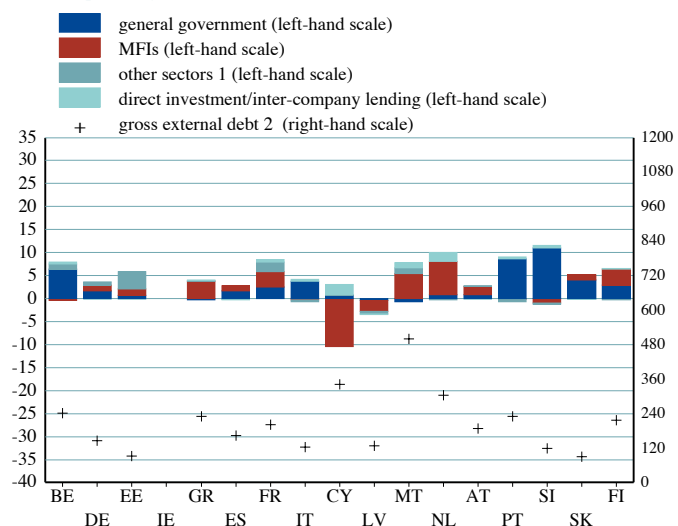
(1 Jan. 2007 - 14 Nov 2014; units of national currency per euro)



Sources: Bloomberg and ECB calculations.

### S.1.5 Quarterly changes in gross external debt

(2014 Q1; percentage of GDP)



Source: ECB.

Notes: For Luxembourg, quarterly changes were 0.1% for general government, -11.8% for MFIs, 13.7% for other sectors and 121.1% for direct investment/inter-company lending. Gross external debt was 5,482% of GDP.

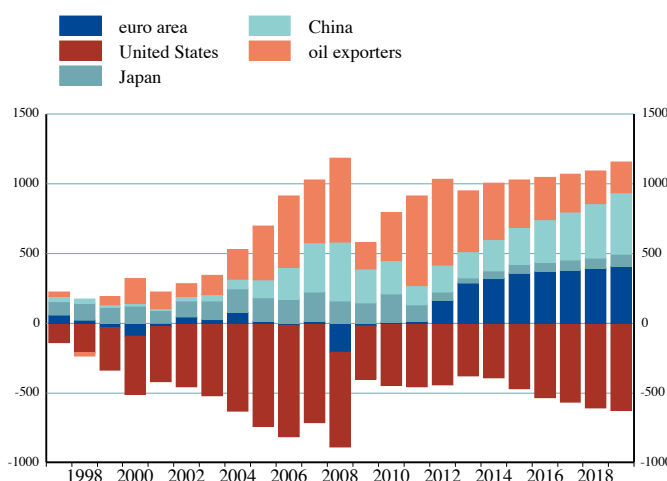
Comparable data for Ireland for 2014 Q1 is not available.

1) Non-MFIs, non-financial corporations and households.

2) Gross external debt as a percentage of GDP.

### S.1.6 Current account balances in selected external surplus and deficit economies

(1997 - 2019; USD billions)



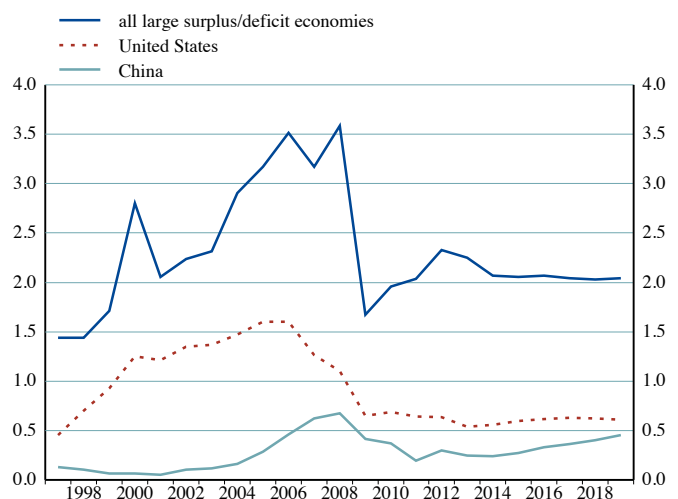
Source: IMF World Economic Outlook.

Notes: Oil exporters refers to the OPEC countries, Indonesia, Norway and Russia.

Figures for 2014 to 2019 are forecasts.

### S.1.7 Current account balances (in absolute amounts) in selected external surplus and deficit economies

(1997 - 2019; percentage of world GDP)

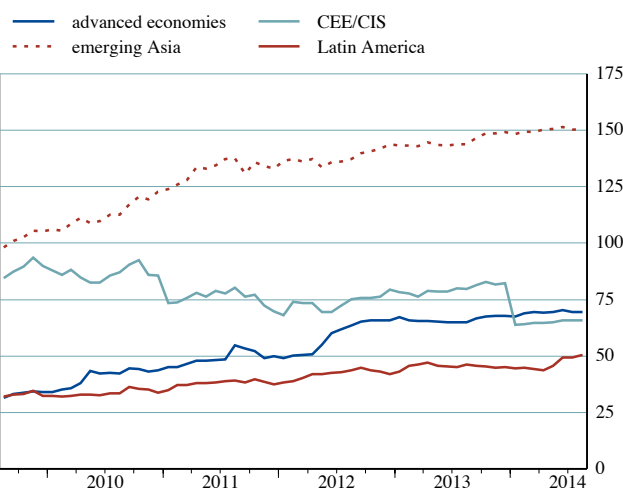


Source: IMF World Economic Outlook.

Notes: All large surplus/deficit economies refers to oil exporters, the EU countries, the United States, China and Japan. Figures for 2014 to 2019 are forecasts.

### S.1.8 Foreign exchange reserve holdings

(Aug. 2009 - Aug. 2014; percentage of 2009 GDP)

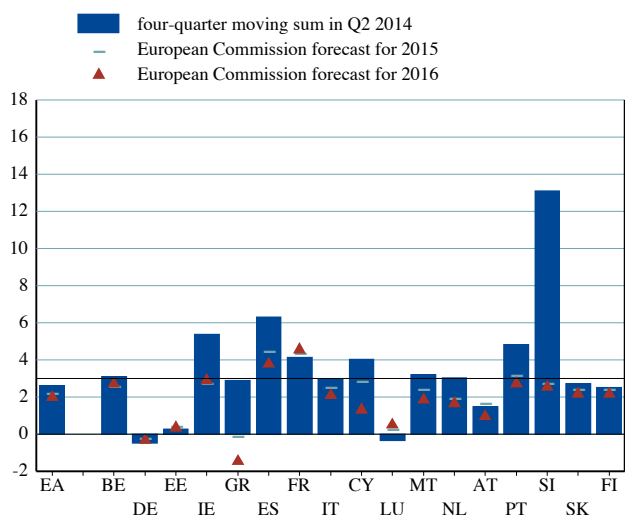


Sources: Bloomberg, IMF World Economic Outlook and IMF International Financial Statistics.

Note: CEE/CIS stands for central and eastern Europe and the Commonwealth of Independent States.

### S.1.9 General government deficit/surplus (+/-)

(percentage of GDP)

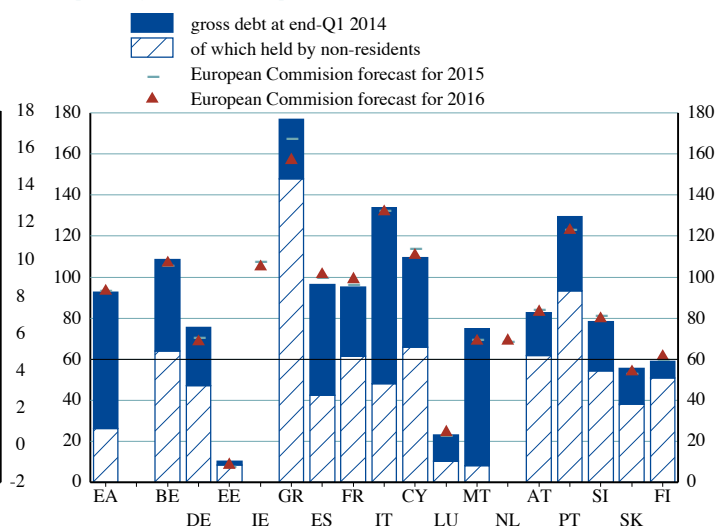


Sources: National data, European Commission (AMECO, Autumn 2014 forecast) and ECB calculations.

Notes: Data on four quarter moving sum refer to accumulated deficit/surplus in the relevant quarter and the three previous quarters expressed as a percentage of GDP.

### S.1.10 General government gross debt

(percentage of GDP, end of period)

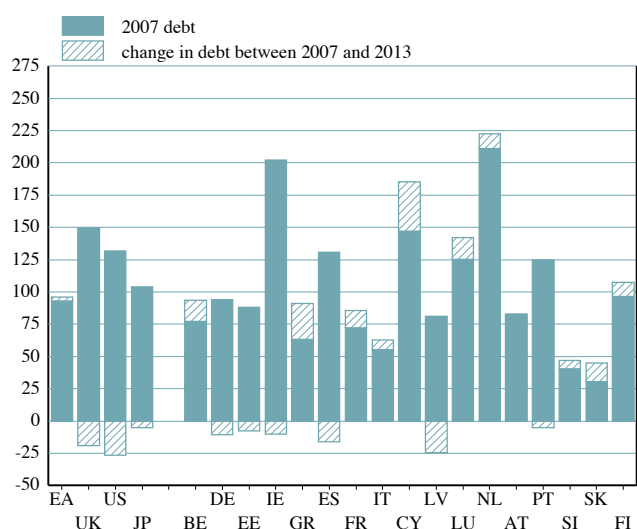


Sources: National data, European Commission (AMECO, Autumn 2014 forecast) and ECB calculations based on ESA95 data.

Notes: Government debt data for Q1 2014 are not available for Ireland and the Netherlands.

### S.1.11 Household debt-to-gross disposable income ratio

(percentage of disposable income)

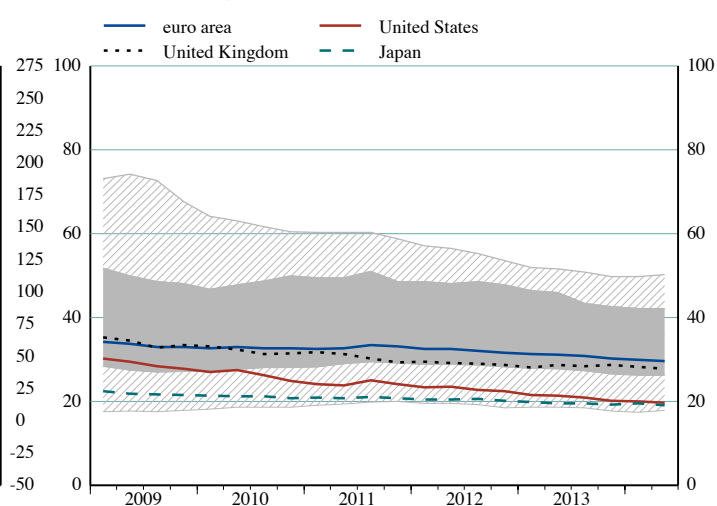


Sources: ECB, Eurostat, US Bureau of Economic Analysis and Bank of Japan.

Notes: Gross disposable income adjusted for the change in net equity of households in pension fund reserves. For Luxembourg initial debt data refer to 2008, change in debt refers to 2008 and 2012. For Japan, Estonia, Greece, Cyprus, Latvia and Slovakia change in debt refers to 2007 and 2012. Data for Malta are not available. The figures are based on both ESA2010 and ESA95 methodology.

### S.1.12 Household debt-to-total financial assets ratio

(Q1 2009 - Q2 2014; percentages)

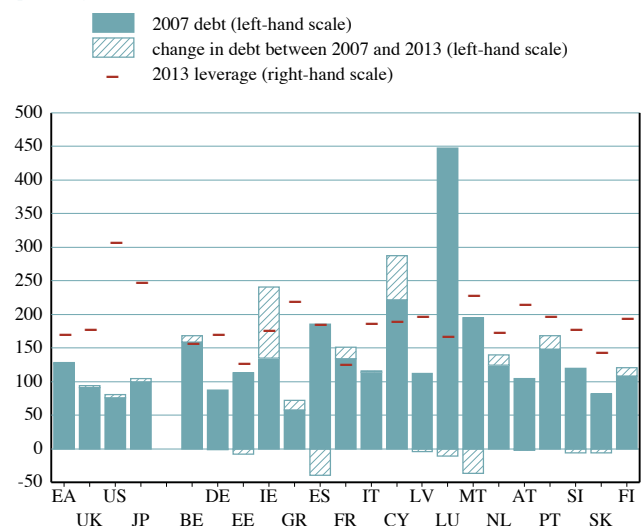


Sources: ECB and ECB calculations, Eurostat, US Bureau of Economic Analysis and Bank of Japan.

Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across euro area countries. The figures are based on both ESA2010 and ESA95 methodology.

### S.1.13 Corporate debt-to-GDP and leverage ratios

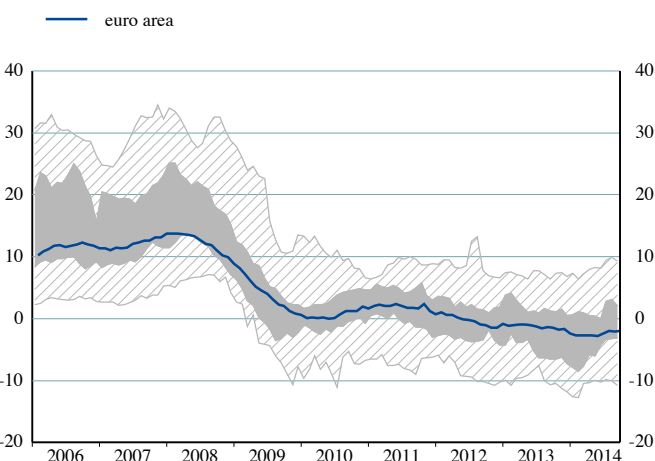
(percentages)



Sources: ECB, Eurostat, US Bureau of Economic Analysis and Bank of Japan.  
Note: The figures for Japan and Great Britain are based on ESA95 methodology.  
For Germany, Estonia and Latvia initial debt data refer to 2012, change in debt refers to 2012 and 2013. For Malta initial debt data refer to 2009, change in debt refers to 2009 and 2013.

### S.1.14 Annual growth of MFI credit to the private sector in the euro area

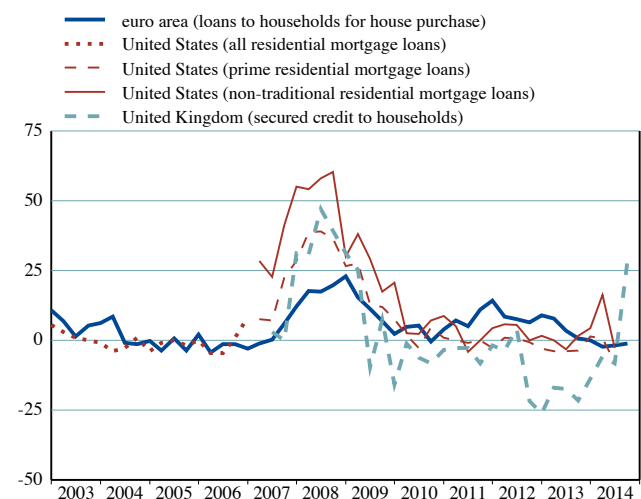
(Jan. 2006 - Sep. 2014; percentage change per annum)



Sources: ECB and ECB calculations.  
Notes: MFI sector excluding the Eurosystem. Credit to the private sector includes loans to, and holdings of securities other than shares of, non-MFI residents excluding general government; MFI holdings of shares, which are part of the definition of credit used for monetary analysis purposes, are excluded. The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across euro area countries.

### S.1.15 Changes in credit standards for residential mortgage loans

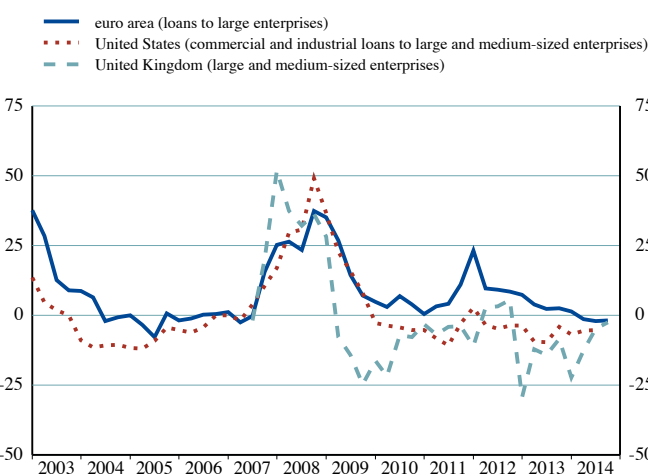
(Q1 2003 - Q4 2014; percentages)



Sources: ECB, Federal Reserve System and Bank of England.  
Notes: Weighted net percentage of banks contributing to the tightening of standards over the past three months. Data for the United Kingdom refer to the net percentage balances on secured credit availability to households and are weighted according to the market share of the participating lenders. Data are only available from the second quarter of 2007 and have been inverted for the purpose of this chart. For the United States, the data series for all residential mortgage loans was discontinued owing to a split into the prime, non-traditional and sub-prime market segments from the April 2007 survey onwards.

### S.1.16 Changes in credit standards for loans to large enterprises

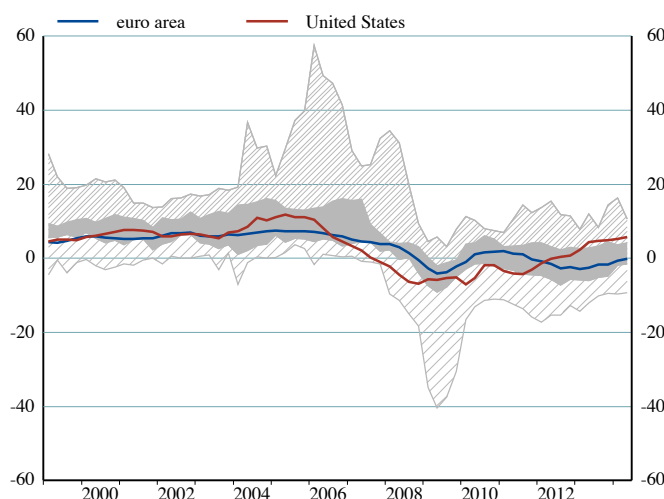
(Q1 2003 - Q4 2014; percentages)



Sources: ECB, Federal Reserve System and Bank of England.  
Notes: Weighted net percentage of banks contributing to the tightening of standards over the past three months. Data for the United Kingdom refer to the net percentage balances on corporate credit availability and are weighted according to the market share of the participating lenders. Data are only available from the second quarter of 2007 and have been inverted for the purpose of this chart.

### S.1.17 Changes in residential property prices

(Q1 1999 - Q2 2014; annual percentage changes)

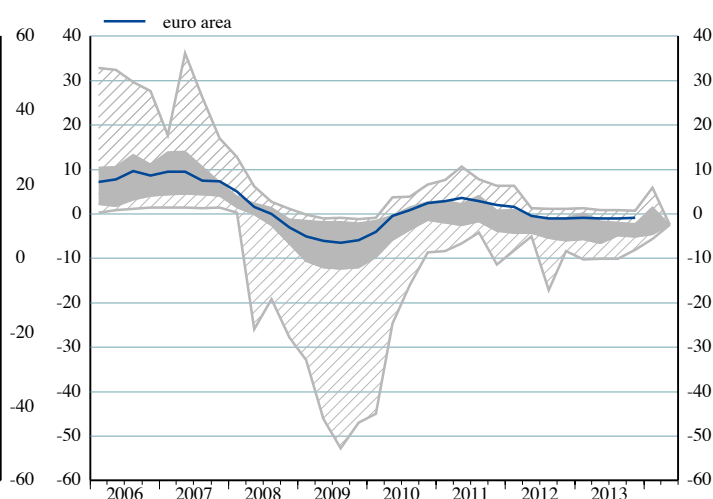


Sources: National data and ECB calculations.

Notes: The target definition for residential property prices is total dwellings (whole country), but there are national differences. The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across euro area countries.

### S.1.18 Changes in commercial property prices

(Q1 2006 - Q2 2014; capital value; annual percentage changes)



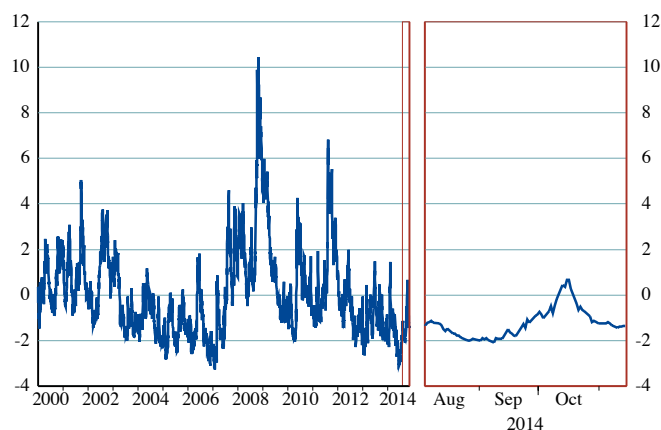
Sources: experimental ECB estimates based on IPD data and national data for Germany and Italy.

Note: The hatched/shaded areas indicate the max.-min./interquartile range across EA countries, except DE, EE, GR, CY, LV, LU, MT, SI, SK and FI.

## 2 FINANCIAL MARKETS

### S.2.1 Global risk aversion indicator

(3 Jan. 2000 - 14 Nov 2014)

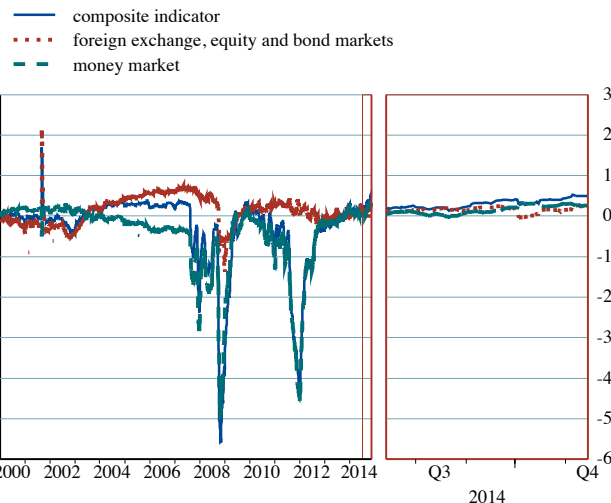


Sources: Bloomberg, Bank of America Merrill Lynch, UBS, Commerzbank and ECB calculations.

Notes: The indicator is constructed as the first principal component of five currently available risk aversion indicators. A rise in the indicator denotes an increase of risk aversion. For further details about the methodology used, see ECB, "Measuring investors' risk appetite", *Financial Stability Review*, June 2007.

### S.2.2 Financial market liquidity indicator for the euro area and its components

(4 Jan. 1999 - 14 Nov 2014)

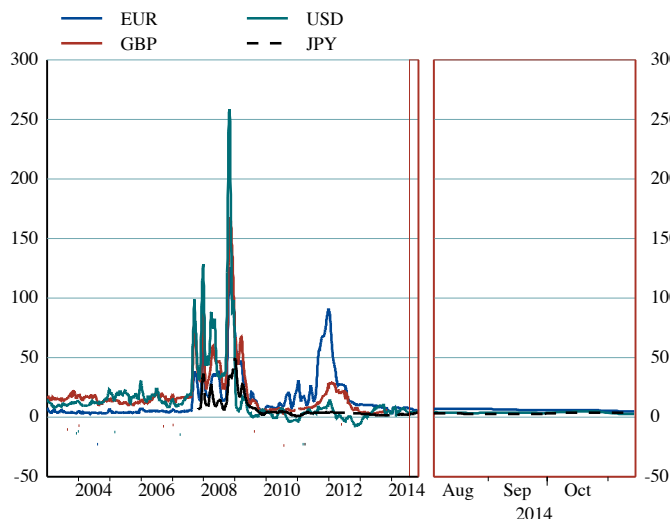


Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.

Notes: The composite indicator comprises unweighted averages of individual liquidity measures, normalised from 1999 to 2006 for non-money market components and over the period 2000 to 2006 for money market components. The data shown have been exponentially smoothed. For more details, see Box 9 in ECB, *Financial Stability Review*, June 2007.

### S.2.3 Spreads between interbank rates and repo rates

(3 Jan. 2003 - 14 Nov 2014; basis points; 1-month maturity; 20-day moving average)

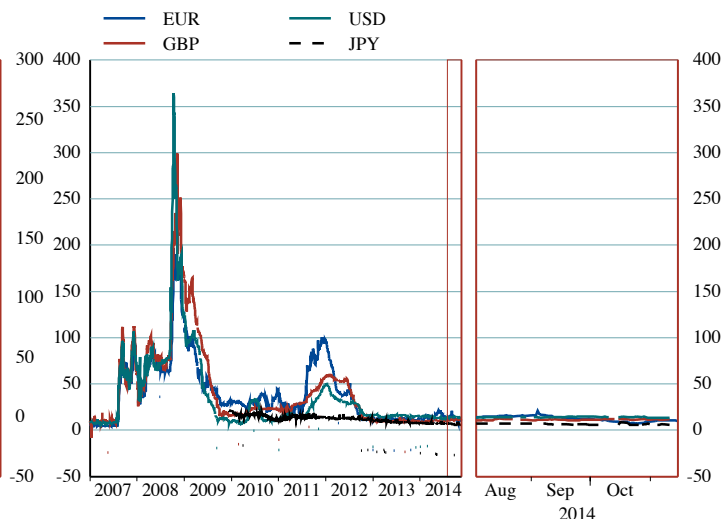


Sources: Thomson Reuters, Bloomberg and ECB calculations.

Notes: Due to the lack of contributors, the series for GBP stopped in October 2013.

### S.2.4 Spreads between interbank rates and overnight indexed swap rates

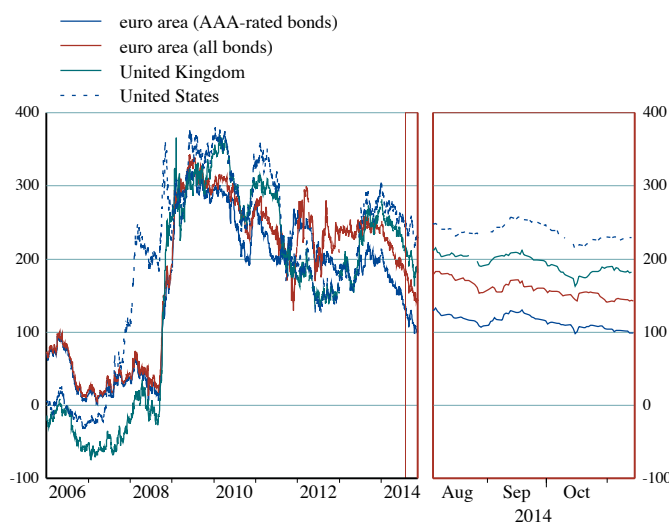
(1 Jan. 2007 - 14 Nov 2014; basis points; 3-month maturity)



Sources: Thomson Reuters, Bloomberg and ECB calculations.

### S.2.5 Slope of government bond yield curves

(2 Jan. 2006 - 14 Nov 2014; basis points)

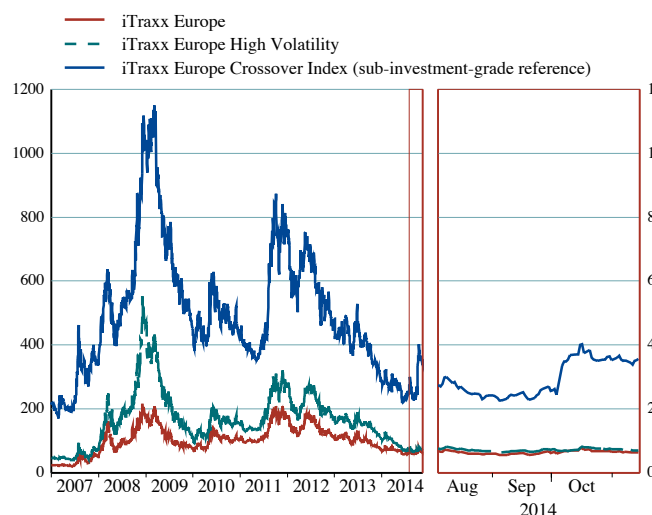


Sources: European Central Bank, Bank for International Settlements, Bank of England and Federal Reserve System.

Notes: The slope is defined as the difference between ten-year and one-year yields. For the euro area and the United States, yield curves are modelled using the Svensson model; a variable roughness penalty model is used to model the yield curve for the United Kingdom.

### S.2.7 iTraxx Europe five-year credit default swap indices

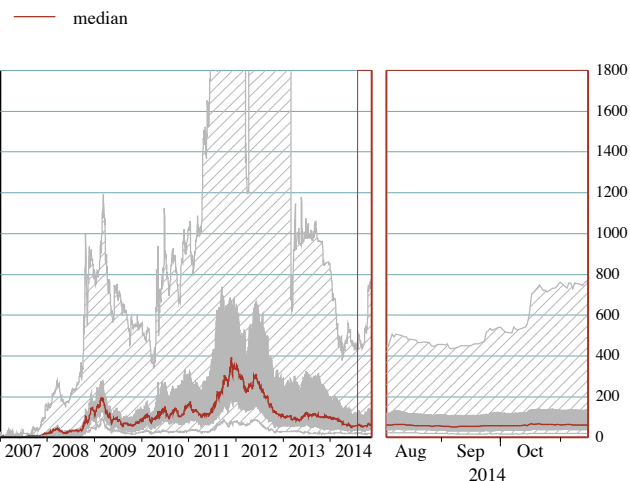
(1 Jan. 2007 - 14 Nov 2014; basis points)



Source: Bloomberg.

### S.2.6 Sovereign credit default swap spreads for euro area countries

(1 Jan. 2007 - 14 Nov 2014; basis points; senior debt; five-year maturity)

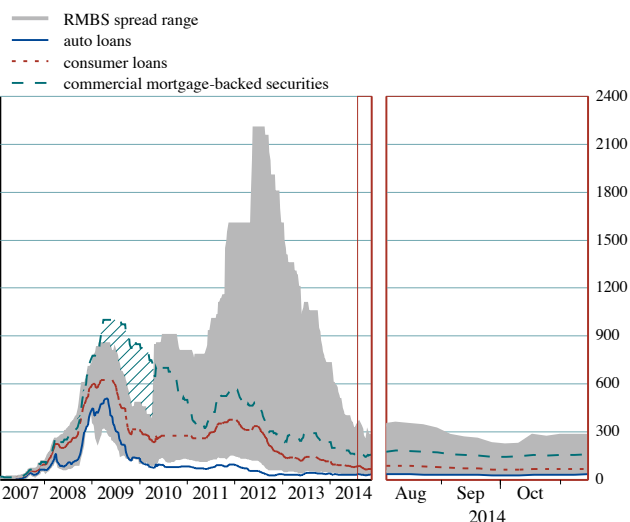


Sources: Thomson Reuters and ECB calculations.

Notes: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across national sovereign CDS spreads in the euro area. Following the decision by the International Swaps Derivatives Association that a credit event had occurred, Greek sovereign CDS were not traded between 9 March 2012 and 11 April 2012. Due to lack of contributors, Greek sovereign CDS spread is not available between 1st of March and 21 May 2013. For presentational reasons, this chart has been truncated.

### S.2.8 Spreads over LIBOR of selected European AAA-rated asset-backed securities

(26 Jan. 2007 - 14 Nov 2014; basis points)

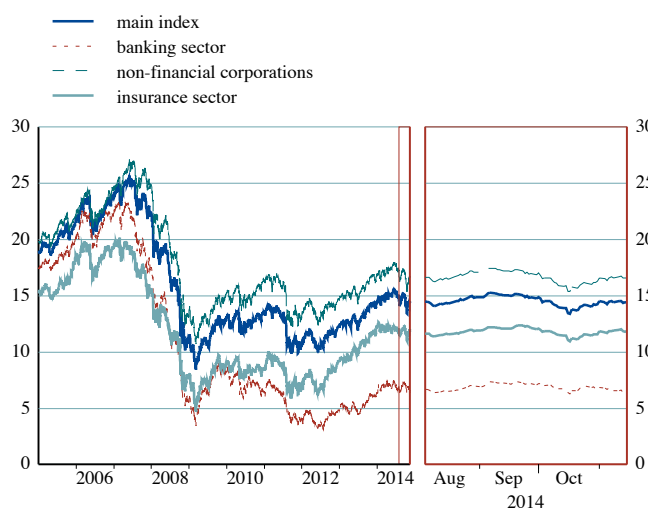


Source: JPMorgan Chase & Co.

Note: In the case of residential mortgage-backed securities (RMBSs), the spread range is the range of available individual country spreads in Greece, Ireland, Spain, Italy, the Netherlands, Portugal and the United Kingdom.

## S.2.9 Price/earnings ratio for the euro area stock market

(3 Jan. 2005 - 14 Nov 2014; ten-year trailing earnings)

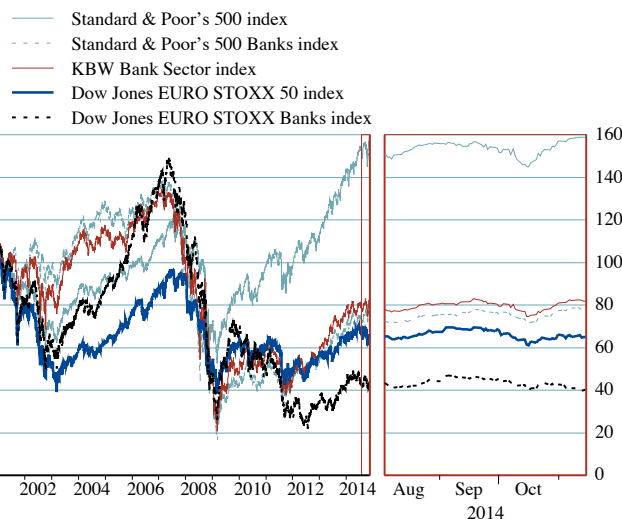


Sources: Thomson Reuters and ECB calculations.

Note: The price/earnings ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

## S.2.10 Equity indices

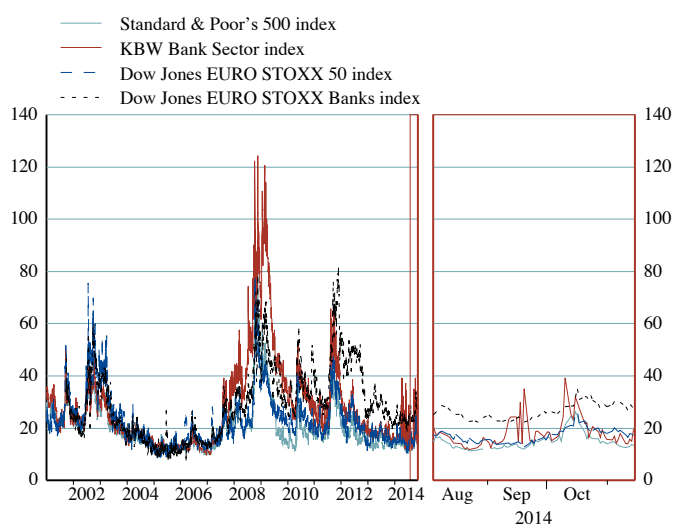
(2 Jan. 2001 - 14 Nov 2014; index: Jan. 2001 = 100)



Source: Bloomberg.

## S.2.11 Implied volatilities

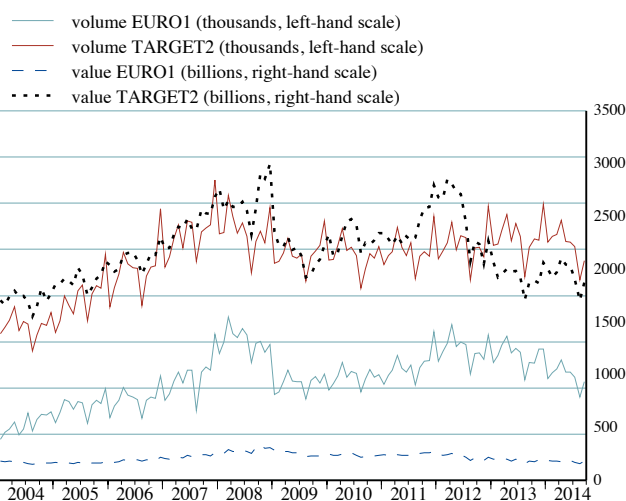
(2 Jan. 2001 - 14 Nov 2014; percentages)



Sources: Bloomberg and Thomson Reuters Datastream.

## S.2.12 Payments settled by the large-value payment systems TARGET2 and EURO1

(Jan. 2004 - Sep. 2014; volumes and values)

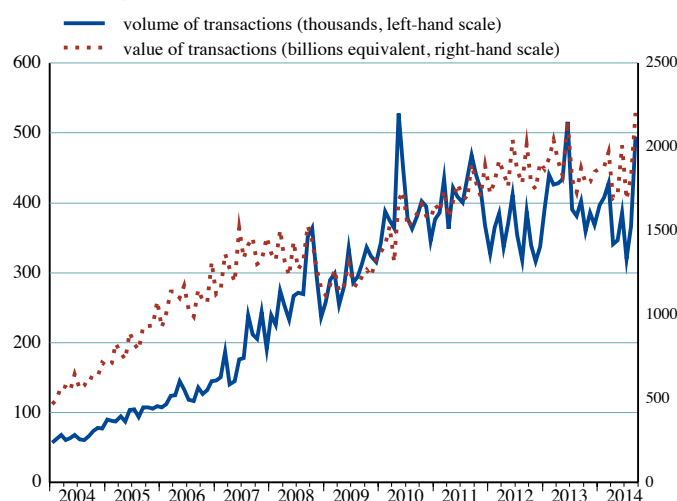


Source: ECB.

Notes: TARGET2 is the real-time gross settlement system for the euro. TARGET2 is operated in central bank money by the Eurosystem. TARGET2 is the biggest large-value payment system (LVPS) operating in euro. The EBA CLEARING Company's EURO1 is a euro-denominated net settlement system owned by private banks, which settles the final positions of its participants via TARGET2 at the end of the day. EURO1 is the second-biggest LVPS operating in euro.

### S.2.13 Volumes and values of foreign exchange trades settled via the Continuous Linked Settlement Bank

(Jan. 2004 - Sep. 2014; volumes and values)

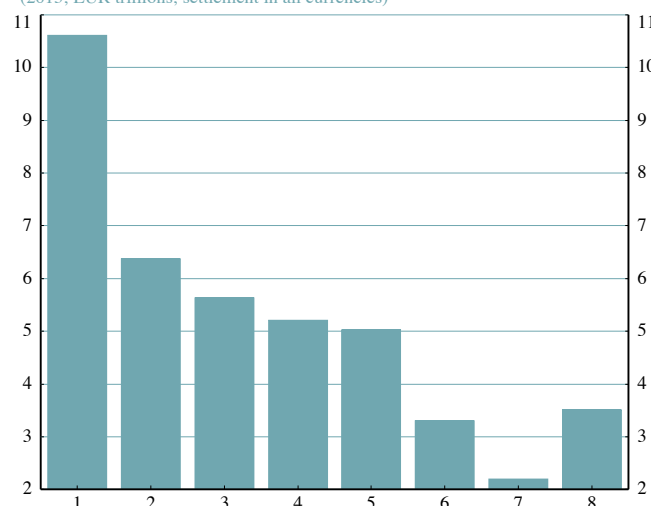


Source: ECB.

Notes: The Continuous Linked Settlement Bank (CLS) is a global financial market infrastructure which offers payment-versus-payment (PvP) settlement of foreign exchange (FX) transactions. Each PvP transaction consists in two legs. The figures above count only one leg per transaction. CLS transactions are estimated to cover about 60% of the global FX trading activity.

### S.2.14 Value of securities held in custody by CSDs and ICSDs

(2013; EUR trillions; settlement in all currencies)

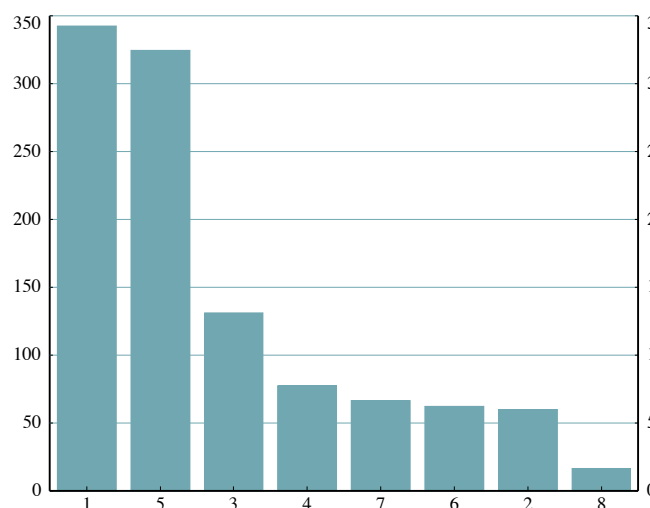


Source: ECB.

Notes: CSDs stands for central securities depositaries and ICSDs for international central securities depositaries. 1 - Euroclear Bank (BE); 2 - Clearstream Banking Frankfurt - CBF (DE); 3 - Euroclear France; 4 - Clearstream Banking Luxembourg - CBL; 5 - CRESTCo (UK); 6 - Monte Titoli (IT); 7 - Iberclear (ES); 8 - Remaining 40 CSDs in the EU.

### S.2.15 Value of securities settled by CSDs and ICSDs

(2013; EUR trillions; settlement in all currencies)

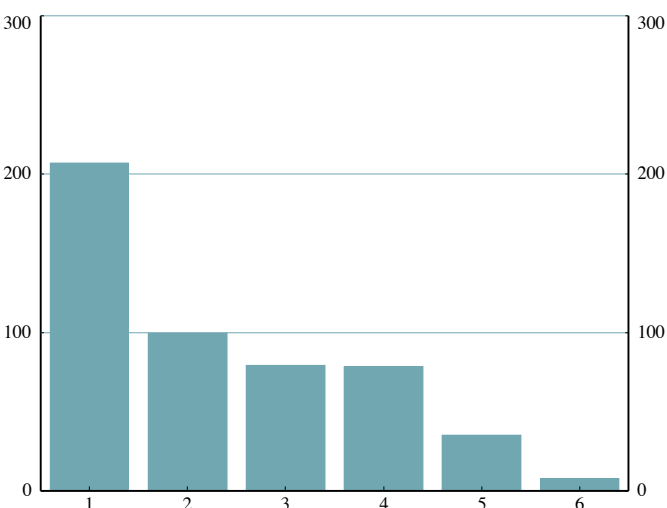


Source: ECB.

Note: See notes of Chart S.2.14.

### S.2.16 Value of transactions cleared by central counterparties

(2013; EUR trillions)



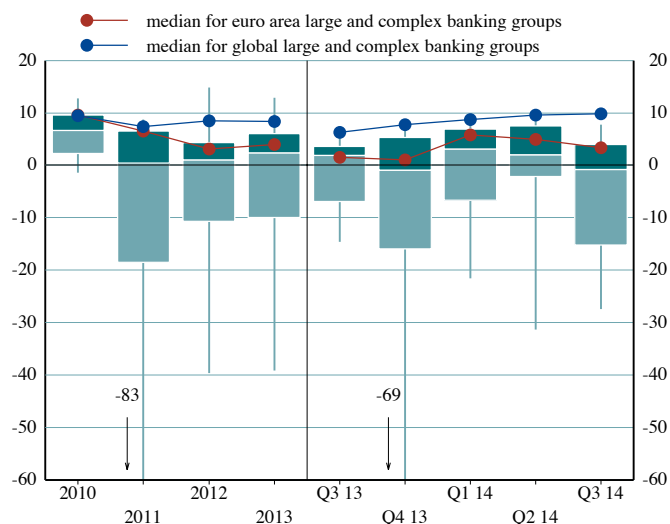
Source: ECB.

Notes: 1 - EUREX Clearing AG (DE); 2 - ICE Clear Europe (UK); 3 - LCH Clearnet Ltd; 4 - LCH Clearnet SA (FR); 5 - CC&G (IT); 6 - Others. The chart includes outright and repo transactions, financial and commodity derivatives.

## 3 FINANCIAL INSTITUTIONS

### S.3.1 Return on shareholders' equity for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

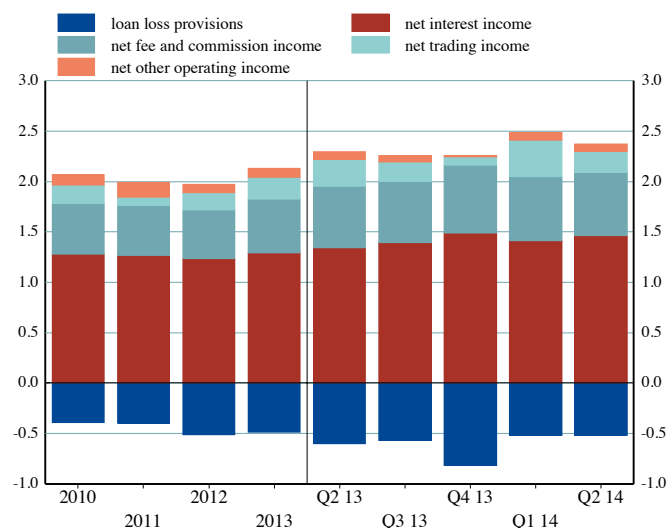


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. Quarterly figures are annualised.

### S.3.3 Breakdown of operating income for euro area significant banking groups

(2010 - Q2 2014; percentage of total assets; weighted average)

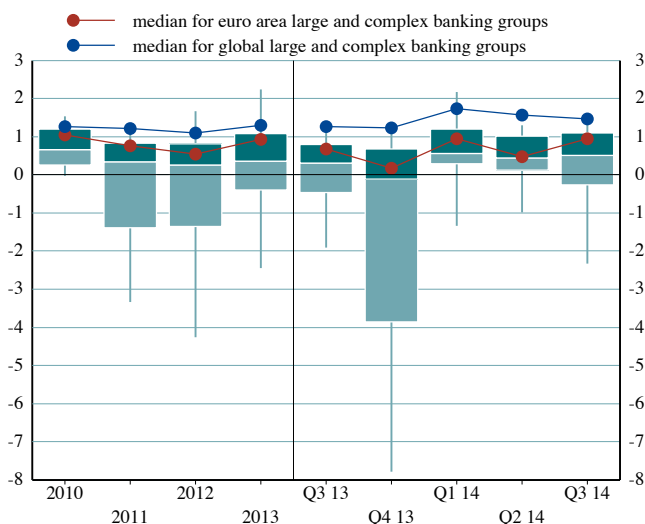


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. Quarterly results are annualised. Annual and quarterly indicators are based on common samples of 66 and 27 significant banking groups in the euro area, respectively.

### S.3.2 Return on risk-weighted assets for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

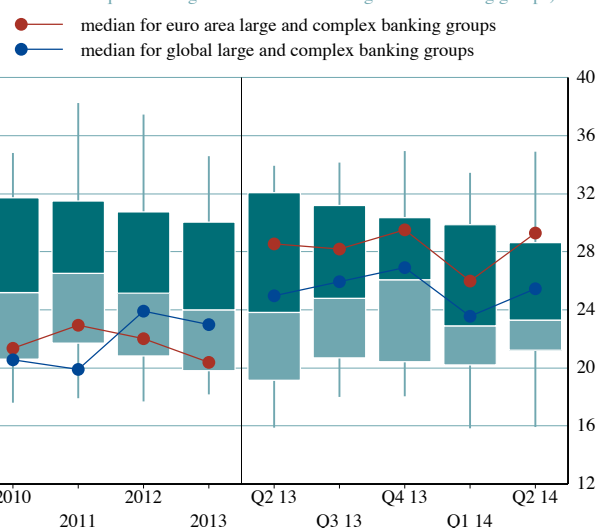


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. Quarterly figures are annualised.

### S.3.4 Diversification of operating income for euro area significant banking groups

(2010 - Q2 2014; individual institutions' standard deviation dispersion; 10th and 90th percentile and interquartile range distribution across significant banking groups)

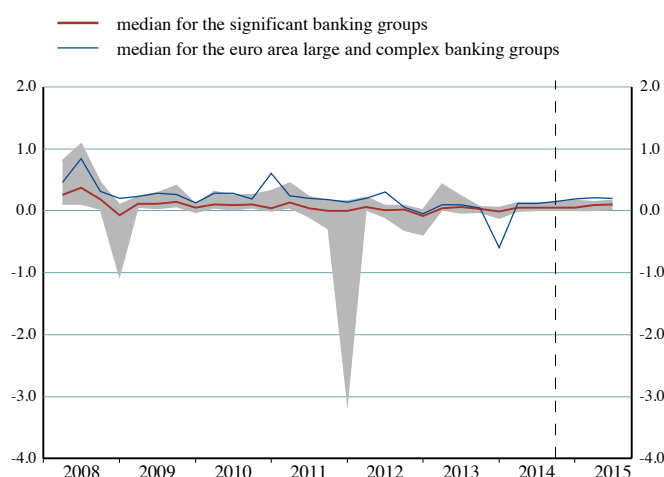


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. A value of "0" means full diversification, while a value of "50" means concentration on one source only. Annual and quarterly indicators are based on common samples of 68 and 27 significant banking groups in the euro area, respectively.

### S.3.5 Actual and forecast earnings per share for euro area significant banking groups

(Q1 2008 - Q2 2015; EUR)

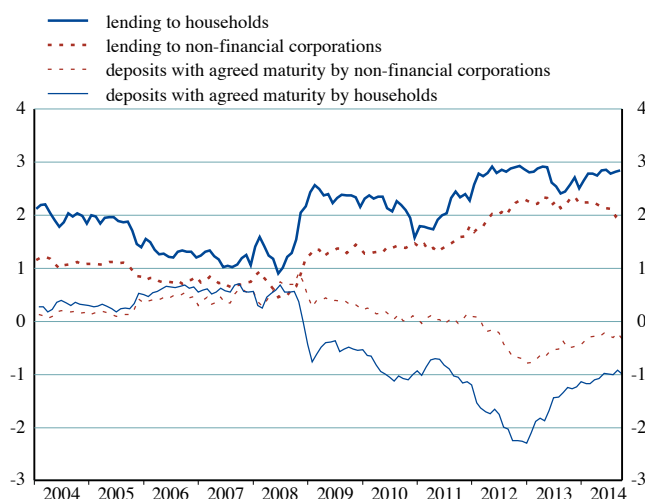


Sources: SNL Financial and ECB calculations.

Note: The shaded area indicates the interquartile ranges across the diluted earnings per share of selected significant banking groups in the euro area.

### S.3.6 Lending and deposit spreads of euro area MFIs

(Jan. 2004 - Sep. 2014; percentage points)

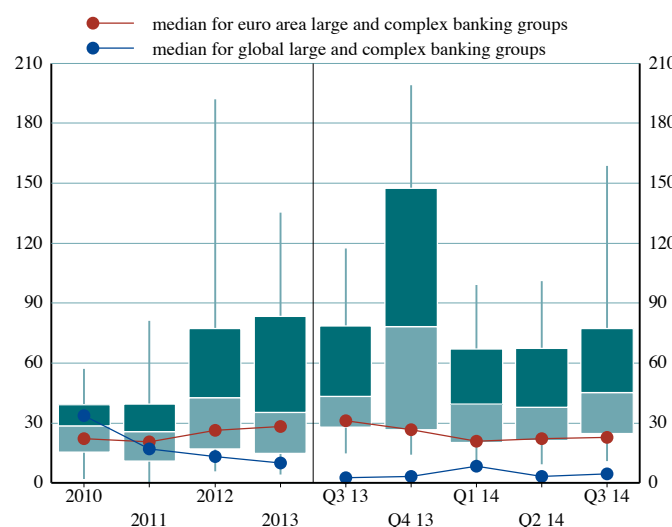


Sources: ECB, Thomson Reuters and ECB calculations.

Notes: Lending spreads are calculated as the average of the spreads for the relevant breakdowns of new business loans, using volumes as weights. The individual spreads are the difference between the MFI interest rate for new business loans and the swap rate with a maturity corresponding to the loan category's initial period of rate fixation. For deposits with agreed maturity, spreads are calculated as the average of the spreads for the relevant break-downs by maturity, using new business volumes as weights. The individual spreads are the difference between the swap rate and the MFI interest rate on new deposits, where both have corresponding maturities.

### S.3.7 Net loan impairment charges for euro area significant banking groups

(2010 - Q3 2014; percentage of net interest income; 10th and 90th percentile and interquartile range distribution across significant banking groups)

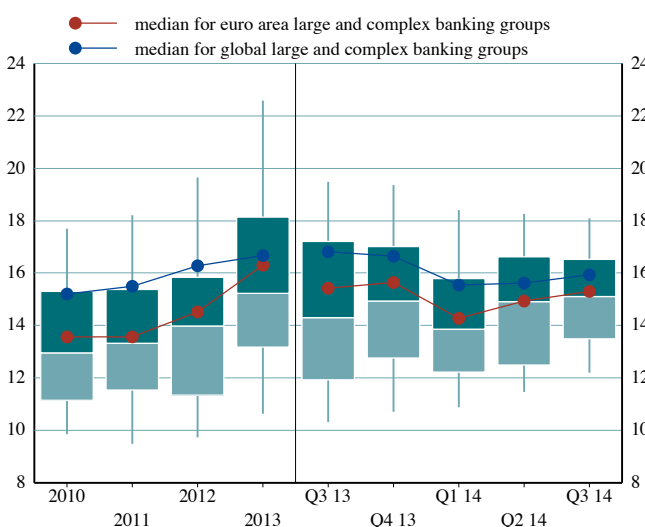


Sources: SNL Financial and ECB calculations.

Note: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis.

### S.3.8 Total capital ratios for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

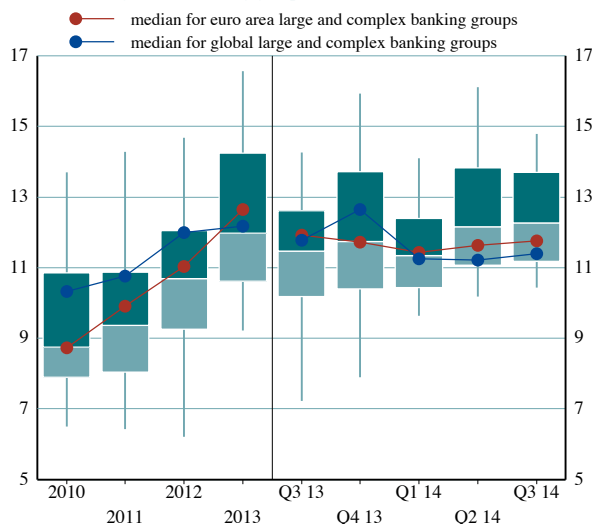


Sources: SNL Financial and ECB calculations.

Note: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis.

### S.3.9 Core Tier I capital ratios for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

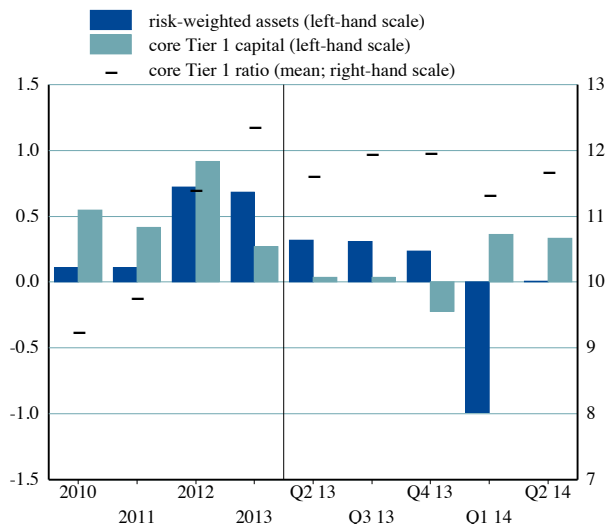


Sources: SNL Financial and ECB calculations.

Note: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis.

### S.3.10 Contribution of components of the core Tier I capital ratios to changes for euro area significant banking groups

(2010 - Q2 2014; percentages)

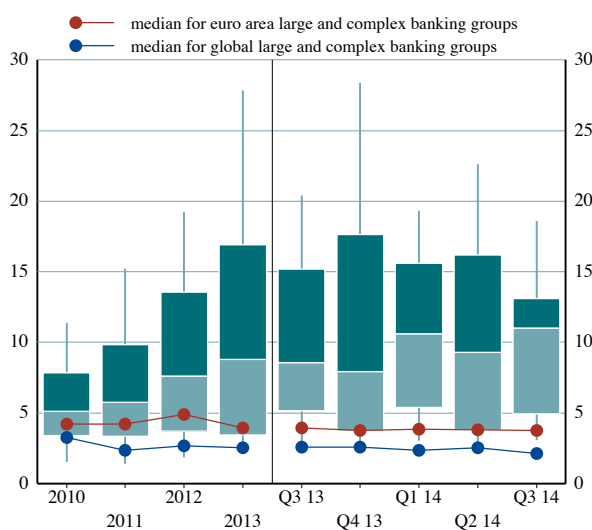


Sources: SNL Financial and ECB calculations.

Note: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. Annual and quarterly indicators are based on common samples of 53 and 27 significant banking groups in the euro area, respectively.

### S.3.11 Non-performing loan ratios for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

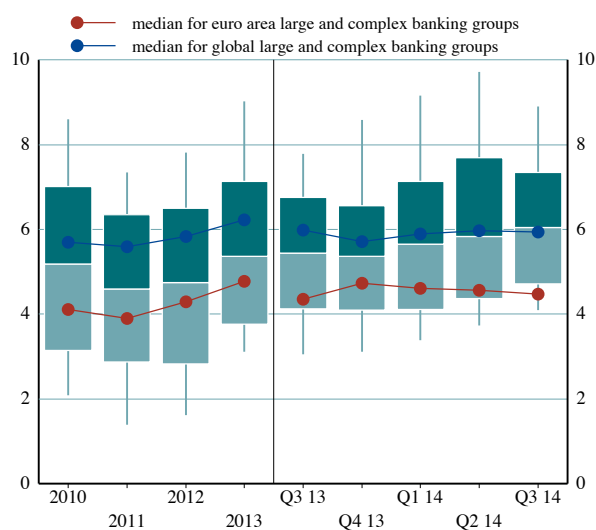


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. The non-performing loan ratio is defined as the ratio of impaired customer loans to total customer loans.

### S.3.12 Leverage ratios for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

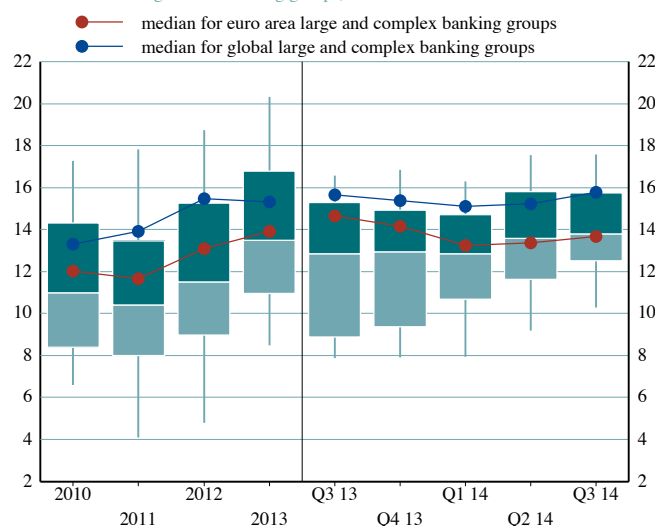


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly frequency. Leverage is defined as the ratio of shareholder equity to total assets.

### S.3.13 Risk-adjusted leverage ratios for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

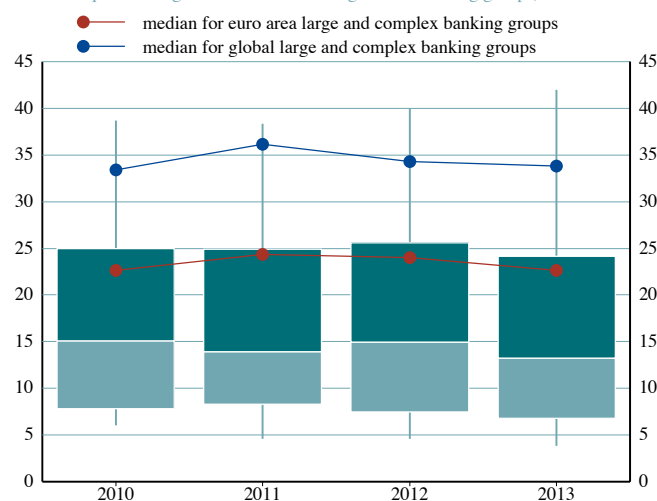


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. Risk-adjusted leverage is defined as the ratio of shareholder equity to risk-weighted assets.

### S.3.14 Liquid assets ratios for euro area significant banking groups

(2010 - 2013; percentage of total assets; 10th and 90th percentile and interquartile range distribution across significant banking groups)



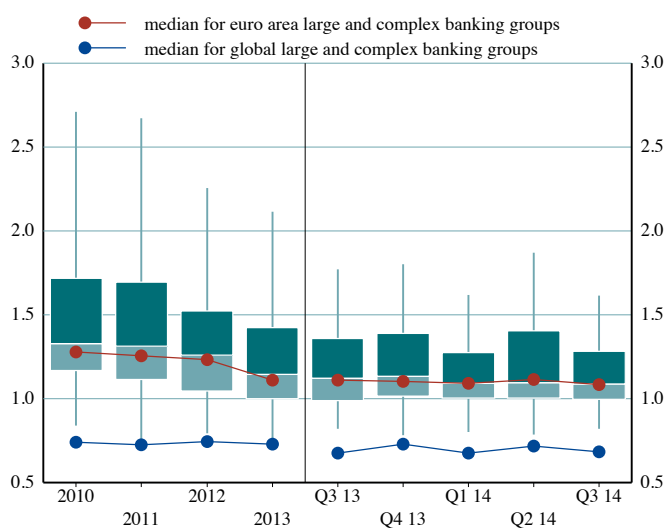
Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements. Liquid assets comprise cash and cash equivalents as well as trading securities.

Quarterly data are not included on account of the inadequate availability of interim results on the date of publication.

### S.3.15 Customer loan-to-deposit ratios for euro area significant banking groups

(2010 - Q3 2014; multiple; 10th and 90th percentile and interquartile range distribution across significant banking groups)

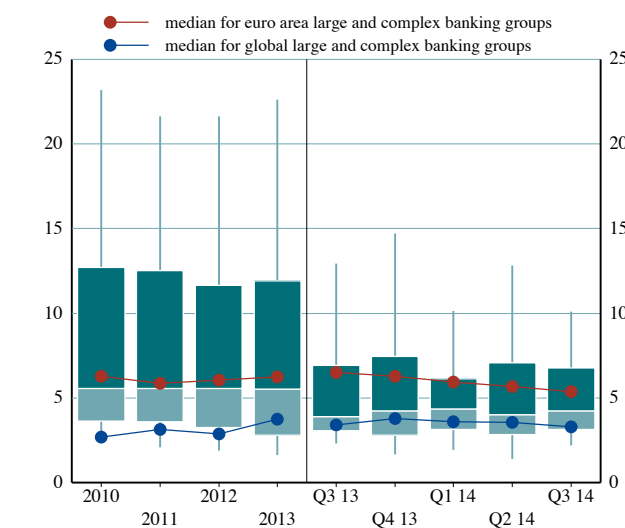


Sources: SNL Financial and ECB calculations.

Note: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis.

### S.3.16 Interbank borrowing ratio for euro area significant banking groups

(2010 - Q3 2014; percentage of total assets; 10th and 90th percentile and interquartile range distribution across significant banking groups)

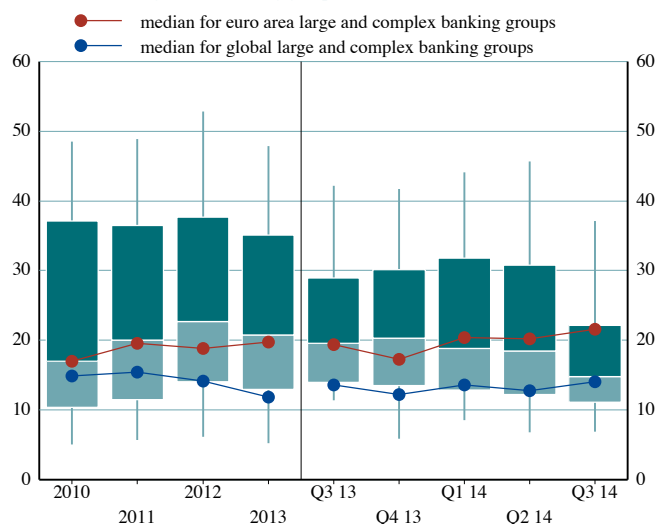


Sources: SNL Financial and ECB calculations.

Note: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis.

### S.3.17 Ratios of short-term funding to loans for euro area significant banking groups

(2010 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution across significant banking groups)

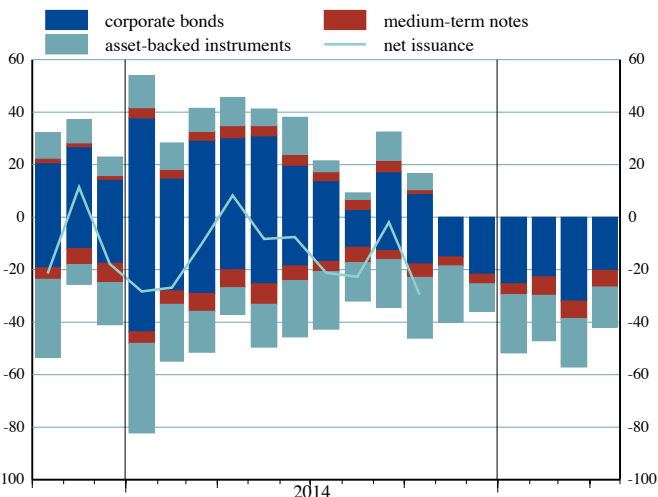


Sources: SNL Financial and ECB calculations.

Notes: Includes publicly available data for significant banking groups that report annual financial statements and a subset of those banks that report on a quarterly basis. Interbank funding is used as the measure of short-term funding.

### S.3.18 Issuance profile of long-term debt securities by euro area significant banking groups

(Oct. 2013 - Apr. 2015; EUR billions)

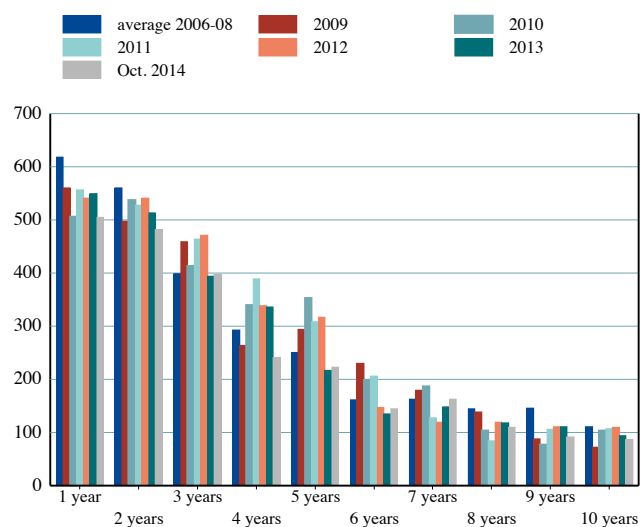


Sources: Dealogic DCM Analytics and ECB calculations.

Notes: Net issuance is the total gross issuance minus scheduled redemptions. Dealogic does not trace instruments after their redemption, so that some of the instruments may have been redeemed early. Asset-backed instruments encompass asset-backed and mortgage-backed securities, as well as covered bond instruments.

### S.3.19 Maturity profile of long-term debt securities for euro area significant banking groups

(2006 - Oct. 2014; EUR billions)

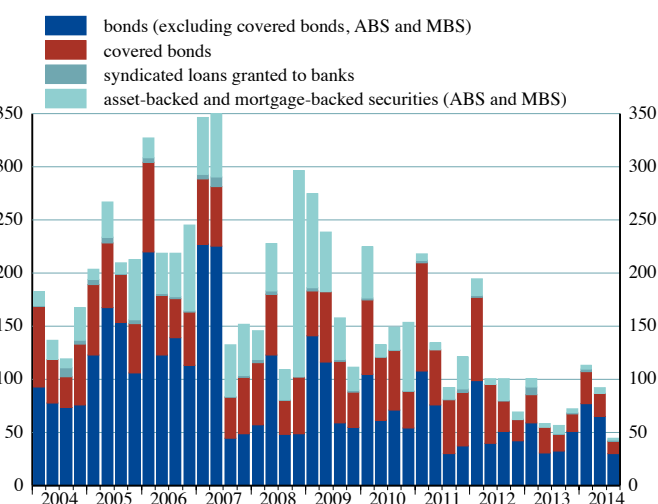


Sources: Dealogic DCM Analytics and ECB calculations.

Notes: Data refer to all amounts outstanding at the end of the corresponding year/month. Long-term debt securities include corporate bonds, medium-term notes, covered bonds, asset-backed securities and mortgage-backed securities with a minimum maturity of 12 months.

### S.3.20 Issuance of syndicated loans and bonds by euro area banks

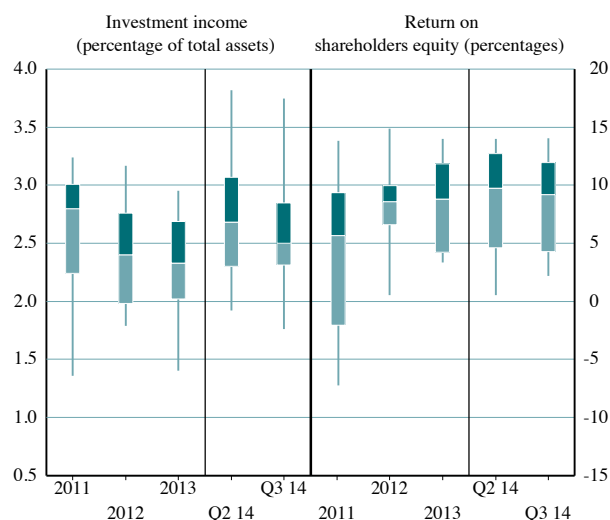
(Q1 2004 - Q3 2014; EUR billions)



Sources: Dealogic DCM Analytics and Loan Analytics, ECB calculations.

### S.3.21 Investment income and return on equity for a sample of large euro area insurers

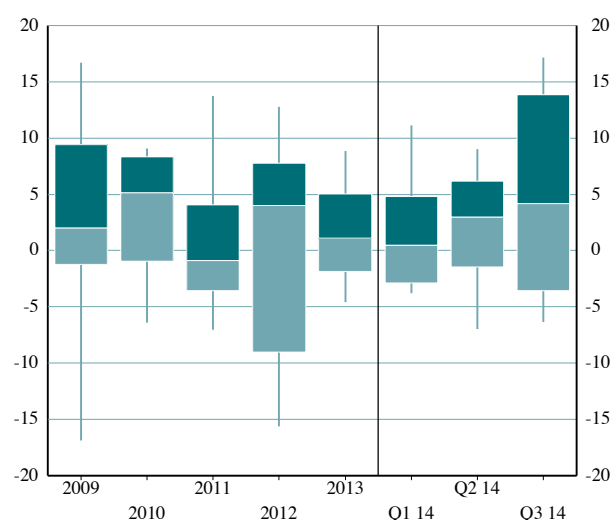
(2011 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution)



Sources: Bloomberg, individual institutions' reports and ECB calculations.  
Notes: Based on available figures for 21 euro area insurers and reinsurers.

### S.3.22 Gross-premium-written growth for a sample of large euro area insurers

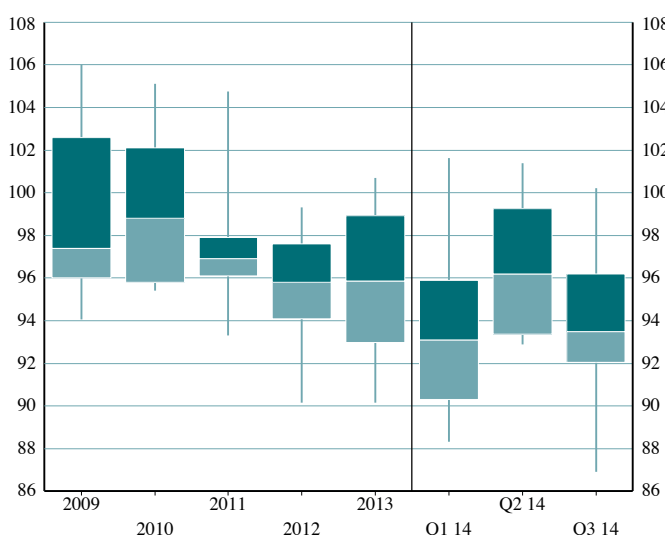
(2009 - Q3 2014; percentage change per annum; 10th and 90th percentile and interquartile range distribution)



Sources: Bloomberg, individual institutions' reports, and ECB calculations.  
Note: Based on available figures for 21 euro area insurers and reinsurers.

### S.3.23 Distribution of combined ratios for a sample of large euro area insurers

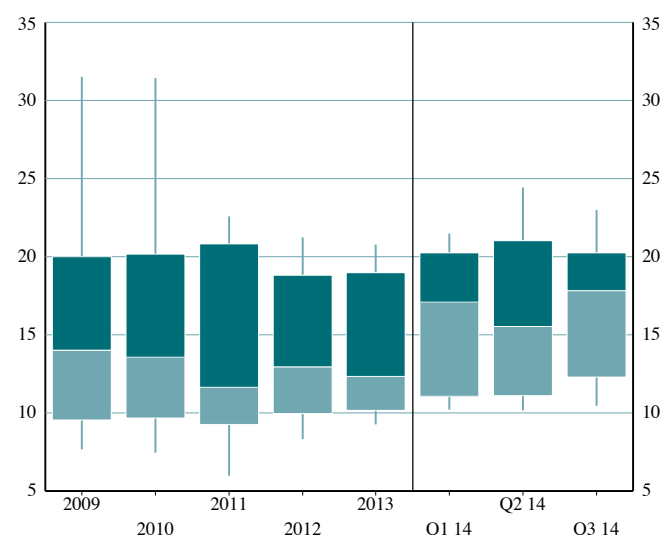
(2009 - Q3 2014; percentages; 10th and 90th percentile and interquartile range distribution)



Sources: Bloomberg, individual institutions' reports and ECB calculations.  
Notes: Based on available figures for 21 euro area insurers and reinsurers.

### S.3.24 Capital distribution for a sample of large euro area insurers

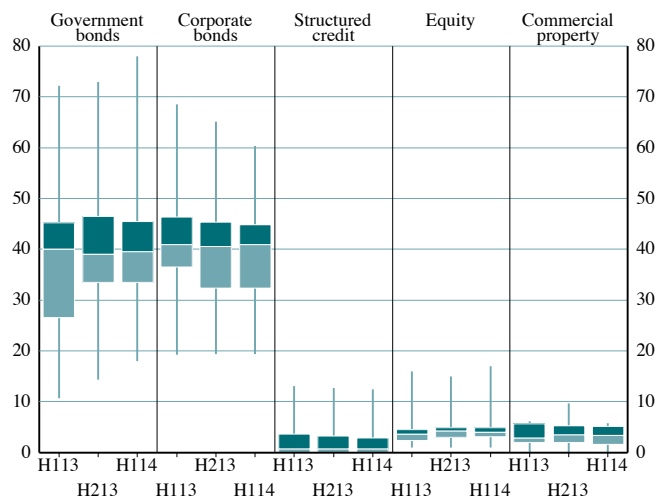
(2009 - Q3 2014; percentage of total assets; 10th and 90th percentile and interquartile range distribution)



Sources: Bloomberg, individual institutions' reports and ECB calculations.  
Notes: Capital is the sum of borrowings, preferred equity, minority interests, policyholders' equity and total common equity. Data are based on available figures for 21 euro area insurers and reinsurers.

### S.3.25 Investment distribution for a sample of large euro area insurers

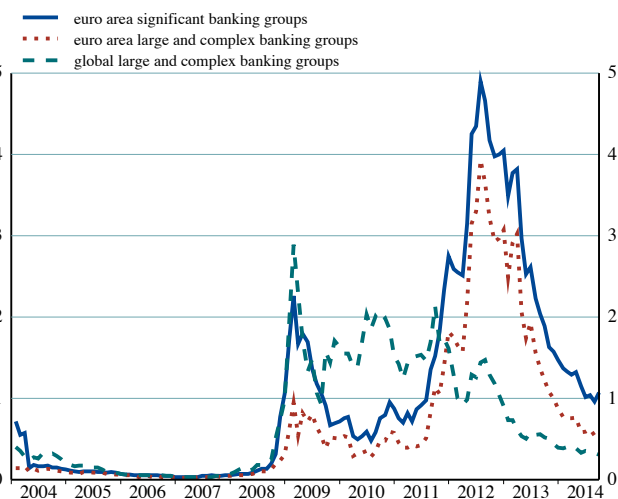
H1 2013 - H1 2014; percentage of total investments; minimum, maximum and interquartile distribution)



Sources: Individual institutions' financial reports and ECB calculations.  
Notes: Equity exposure data exclude investments in mutual funds. Data are based on available figures for 14 euro area insurers and reinsurers.

### S.3.26 Expected default frequency for banking groups

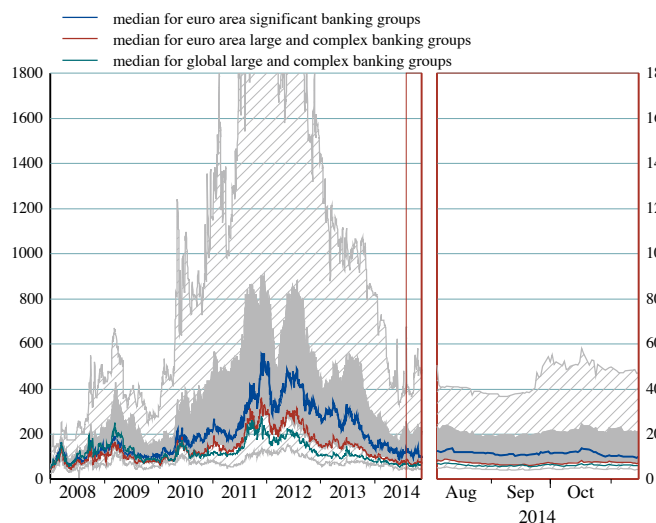
(Jan. 2004 - Sep. 2014; percentages; weighted average)



Sources: Moody's KMV and ECB calculations.  
Note: The weighted average is based on the amounts of non-equity liabilities.

### S.3.27 Credit default swap spreads for euro area significant banking groups

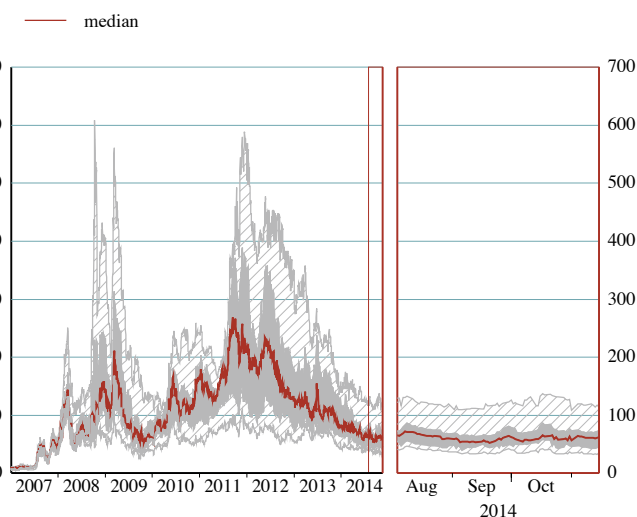
(1 Jan. 2008 - 14 Nov 2014; basis points; senior debt; five-year maturity)



Sources: Thomson Reuters, Bloomberg and ECB calculations.  
Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across the CDS spreads of selected large banks. For presentational reasons, this chart has been truncated.

### S.3.28 Credit default swap spreads for a sample of large euro area insurers

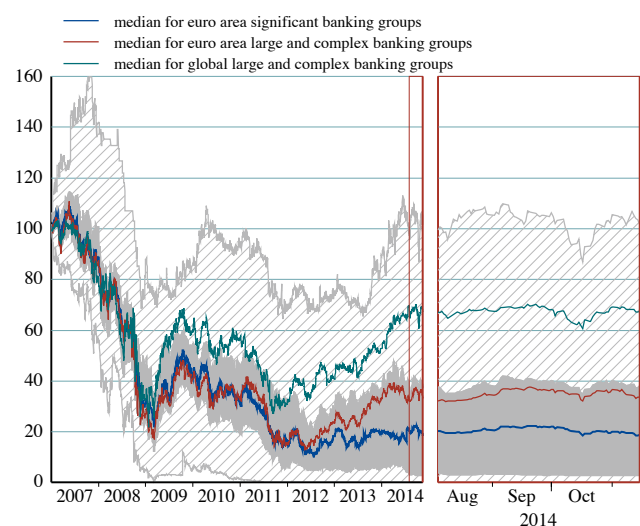
(3 Jan. 2007 - 14 Nov 2014; basis points; senior debt; five-year maturity)



Sources: Thomson Reuters, Bloomberg and ECB calculations.  
Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across the CDS spreads of selected large insurers.

### S.3.29 Stock performance of the euro area significant banking groups

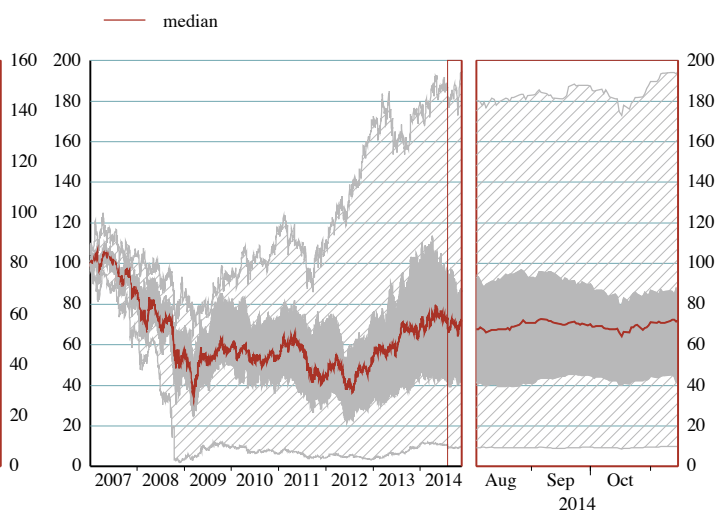
(3 Jan. 2007 - 14 Nov 2014 ; index: 2 Jan. 2007 = 100)



Sources: Thomson Reuters , Bloomberg and ECB calculations.  
Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across equities of selected large insurers. this chart has been truncated.

### S.3.30 Stock performance of a sample of large euro area insurers

(3 Jan. 2007 - 14 Nov 2014 ; index: 2 Jan. 2007 = 100)



Sources: Thomson Reuters , Bloomberg and ECB calculations.  
Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across equities of selected large insurers.

