



EUROPEAN CENTRAL BANK

EUROSYSTEM

FINANCIAL STABILITY REVIEW

MAY 2013





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PREFACE

Financial stability can be defined as a condition in which the financial system – which comprises financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances. This mitigates the likelihood of disruptions in the financial intermediation process that are severe enough to significantly impair the allocation of savings to profitable investment opportunities. Understood this way, the safeguarding of financial stability requires identifying the main sources of risk and vulnerability. Such sources include inefficiencies in the allocation of financial resources from savers to investors and the mispricing or mismanagement of financial risks. The identification of risks and vulnerabilities is necessary because the monitoring of financial stability must be forward looking: inefficiencies in the allocation of capital or shortcomings in the pricing and management of risk can, if they lay the foundations for vulnerabilities, compromise future financial system stability and therefore economic stability. This Review assesses the stability of the euro area financial system both with regard to the role it plays in facilitating economic processes and with respect to its ability to prevent adverse shocks from having inordinately disruptive impacts.

The purpose of publishing this Review is to promote awareness in the financial industry and among the public at large of issues that are relevant for safeguarding the stability of the euro area financial system. By providing an overview of sources of risk and vulnerability for financial stability, the Review also seeks to play a role in preventing financial crises.

The analysis contained in this Review was prepared with the close involvement of the Financial Stability Committee (FSC). The FSC assists the decision-making bodies of the European Central Bank (ECB) in the fulfilment of the ECB's tasks in the field of financial stability.



OVERVIEW

Stress in the euro area financial sector has fallen markedly from previous peaks. Measures capturing tension within the banking sector and across financial markets suggest that euro area systemic stress is at its lowest point in two years. ECB policies, in particular the Outright Monetary Transactions programme that effectively eliminated the perceived tail risk of a euro area break-up, have been key – but not the only positive development. Fundamental adjustment continues at the national level, alongside ongoing initiatives at the EU level to strengthen the institutional framework of Monetary Union. The credibility of these policies and ongoing processes is demonstrated by the muted financial market reactions and limited observable contagion from country-specific instability such as that witnessed in Cyprus. The current resilience of the euro area macro-financial environment is in stark contrast to earlier stages of the financial crisis. Financial market participants seem to have increasingly internalised the commitment of the political authorities, at European and national level, to ensure the stability of the single currency and its banking and financial markets, even though the decision-making process might appear hesitant at times.

Financial sector stress has eased markedly...

... with increased resilience...

Financial stability conditions, however, still remain fragile in the euro area. Several vulnerabilities in the interaction between sovereigns, banks and the macroeconomy persist. Notwithstanding progress to date in addressing fiscal, competitiveness and financial imbalances – the root causes of the crisis – adjustment remains incomplete. This adjustment has been buttressed by extraordinary liquidity support from the ECB, which can address the symptoms but not the root causes of financial stress. Further concrete action by public and private sector representatives alike is needed to durably sever negative feedback loops between distressed sovereigns, increasingly diverging economic growth prospects at the country level and concerns about the financial soundness of banks. A roadmap has been drawn up for completing Economic and Monetary Union (EMU). Its completion, including notably the part related to the banking union, is essential.

... but vulnerabilities remain

MAIN RISKS TO EURO AREA FINANCIAL STABILITY

The main sources of vulnerability are summarised in the table below. Key risks in the fiscal, macroeconomic and financial sphere and their interaction, which have fuelled the crisis, could – if conditions deteriorate – reignite financial market tensions. In addition, potential imbalances from a search for yield, amid continued crisis-related dislocations in capital flows, have gained prominence as a further potential risk to euro area financial stability, as risk premia in key global credit markets might at some point be reassessed.

Four key risks to euro area financial stability...

Key risks to euro area financial stability		
		Current level and recent change
1. Further decline in bank profitability, linked to credit losses and a weak macroeconomic environment		
2. Renewed tensions in sovereign debt markets due to low growth and slow reform implementation		
3. Bank funding challenges in stressed countries		
4. Reassessment of risk premia in global markets, following a prolonged period of safe-haven flows and search for yield		
considerable 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, based on the judgement of the ECB's staff. The arrows indicate the change since the previous FSR.
systemic risk		
potential systemic risk		

A weak economy is affecting bank profitability and solvency...

Key risk 1: Further decline in bank profitability, linked to credit losses and a weak macroeconomic environment

A weakening in the macroeconomic environment has resulted in increasing risks to banks' credit exposures, profitability and capital levels. Macroeconomic growth expectations in the euro area have progressively declined, from an anticipated expansion of around 1% for 2013 by private sector forecasters at the beginning of 2012, to the currently foreseen contraction of 0.4%. Around this euro area average, the dispersion of country forecasts has steadily widened. As the aggregate macroeconomic environment has deteriorated, so too has the profitability of euro area banks including large and complex banking groups (LCBGs). Importantly, a higher cost of equity and lower, or negative, returns on equity over the last years have underscored a structural need for further bank balance sheet adjustment.

At the same time, the steady improvements in solvency positions of euro area banks observed during the past years, reflected in rising regulatory capital ratios, should provide a more solid buffer against possible losses and a more sustainable basis for banking activity going forward. For LCBGs, the median core Tier 1 capital ratio reached 11.1% in the first quarter of 2013 – up from 9.6% at the end of 2011 and 8.3% at end-2009. Rising capital, in turn, has also been the most important contributor to the ongoing deleveraging process of the euro area banking sector, with increased equity capital constituting the main driving force behind a fall by one-third in the ratio of assets to equity over the last four years.

Notwithstanding this aggregate adjustment to date, the credit quality of banks remains uneven across the euro area banking sector. Particularly vulnerable are banks that are confronted with a significant deterioration of asset quality with high and rising non-performing loan (NPL) levels, and have low NPL coverage ratios and a weak profit and/or solvency base. The risks of rising NPLs eroding profitability is most relevant for banks with exposures to highly indebted households and firms, vulnerable to adverse developments in the form of falling or subdued commercial and residential property prices, rising unemployment or weak economic demand. The accommodative interest rate environment has played an important role in attenuating the non-financial sector's debt burden. At the same time, the effects of a low interest rate environment on bank profitability have been mixed, depending on the structural characteristics of banks' loan books (notably the prevalence of fixed versus floating rate loans). Ultimately, economic activity has continued to slow, while the euro area aggregate unemployment rate rose to 12.1% in March 2013, up from under 8% five years ago. Unemployment rates across countries now range from a low of below 5% to a maximum of over a quarter of the active labour force.

Concerns – justified or not – related to the lack of information available to evaluate banks' asset quality weigh on the entire euro area banking sector. Banks facing deteriorating credit quality might have engaged in loan forbearance, especially in a low-cost funding environment. This can be productive to the extent that it helps debtors through temporary problems. But it can also be counterproductive if such practices delay the clean-up of banks' balance sheets and divert credit supply away from productive sectors.

... and calls for further progress in tackling balance sheet problems

To mitigate these concerns, continued and prompt progress in proactively tackling bank balance sheet problems is required. Adequate provisions for costs in the form of non-performing assets, as well as any other foreseeable expense (for example, potential further litigation costs), should be made. Ongoing initiatives to provide clarity on banks' balance sheets, including thorough asset

quality reviews, are a key tool in this respect. Promoting market confidence in the condition of banks' balance sheets is paramount and efforts to enhance the transparency of balance sheets are a key step towards easing banking vulnerabilities. In this vein, reduced complexity and opacity of banks' calculations of risk-weighted assets would help to boost confidence in regulatory capital ratios of banks. This would not only support the recovery in the banking sector, but also improve investor confidence and banks' ability to lend to the real economy.

Key risk 2: Renewed tensions in sovereign debt markets due to low growth and slow reform implementation

Tensions in sovereign debt markets have declined tangibly since the peaks in mid-2012. Spreads of ten-year sovereign bond yields over overnight indexed swap rates have fallen significantly since mid-2012, by around 160 basis points in Italy, 180 basis points in Spain, 260 basis points in Ireland and 440 basis points in Portugal. These developments suggest a lower common premium on government bond yields in euro area countries that have experienced sovereign tensions. As spreads have fallen, sovereign issuance in the first quarter of this year for these countries rose to its strongest level since the outbreak of sovereign tensions three years ago. And, reflecting a decline of the euro area monetary and financial tensions, the cross-country divergence among TARGET2 balances within the euro area, while still high, has also declined steadily and substantially.

This notwithstanding, stress in euro area sovereign debt markets remains a notable risk factor. Weaknesses in public finances, in particular, persist in several countries, with expectations for government deficits in 2013 having worsened in approximately half of the euro area countries since December. Fiscal vulnerabilities extend more generally to the high public debt, muted economic growth, contingent liabilities from the banking sector and longer-term demographic challenges from an ageing population. Structural reforms are a key component of adjustment, not least in their potential to remove inefficiencies in human and physical capital allocation within the euro area. Such reforms would also address the problem of high unemployment, particularly amongst the youth, and related uneven income prospects that increase the risks of spreading discontent, including waning support for European integration.

Stressed countries have over the past few years made considerable efforts to adjust their public finances. This should not unravel now. These achievements should continue – this demonstrated willingness to tackle challenges to public finances should involve a parallel focus on productivity-enhancing structural economic and financial reforms. Beyond this, continued momentum is needed towards completing a genuine Economic and Monetary Union, notably including a full banking union and a strengthening of fiscal frameworks. As the crisis has illustrated, only a steady and timely implementation of these commitments can effectively contain a re-emergence of negative self-fulfilling market dynamics.

Key risk 3: Bank funding challenges in stressed countries

The ongoing return of investor risk appetite has led to some improvement in funding conditions for euro area banks, as captured by four key developments. First, deposit funding has improved overall and earlier outflows from banks in some countries under stress have begun to reverse. Second, despite some recent slowing, euro area banks' issuance of medium and long-term debt was solid at the beginning of the year when banks issued, in total, bonds amounting to €58 billion, compared with average monthly issuance during 2012 of €26 billion. Additionally, the access to

Continued easing of sovereign tensions but vulnerabilities remain...

... highlighting a need for continued policy action

Funding market fragmentation has decreased but strains remain in stressed countries...

markets by banks residing in euro area countries faced with sovereign tensions improved, with about half of January's issuance by Italian, Spanish, Irish, Greek and Portuguese banks. Third, there has been a noticeable pick-up in repo market activity of Spanish and Italian banks since late 2012. Fourth, on average banks are again able to issue bonds at a cost below those incurred by investment-grade non-financial corporates. These varied improvements in bank funding have facilitated the repayment by hundreds of banks of the ECB's three-year longer-term refinancing operations – amounting to some €290 billion, more than half of the net liquidity injection (accounting for lengthened maturities) provided by these operations.

Fragmentation in bank funding markets nevertheless remains an issue, with funding costs still markedly different depending on factors such as the country of banks' headquarters or bank size. Although larger banks in stressed euro area countries regained access to wholesale funding markets, funding costs remained prohibitively high in many cases. Furthermore, bank debt issuance has slowed significantly since February, partly reflecting uncertainties related to the Italian election and, in particular, following the announcement of official sector assistance for Cyprus. While issuance has generally shown signs of recovery, these recent episodes of heightened volatility have served as a reminder of the fragility of funding markets. Bank funding markets would certainly benefit from a predictable and consistent approach to bank supervision and resolution across Europe.

Persistently high funding costs for banks can amplify pressures on banks to deleverage in a disorderly way and weaken the economy further. They also imply a divergent burden on non-financial corporations depending on their size and location – and in particular their ability to tap capital markets directly. Indeed, even if funding conditions have eased, banks have continued to tighten lending standards, although conditions vary considerably across countries. For example, the average interest rates on new loans to small and medium-sized enterprises (SMEs) (as proxied by loans up to €1 million) currently stand at all-time lows of below 3% in Germany and France. In Spain and Italy, on the other hand, the interest rates on corresponding loans are much higher – at around 4.5-5%. Such financial fragmentation is contributing to increasingly divergent economic conditions across euro area countries.

*... and confidence
in banks therefore
needs to be
reinforced*

Timely and comprehensive ECB action has addressed the most acute phases of fragmentation of funding markets in the euro area. Perhaps most notably, market operations and the accepted collateral have been broadened, while the maturity of lending has been lengthened. These measures, as powerful as they have been, cannot – and indeed *should* not – replace measures in both the public and private sectors to address underlying vulnerabilities in balance sheets of both banks and sovereigns. Continued action to remedy joint sovereign-banking weaknesses, through fiscal, economic and financial adjustment at the national level, as well as supranational steps to complete EMU, are needed to fundamentally resolve remaining fragmentation in euro area funding markets.¹ As the real economic implications of fragmentation are growing, efforts should focus on overcoming current financing difficulties for SMEs, the activity of which lies at the heart of productivity and innovation in the euro area. In particular, a more vibrant European securitisation market would help smaller firms unable to directly tap market-based sources of financing. In this vein, the ECB has started consultations with other European institutions on initiatives to promote a functioning market for asset-backed securities collateralised by loans to non-financial corporations.

¹ See ECB, *Financial Integration Report*, 2013.

Key risk 4: Reassessment of risk premia in global markets, following a prolonged period of safe-haven flows and search for yield

The ongoing strengthening in financial market sentiment has occurred alongside continued strong demand for liquid and highly rated assets, which are increasingly in short supply. Past safe-haven capital flows, combined with investors now searching for higher-yielding assets, create vulnerabilities regarding potentially underpriced risk in several financial market segments. Such potential for an underpricing of risk is most evident in those credit market segments where yields have fallen to historical lows.

Two segments of the global credit market, in particular, have been exhibiting a combination of low yields and strong inflows. First, yields on higher-rated sovereign debt of perceived safe-haven countries – such as the United States, Japan, the United Kingdom and selected euro area countries – have drifted down to levels at, or below, long-term historical averages, as a continued premium is placed on perceived safety and liquidity. This generalised fall in yields appears little correlated with country-specific fiscal fundamentals such as sovereign indebtedness.

Second, there has been a decline in corporate bond yields in several markets, across all rating classes, to levels touching record lows. This partly reflects difficulties in obtaining yield in a generally low-return environment, particularly for institutional investors such as insurance companies and pension funds where asset returns over the last years may have failed to keep pace with guaranteed returns for policyholders. The average yield on euro area speculative non-financial corporate debt, in particular, has fallen by 690 basis points to 5.0% in mid-May 2013, from a crisis peak of 11.9% at the end of 2011. Moreover, the quality of bond issuance has arguably declined, with an increasing share of issuance by speculative-grade firms. As with safe-haven sovereign bond markets, there are signs that such correlated downward movement in yields is somewhat divorced from company-specific fundamentals. With a tepid macroeconomic outlook, credit risks in the corporate sector are arguably increasing. Moreover, liquidity risk may arise from increasing primary issuance of novel instruments in the corporate sector – for instance, of corporate hybrids – with limited (or at least untested) secondary market depth.

The search-for-yield phenomenon has not been limited to the advanced economies. Emerging markets are experiencing continued capital inflows, which – although partly linked to financial deepening, growth differentials and improving fundamentals – might also reflect a search for yield. Within the emerging market investment universe, investors have increasingly invested in local currency-denominated bonds, exposing themselves to currency risk.

An abrupt adjustment in benchmark sovereign interest rates, generally considered as the riskless rate in asset pricing models, or risk premia in specific market segments where yields are compressed, could result in a disorderly unwinding of flows, direct losses for fixed income investors – including banks and insurers – and indirect second-round effects on banks. It could also translate into higher funding costs for non-financial corporations, hampering the economic recovery and putting additional pressure on banks.

Stable and predictable policies are key to the prevention of such a risk reversal. In mitigating prospective losses in the banking sector, banks and supervisors should ensure that bank capital buffers are sufficient also by stress testing banks' balance sheets.

A search for safety and yield could lead to underpricing of credit market risk...

... in sovereign...

... corporate...

... and emerging economy credit markets

Stable and predictable policies key to prevent risk reversal



*Regulatory initiatives
to improve financial
stability...*

*... for banks,
non-banks and
markets...*

*... and including
notably banking
union in Europe*

ONGOING REGULATORY INITIATIVES

The reshaping of the regulatory and supervisory framework for financial institutions, markets and infrastructures has continued apace. This agenda, necessary to strengthen the resilience of the euro area financial sector, consists of many key elements that form a post-crisis architecture, and also fits into the broader context of the ongoing strengthening of the regulatory environment at the global level.

Indeed, remarkable progress has been achieved in moving European and global regulatory reform forward. The European Union has been at the forefront in delivering on key G20 commitments in the area of financial regulatory reform, with the forthcoming adoption of the CRD IV (which transposes Basel III into EU law), the strengthening of the institutional supervisory framework and the proposal for a resolution framework for banks in line with work by the Financial Stability Board and related work at the global and EU level on a resolution framework for market infrastructures. Notwithstanding the considerable regulatory progress to date, continued momentum is needed to strengthen oversight not only of banks, but also of a growing shadow banking sector and derivatives markets.

Among these regulatory initiatives, one with particular relevance for the ECB involves the European Commission's proposal for a banking union, which aims to set up a single supervisory mechanism (SSM) in the euro area, with specific micro- and macro-prudential tasks being conferred upon the ECB. Beyond the envisaged SSM, further building blocks in the form of a single resolution mechanism (SRM) and a single resolution authority (SRA), along with more harmonised deposit guarantee schemes, would be essential ingredients of an integrated framework that safeguards financial stability and minimises the cost of bank failures. Swift and complete implementation of a banking union should make an important contribution to key financial stability threats outlined in this Review, including by reducing negative feedback effects between banks and national authorities, whilst also fostering a reintegration of euro area financial markets.



I MACRO-FINANCIAL AND CREDIT ENVIRONMENT

Macro-financial risks remain elevated since economic growth prospects have failed to keep pace with improving financial market conditions. Balance sheet adjustment in the private and public sectors continues to weigh on the underlying economic growth momentum, both in the euro area and abroad. In the euro area, the outlook for economic growth and employment has been worsening amid an increasing degree of country-level divergence. In major advanced economies, including the euro area, macroeconomic policies continue to play a key role in shaping a fragile economic recovery. In a number of emerging economies, by contrast, indications of an advanced stage of the credit cycle highlight the risk of a possible disorderly unwinding of capital flows.

Sovereign tensions in the euro area have eased markedly amid an abatement of risks related to euro area cohesion and improved financial market conditions. Nevertheless, fiscal vulnerabilities remain in several countries, relating to the interaction between public finances, banking sector fragilities and macroeconomic weakness. After the high volatility observed in sovereign yields over the last year, both fiscal adjustment at the national level and initiatives announced to strengthen fiscal governance at the European level continue, although implementation risks remain a concern in the event of any reform fatigue or complacency.

Risks for the non-financial private sector in the euro area have increased on account of weakening aggregate macroeconomic conditions. Subdued income and earnings prospects have affected households' and non-financial corporations' debt servicing capabilities. Compounding this, a high level of non-financial sector indebtedness suggests persistent balance sheet fragilities in several countries, while fragmentation continues to affect the cost and availability of bank credit, in particular for small and medium-sized enterprises. Residential and commercial property markets continue to exhibit marked heterogeneity in terms of both price developments and valuations. Going forward, possible further sharp corrections in property values pose a risk, not least in view of the sizeable property-related exposures of banks in several countries.

I.1 GRADUAL ECONOMIC RECOVERY WITH CONSIDERABLE DOWNSIDE RISKS

Aggregate economic conditions in the **euro area** have remained weak despite clear improvements in financial market conditions (see Chart S.2.7). Subdued domestic demand remains the root cause of weak economic activity. Legacy balance sheet issues and a weak earnings and income outlook for firms and households, in combination with adverse credit supply conditions, have continued to weigh on consumption and investment. Both private and public sector forecasts indicate an only gradually improving near-term economic outlook in the euro area. The latest ECB staff projections suggest a gradual recovery in the second half of this year, largely driven by a pick-up in domestic demand. The real GDP growth forecast has been revised downward successively since the beginning of last year, with the current outlook a contraction of between -0.9% and -0.1% in 2013 and a recovery to between 0.0% and 2.0% in 2014.

Along the economic recovery path, uncertainty regarding the depth of the downturn and the pace of recovery in the euro area remains (see Chart 1.1). A weakening aggregate outlook masks considerable cross-country heterogeneity, with an increasing downside skew in the distribution of growth prospects amongst euro area countries (see Chart 1.2). The prospects for the euro area remain well below those for international peers – including major advanced and emerging market economies. Restoring competitiveness is vital for a number of countries within the euro area, with policies needed to ensure sufficient responsiveness in wages and prices, as well as to boost productivity.

Economic conditions in the euro area remain challenging

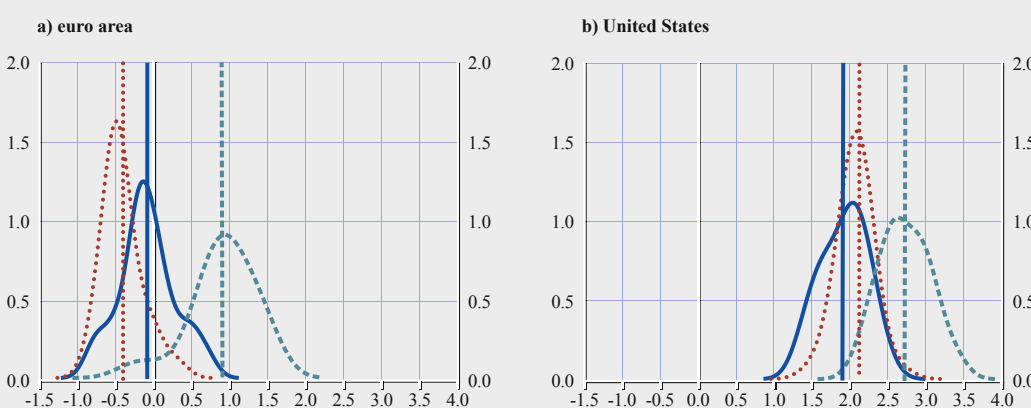
Substantial cross-country heterogeneity prevails across the euro area

Chart 1.1 Distribution of the 2013 and 2014 real GDP growth forecasts for the euro area and the United States

(probability density)

x-axis: real GDP growth forecasts

— Dec. 2012 forecast for 2013
 Apr. 2013 forecast for 2013
 - - - Apr. 2013 forecast for 2014



Sources: Consensus Economics and ECB calculations.

Ongoing adjustment of euro area country differentials is reflected in narrowing current account deficits (see Chart 1.3), a convergence of unit labour costs, corrections in house prices and reductions of private sector indebtedness. However, according to the European Commission’s *Macroeconomic Imbalance Procedure*, macroeconomic imbalances continue to persist in some countries, with weak economic conditions also hampering the adjustment process. In particular, the very marked disparity of labour market conditions in the euro area (see Chart 1.4) has underscored the role of employment and growth-enhancing structural reforms to support a broad-based and inclusive economic recovery.

Global economic activity is gradually gaining momentum

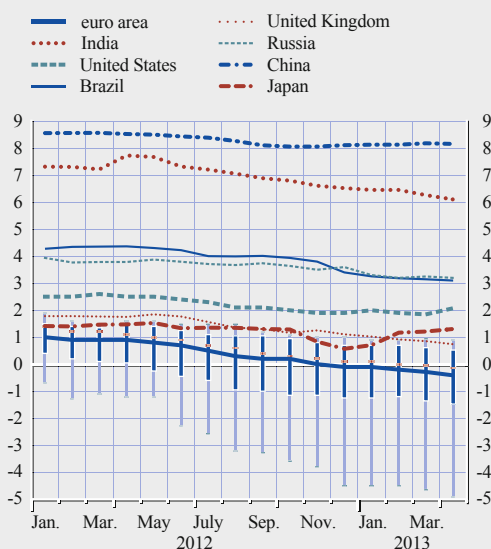
Mirroring economic developments in the euro area, the **global economy** lost some momentum in 2012, but improving global financial market conditions are likely to translate into real economic activity, albeit only slowly. This global outlook is, however, predicated on significant macroeconomic policy support by authorities in major advanced and emerging economies alike. Moreover, developments in advanced and emerging economies reflect differing stages of the economic and credit cycle – with advanced economies below their normal path of credit growth, while many emerging economies already in an advanced stage of the credit cycle (see Chart 1.5).

Support from policy action in advanced economies...

Economic developments in **advanced economies** outside the euro area suggest moderate growth going forward, with a strong role for policy support. In particular, the Federal Reserve and the Bank of England have continued their ongoing asset purchase programmes. The Bank of Japan has introduced a new programme of “quantitative and qualitative monetary easing” with the aim of doubling the monetary base in two years, purchasing about JPY 7 trillion of Japanese government bonds per month, as well as other financial assets, over the next two years. These measures have resulted in the fastest pace of depreciation of the Japanese yen against the euro seen since the introduction of the single currency in 1999. In general, central bank policy action remains important as a counterbalance to a number of factors, including tight private sector credit conditions and

Chart 1.2 Evolution of the forecasts for real GDP growth in selected countries for 2013

(Jan. 2012 – Apr. 2013; percentage change per annum)

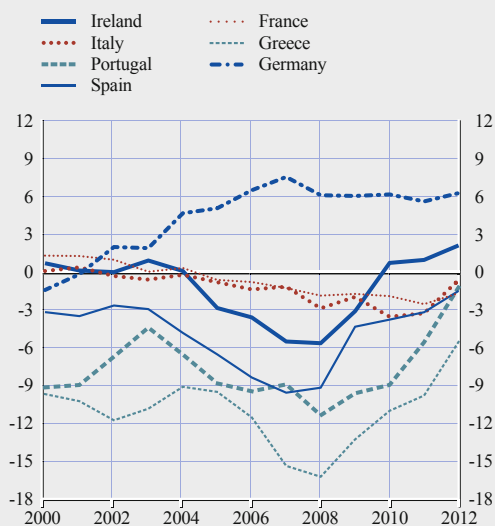


Source: Consensus Economics.

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

Chart 1.3 Evolution of external borrowing (-) and lending (+) in selected euro area countries

(2000 – 2012; percentages)



Source: European Commission.

ongoing balance sheet adjustment in the private and public sectors, which continue to restrain the medium-term growth outlook in major advanced economies.

In the **United States**, fiscal sustainability concerns have receded as the fiscal deficit has recently been shrinking. However, the need to extend the debt ceiling, which may become binding in the summer of 2013, still remains. While household balance sheet adjustment has become gradually less binding and the housing market recovery has continued, the negative effects of automatic spending cuts and still moderate employment growth are still a drag on the US economy. In **Japan**, high fiscal imbalances and rising public debt raise concerns about both the sustainability of public finances and financial stability. Any potential increase in government bond yields due to a repricing of risk in financial markets could have a negative effect on banks, in particular smaller regional banks that carry substantial amounts of Japanese government bonds on their balance sheets. In the **United Kingdom**, economic activity remains hampered by a combination of weak external demand and the effects of the ongoing domestic balance sheet repairs. Although private sector debt has been declining, it remains a key macroeconomic imbalance and poses a downside risk to economic growth.

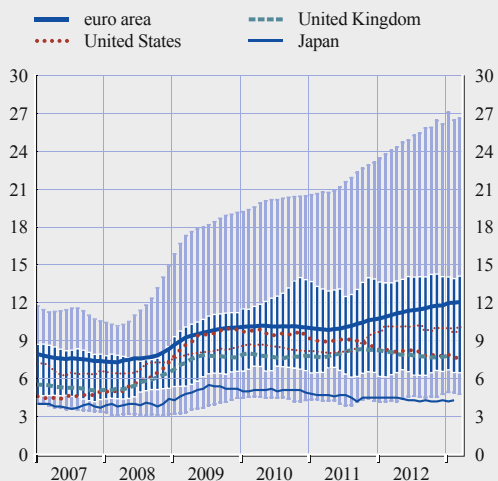
Emerging economies have proven fairly resilient to the weak economic conditions in advanced economies and are widely expected to remain the driving force behind global growth in future. Nonetheless, after a rebound towards the end of 2012, economic activity in emerging markets is likely to have slowed down temporarily in the first quarter of 2013. Risks to economic activity remain on the downside, as emerging economies are still dependent on external demand from advanced economies, so that a deeper or longer than expected economic downturn in major trading partners may also weigh on their growth prospects.

... with risks
still tilted to the
downside

Emerging
economies remain
the engine of global
growth...

Chart 1.4 Unemployment rates in the euro area and other major advanced economies

(Jan. 2007 – Mar. 2013; percentages)



Sources: Eurostat and ECB calculations.
 Note: The box plot shows the minimum, maximum, median and interquartile distribution across the euro area countries.

Chart 1.5 Difference between credit growth and nominal GDP growth

(Jan. 2003 – Nov. 2012; percentage points)



Source: Haver Analytics.
 Note: Advanced economies comprise the United States, the euro area, the United Kingdom, Japan, Australia, Denmark, Sweden and Switzerland, while the emerging economies include the BRICS countries, Argentina, Mexico, Indonesia, Korea, Saudi Arabia and Turkey.

This holds particularly true for **emerging economies within Europe**, which have strong trade and financial linkages with the euro area. The medium-term growth prospects for the region are considerably weaker than before the crisis. They are also perceptibly weaker than those in other emerging market regions, and the differences in growth across countries appear to be increasing. This is a risk as a lower potential output growth may hinder the further dismantling of macroeconomic imbalances, reduce the resilience to adverse shocks and undermine the debt servicing ability. Other vulnerabilities in the region continue to be a high level of private sector indebtedness (in Bulgaria, Hungary and Latvia, for instance), a potentially disruptive process of deleveraging by foreign banks and currency mismatches as a result of foreign currency lending.

... although some have already entered a late stage of the credit cycle

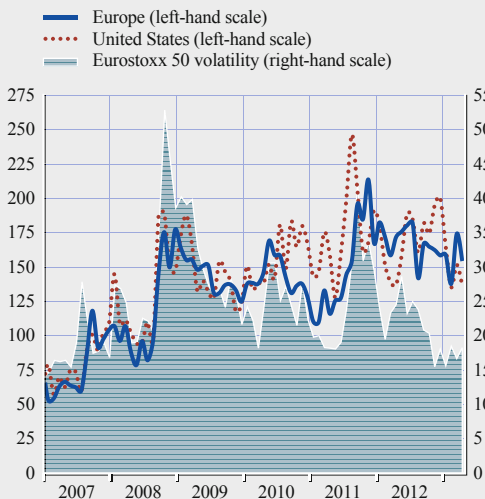
A number of emerging economies, predominantly in **Asia** and **Latin America**, exhibit prospective financial vulnerabilities fuelled by strong capital inflows that have gained momentum in the context of the increasing global search for yield and a related rebalancing of portfolios from safer to riskier assets. That said, several countries may already be in an advanced stage of the credit cycle (Brazil, China and India, for instance), following an expansion of credit at average annual rates in excess of nominal GDP in recent years. In practice, it has proven difficult to differentiate between genuine financial deepening and potential asset growth against the background of the expansion of non-regulated or less-regulated market segments outside (but with strong linkages to) the banking sector. Funding risks, however, remain a concern irrespective of such considerations – particularly the risk of a sudden stop or reversal of capital inflows and asset price collapses, with a negative impact on bank profitability and capitalisation.

Major downside risks relate to continued policy uncertainty...

All in all, the global growth outlook remains surrounded by a high degree of uncertainty, with risks clearly tilted to the downside. First and foremost, a high level of **economic policy uncertainty** is still visible in both the United States and Europe (see Chart 1.6). In the euro area, while timely

Chart 1.6 Economic policy uncertainty in the United States and Europe

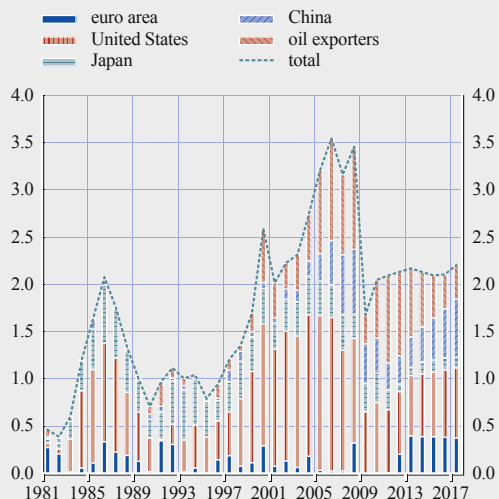
(Jan. 2007 – Apr. 2013; index)



Sources: Bloomberg and S. Baker, N. Bloom and S. J. Davis at www.policyuncertainty.com.
Notes: Europe comprises the five largest European countries France, Germany, Italy, the United Kingdom and Spain. The economic policy uncertainty index for the United States is constructed from three types of underlying components. The first quantifies newspaper coverage of policy-related economic uncertainty. The second uses disagreement among economic forecasters as a proxy for uncertainty. The third reflects the number of federal tax code provisions set to expire in future years. For Europe, the index is constructed on the basis of the first two components.

Chart 1.7 Global current account imbalances

(1981 – 2017; percentage of world GDP)



Sources: IMF World Economic Outlook (April 2013) and ECB calculations.

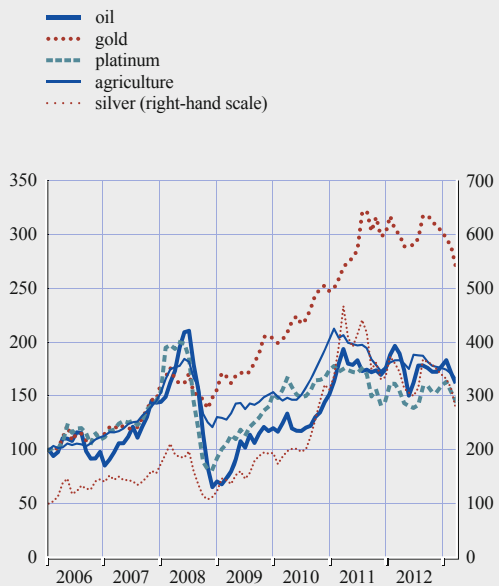
and resolute policy action has led to a substantial curtailment of euro area tail risk, concerns still persist, notably with regard to the risk of waning policy determination at both the national and the supranational level.

Moreover, **global imbalances** remain high by historical standards, although they are now only just over half the level recorded at the start of the global crisis (see Chart 1.7). The largely cyclical nature of this adjustment, however, continues to highlight the need for addressing long-lasting structural issues. The United States and China are likely to remain the economies with the largest imbalances, even though oil-exporting countries have meanwhile emerged as the main group of external surplus economies, ahead of China, in an environment of persistently high oil prices (see Chart 1.8). In fact, despite recent corrections, high commodity prices that are largely driven by supply-side factors such as geopolitical tensions may give rise to downside risks to global economic activity and could also contribute to preserving global imbalances. Mirroring current account misalignments, the prospects for an abrupt and/or disorderly retrenchment of capital flows, possibly in the context of sharp exchange rate realignments, remain substantial. In particular, a disorderly unwinding of safe-haven or search-for-yield flows remains a cause for concern. That having been said, bond markets in emerging markets, in particular, have recently continued to see relatively strong inflows (see Chart 1.9). These developments, however, may lead to an under-pricing of risks, both across asset classes and across borders.

... and persistent
global imbalances...

Chart 1.8 Selected commodity price developments

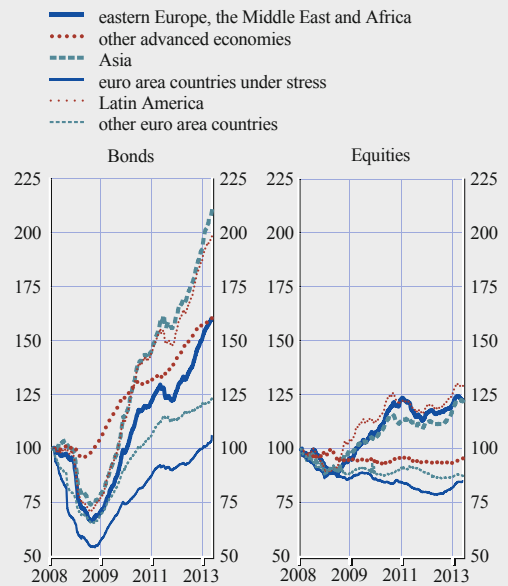
(Jan. 2006 – Apr. 2013; index Jan. 2006 = 100)



Source: Bloomberg.

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

(Jan. 2008 – Apr. 2013; index: Jan. 2008 = 100)



Source: EPFR.

Note: Bonds include both sovereign and corporate bonds.

... with related risks to financial stability

Overall, in terms of the macro-financial environment, risks to euro area financial stability emanate from both within and outside the euro area. Internal factors weighing on the underlying euro area growth momentum include the potential re-intensification of the euro area sovereign debt crisis as a result of remaining policy uncertainty with a view to implementing agreed policy measures at the national and European levels, the ongoing process of balance sheet adjustment in the financial and non-financial sectors and weak labour market conditions. At the same time, risks from outside the euro area stem from subdued foreign demand as a result of still relatively weak global economic conditions, persistent real and financial imbalances across the globe and a possible further increase in commodity prices. That said, a challenging macroeconomic environment and remaining uncertainty regarding the depth and duration of the economic weakness both inside and outside the euro area imply potential for higher credit risk for banks, which could – if it materialises – have systemic consequences for their asset quality, profitability and capital levels. Particularly vulnerable in this context are banks that face high and rising non-performing loan levels, that have low coverage ratios and a weak profit base. Nevertheless, the increased capital level of banks may provide a buffer in the current weak macro-financial environment, and could thus serve as a risk-mitigating factor. At the same time, a lasting divergence of growth prospects across individual euro area countries may cement the fragmentation of euro area funding markets. Should these developments become more structural in character, inefficient or insufficient financial intermediation could harm the prospects for economic growth.

1.2 SOVEREIGN TENSIONS SUBSIDE, BUT IMPLEMENTATION RISKS CONTINUE TO FUEL UNCERTAINTY

Sovereign stress in the euro area has continued to decline this year, following a marked easing in the second half of 2012. This has been evident in a broad-based decline in country spreads across both sovereign bond and credit default swap (CDS) markets (see Section 2.2 and Chart S.2.6). ECB initiatives that have contained redenomination risks and contagion fears have been a key factor in removing this distortion in pricing. At the same time, this development has been underpinned by the progress made so far in addressing the underlying vulnerabilities in the most important fundamentals, including fiscal consolidation, structural reform and action taken at the national and supranational levels to strengthen fiscal governance. Nevertheless, vulnerabilities in the public sector remain elevated and continue to weigh on the sovereign outlook, including sovereign and financial sector vulnerabilities in some countries, compounded by political risks. Indeed, this uncertainty has underscored a need to determinedly tackle high public debt levels and sizeable explicit and implicit contingent liabilities in the financial sectors of some countries.

Sovereign stress in the euro area persists, but it has declined...

The near-term **government deficit** for the euro area as a whole should continue to decline, from 3.7% of GDP in 2012 to 2.9% in 2013 and 2.8% in 2014. This deficit path, as reflected in the European Commission's 2013 spring economic forecast, is slightly less favourable than that anticipated six months ago, given a weaker than expected macroeconomic environment. At the country level, the fiscal outlook for 2013 has worsened in nine of the 17 euro area countries. The projected fiscal weakening is most pronounced in jurisdictions that face worse than initially expected macroeconomic conditions and/or bear larger support to their financial sectors (e.g. Slovenia, Portugal, Italy, the Netherlands and Cyprus). Nonetheless, compared with 2012, the fiscal balance is projected to improve in the majority of the euro area countries in 2013, most substantially in Greece, Spain, and Slovakia (see Chart 1.10).

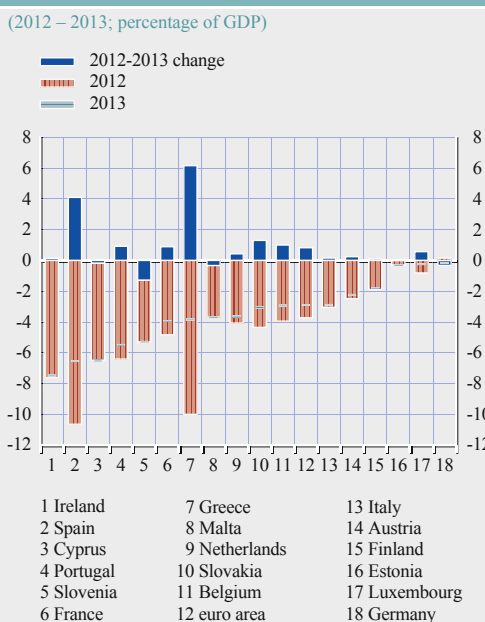
... amid a slight weakening of the fiscal outlook

In some cases, fiscal positions are also expected to suffer (albeit to differing degrees) from support granted to financial sectors, which had, up to end-2012, the most marked negative impact on the budget deficits in Ireland, Spain, Greece, Portugal and Germany. Since the Financial Stability Review (FSR) of December 2012, further bank support operations have been approved by governments (e.g. the Netherlands), or have been reclassified to public accounts (e.g. Slovenia). In a few euro area Member States with deadlines for the correction of their excessive deficits in 2012 or 2013, the impact of financial sector support is likely to imply that these countries will not meet the deadlines initially foreseen (see Chart 1.11).

Direct support for, and contingent liabilities vis-à-vis, the financial sector continue to weigh on public finances

There are several prominent recent examples of financial sector support in euro area countries. In Belgium, for example, the government's decision in late 2012 to support Dexia further (in the amount of 0.8% of GDP) implied that the 2012 fiscal deficit would exceed the 3%

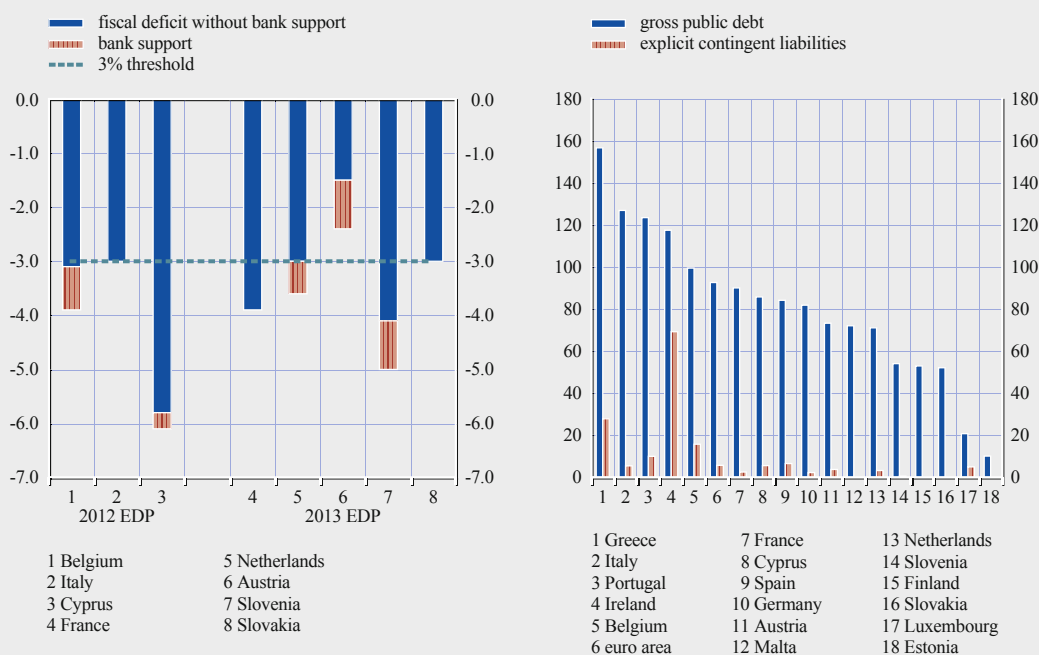
Chart 1.10 Fiscal positions in the euro area in 2012 and projected change in 2013



Source: European Commission's 2013 spring economic forecast.

Chart 1.11 Government support to the financial sector

(2012; percentage of GDP)



Sources: European Commission's 2013 spring economic forecast and national sources.

Notes: The left part of the chart refers only to countries with EDP deadlines in 2012 and 2013. Explicit contingent liabilities reflect guarantees and other forms of contingent support outstanding at the end of 2012 and granted by governments to their respective financial sector since 2008. In Greece, the support for the financial sector (in particular, the effects on the deficit and debt) also reflects the impact of the private sector involvement (PSI) agreed in the context of the EU-IMF programme.

threshold, thereby causing the country to miss the 2012 deadline envisaged under the excessive deficit procedure (EDP). In the Netherlands, the nationalisation of SNS Reaal in early 2013 had an impact on the deficit that has been estimated by the government to be in the order of 0.6% of GDP, which will bring the projected deficit in 2013 (the EDP correction deadline) to above the 3% threshold. In Slovenia, among others, the capital injection for NLB through contingent convertible bonds was retroactively reclassified as a capital transfer, thereby increasing the 2013 deficit by 0.9 percentage point of GDP. In other euro area countries with an EDP deadline to meet in 2012 or 2013, the issue seems to be less relevant at the moment, either because there was no impact of financial support in the respective years (France,¹ Italy and Slovakia) or because that support is not relevant with regard to meeting the EDP deadline. In the case of Austria, for example, the deficit including financial sector support is projected to remain below the 3% threshold, while that in Cyprus clearly exceeded the threshold in 2012, irrespective of the financial sector support granted.

Public debt levels remain elevated and continue to rise in most countries

The aggregate euro area **public debt** outlook for 2013 and 2014 has deteriorated by 0.9 and 1.7 percentage points of GDP respectively since the last FSR, on account of somewhat weaker primary balance surpluses and for 2013, also due to larger interest rate growth differentials than initially anticipated. Moreover, direct support to the financial sector is adding to sovereign debt in several countries, while related contingent liabilities continue to pose risks to debt dynamics (see Chart 1.11). Public debt levels in some countries may also increase as a result of the envisaged

1 For France, the temporary deficit-increasing impact due to Dexia support occurred in 2012 (and not the year set as the EDP deadline) and, at 0.13% of GDP, is considerably lower than in the case of Belgium.

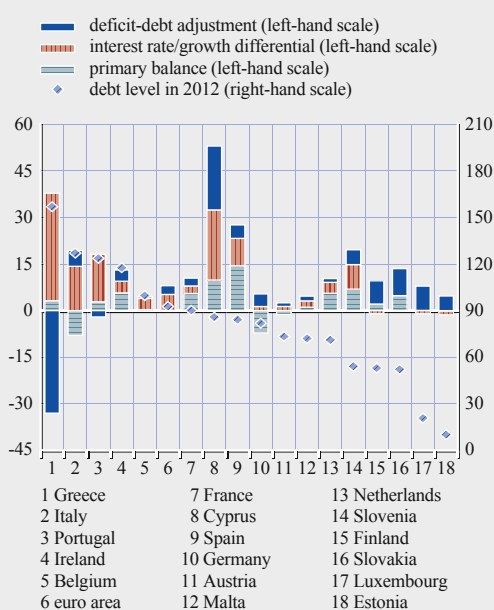
payment of arrears on state debt to the private sector. The public debt-to-GDP ratio is projected by the European Commission to remain on an upward trend in 2013, but to broadly stabilise in 2014. Over the period from 2012 to 2014, an adverse interest rate-growth differential (“snowball effect”) is projected to be the main driving force behind the increase in the debt ratios of most euro area countries (see Chart 1.12). To a lesser extent, extensive deficit-debt adjustments, including support to the financial sector, and still high primary deficits in some countries are expected to cause debt levels to rise.

Financial stability risks may also emanate from near-term **sovereign financing needs**, in particular in euro area countries under stress. In this context, the average gross financing needs of euro area governments are expected to decline somewhat in 2013, given lower deficits and slightly lower redemptions. Nonetheless, based on available information on securities redemptions up to end-March 2013 – thus excluding part of the short-term debt refinancing requirements in 2013 – the 2013 gross financing needs remain significant in many euro area countries (see Chart 1.13).

Financing needs are expected to decline in 2013, but they remain sizeable in some countries

Chart 1.12 Decomposition of the change in the gross government debt-to-GDP ratio – cumulative 2012-2014

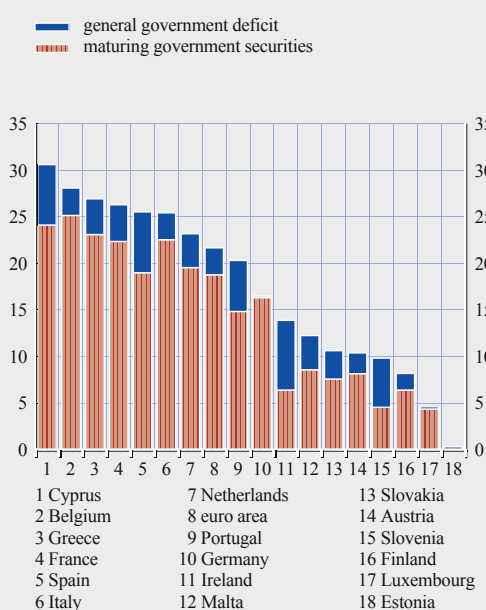
(2012 – 2014; percentage of GDP and percentage points)



Sources: European Commission’s 2013 spring economic forecast and ECB calculations.

Chart 1.13 Maturing securities and projected deficit financing needs of euro area governments in 2013

(percentage of GDP)



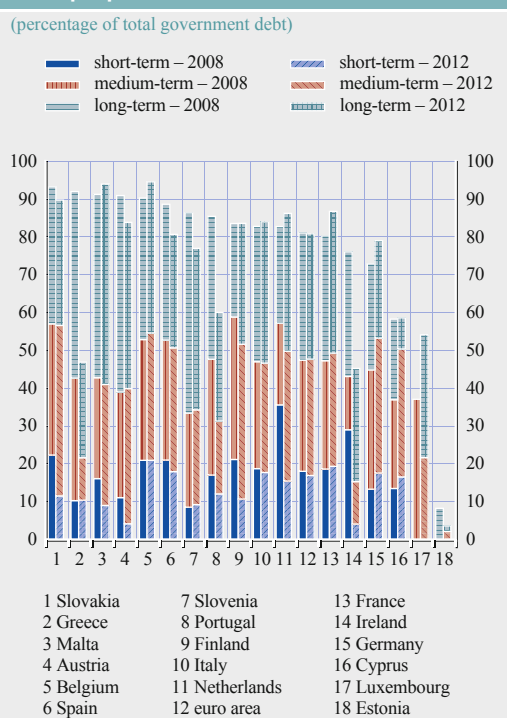
Sources: European Commission’s 2013 spring economic forecast, ECB and ECB calculations.

Notes: Based on data on maturing securities as at end-March 2013. The gross financing needs for 2013 (entire year) are broad estimates consisting of redemptions of government debt securities maturing in 2013 and the government deficit. The estimates are subject to caveats. First, they only account for redemptions of securities, while maturing loans are not included, given the lack of data. Second, some government securities do not fall into the definition used in ESA 95 for general government debt. Third, estimates disregard that some maturing government securities are held within the government sector. Finally, refinancing needs corresponding to short-term debt issued after March 2013 are not reflected in the 2013 data. The redemption values for Greece reflect the impact of the debt exchanged in the context of the private sector involvement (PSI). For Cyprus, a special-purpose bond issued with a maturity of one year in June 2012 was excluded, since it will automatically be renewed for a period of up to five years unless it is exchanged for cash.

Sovereign debt that is maturing in the near to medium term remains considerable in the euro area, albeit with major cross-country differences. At end-March 2013, securities with a residual maturity of up to one year accounted for around 20% of total debt securities outstanding in the euro area, while about one-third of the debt securities outstanding will mature within two years, and close to 60% within five years. The average residual maturity of the outstanding euro area government securities at end-March 2013 was 6.3 years, ranging from 2.6 years in Cyprus to 11.8 years in Ireland. Compared with the situation at the start of the crisis, the share of marketable securities in total debt has declined in most euro area countries, in particular in those subject to EU-IMF programmes (see Chart 1.14). Loans make up for most of the difference. Over the period, the share of short-term debt securities in total debt increased marginally in Germany, Cyprus, France and Slovenia, while it declined sharply in Ireland, the Netherlands, Slovakia and Finland.

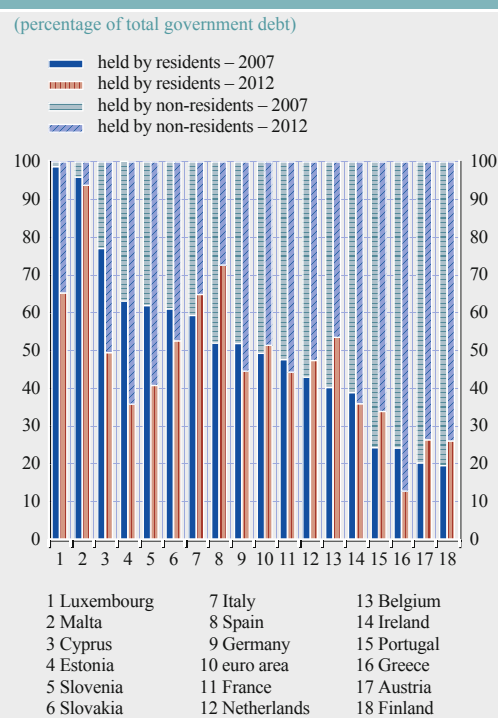
As regards the ownership of government debt, compared with the period before the crisis (2007), non-resident owners (both private and public creditors) had decreased their share in total debt in about seven euro area countries at the end of 2012, although only marginally in most cases (and somewhat more in Spain). The breakdown by residency of the creditor of the euro area aggregate remained broadly unchanged (see Chart 1.15 and Chart S.1.10). Some of the most pronounced changes in the ownership pattern by residency took place in Luxembourg, Cyprus, Estonia and Slovenia, with larger shares being held by non-residents, which may make them more vulnerable to the risk of a sudden stop in, and a reversal of, flows.

Chart 1.14 General government debt securities, by residual maturity, as a proportion of total debt



Sources: ECB, European Commission's 2013 spring economic forecast (for total government debt) and ECB calculations.

Chart 1.15 Total general government debt, by residency of creditors



Sources: ECB, European Commission's 2013 spring economic forecast (for total government debt) and ECB calculations.

Financing needs could in some cases be eased through the sale of financial assets

Sustaining the reform momentum remains key, given persisting fiscal challenges

To some extent, sovereign financing needs could be mitigated via recourse to existing financial assets. At the end of 2012, the average amount of consolidated financial assets held by euro area governments stood at 36% of GDP, with some variation across countries, while the market value of consolidated government liabilities was in the order of 102% of GDP. Accordingly, the net debt of euro area governments totalled 66% of GDP. Overall, the use of financial assets for smoothing governments' financing needs depends on their liquidity and marketability, which is arguably lower in times of crisis. Nevertheless, government holdings of financial assets are relevant for assessing the sustainability of sovereign debt over the medium term, when a larger proportion of the financial assets could potentially be mobilised.

The severity of the sovereign debt crisis, and its persistence, has underscored the need for improved **fiscal governance** to restore market confidence in the credibility of euro area public finances. In this context, notable progress has been made in reducing budgetary imbalances, but risks to fiscal fundamentals remain despite the policy action taken at both the national and the euro area levels. A possible loss of reform momentum amid increased political uncertainties represents a key risk to crisis resolution in the euro area. Consolidation fatigue and reform complacency may compromise the progress thus far made towards a resolution of the crisis. This underscores the need for a cohesive fiscal consolidation strategy that restores debt sustainability in conjunction with policies to improve the growth potential.

Box 1

DEVELOPMENTS IN CYPRUS AND THEIR IMPACT ON FINANCIAL STABILITY IN THE EURO AREA

The financial sector in Cyprus harboured many vulnerabilities, predominantly in the two largest domestic banks which held total assets with a value equalling almost four times the country's GDP. In particular, the financial sector was characterised by high exposures to Greek sovereign bonds (and the associated private sector involvement) and the private sector in Greece. Together with a significant deterioration of the quality of domestic bank assets, this eroded the banks' capital. Ultimately, the capital needs of major Cypriot banks rose to almost €9 billion,¹ equivalent to 50% of Cypriot GDP. These vulnerabilities had been highlighted by the European Commission and the IMF in their regular country monitoring reports, and in the EU Capital Exercise undertaken by the European Banking Authority.

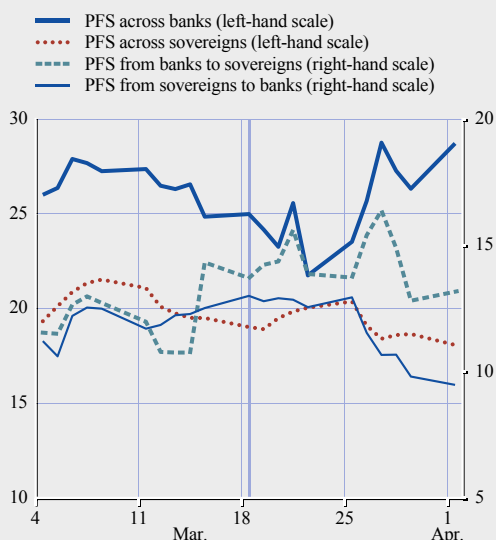
Against this background, on 25 March, the Eurogroup approved an adjustment programme of €10 billion which stipulated that the financial sector needs would be addressed, to a large extent, by means of a bail-in of uninsured creditors of the two largest Cypriot banks. To mitigate the risk of broad-based outflows from domestic banks, the authorities introduced temporary restrictions on domestic and cross-border transfers and payments.

Providing solvency support for Cyprus' very large banking system would immediately have called into question the sustainability of its public finances. The country stood in marked contrast to other euro area Member States with respect to the size, international significance and capital needs of its largest banks. The bail-in of uninsured creditors was thus the only viable strategy

¹ See PIMCO, "Independent Due Diligence of the Banking System of Cyprus – February 2013", report published by the Central Bank of Cyprus on 19 April 2013.

Chart A The impact of Eurogroup's first Cyprus-related decision on the potential for spillover (PFS) index and its components

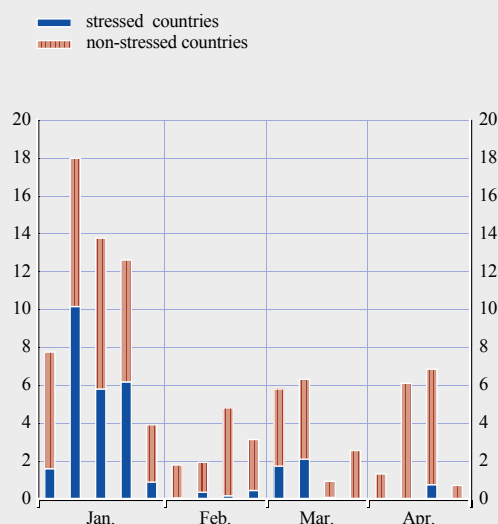
(20-day window around the Cypriot event)



Sources: CMA, Bloomberg and ECB calculations.
 Note: Technical details of this methodology can be found in Box 5, entitled “Gauging the potential for sovereign and banking sector spillovers in the euro area”, in ECB, *Financial Stability Review*, December 2012.

Chart B Weekly issuance of medium and long-term debt by euro area banks in 2013

(Jan. 2013 – Apr. 2013; EUR billions)



Source: Dealogic.
 Notes: Retained deals are excluded. Stressed countries are Italy, Spain, Ireland and Portugal.

that could ensure both the sustainability of public debt and the protection of insured depositors. It nonetheless came as a surprise for market analysts, and was erroneously interpreted by some as a possible template for future bank resolutions in the euro area.

The spreading of contagion to other euro area markets, however, appears to have been largely contained in most cases. According to data provided by the Bank for International Settlements (BIS), euro area banks' exposure to Cyprus is limited (around €18 billion in December 2012). Perhaps most susceptible to direct contagion were banking sectors where Cypriot banks had operations, most notably Greece. This was addressed in the programme by ring-fencing the Greek operations of Cypriot banks to this end, and in line with the Eurogroup agreement, assets and liabilities of the Cypriot banks' branches operating in Greece were transferred to a Greek bank. Contagion would have been conceivable also through other channels, including confidence. However, no evidence of elevated deposit outflows were witnessed outside Cyprus – reinforcing the view that Cyprus is a unique case. More generally, market-based data suggest some limited spillovers in terms of only bank-specific risk (not sovereign risk), with the potential for spillovers (PFS) index rising for banks (see Chart A).²

Such concerns may also help to explain the limited deterioration in funding conditions for euro area banks. As shown in Chart 3.20, weekly issuance of medium and long-term debt by euro area banks fell to relatively low levels after a strong start into the year – with banks in countries under stress being affected most (see Chart B).

2 The potential for spillovers (PFS) index captures the potential impact of shocks to sovereign and bank credit default swap (CDS) spreads. See also Box 5 in ECB, *Financial Stability Review*, December 2012.

Notwithstanding the limited impact, the idiosyncratic aspects of the bail-in of uninsured depositors in Cyprus may raise concerns for some investors. To this end, further progress towards the establishment of an EU banking union, including a clear and consistent EU-wide approach to bank restructuring and resolution, is important to further limit any prospective contagion. This approach should be completed by an EU-wide single resolution mechanism to provide the required funding ex ante, without jeopardising the sustainability of the public finances of the Member States.³

³ See also Y Mersch, “The Banking Union – a European perspective: reasons, benefits, and challenges of the Banking Union”, speech presented at the seminar “Auf dem Weg zu mehr Stabilität – Ein Dialog über die Ausgestaltung der Bankenunion zwischen Wissenschaft und Praxis“ (Along the path towards greater stability – a dialogue on the design of the banking union between science and practice) organised by *Europolis* and the *Wirtschaftswoche*, Berlin, 5 April 2013.

1.3 WEAK ECONOMIC CONDITIONS ACCENTUATE CHALLENGES FOR THE NON-FINANCIAL PRIVATE SECTOR

Risks to **incomes and earnings** in the euro area non-financial private sector increased after the release of the December FSR on account of weakening macroeconomic dynamics. Some of these risks may recede if the gradual recovery of the euro area economy projected for the second half of this year materialises. Nonetheless, high and still increasing unemployment rates continue to weigh on the income prospects of households in many euro area countries. Notwithstanding sizeable variations in labour market conditions across countries, euro area households are still very pessimistic with regard to both their unemployment expectations and their financial situation (see Chart 1.16). Declining household saving rates in a number of countries are pointing towards reduced buffers for withstanding further negative income shocks. Over and beyond an increased susceptibility to economic and financial shocks, uneven income prospects increase the risks of discontent spreading, particularly in the younger generation among whom unemployment is high.

Weak earnings also characterise euro area non-financial corporations (NFCs), with corporate profitability remaining at rather low levels. Slow demand has affected firms across all major industrial sectors. Its impact, however, has been particularly detrimental to the health of firms in countries under stress. This is evident in an increasing number of corporate insolvencies (see Chart 1.17), which may, however, also reflect a correction of the imbalances built up in the run-up to the crisis. On the one hand, weak economic prospects suggest a limited capacity of firms to accumulate capital through retained earnings. This may imply a higher degree of dependence on external financing, with associated refinancing risks. On the other hand,

Economic weakness is dampening income and earnings

Chart 1.16 Euro area households' financial situation and unemployment expectations

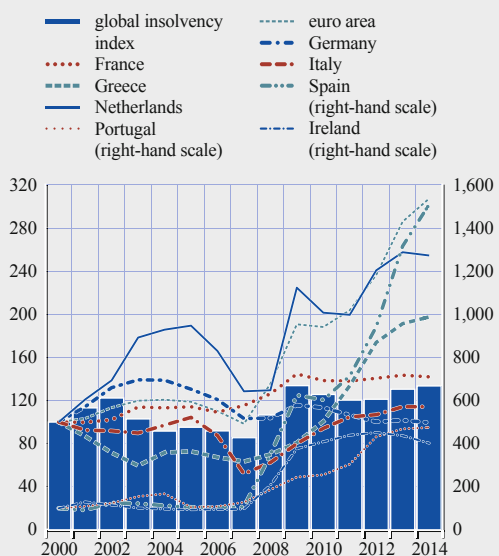
(Jan. 2003 – Apr. 2013; percentage balances; three-month moving averages)



Source: European Commission Consumer Survey.
Note: Unemployment expectations are presented in an inverted scale, i.e. an increase (decrease) in this indicator corresponds to more (less) optimistic expectations.

Chart 1.17 Corporate insolvencies in selected euro area countries

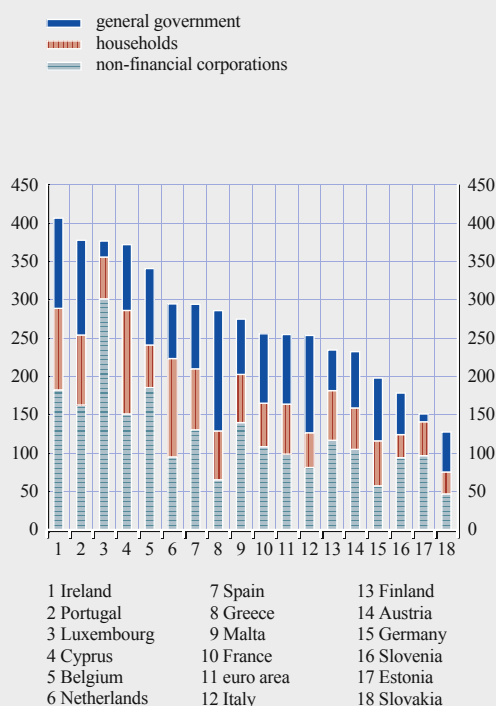
(2000 – 2014; index 2000 = 100)



Sources: Euler Hermes and ECB calculations.
Note: Data for 2013 and 2014 are forecasts.

Chart 1.18 Indebtedness of the general government, households and non-financial corporations in the euro area

(Q4 2012; percentage of GDP)



Sources: ECB and Eurostat.
Note: Data include cross-border intercompany lending which may be particularly relevant for countries where international holding companies are traditionally located.

Indebtedness remains high amid increasing cross-country heterogeneity

in the context of high risk aversion, corporations are pushed to deleverage and may increase their retention of earnings. The impact of protracted economic weakness might also prove insidious as any funding difficulties weigh on corporate investment.

Unlike weak income prospects, which appear to be quite widespread across the euro area, **indebtedness** of the non-financial private sector differs considerably at the country level. Indebtedness of euro area households has remained fairly stable at some 66% of GDP since 2010. However, the country dispersion around these aggregate figures has grown together with the sharp decline of GDP in countries under stress. As a result, household indebtedness in 2012 ranged from some 28% of GDP in Slovakia to over 130% of GDP in Cyprus (see Chart 1.18). The level of indebtedness of euro area NFCs remained broadly unchanged at 100% of GDP in 2012 and, taking a longer perspective, has done so since 2008. Similarly to that of households, NFC debt has also shown a high degree of cross-country heterogeneity (see Chart 1.18). This increasing dispersion of the ratio of indebtedness to GDP across countries appears to be partly explained by cyclical factors, including the effect of declining economic activity on both the internal cash flow and GDP itself, which holds particularly true for stressed countries. The incidence of indebtedness across firms may also differ on the basis of structural factors –

with larger and older firms that are able to tap market sources of financing directly contrasting with smaller and younger firms that are dependent on bank-based financing, so that they are confronted with tight credit conditions.

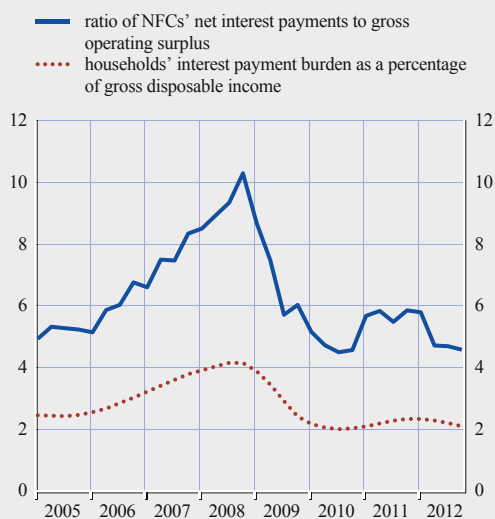
In those countries where the level of non-financial private sector indebtedness is high, the need for deleveraging will continue to weigh on loan demand for a protracted period of time. This is likely to be particularly true for the household sector, where the deleveraging process can be expected to follow an only gradual and longer-term path, especially in the light of impediments to household defaults and subdued prospects for income growth. A further deleveraging of NFCs is also likely – although leverage continued to increase for firms with low indebtedness in the years after the outbreak of the crisis, while it declined almost immediately for highly leveraged firms.

Households' interest payment burden as a percentage of disposable income has remained low and broadly stable at 2.1% of disposable income for years (see Chart 1.19). However, if weak economic conditions persist and disposable income decreases, there is a risk that the debt-servicing capacity of households – in particular of those with low incomes – erodes. This could affect bank balance sheets via a deteriorating credit quality, which could subsequently restrict the lending capacity of banks and weigh further on economic activity. This risk is especially relevant for euro area countries with highly indebted households, a weak housing market and persistently high and increasing unemployment. Indeed, the most recent Eurosystem Household Finance and Consumption Survey points to such risks in a number of countries (see Table 1.1). The ability of NFCs to service their debt continued to be supported by low corporate bond yields and the low interest rate environment, but the income position of NFCs is still weak, so that interest payments remain at a relatively elevated level.

The interplay of balance sheet positions and income flows had a clear impact on **lending flows** to the non-financial private sector, which have remained muted. In fact, lending to euro area households remained weak, even though the aggregate picture continued to mask rather heterogeneous developments across individual euro area countries (see Chart 1.20). The euro area bank lending survey of April 2013 suggests that developments in bank lending to euro area households are being driven more by a contraction in demand than by supply-side constraints. Banks continue to report a net decrease in demand for loans for housing purchase and consumption. According to the bank lending survey, the decline in demand for loans for house purchase reflects gloomier housing market prospects and low consumer confidence, as well as the growing relevance of household savings as a source of funding. Moreover, euro area banks have reported an increase in the net tightening of credit standards on loans for house purchase, given that worsening housing market prospects and expectations regarding the general economic activity have caused banks to perceive an increase in risks. Banks' cost of funds and balance sheet constraints continued to weigh on the credit supply, although these effects declined in the second half of 2012, reflecting a positive impact of the ECB's measures with respect to banks' funding costs,

Chart 1.19 Interest payment burden of the non-financial private sector in the euro area

(Q1 2005 – Q4 2012; percentages)



Sources: ECB and Eurostat.

Debt servicing risks may rise given weak income growth

MFI lending to the non-financial private sector is constrained by both demand and supply-side factors

Table 1.1 Indicators of households' debt in the euro area and selected euro area countries

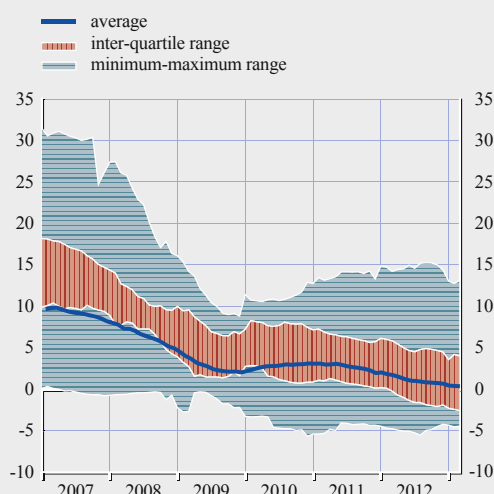
(percentages)				
	Total debt participation	Debt service-to-income ratio	Debt-to-asset ratio	Debt-to-income ratio
Euro area	43.7	13.9	21.8	62.0
Belgium (2010)	44.8	15.1	18.2	79.8
Germany (2010)	47.4	10.9	28.4	37.3
Greece (2009)	36.6	14.7	14.8	47.2
Spain (2008)	50.0	19.9	17.9	113.5
France (2010)	46.9	14.7	18.9	50.4
Italy (2010)	25.2	13.2	11.7	50.3
Cyprus (2010)	65.4	25.0	17.0	157.0
Luxembourg (2010)	58.3	16.6	18.2	86.9
Malta (2010)	34.1	11.5	6.2	52.0
Netherlands (2009)	65.7	14.5	41.3	194.1
Austria (2010)	35.6	5.6	16.7	35.6
Portugal (2010)	37.7	17.3	25.7	134.0
Slovenia (2010)	44.5	15.8	3.9	26.6
Slovakia (2010)	26.8	12.5	6.6	22.7
Finland (2009)	59.8	M	34.6	64.3

Sources: Eurosystem Household Finance and Consumption Survey (HFCS).

Notes: The table reports the proportion of households that have debt, the median debt-to-assets ratio for indebted households and the median debt service-to-income ratio, which is calculated as the ratio between the total monthly debt servicing burden (which includes both debt repayments and interest payments) and households' gross monthly income. The debt service-to-income ratio is defined for indebted households, but excluding households that only hold credit lines/overdraft debt or credit card debt, as no debt service information is collected for these types of debt. The debt-to-assets ratio is calculated as the ratio between total liabilities and total gross assets for indebted households. Finally, the table shows the median debt-to-income ratio, which is calculated as the ratio of total debt to the annual gross household income for indebted households. Statistics are calculated using survey weights and are adjusted for multiple imputations. All figures are given as percentages. Information on debt service is not available in Finland, so that relevant statistics for Finland are missing. Ireland and Estonia have not participated in the first wave of the HFCS, so that no data are available for these countries. For each country, the figures in brackets denote the reference year for the survey. For further details, see ECB, "The Eurosystem Household Finance and Consumption Survey – results from the first wave", *ECB Statistics Paper Series*, No 2, April 2013.

Chart 1.20 MFI lending to euro area households

(Jan. 2007 – Mar. 2013; percentage change per annum)



Source: ECB.
Note: Data adjusted for securitisation.

including the announcement of the Outright Monetary Transaction (OMT) programme. At the same time, despite those positive developments, financial fragmentation remained high and also continues to affect the loan supply.

The net external financing of euro area NFCs declined towards the end of 2012 (see Chart 1.21). The lower demand for external financing was partly related to deteriorating economic conditions and weak investment dynamics. Indeed, in the bank lending survey of April 2013, euro area banks continued to report a pronounced net decline in the demand for loans to NFCs, which was driven by a substantial negative impact of fixed investment on firms' financing needs. At the same time, the availability of internal funds may also explain the moderate dynamics of external financing, in particular for large firms.

Turning to the supply of credit, the bank lending survey showed that, compared with the previous survey round, the net tightening of credit standards for loans to NFCs by euro area banks declined modestly in the first quarter of 2013. Borrowers' risk and macroeconomic uncertainty remain the main concerns of euro area banks in setting their lending policies. The decline in the net tightening of credit standards in the first quarter of 2013 reflected somewhat reduced contributions not only from banks' risk perceptions but also from cost of funds and balance sheet constraints – although euro area results continued to mask substantial cross-country disparities in credit standards and loan demand.

In terms of the different sources of external financing, the decline in new MFI loans to NFCs was partly counterbalanced by an increasing issuance of market-based debt (see Chart 1.21). However, such substitution still remains limited

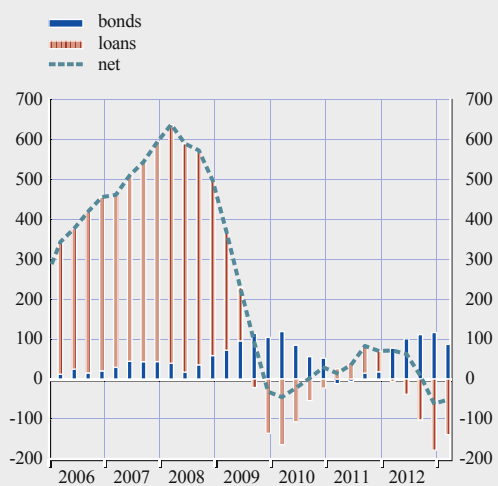
to larger companies and firms located mainly in countries with more developed corporate bond markets (e.g. France and Germany). At the same time, those corporations that are most dependent on bank funding, for example small and medium-sized enterprises (SMEs) and firms located in stressed countries, have remained vulnerable to persistently tight credit supply conditions. However, in the most recent ECB survey, covering the period from October 2012 to March 2013, euro area SMEs reported, in net terms, a substantially smaller deterioration in the availability of bank loans. In particular, SMEs in Italy and Spain reported that bank loan availability was deteriorating, but far less than in the previous period. Mirroring the smaller deterioration in the availability of bank loans to SMEs, financing obstacles for SMEs in receiving a bank loan became less severe at the euro area level: 16% of the SMEs cited “access to finance” as the most pressing problem (down from 18%), while the survey reported an increase in the share of successful loan applications to 65% (up from 60%) and a decrease in the rejection rate, to 11% (from 15%). However, the development of financing obstacles remained mixed across countries, reflecting a high heterogeneity of bank lending conditions in the euro area.

Funding costs in the euro area non-financial private sector saw a fairly broad-based decline over the last few months. In fact, the average financing costs borne by the euro area households have continued to fall, mainly on account of a decrease in interest rates on longer-maturity loans for house purchase. Over the same period, interest rates on short-term loans (i.e. loans with floating rates or an initial rate fixation period of up to one year) have stabilised at a relative high level in comparison with those on other maturities. At the same time, cross-country heterogeneity in the euro area, as measured by the range between the lowest and highest interest rate charged on loans to households, remained elevated (see Chart 1.22), reflecting country-specific risk constellations, as well as a still impaired monetary transmission in the euro area.

Similarly, the overall financing costs of NFCs have continued to fall over the last few months, with a fairly broad-based decline across all forms of external financing available (see Chart 1.23).

Chart 1.21 External financing of euro area non-financial corporations

(Q1 2006 – Q1 2013; EUR billions; net annual flows)



Sources: ECB and ECB calculations.

NFCs' debt issuance activity remained strong

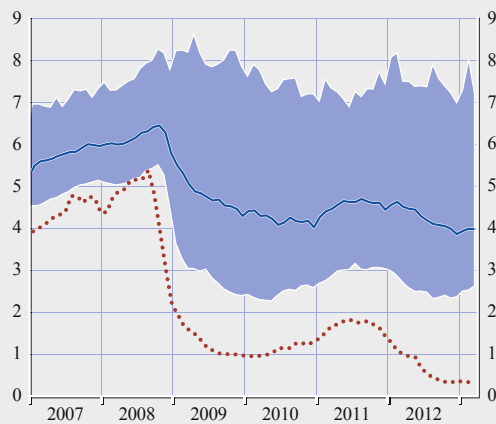
Household financing costs have declined, but marked cross-country disparity remains

Funding costs for NFCs drop amid improved financial market sentiment

Chart 1.22 Euro area MFI lending rates on new household loans and the EURIBOR

(Jan. 2007 – Mar. 2013; percentages; average, maximum and minimum)

- euro area average MFI lending rate
- six-month EURIBOR
- minimum-maximum MFI lending rate

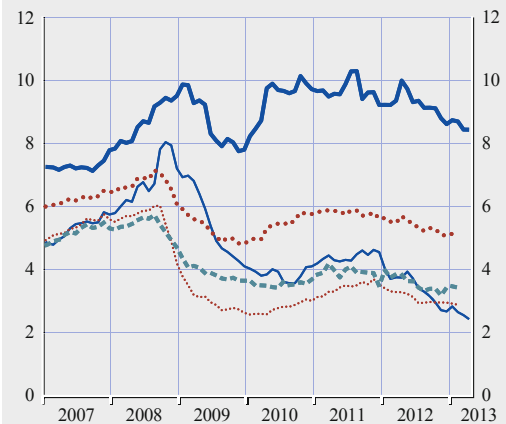


Sources: ECB and European Banking Federation.

Chart 1.23 Cost of external financing of euro area non-financial corporations

(Jan. 2007 – May 2013; percentages)

- cost of quoted equity
- overall cost of financing
- long-term MFI lending rates
- cost of market-based debt
- short-term MFI lending rates



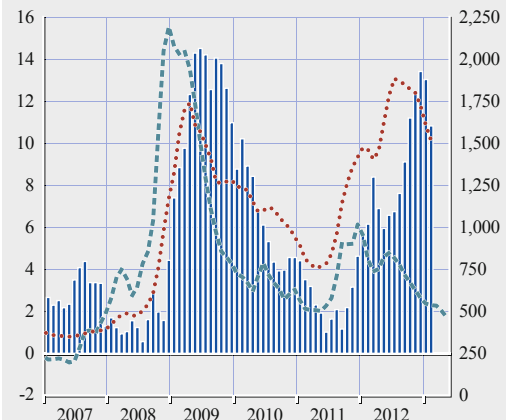
Sources: ECB and ECB calculations.

This was due mainly to improved financial market sentiment after the announcement of the ECB's OMT programme and to the ongoing search for yield. In particular, the cost of market-based debt financing fell sharply and reached a historic low in early 2013, a development which seems to be in contrast with the increasing number of corporate insolvencies and still elevated level of expected default frequencies (EDFs) (see Chart 1.24). However, this may be partly due to the fact that EDFs only cover listed companies. Improved financial market conditions were also reflected by the falling cost of equity. With regard to bank financing, MFI lending rates for NFCs remained broadly stable over the last few months, but continued to diverge widely across the euro area. On the one hand, this can be attributed to the fact that the deterioration of the creditworthiness of corporations in more vulnerable jurisdictions as a result of the prolonged period of weak economic activity and the high uncertainty regarding the growth outlook, as well as, in some cases, investments in non-viable projects, caused banks to demand higher risk premia, and thus to charge higher lending rates. On the other hand, the divergence of bank lending rates may also reflect cross-country differences in bank

Chart 1.24 High-yield bond spreads, bond issuance and expected default frequency (within one year) of euro area non-financial corporations

(Jan. 2007 – May 2013)

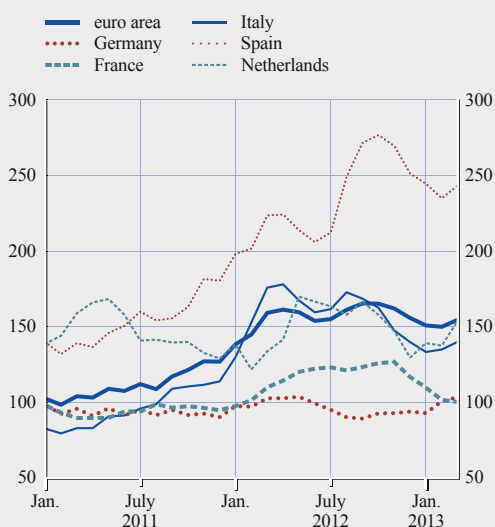
- net issuance of long-term debt securities (EUR billions; 6 month averages – left-hand scale)
- expected default frequency (percentages multiplied by 10 - left-hand scale)
- speculative-grade corporate bond spread (basis points – right-hand scale)



Sources: Moody's, Bloomberg and ECB.

Chart 1.25 Spread between lending rates on small and large-sized loans in selected euro area countries

(Jan. 2011 – Mar. 2013; basis points; three-month moving average)

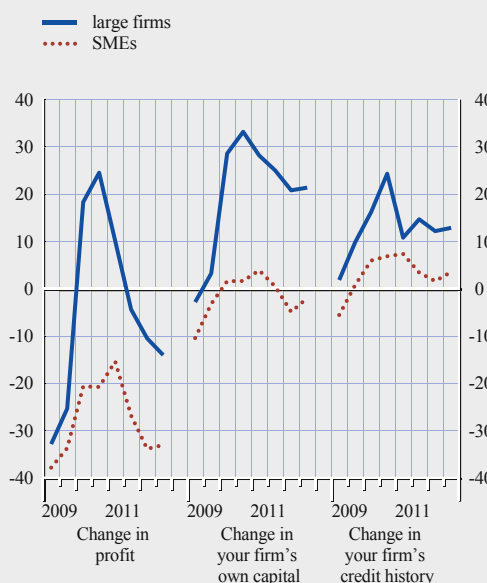


Sources: ECB and ECB calculations.

Notes: Small loans are loans of up to €1 million, while large loans are those in amounts of more than €1 million. Aggregation is based on new business volumes.

Chart 1.26 Financial health of euro area small and medium-sized enterprises in comparison with that of large firms

(2009 – 2012; net percentages of respondents; changes over the past six months)



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

funding conditions, as well as a possible impact of banks' deleveraging strategies in the context of their adjustment to meet higher regulatory capital requirements.

The spread between bank lending rates for small and large loans to NFCs has remained high, although it narrowed somewhat towards the end of 2012 (see Chart 1.25). This difference between the loan pricing conditions for small and large firms, which results primarily from the divergence of firm-specific risks, highlights the more adverse conditions faced by small firms, particularly in countries under stress. In part, this difference may reflect the fact that SMEs are more dependent on their respective domestic banking sectors, and are subject to tighter credit conditions, than larger firms that have better access to financial markets. In fact, given their relatively small size and lower degree of transparency, as well as their more bespoke funding needs in comparison with large firms, SMEs' access to capital markets is limited, but securitisation could be a possible way of channelling resources to SMEs, thereby also enhancing their resilience through the business cycle and helping them reap the benefits of a diversification of risks along geographic and sectoral dimensions. In this regard, the ECB has started consultations with other European institutions on initiatives to promote a functioning market for asset-backed securities that are collateralised by loans to non-financial corporations. Moreover, developments in firms' financial conditions may also affect their access to, and cost of, funding. In this regard, there are signs of a decoupling of the profits of large firms from those of SMEs (see Chart 1.26). According to the ECB's latest survey on the access to finance of SMEs in the euro area, the evolution of profits in 2012 was far more adverse for SMEs than for large firms. This was also mirrored by less favourable developments in the credit history of SMEs.

The availability and cost of funding for NFCs depend largely on the firm size

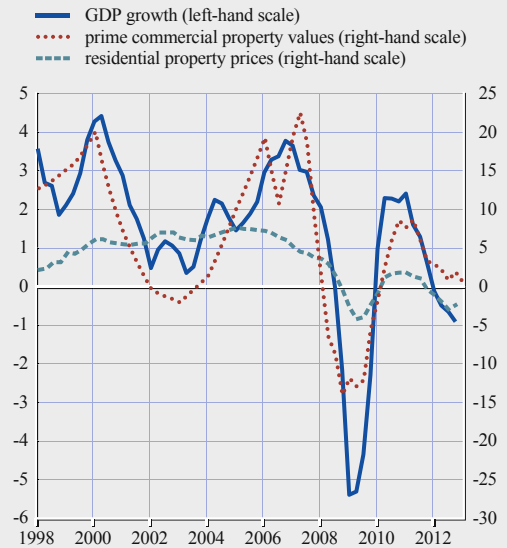
Euro area property prices continued to decline amid bifurcating developments at the country level

Euro area **property market** developments have remained subdued since the December FSR. In the euro area as a whole, residential property prices declined in annual terms in the course of 2012, although data for the fourth quarter of 2012 suggest that the downward trend in annual house price growth observed since the end of 2010 has come to a halt (see Chart 1.27). On average, prime commercial property prices decreased less markedly in 2012. This can largely be explained both by rather significant property price increases in some of the larger euro area countries and by the fact that prime commercial property performed better than the non-prime segment.

Across both segments, property prices have tended to follow macroeconomic growth developments rather closely (see Chart 1.27). However, the divergence in property markets remains marked across countries (see Charts S.1.17 and S.1.18). Commercial

Chart 1.27 Residential and prime commercial property values and GDP growth in the euro area

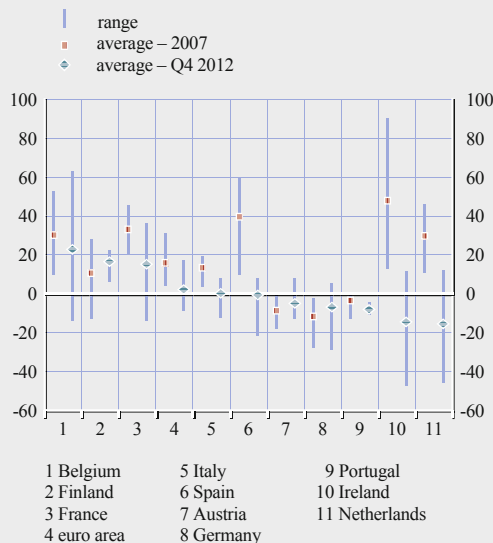
(Q1 1998 – Q1 2013; percentage change per annum)



Sources: Eurostat, ECB and Jones Lang LaSalle.

Chart 1.28 Residential property price valuation measures for selected euro area countries

(percentages; deviation from estimated equilibrium)

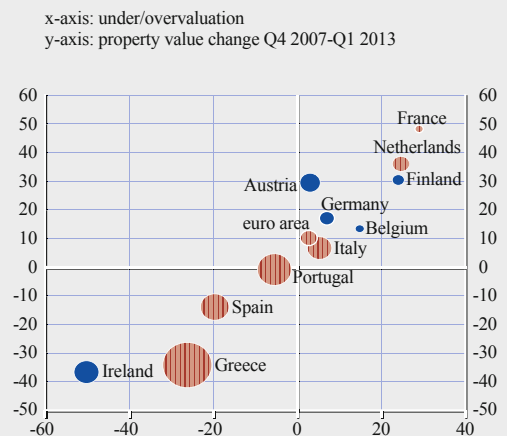


Sources: Eurostat, OECD, national sources and ECB calculations.

Notes: Estimates are based on data up to the fourth quarter of 2012. The sample starts in 1980 for all countries except Austria and Portugal, where it begins in 1987 and 1988 respectively. See Box 3 in ECB, *Financial Stability Review*, June 2011, for more details on these measures.

Chart 1.29 Value misalignment and value changes of prime commercial property and expected GDP growth in selected euro area countries in 2013

(percentages)



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

Notes: The size of the bubbles is defined relative to the expected change in GDP in 2013, with the red bubbles showing negative values and the blue bubbles positive values. For further details, see Box 6 in ECB, *Financial Stability Review*, December 2011.

and residential property prices continued to drop primarily (but not only) in more vulnerable euro area countries like Greece, Portugal and Spain, while they were still on an upward trend in other countries like Belgium and Finland. The outlook for property price developments in future remains weak in the euro area, reflecting not only subdued demand for housing, but also potential corrections in some countries with overvalued property markets.

Valuation in euro area property markets remains not only varied, but also subject to a high degree of uncertainty. The degree of residential property market overvaluation at the aggregate euro area level – measured by a range of measures such as housing affordability (house price-to-income ratios) and asset valuation (house price-to-rent ratios) – continued to decline after the December FSR and appeared to be broadly in line with demand fundamentals (see Chart 1.28). Commercial property valuations for the euro area aggregate were still somewhat above their long-term average (see Chart 1.29). However, these aggregate figures mask highly divergent developments at the country level. Both residential and commercial property market valuations have come down considerably from previous peaks (as in the case of Ireland), with the continued working-off of large pre-crisis excesses bringing prices back to the level suggested by the underlying values, or even below these – although the wide range of estimates underscores the uncertainty surrounding any individual valuation method. In Belgium, Finland and France, by contrast, overvaluation remained high in both market segments and even increased further in the commercial property market.

*Overvaluation is still
a concern in some
countries*



2 FINANCIAL MARKETS

On the back of the strong policy actions taken last year, conditions in the financial markets have continued to improve. Developments in the euro area since the beginning of the year have largely been characterised by increased confidence, reduced fragmentation and, in many ways, greater resilience. Improving sentiment has led to a persistent abatement of tensions in the secured and unsecured euro area money markets. Owing to increased investor confidence, prices and liquidity conditions for stressed sovereign and corporate credit markets have improved considerably. This improvement in financial market sentiment is also reflected in the strong growth of equity market valuation.

Notwithstanding these positive developments, fragmentation within euro area financial markets, although reduced, persists. Perhaps most notably, both the secured and unsecured interbank money markets remain impaired, in particular across national borders. In credit markets, developments reflect a combined search for liquidity and yield. Signs of a possible under-pricing of risk have intensified. In particular, yields both on sovereign bonds perceived to be safe and liquid and on lower-rated corporate debt continue to touch historic lows – both within and outside the euro area – while corporate bond issuance has reached record highs. An abrupt adjustment in risk premia could result in a disorderly unwinding of flows, direct losses for unhedged fixed income investors – including banks and insurers – and indirect second-round effects on banks. The implications for financial stability depend on a number of factors, including prevailing market liquidity, the use of leverage and the extent of maturity mismatches.

2.1 CONTINUED ABATEMENT OF MONEY MARKET TENSIONS

Conditions in the **euro area money market** have continued to improve since the publication of the December 2012 Financial Stability Review (FSR). The spread between unsecured interbank rates and overnight index swap (OIS) rates has declined to its lowest level since 2007, not only in the euro area, but also in the United States and the United Kingdom, as markets continued to benefit from declining global risk aversion (see Charts 2.1 and S.2.1). A negligible increase in the indicator from end-February was evident for the euro area, reflecting tensions in Italy and Cyprus, but it remained at a level below that observed in December 2012. In addition, the contribution of the money market to systemic stress in the euro area was relatively stable and slightly lower than in December 2012 (see Chart 2.2).

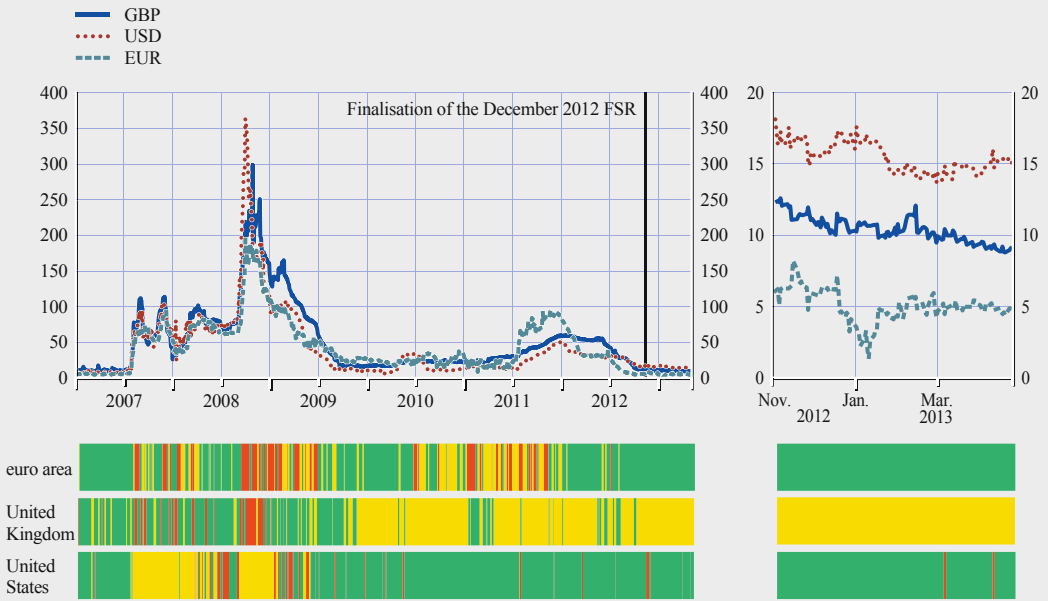
Unsecured money markets, which had seen bouts of broad-based malfunctioning throughout the euro area banking sector at the height of the crisis, continued to normalise. Euro area overnight unsecured money market (EONIA) volumes have increased slightly, EONIA panel contributors' participation has become more active, and there has been some evidence of maturity extension in the issuance of short-term European paper (STEP) by euro area monetary financial institutions (MFIs) – which may reflect their eligibility for use as ECB collateral since January 2012 and, possibly, also an incipient search for yield, as well as a reduction of risk aversion. However, despite these positive developments since the end of last year, access for banks from stressed countries remains difficult and the daily EONIA market volume in the first quarter of 2013, although higher, was still only two-thirds the level observed in the first quarter of 2012. Preliminary results from the ECB's first quarterly survey of money markets showed a substantial reduction of 50% in unsecured lending in the second half of 2012. In addition, there have been a series of high-profile exits from the panel determining the EURIBOR and EONIA as investigations into the manipulation of key money market reference rates continued (see Box 2). Finally, reflecting continued fragmentation, the dispersion of unsecured lending rates remains above pre-crisis levels (see Chart 2.3).

Tensions in money markets continue to subside

Conditions in unsecured markets have improved, but fragmentation persists

Chart 2.1 Spreads between unsecured interbank lending and overnight index swap (OIS) rates

(Jan. 2007 – May 2013; basis points; three-month maturities)



Sources: Bloomberg and ECB calculation.

Notes: In the lower panel, red indicates rising pressure, yellow moderating pressure 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 ECB, *Financial Stability Review*, June 2012.

In contrast to the unsecured market, access of banks in stressed countries to secured lending have improved significantly...

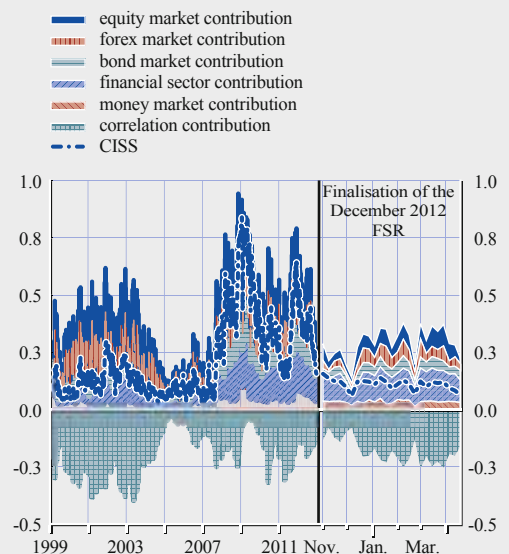
Conditions in the **secured segment of the euro area money market** have continued to improve for banks in countries that had witnessed sovereign stress. In particular, the access of Spanish and Italian MFIs to repo markets has improved, their margin requirements have been reduced and maturities have been extended slightly. Perhaps more importantly, some non-domestic banks have re-opened their credit lines to Spanish banks. In Italy, enhanced resilience was illustrated by increased turnover in the repo market, with repo rates remaining at very low levels despite the increase in tensions as a result of increased uncertainty in the wake of the election results. All in all, although a further deterioration of cross-border lending was not evident at the euro area level over the first quarter of this year, cross-border lending in the interbank market remains subdued in several countries, as compared with pre-crisis levels (see Chart 2.4).

... and banks have repaid over a quarter of their LTRO borrowings

Reflecting increased confidence, euro area banks repaid over a quarter of the gross financing they had raised through longer-term

Chart 2.2 Composite indicator of systemic stress (CISS) for the euro area and contributions of its components

(Jan. 1999 – May 2013)

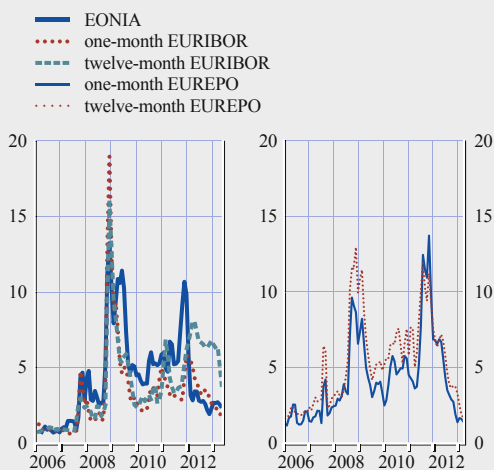


Sources: Bloomberg and ECB calculations.

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

Chart 2.3 Cross-country standard deviation of average unsecured lending and repo rates

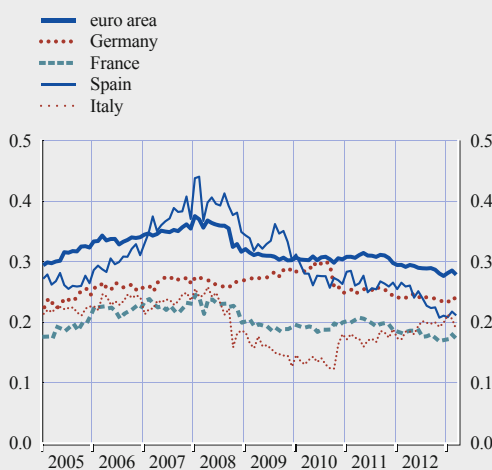
(Jan. 2006 – May 2013; basis points; two-month moving average, volume weighted)



Sources: European Banking Federation and ECB calculations.

Chart 2.4 Cross-border non-repo interbank lending

(Jan. 2005 – Mar. 2013; percentage of total non-repo interbank lending and borrowing)



Sources: ECB and ECB calculations

Note: Excludes lending to (deposits at) the European System of Central Banks.

refinancing operations (LTROs) by end-May, with some banks repaying it in full. The repayments were associated with a reduction of excess liquidity. Estimated excess liquidity fell from more than €585 billion on the day before repayments began to slightly over €310 billion by early May 2013. Bank-level data do not indicate any replacement of LTRO borrowings with recourse to shorter-term ECB operations. In addition, the overall volumes of main refinancing operations (MROs) have remained stable. However, although it has been reduced significantly, reliance on the Eurosystem remains high. Moreover, since the larger than expected initial repayments, the magnitude of weekly LTRO repayments has generally remained more moderate.

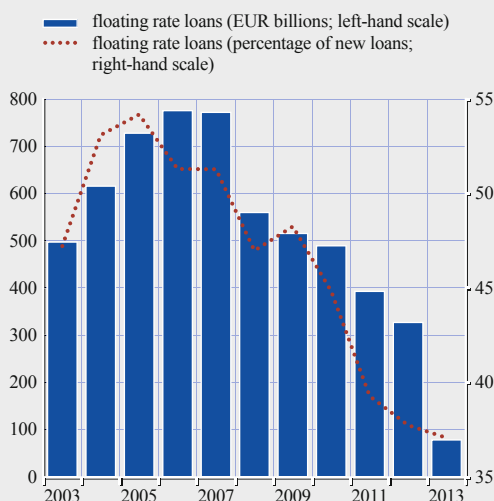
Box 2**FINANCIAL STABILITY IMPLICATIONS OF REFERENCE RATES AND KEY REQUIREMENTS FOR THE NEXT GENERATION OF BENCHMARKS**

Reference interest rates serve as a key orientation or benchmark of the prevailing price of liquidity for financial market participants and help in standardising financial contracts for both wholesale and retail clients (e.g. loans for house purchase). A commonly agreed reference rate is superior to multiple customised interest rates from an efficiency perspective as it lowers the cost of information and, hence, transaction costs and – ultimately – leads to higher market liquidity. In this way, such rates have a clear social function, making them a public good. Financial stability risks may arise, however, with market failures associated with this public good if, for instance, trust in the reliability and robustness of the reference rates is compromised.¹ Financial

¹ See Bank for International Settlements (BIS), “Towards better reference rate practices: a central bank perspective”, March 2013. The report reviews issues in relation to the use and production of reference interest rates from the perspective of central banks.

Chart A New loans to households with a floating rate in the euro area

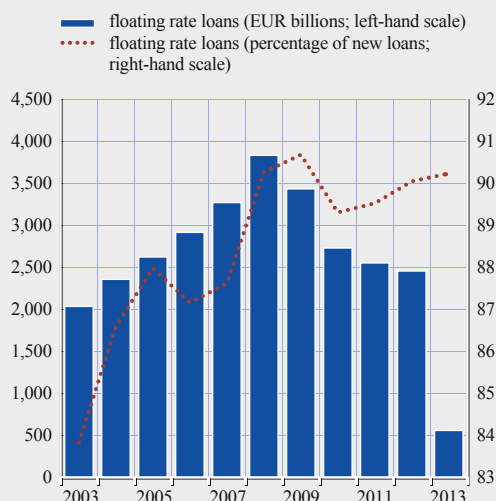
(2003 – 2013)



Source: ECB.
Notes: Floating rate loans comprise loans with a floating rate or an initial rate fixation period of up to one year. Revolving loans and overdrafts, convenience and extended credit card debt are excluded. Data for 2013 cover the period up to March 2013.

Chart B New loans to non-financial corporations with a floating rate in the euro area

(2003 – 2013)



Source: ECB.
Notes: Floating rate loans comprise loans with a floating rate or an initial rate fixation period of up to one year. Revolving loans and overdrafts, convenience and extended credit card debt are excluded. Data for 2013 cover the period up to March 2013.

stability risks may, however, also arise if the widespread use of particular reference rates leads to unsuitable applications – for example, in the pricing of credit instruments, the implementation and calibration of hedging strategies and the valuation of a wide range of financial instruments for risk management and asset-liability or performance measurement purposes that create basis risk.²

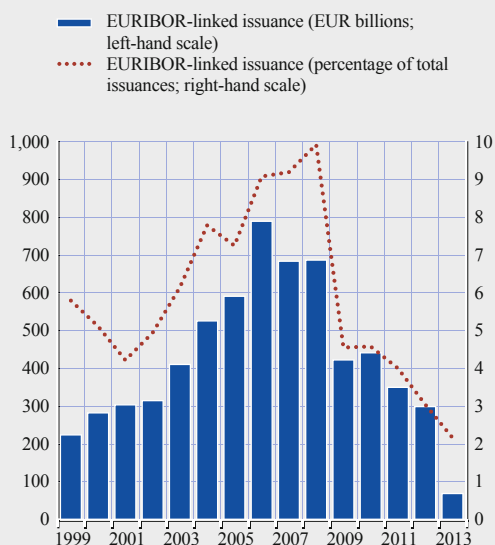
Within the euro area, the euro interbank offered rate (EURIBOR) is the reference rate that is relevant for the euro-denominated financial market in three key areas. First, as reference rates are an important part of the interest rate channel in the transmission of monetary policy, the development of loan categories that are linked to the reference rate are closely monitored. EURIBOR-linked loans by banks to households and non-financial corporations in the euro area are an example, even though their significance has been declining over the last few years (see Charts A and B). For households, the total value of new loans linked to floating rates has fallen from €776 billion in 2008 – or around half of total loans – to €327 billion in 2012 – only 38% of total loans. Similarly, the value of new loans for non-financial corporations has declined from €3.8 trillion in 2008 to €2.5 trillion in 2012 – although floating rate contracts continue to account for the vast majority of corporate loans.

Second, debt issuance with interest rates linked to the EURIBOR has increased steadily since the start of Economic and Monetary Union, reaching an annual total of approximately €300 billion

2 The aforementioned BIS report more broadly reviews aspects of the possible risks for monetary policy transmission and financial stability that may arise from deficiencies in the design of reference interest rates, from market abuse, or from market participants using reference interest rates that embody economic exposures other than those they actually want or need. In this context, it mentions the following potential financial stability implications linked to a wide use of reference rates: (i) market disruptions as a result of a loss of confidence loss that accompanies lower market liquidity; (ii) the build-up of risks and an overly high reliance on unsecured wholesale funding due to the mispricing of the common bank risk component; (iii) the spread of bank funding risks across the system; (iv) a potential misuse of reference rates for risk management practices that create basis risk; and (v) the impairment of a central bank's capacity to respond to financial fragilities caused by idiosyncratic reference rate factors that are difficult to address.

Chart C Debt issuance with interest rates linked to the EURIBOR

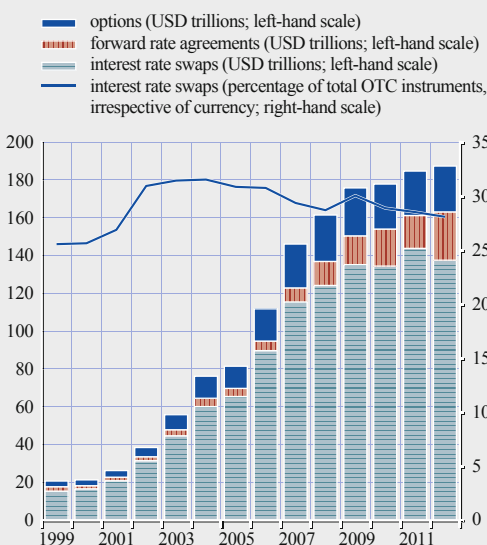
(1999 – 2013)



Sources: Dealogic and ECB calculations.
Note: Euro-denominated debt issuance with rates linked to the EURIBOR; data for 2013 until April 2013.

Chart D Notional outstanding amounts of euro-denominated over-the-counter (OTC) interest rate derivatives

(1999 – 2012)



Source: Bank for International Settlements.

in 2012 (see Chart C). EURIBOR-linked instruments accounted for an only small proportion of overall debt market activity in 2012, namely 3%.

Third, the EURIBOR has played an increasingly prominent role in derivatives markets, serving as a reference rate for both over-the-counter (OTC) and exchange-traded derivatives contracts with a notional value of hundreds of trillions of euro. The notional amount outstanding of single-currency OTC interest rate derivatives totalled to USD 489.7 trillion in December 2012.³ Broken down by currency, notional amounts referenced to euro interest rates accounted for the largest share (USD 187.4 trillion), exceeding those referenced to US dollar rates (USD 148.6 trillion). The volume of euro-denominated OTC interest rate contracts has risen since the beginning of the financial crisis, driven mainly by an increase in the volume of euro-denominated OTC interest rate swaps (see Chart D). While not directly evident from the data, there is a broad market consensus that the EURIBOR is the main reference rate underlying euro interest rate derivatives. Data published by Euronext show that the total notional amount of the three-month EURIBOR futures contracts in all interest rate derivatives traded on the London International Financial Futures and Options Exchange (LIFFE) in 2012 amounted to €178.7 trillion and that the notional amount of the EURIBOR options on futures totalled €70.7 trillion.

Given their great importance, the scandals that broke out in the course of 2012 regarding the London interbank offered rate (LIBOR) but also the EURIBOR and the Tokyo interbank offered rate (TIBOR) had the potential to create major destabilising forces. To ensure a smooth functioning of financial markets, reform is in progress to make the EURIBOR (as well as other reference rates): (i) more reliable, with a transparent, robust and credible governance structure to oversee its calculation; (ii) more representative of the nature of the underlying market in

3 BIS data covering the G10 countries since end-June 1998 and also Australia and Spain as from December 2011.

accordance with its definition; and (iii) more resilient so as to ensure that it can be reliably calculated during periods of market stress.⁴ From a financial stability point of view, it is crucial that such measures convey critical information during times of stress when liquidity may evaporate. Furthermore, it is vital that any potential transition to a more transaction-based rate or methodology takes place only if the following three conditions are met: (i) that there are more transaction-based methodologies or reference rates that represent suitable replacement solutions; (ii) that, where such alternatives exist, any envisaged transition can be undertaken in an orderly manner that preserves financial stability and ensures the legal continuity of financial contracts; and (iii) that private sector choices in any transition process are safeguarded.

With this in mind, the design of the next-generation reference rates needs to extend beyond ensuring a sound governance framework. Reference rates need to also have a transparent methodology that is grounded, wherever possible, in observable transactions entered, at arm's length, between buyers and sellers. The design of reference rates also needs to ensure that such rates are resilient and can be reliably computed during times of acute market distress, when the continuous availability of such benchmarks is critical with respect to the functioning of markets.

4 See ECB, "European Commission's public consultation on the regulation of indices – Eurosystem's response", November 2012.

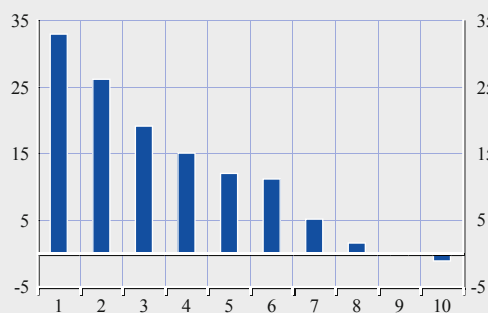
2.2 A GROWING SEARCH FOR YIELD AMID PERSISTENTLY HIGH DEMAND FOR SAFETY IN CREDIT AND EQUITY MARKETS

Developments in credit markets remain characterised by a growing search for yield and persistently high demand for safety

Developments in **credit and equity markets** have been characterised by continued high demand for limited amounts of safe and liquid assets, alongside an increasing search for yield. As a result, yields on highly rated sovereign bonds remain in the vicinity of historic lows, while corporate bond yields have also fallen more broadly across developed markets and emerging economies alike. Low and even negative returns on highly rated sovereigns are increasing the attractiveness of riskier assets (see Chart 2.5). Flows into fixed income funds located in the euro area continued to increase substantially in 2012 (see Chart 2.6), as part of signs of a more widespread demand for bonds worldwide (see Chart 1.9 in Section 1). By contrast, investment in equity funds declined slightly in 2012. Although equities have exhibited robust performance since the beginning of the year, the gap between the potential return on corporate bonds and equities may, given the uncertain macroeconomic outlook, not be wide enough for investors to shift aggressively into equities. Beyond this, demand for high-yielding corporate hybrids has been strong, with issuance of hybrids by non-financial euro area corporates in 2013 already almost four times as high as total issuance in 2012.

Chart 2.5 Return on selected global and euro area assets

(percentages; returns from May 2012 to May 2013)



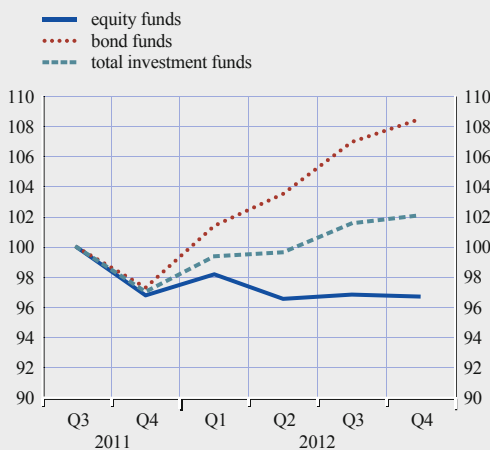
- 1 Dow Jones EuroStoxx 50
- 2 Standard & Poor's 500
- 3 Euro area high-yield corporate bonds
- 4 Emerging market sovereign bonds
- 5 Spanish sovereign bonds
- 6 Italian sovereign bonds
- 7 Euro area AAA-rated corporate bonds
- 8 Global AAA-rated corporate bonds
- 9 US Treasuries
- 10 German sovereign bonds

Sources: Bloomberg, Bank of America Merrill Lynch and IBoxx. Note: The returns on bonds refer to total return indices, while those on Standard & Poor's 500 and the Dow Jones EuroStoxx 50 indices refer to the respective price indices.

Increased stability within the euro area, together with a pent-up search for yield, has translated into renewed investment flows and declining yields for stressed sovereigns within the euro area **government debt markets** (see Chart 2.7). Pivotal developments in reversing the deteriorating trend in confidence included announcements regarding the Outright Monetary Transaction (OMT) programme and moves towards a banking union, along with noteworthy national developments, including the recapitalisation and restructuring of the Spanish banking sector. The increased resilience of euro area government bond markets was perhaps most vividly illustrated in the relatively low dispersion of yields in the first quarter of 2013, and by the low level of volatility, which remained close to its 2009 (pre-sovereign debt crisis) levels.

Chart 2.6 Assets of euro area investment funds

(Q3 2011 – Q4 2012; index of notional stocks; Q3 2011 = 100)



Sources: ECB and ECB calculations.

Increased stability and high returns have resulted in increased flows to euro area government debt markets...

A marked decline in the dispersion in euro area government bond yields was evident as spreads reverted to the levels recorded in late 2010 (see Chart 2.7) – with a particularly pronounced drop at shorter maturities. Following announcement of the OMTs, which would have a stronger impact on the shorter end of the yield curve, the liquidity premia for two-year bond maturities fell to historically low levels (see Chart 2.8). By contrast, the liquidity premia in five and ten-year yields, although reduced, remain elevated.

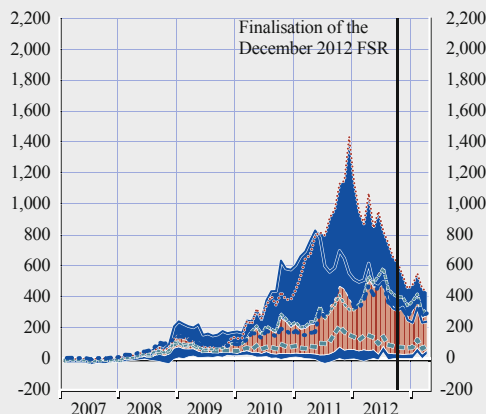
... resulting in a marked reduction of spreads

Chart 2.7 Spread between euro area sovereign bond yields and the overnight index swap

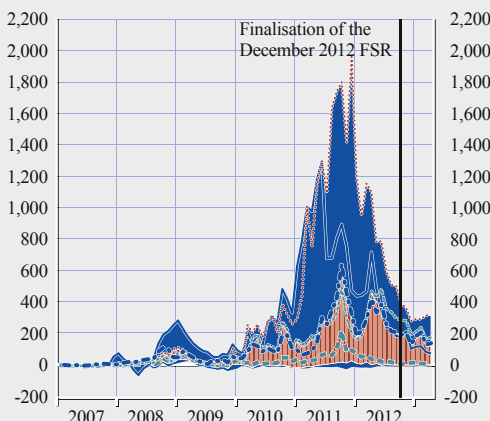
(Jan. 2007 – May 2013; basis points)

■ minimum – maximum range — Ireland - - - Spain
■ interquartile range - - - Portugal - - - Italy
- - - median

Ten-year maturities



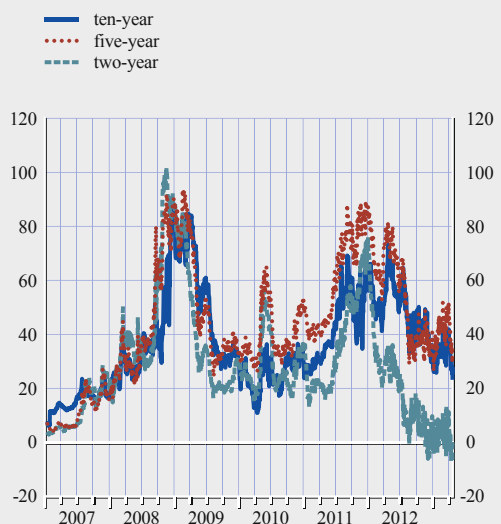
Two-year maturities



Source: Bloomberg.

Chart 2.8 Liquidity premia on German two, five and ten-year government bonds

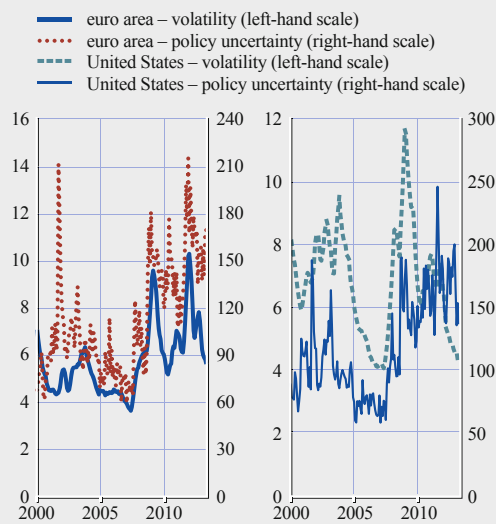
(Jan. 2007 – May 2013; basis points)



Sources: Thomson Reuters Datastream and ECB calculations.
Note: Difference between zero coupon yields on German government-guaranteed KfW agency bonds and German government bonds.

Chart 2.9 Implied government bond market volatility and policy uncertainty in the euro area and United States

(Jan. 2000 – Apr. 2013; percentages; index, 100=long-run average)



Sources: Bloomberg and S. Baker, N. Bloom and S.J. Davis (available at www.policyuncertainty.com).

In the euro area, implied bond market volatility has fallen to its pre-sovereign crisis level, while that in the United States has declined to its lowest level since June 2007. However, market indicators suggest a break in the connection between the low level of volatility and policy uncertainty (see Chart 2.9). In this way, a sharp rise in volatility could trigger a re-pricing of risks and have implications for yields, and perhaps also for liquidity, in secondary government debt markets.

Issuance by stressed sovereigns was strong

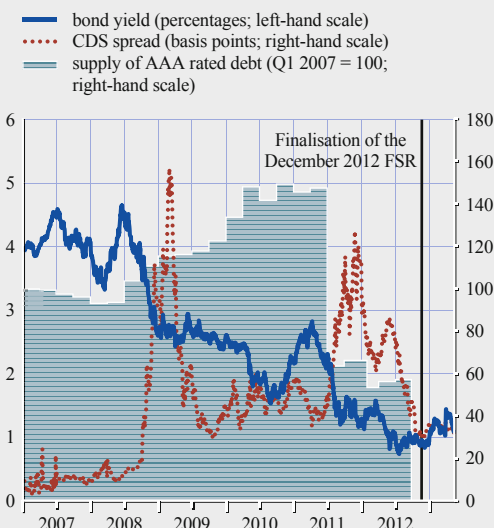
Benefiting from increased foreign demand and falling borrowing costs, quarterly bond issuance by stressed euro area sovereigns in early 2013 reached the highest level recorded since the sovereign debt crisis began in 2010. The increase was largely driven by Spain and Italy, but the first quarter of 2013 also saw Portugal's first issuance of bonds with a maturity of over one year since the start of its EU-IMF programme, as well as extensive issuance by Ireland. While governments are benefiting from lower costs, the relatively high returns offered by this debt is an attractive prospect for investors facing low and even negative returns on government debt from higher-rated countries that had benefited from flights to safety in the course of the crisis.

Yields on key global government bonds remain at historically low levels, despite rising government debt-to-GDP ratios

Key global government bond markets, including those outside the euro area, continued to be characterised by historically low yields. Since the outbreak of the financial crisis, the supply of government debt with triple-A ratings from Standard & Poor's, Moody's and Fitch Ratings has fallen by over 60%, limiting the choices available to credit rating-constrained or index-tracking investors. The sharp reduction in supply amid a continued search for safety and liquidity has pushed yields on such debt to historically low levels (see Chart 2.9). Despite not benefiting from consistent AAA ratings, yields on UK gilts, US Treasuries and Japanese bonds continued to benefit from their safe and highly liquid status and from significant central bank purchases. The continuous decline in

Chart 2.10 Average bond yield and CDS spread of AAA-rated sovereigns and the supply of AAA-rated government debt

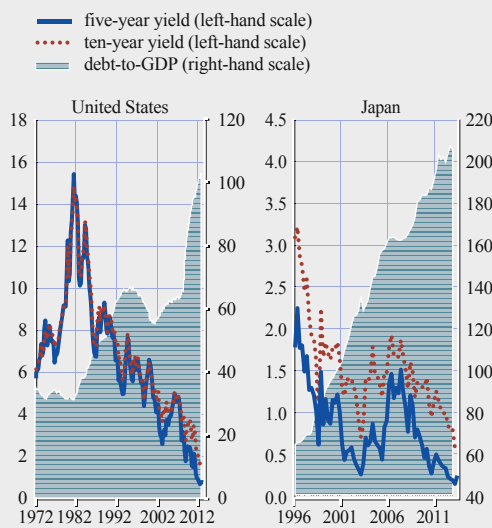
(Jan. 2007 – May 2013)



Sources: Bloomberg, the Financial Times, ECB, BIS, Haver Analytics and ECB calculations.
Note: Supply of AAA-rated debt refers to countries with a triple-A rating from Standard & Poor's, Moody's and Fitch, and data are to Q3 2012.

Chart 2.11 Yields on US and Japanese government bonds and government debt-to-GDP ratios

(percentages)



Sources: Federal Reserve Bank of St. Louis, Bloomberg and ECB calculations.

these yields contrasts with rising government debt-to-GDP ratios (see Chart 2.11). This dichotomy carries a risk of changing perceptions regarding the relative safety of this debt, not least as US Treasuries and Japanese government account for half of the global supply of public debt. Clearly, given the size of this market, an adjustment in the yields on this debt could entail broad-based implications for government debt markets elsewhere, including in the euro area.

Low and even negative returns on higher-rated government debt have contributed to increasing flows into **corporate debt markets**. Strong demand has caused corporate bond issuance to reach record highs, and yields to decline to historically low levels. The increased issuance may also reflect structural changes in corporate financing on account of a limited availability of bank credit.

Total issuance of euro area non-financial corporate debt in 2012 was 60% higher than issuance in 2011, and it remained strong in the first months of 2013. The share of high-yield debt in total issuance rose from one-quarter in 2012 to one-third in the first quarter 2013, above the average recorded from 2006 to 2012. To some extent, the increased issuance of high-yield debt reflected corporate rating downgrades, but firms already rated as high-yield also increased their issuance, reflecting an increased willingness of investors to take on more risk.

Issuance of corporate hybrid debt by euro area non-financial firms was particularly high in the first quarter of 2013, reaching almost four times the level of total issuance in 2012. While the strong increase was largely driven by a small number of firms, it brought the share of hybrids in total issuance for the first quarter of 2013 up to 14% (compared with 2% in the first quarter of 2012). The expansion of the corporate hybrid debt market reflects demand and supply factors. On average,

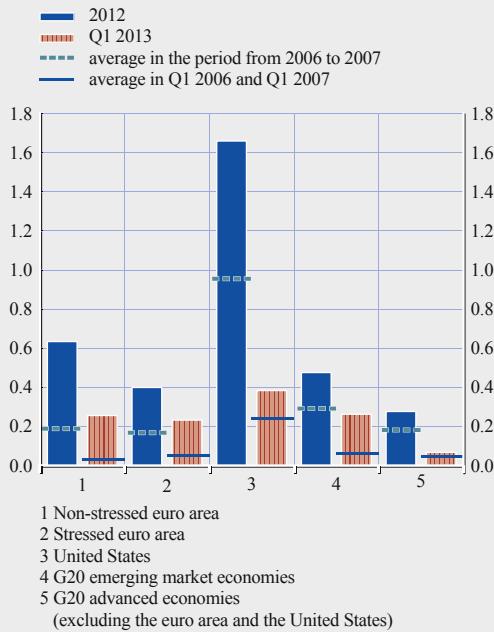
Corporate debt has benefited from the search for yield...

... resulting in higher corporate bond issuance

Issuance of euro-denominated corporate hybrids in the first quarter 2013 was almost four times as high as in 2012

Chart 2.12 Issuance of high-yield bonds by non-financial corporations

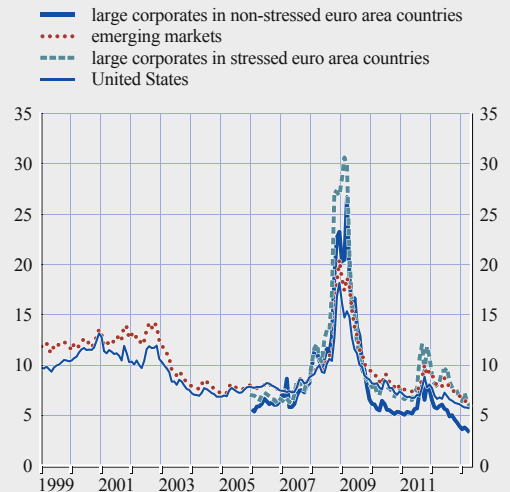
(Q1 2006 – Q1 2013; percentage of GDP)



Sources: Dealogic and ECB calculations.

Chart 2.13 Yields on high-yield bonds issued by non-financial corporations

(Jan. 1999 – Apr. 2013; percentages)



Sources: Bank of America Merrill Lynch and Thomson Reuters Datastream.

Notes: On account of data availability, the two groups “stressed euro area countries” and “non-stressed euro area countries” include Italy/Spain and France/Germany respectively. Composite yields are computed as simple averages of individual countries.

European corporate hybrids provide investors with yields that are 2% to 3% higher than those on senior debt, and increased exposure to highly rated (investment-grade) corporates, which are in smaller supply owing to downgrades. For issuers, hybrids offer cheap equity-like financing that allows them to raise funds without damaging their credit rating since rating agencies tend to view hybrid issues as 50% equity and 50% debt.¹ The highly structured nature of many hybrids can make it difficult to properly assess the risks of these securities and given its short history, there are limited data available on the extension/deferral risk and recovery rates for euro area corporate hybrids. However, a number of high-profile cases (for example, the restructuring of the French technology firm Thomson) demonstrate the highly subordinated nature and poor recovery rate of hybrids (5% in the case of Thomson), as well as the risk of coupon deferral.²

Against the background of strong demand for corporate bonds, yields and spreads have witnessed a notable compression (see Chart 2.13). In the United States, yields on high-yield non-financial corporate bonds are currently below their pre-crisis levels. In the euro area, yields on the bonds of corporates from non-stressed euro area countries declined to their lowest level on record in January 2013, diverging substantially from those of corporates located in stressed countries. For

1 See Royal Bank of Scotland, “The Revolver”, February 2013.
2 See Société Générale, “Corporate hybrids”, April 2013.

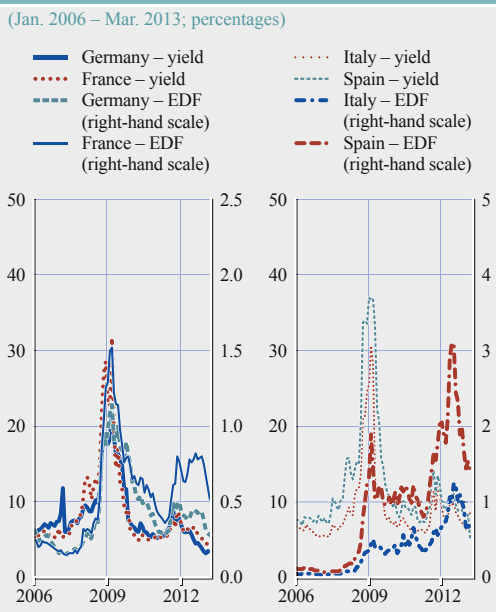
Corporate bond yields have fallen significantly, raising concerns of under-pricing of risk

certain countries, spreads appear to have narrowed more than would be expected given the decline in official policy rates, the increase of insolvencies and expected default frequencies on account of the economic outlook (see Chart 2.14). Emerging markets – which typically do not benefit from a safe-haven status and generally face higher yields – have nonetheless also witnessed a continuous downward trend in yields, which reached historically low levels at the beginning of 2013.

After the finalisation of the December 2012 FSR, **equity markets** continued to improve in all countries, including those subject to heightened market tensions. Key German and US equity market indices have surpassed their pre-Lehman levels. While indices for euro area countries under stress remain below 2008 levels, they have improved since the end of 2012. At the sectoral level, one noteworthy shock pertained to developments in Cyprus, which temporarily had a negative impact on equity markets throughout the euro area. Despite high returns (see Chart 2.5), flows to euro area equity funds have been muted, which may reflect the gap between returns on equity and corporate debt and/or hybrids not being sufficient, given the uncertain macroeconomic outlook, to aggressively push investors into equities.

In the event of an abrupt unwinding of search-for-safety and/or search-for-yield flows, active leveraged investors may exacerbate adverse financial asset price dynamics. In addition to any involuntary deleveraging, the amplifying effects may also stem from unstable funding sources, or highly similar investment positions. Various credit-oriented investment strategies tend to be associated with higher levels of leverage, which makes **hedge funds**, for instance, vulnerable to otherwise manageable investment losses as a result of a disorderly adjustment in global benchmark interest rates and/or risk premia. The recent investment performance of hedge funds that pursue credit-oriented investment strategies, such as fixed income arbitrage or event-driven, has been rather positive (see Chart 2.15) and this, together with lower volatility in financial

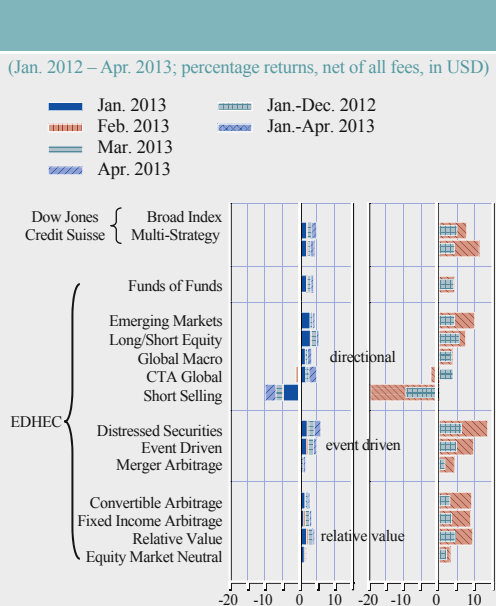
Chart 2.14 Yields on high-yield bonds issued by NFCs and expected default frequencies for selected countries



Source: Bloomberg and Moody's KMV.
Note: Yields refer to weighted averages and EDFs are expected default frequencies within one year.

Equity markets continue to benefit from declining risk aversion

Chart 2.15 Global hedge fund returns



Sources: Bloomberg, EDHEC Risk and Asset Management Research Centre and ECB calculations.
Notes: EDHEC indices represent the first component of a principal component analysis of similar indices taken from major hedge fund return index families. "CTA Global" stands for "Commodity Trading Advisors"; this investment strategy is also often referred to as managed futures.

Leveraged investors, such as hedge funds, can exacerbate adverse asset price dynamics...

... as a result of funding pressures...

markets, low nominal investment yields and low borrowing rates, may be inducing hedge funds to take on additional leverage (see also the subsection on counterparty credit risk in Section 3.1).

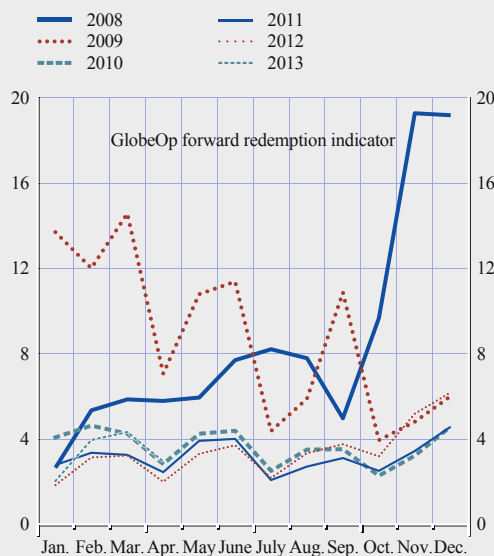
Hedge fund investors' redemption activity increased in 2013 (see Chart 2.16), thereby making affected hedge funds vulnerable to a forced unwinding of investment positions. Higher gross redemptions may not necessarily lead to net outflows from the hedge fund sector as a whole, but could be interpreted as a symptom of lower investor tolerance for underperformance and more active reallocations of hedge fund portfolios, both across investment strategies and across hedge funds within those strategies.

... or the unwinding of crowded trades

Potential crowding of hedge fund trades may further aggravate a sharp reversal of excessive accumulated search-for-safety and/or yield flows. However, the moving median pairwise correlation coefficients of the investment returns of hedge funds within broadly defined investment strategies – a measure of the possible similarity of hedge funds' investment positioning – decreased after July-August 2012, and at the end of April 2013, remained below July-August 2012 levels for most credit-oriented and other hedge fund investment strategies, suggesting a lower associated risk of simultaneous and disorderly collective exits from crowded trades in credit and other financial markets.

Chart 2.16 Near-term investor redemption pressures for hedge funds

(Jan. 2008 – Apr. 2013; percentage of hedge fund assets under administration that investors plan to withdraw)



Source: GlobeOp.

Notes: Assets under administration refer to the sum total of the net asset value of all hedge funds administered by GlobeOp. Data are based on actual redemption notices received by the 12th business day of the month.

Box 3

THE NETWORK STRUCTURE OF THE CREDIT DEFAULT SWAP MARKET AND ITS DETERMINANTS

Despite considerable growth in the credit default swap (CDS) market over the last decade, it remains opaque in many respects. In particular, the over-the-counter (OTC) nature of the trades implies a high potential for counterparty risk, which may embed externalities that reverberate well beyond a bilateral structure of exposures. A more detailed understanding of the network structure is thus essential to identify potential sources of financial stability risks that may emanate from this financial market segment. Indeed, while such questions have already been at the centre of attention in the context of interbank markets for some time now, derivative markets have been analysed less deeply to date, mainly on account of an unavailability of data.

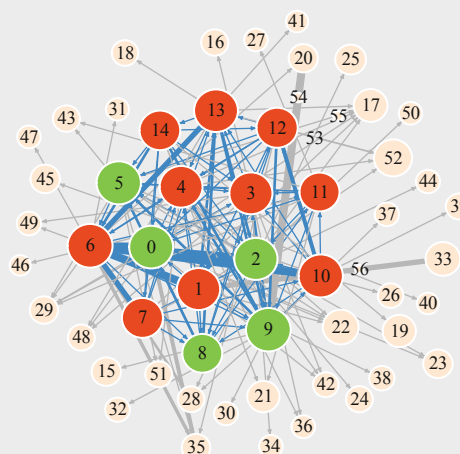
This box analyses the CDS market structure using a large and novel dataset, focusing on the network structure and the analysis of the determinants of some key network properties at a

reference entity level.¹ The dataset, obtained from the Trade Information Warehouse (TIW)² of the Depository Trust and Clearing Corporation (DTCC), comprises virtually all gross and net exposures on 642 reference entities worldwide, including 40 sovereigns (18 G20 sovereigns and 22 European sovereigns) and 602 financial reference entities as at the end of 2011.³

The resulting map of the market structure of the CDS exposure network shows that it shares many features with other financial networks such as networks for interbank loans. The chart illustrates the structure of the aggregated CDS network for key sovereign and financial CDS reference entities. The analysis shows that, on aggregate, active traders sell and less active traders buy (net) CDS protection, which is in line with the finding that smaller banks tend to lend to larger, “money centre” banks.⁴ The analysis shows that the interconnectedness on the CDS market does not arise from the large number of bilateral links between any two counterparties, but rather as a result of the fact that all traders are close to one another due to the existence of a few key intermediary traders. There is also a high(er) concentration among counterparties (i.e. buyers and sellers of protection) than among CDS reference entities (i.e. the underlying entity being hedged).⁵ In terms of stability and contagion, scale-free networks, such as the CDS network, have been shown to be more robust than random networks to the disappearance of

The structure of the aggregated CDS network for key sovereign and financial CDS reference entities

(as at end-2011)



Sources: T. Peltonen, M. Scheicher and G. Vuillemy, “The Network Structure of the CDS market and its Determinants”, *ECB Working Paper Series*, forthcoming. The dataset of this paper is obtained from the Trade Information Warehouse (TIW) of the Depository Trust and Clearing Corporation (DTCC).
Notes: The chart is constructed as follows: in order to isolate the net behaviour of systemically important institutions in the network, the top 15 counterparties and their top ten exposures are depicted. Hence, the coloured nodes at the centre are the 15 largest counterparties in the CDS market, when counterparties are ranked by their total notional exposure. Among them, the red nodes represent net sellers and the green nodes overall net buyers. For each of these 15 traders, the ten largest bilateral net sell exposures are shown. The size of each node is proportional to the log of the underlying gross exposure. The size of each link is proportional to the log of the net exposure it represents. Large net exposures between the top 15 traders are in blue.

¹ For further details, see T. Peltonen, M. Scheicher and G. Vuillemy, “The Network Structure of the CDS market and its Determinants”, *ECB Working Paper Series*, forthcoming.

² The TIW is a global trade repository, i.e. a database of transactions covering the vast majority of CDS trades worldwide, and virtually all recent CDS trades. It has several interesting features. First, it covers both centrally cleared and bilateral OTC transactions. Second, not only banks or dealers report their trades to DTCC, but all types of counterparties, so that the dataset encompasses all main non-bank institutions such as hedge funds, insurance companies, central counterparties (CCPs) and, potentially, some industrial corporations. Third, this dataset is a legal record of party-to-party transactions, as the Warehouse Trust Company (a subsidiary of DTCC which operates the Trade Information Warehouse) is supervised by US regulatory authorities.

³ The amount of the total gross notional value in the analysis sample equals €4.28 trillion. Therefore, the sample represents around one-third of the global single-name CDS market and around one-fifth of the total CDS market (including multi-name instruments) at that point in time. For each reference entity, the dataset contains gross and net bilateral exposures between any two counterparties. The overall network consists of 57,642 bilateral exposures of individual reference entities. As any bilateral exposure may result from several separate transactions, the number of transactions covered by the dataset is 592,083.

⁴ See, for example, S. Markose, S. Giansante and A.R. Shaghghi, “Too Interconnected To Fail? Financial Network of US CDS Market: Topological Fragility and Systemic Risk”, *Journal of Economic Behavior & Organization*, No 83(3), forthcoming; and B. Craig and G. von Peter, “Interbank tiering and money center banks”, *BIS Working Paper Series*, No 322, 2010.

⁵ The top ten most active traders account for 73% of the gross protection bought or sold, and are active in more than 55% of the sovereign and financial reference entities.

one node, but also to be highly vulnerable in the event of one of the few highly connected nodes (i.e. key intermediary traders) disappearing from the network.⁶

An econometric analysis – using a generalised linear model of the determinants of the properties of the CDS network for individual reference entities – yields some insight into the relationship between features of the networks of individual reference entities and the characteristics of the underlying reference entity. First, a higher pool of underlying bonds outstanding, together with a higher proportion of unsecured funding, increases both the size and the activity on the CDS market. Second, higher debt maturity decreases both the CDS network size and its activity, indicating potentially that roll-over risk by underlying reference entities is an important concern for CDS traders. Third, regarding the risk characteristics, CDS volatility and “beta” are found to have a greater influence on the size and activity than the absolute level of the CDS spread. Traders are more numerous and more active in reference entities whose perceived changes in creditworthiness can be larger and whose systematic component is higher. Fourth, two key determinants of concentration are the level of activity in a reference entity and its market beta. Therefore, fewer traders are willing to bear a large share of systematic risk when it is relatively higher. Finally, with regard to differences due to the type of reference entity and its location, the distinction between sovereign and financial reference entities has an effect on the network structure, but there are almost no significant differences in structural properties between European and non-European reference entities.

The analysis has shown that the CDS market is highly interconnected through a few key intermediary traders. Thus, monitoring their solvency and liquidity positions is essential for assessing the stability of this market segment. However, less regulatory information is available for other types of financial institutions (e.g. hedge funds and investment funds) that are also highly active in this market, which complicates the analysis from a financial stability perspective. Moreover, given the multi-dimensionality and richness of the interconnections between counterparties in the CDS market, a deeper understanding of risk-sharing and the ultimate holder of credit risk is warranted from systemic risk analysis perspective.

⁶ W. Duan, Z. Chen, Z. Liu and W. Jin, “Efficient target strategies for contagion in scale-free networks”, *Phys Rev E Stat Nonlin Soft Matter Phys*, No 72(2 Pt 2), 2005.



3 EURO AREA FINANCIAL INSTITUTIONS

Financial institutions in the euro area continue to be confronted with significant challenges, mainly related to the weak economic environment, which has dampened profitability and increased credit risks.

*The average **financial performance** of large and complex banking groups (LCBGs) in the euro area has remained muted and the earnings outlook remains subdued. Euro area insurers recorded more stable profitability, owing both to a good full-year underwriting result and strengthening investment income, and analysts expect stable earnings also for 2013.*

*At the same time, euro area LCBGs' **solvency** positions have continued to improve – resulting from both rising core Tier 1 capital and reductions in risk-weighted assets – and large euro area insurers' capital buffers still include a reasonable amount of shock-absorbing capacity, even if healthy capital positions partly also reflect accounting effects. Steady improvements in the solvency positions of euro area financial institutions, along with rising regulatory capital ratios, should provide a more solid buffer against possible losses and a more sustainable basis for profitability. However, the conditions and solvency positions of euro area financial institutions remain uneven, with significant vulnerabilities remaining in particular in some countries' banking sectors, where further progress in balance sheet repair is required.*

*The **risk outlook** for banks and insurers is mainly being influenced by the weakening macroeconomic backdrop, which is particularly affecting customers in stressed countries. Faced with the prospect of further deterioration in asset quality, some banks may engage in forbearance and delay loss recognition. While such forbearance may help debtors facing temporary difficulties, it could delay the clean-up of banks' balance sheets and might even constrain lending to more productive borrowers. In contrast with a deteriorating credit risk outlook, bank funding stresses continued to abate in early 2013 and, despite more volatility in funding markets later on, banks continued to strengthen their funding profile by moving further towards deposit-based funding. Despite these positive developments, funding challenges remain for a number of banks, not least due to the somewhat reduced but still significant fragmentation of bank funding markets. The most important risks for insurers in the short term emanate from potential volatility in government and corporate bond markets, which could have an impact on balance sheet valuations. At the same time, some medium-term issues require monitoring, including the low-yield environment.*

***Scenario-based analysis** suggests that a materialisation of key risks (including renewed sovereign tensions, reduced profitability, funding stress and a reassessment of global risk premia) could have significant implications for the banking and insurance sectors, as well as for the wider euro area economy. The estimated impact, however, is likely to be mitigated by the ongoing bank recapitalisation processes, by the potential for further progress on policy reform and by the effects of exceptional ECB policy measures on wholesale funding constraints.*

*Last but not least, the **regulatory framework** continued to be overhauled both at the EU level and globally during the first half of 2013. Of particular importance in the euro area are the establishment of the single supervisory mechanism (SSM) and the adoption of the Capital Requirements Regulation and Directive (CRR/CRD IV).*

3.1 THE EURO AREA BANKING SECTOR: ALONG THE PATH TO A NEW POST-CRISIS WORLD

FINANCIAL SOUNDNESS OF LARGE AND COMPLEX BANKING GROUPS¹

Banks' profitability remains under pressure...

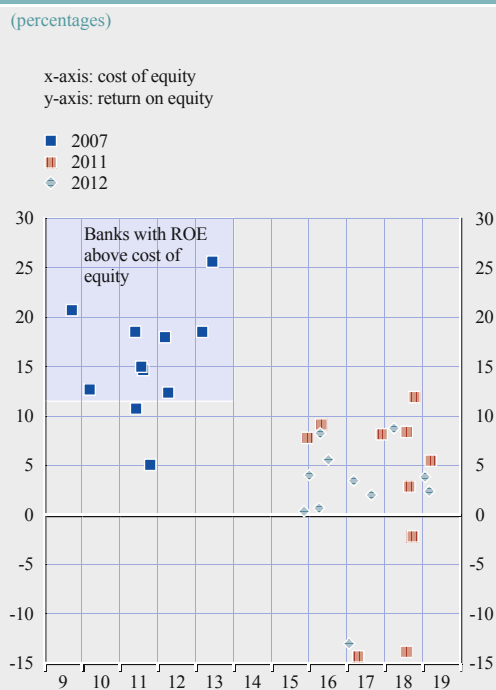
Euro area banks' **profitability** remains muted. Whereas almost all euro area LCBGs generated returns higher than their cost of equity before the onset of the financial crisis, the last two years have been characterised by both a higher cost of equity and lower, or negative, returns on equity (see Chart 3.1). While this may be partly transitory, the economic and regulatory headwinds facing the banks point to a structural need for further balance sheet adjustment.

... due to higher loan losses and significant one-off charges

Profitability of euro area LCBGs trended steadily downwards during 2012, and results for the first quarter of 2013 were, on average, slightly weaker than in the same period last year (see Chart 3.2). This mainly reflected significant one-off charges, such as provisions for litigation costs and fines or goodwill write-downs, but also subdued income from all major income sources and generally higher loan losses.

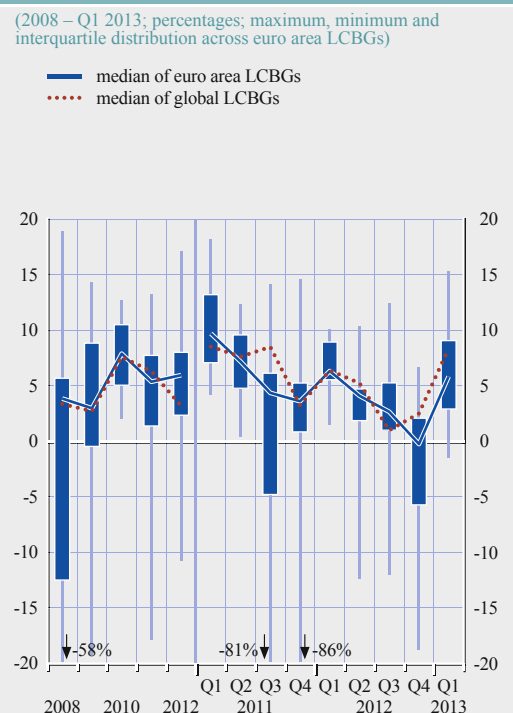
The worsening financial performance of euro area banks reflected primarily a deteriorating macroeconomic environment and its effects on credit quality and, in turn, higher loan loss provisions which more than offset the moderate year-on-year improvements in operating income

Chart 3.1 Return on equity and cost of equity of euro area large and complex banking groups



Sources: SNL Financial and Bloomberg.

Chart 3.2 Return on equity of euro area and global large and complex banking groups

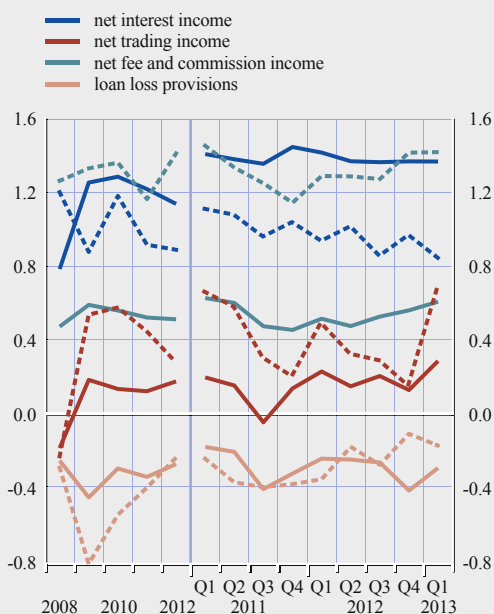


Sources: Individual institutions' financial reports.

¹ The sample used for most of the analysis presented in this section includes 18 euro area banks and 14 global banks with headquarters in the United States, the United Kingdom and Switzerland. The criteria for identifying them are described in ECB, "Identifying large and complex banking groups for financial system stability assessment", *Financial Stability Review*, December 2006.

Chart 3.3 Breakdown of sources of income of euro area and global large and complex banking groups

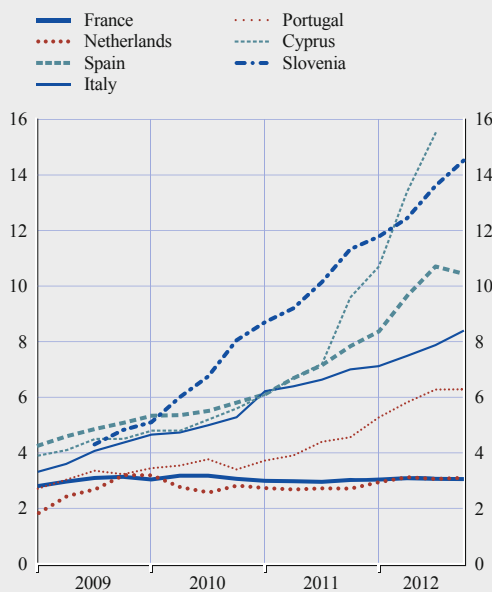
(2008 – Q1 2013; percentage of total assets; solid lines: euro area LCBGs; dotted lines: global LCBGs)



Sources: Individual institutions' financial reports.

Chart 3.4 Non-performing loan ratios in selected euro area countries

(Q1 2009 – Q4 2012; percentage of total loans)



Sources: National central banks and IMF Financial Soundness Indicators.

Notes: The chart shows gross non-performing loans as a share of total loans. Given different national definitions of non-performing loans, cross-country comparison is limited.

at the end of last year and in early 2013 (see Chart S.3.7). First, net interest income remained broadly unchanged in the final quarter of 2012 and in the first three months of 2013 compared with the same periods a year earlier, despite declining somewhat for 2012 as a whole (see Chart 3.3). This resulted from the combination of higher lending margins and the further widening of negative deposit margins at many banks as a by-product of aggressive efforts to raise more stable funding (see Chart S.3.6). While net interest income of euro area banks uniformly benefited from official sector funding, market-based funding remained relatively expensive, despite a decrease observed recently, and marked by country fragmentation.

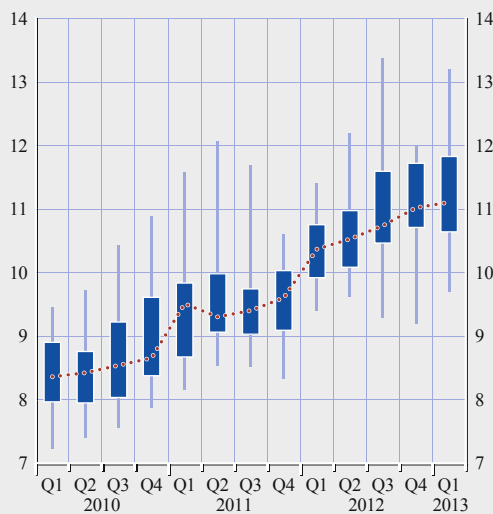
Second, net fee and commission income showed year-on-year increases, albeit modest, both in the last quarter of 2012 and in the first quarter of 2013 thanks to income generated from underwriting activities – notably, strong corporate bond issuance as large companies took advantage of low yields to disintermediate their financing. Third, trading income showed some improvement in the first quarter of 2013 thanks to improved financial market conditions.

Asset quality remains a chief concern, in particular in countries with a weaker growth outlook and/or with fragile property markets. To date, however, such concerns regarding euro area LCBGs' asset quality have not been validated at the aggregate level, as it has remained broadly stable on average when measured in terms of non-performing loan ratios. Likewise, coverage of non-performing loans of LCBGs has remained broadly stable amid loan deleveraging and higher levels of provisioning. Looking at the broader euro area banking sector, however, asset quality

Deterioration in asset quality remains a key concern

Chart 3.5 Core Tier I capital ratios of euro area large and complex banking groups

(Q1 2010 – Q1 2013; percentages; maximum, minimum, interquartile distribution and median)



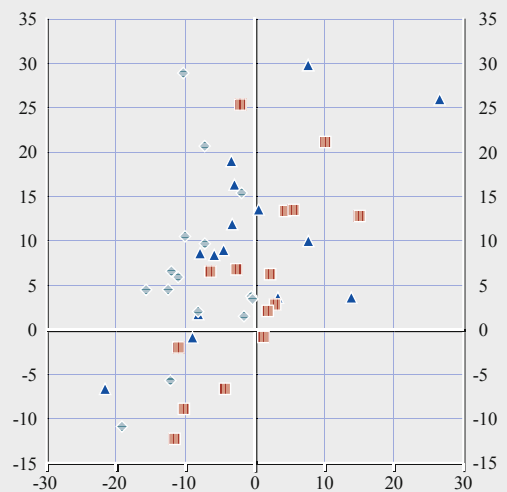
Source: SNL Financial.

Chart 3.6 Changes in core Tier I capital and risk-weighted assets of euro area large and complex banking groups

(percentage change per annum)

x-axis: risk-weighted assets
y-axis: core Tier I capital

▲ 2010
■ 2011
◇ 2012



Source: SNL Financial.

continued to deteriorate in a number of euro area countries (see Chart 3.4). Moreover, there remains a considerable institution and region-specific heterogeneity in coverage ratios across euro area banks. While such discrepancies can be partly explained by differences in national definitions of non-performing loans as well as by fundamental factors, such as differences in collateral, they also highlight the need for some banks to raise their provisioning levels.

Solvency positions improved further...

In contrast to some volatility in profitability, **solvency positions** of euro area LCBGs have continued to steadily improve. The median core Tier 1 ratio reached 11.1% in the first quarter of 2013, up from 9.6% at the end of 2011 (see Chart 3.5). This steady improvement has resulted from both rising core Tier 1 capital and, in the last quarter of 2012, reductions in risk-weighted assets (see Charts 3.6 and S.3.10). Notwithstanding this progress, some euro area LCBGs still need to further increase their common equity capital in the coming quarters, with investors expecting them to meet new capital requirements even before the full implementation of Basel III/CRD IV rules.

... but concerns remain about the consistency of risk-weighted asset calculations

Unfortunately, any confidence benefits from the aggregate reductions in risk-weighted assets (RWAs) have been diluted by uncertainty among bank analysts and investors. While the dispersion of risk weights across banks partly stems from differences in true underlying risk (e.g. the composition of loan books), the approach for their derivation (standardised versus internal-rating-based or IRB) has been at the centre of the debate, which has benefited from the quantifications of two recent studies by the European Banking Authority (EBA) and the Basel Committee on Banking Supervision (see Box 4).

Box 4

EVALUATING DIFFERENCES IN BANKS' CREDIT RISK WEIGHTS

A growing chorus of analysts, investors and regulators have expressed concern about the murkiness of banks' internal models, including the complexity and opacity of risk-weighting formulas.¹ This has led to some loss of confidence in disclosures of banks' risk-weighted assets (RWAs). This box discusses how changes in risk weights affect key reporting such as solvency ratios and illustrates variations in risk weights across euro area LCBGs by utilising publicly available Pillar 3 disclosures.

The observed high variation in the level of risk weights applied by banks, in principle, should reflect genuine differences in underlying risk. Specifically, it should reflect differences in risk profiles across institutions (e.g. due to different business models, asset mixes or macroeconomic conditions). In practice, differences may arise also for less fundamental reasons – such as differences across countries in regulatory practices with regard to the implementation of Basel II rules or different modelling choices made by banks. Such practices could lead to unjustified differences between the capital positions of banks with loan portfolios of similar levels of risk. Indeed, variations and changes in risk weights – the multiplier applied to an underlying position to calculate RWAs – can have a significant impact on banks' capital ratios. For instance, a 25% change in risk weights for a bank with a 10% capital ratio changes the ratio by two percentage points. Such changes are particularly relevant for risk weights used for calculating RWAs for credit risk since they account for almost 85% of total risk-based capital requirements for euro area LCBGs.

An accurate comparison of overall risk weights across countries and banks needs to be drawn following a detailed granular approach with due care taken to account for specificities of business models and portfolio mixes. In addition, there can be sound reasons why banking book risk weights for a bank vary over time or why they vary across banks even for portfolios with similar risk profiles. For example, fluctuations in collateral values and differences within rating buckets (one bank might have exposures at the better end of a rating bucket) can explain differences in risk weights. Nevertheless, banks are meant to be calculating risk weightings using a probability of default over time which should smooth out the impact of credit trends in a single year.

While acknowledging the merits of such a granular approach, insights can also be gleaned from comparing more specific risk weightings across banks and especially changes over time.² In particular, detailed information can be found in euro area LCBGs' Pillar 3 reports on the risk weights for credit risk that they use as an input under their advanced IRB approach. These data suggest that risk weights for both corporate and retail exposures differ substantially across LCBGs even within similar rating categories (see Chart A). This is especially the case for risk weights applied to lower-rated exposures. While, as already mentioned, there might be valid reasons why levels of risk weights vary across the LCBGs even within the same rating buckets – such as higher concentration of exposures at the lower or higher end of each rating category or differences in collateral – differences appear to be too wide to be fully explained by these factors.

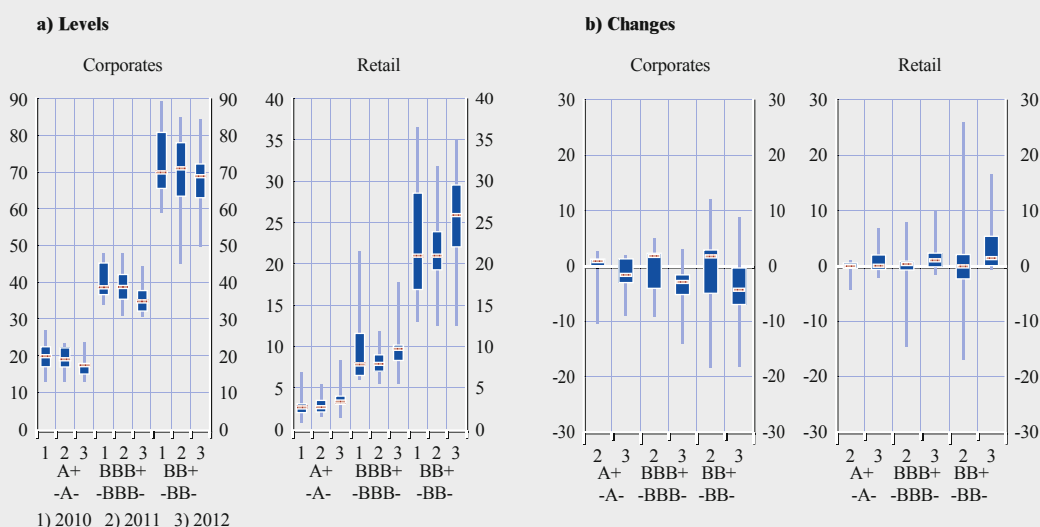
1 See, for example, Barclays Capital, "Bye Bye Basel? Making Basel more relevant", May 2012, and A. Haldane and V. Madouros, "The Dog and the Frisbee", speech at the Federal Reserve Bank of Kansas City's 366th Economic Policy Symposium, August 2012.

2 Barclays Capital, "The Dog That Dug: (Yet) more digging into RWAs", September 2012.

Euro area large and complex banking groups' risk weights for corporate and retail credit exposures

(2010 – 2012; percentages; maximum, minimum, interquartile distribution and median)

(annual percentage point changes; maximum, minimum, interquartile distribution and median)



Sources: Individual institutions' Pillar 3 reports and ECB calculations.

Such reasons might also help to explain why a bank changes its risk weights from one year to the next, although some similarity in changes in risk weights across banks could be expected for this group of large cross-border banks and very large changes should not be common since banks should use a probability of default over time in their calculations. The differences in changes in risk weights from 2010 to 2012 across LCBGs for various exposures are therefore a cause for concern (see chart) and explain why several analysts have voiced strong concerns regarding RWA calculations.

Such variation in risk weights across LCBGs and over time clearly highlights a need for regulatory initiatives to further analyse and assess the consistency of RWA calculations. Two such initiatives are already under way. First, the Basel Committee on Banking Supervision (BCBS) – following a similar exercise for trading book exposures³ – is carrying out an in-depth review of banks' calculation of banking book RWAs. The review uses a top-down approach by sending questionnaires to banks to gather information on their methodologies, as well as a bottom-up approach where banks were asked to calculate RWA numbers generated by identical test portfolios. Banks provided their input to the review in late 2012 and the results from the exercise are expected to be published later this year. Second, the EBA is currently conducting a similar review and some interim results based on a top-down analysis have already been published.⁴ The preliminary findings suggest that *half* the variation in banks' risk-weighted assets cannot be explained by factors such as portfolio and regulatory differences and that such variation appears mainly in corporate and retail portfolios.

3 Basel Committee on Banking Supervision, "Regulatory consistency assessment programme (RCAP) – Analysis of risk-weighted assets for market risk", January 2013.

4 European Banking Authority, "Interim results of the EBA review of the consistency of risk-weighted assets – top-down assessment of the banking book", February 2013.

All in all, these findings suggest that currently used risk-weight calculations might not in all cases be an accurate gauge of the true riskiness of the portfolios of financial institutions. Recent initiatives by the BCBS and the EBA to analyse the issue should help to enhance transparency and contribute to regulatory convergence. Furthermore, the new Basel III regulation on the leverage ratio, which is not risk-based, will also help to improve comparability across banks and to promote transparency. But another equally potent means of reducing the doubt about banks' RWA calculations would include more harmonised – and in some cases more detailed – Pillar 3 disclosures. As a complementary measure, systematic publication of capital requirements given by standardised models as well as internal models would be one means of validating internal models. Such measures would help to not only improve confidence in regulatory disclosures, but also more generally reduce ambiguity about the true health of banks.

Leverage ratios of euro area LCBGs continued to decline in the second half of 2012, falling from assets 23 times equity to assets 22 times equity (see Box 5). In contrast to broader developments since the onset of the global financial crisis in 2008, recent deleveraging efforts in the second half of 2012 focused to a larger extent on asset reductions rather than equity increases. Despite its cumulative decline, the leverage ratio measured as total assets over equity in euro area institutions appears elevated compared with global peers. Some of this may, however, merely relate to accounting differences – a narrower definition of tangible equity over tangible assets on a comparable IFRS

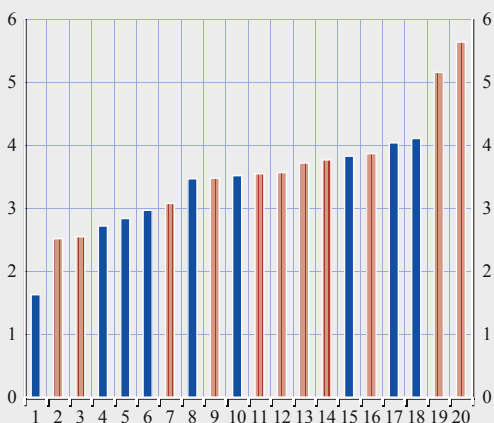
*Leverage ratios
have declined*

Chart 3.7 Leverage ratios of euro area and global large and complex banking groups

(Q4 2012; percentages; IFRS-equivalent estimates of adjusted tangible equity over adjusted tangible assets)

x-axis: banks

- euro area LCBGs
- global LCBGs



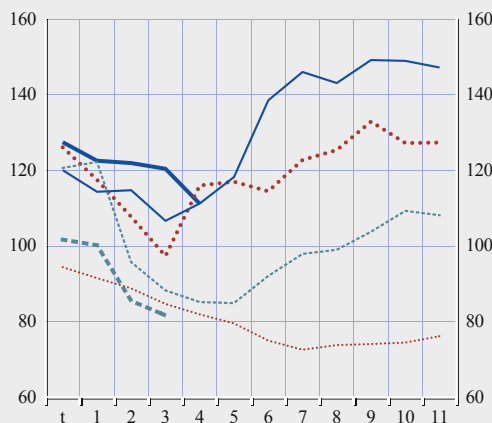
Source: Federal Deposit Insurance Corporation (FDIC).

Chart 3.8 Evolution of banks' loan-to-deposit ratios following banking crises

(percentages; non-bank loans over customer deposits)

x-axis: years following banking crisis

- euro area LCBGs (t=2008)
- Finland (t=1991)
- - - United States (t=2007)
- Norway (t=1991)
- Japan (t=1997)
- - - Sweden (t=1991)



Sources: OECD, Federal Reserve System, financial reports and ECB calculations.

Notes: Banking crises dates are based on L. Laeven and F. Valencia, "Resolution of Banking Crises: The Good, the Bad, and the Ugly", *IMF Working Paper Series*, WP/10/146, 2010. Data for the euro area and other EU countries refer to large banking groups.

basis suggests that while ratios remain low for euro area LCBGs, they are not systemically below those of their global peers (see Chart 3.7).² The loan-to-deposit ratio – another commonly used metric for deleveraging – fell sharply among LCBGs from 120% at end-2011 to 111% by the end of 2012 (see Chart 3.8). As a result of this recent decline, the overall reduction since the onset of the crisis appears more in line with historical and international developments. However, the level of the ratio still remains relatively high – though this may partly stem from the different financial structure of the euro area relative to other large economic areas, notably the prevalence of bank-based (versus market-based) financing for non-financial firms and the retention of mortgage debt on bank (versus government-sponsored enterprise) balance sheets.

2 See also FDIC Vice Chairman Thomas M. Hoenig, “Financial Stability: Incentives Matter”, speech at The Asian Banker Summit, 24 April 2013.

Box 5

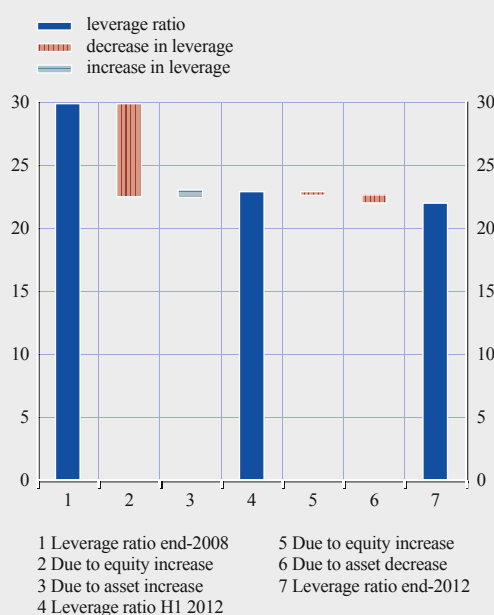
DELEVERAGING BY EURO AREA BANKS

Euro area banks have been reducing their leverage since the outbreak of the financial crisis. This ongoing process is an important component of adapting banks’ balance sheets and business models to a post-crisis environment and, if undertaken in a smooth manner, should result in positive externalities. Clearly, both its *scale* and *pace* require close monitoring, not least given its potential impact on the supply of credit to the real economy. In this vein, several estimates have been published by international organisations and market analysts alike, suggesting large aggregate deleveraging needs and limited adjustment by euro area banks to date. This box describes deleveraging efforts made by euro area banks over the crisis period and highlights the considerable uncertainty surrounding deleveraging projections.

The aggregate leverage ratio for euro area large and complex banking groups (LCBGs) has fallen from assets 30 times equity in 2008 to assets 22 times equity by end-2012. Over this period, deleveraging has largely been driven by equity increases (over 35%), as assets at end-2012 were only slightly below 2008 levels (-1%). That equity increases would drive deleveraging is not surprising given that modest capital increases exert a more substantial impact on leverage than large asset reductions: had equity been unchanged over the crisis period, assets would have had to fall by €4 trillion to achieve the same reduction in the leverage ratio. The modest reduction in the aggregate assets of the LCBGs masks

Chart Leverage ratio of euro area LCBGs

(Q4 2008 – Q4 2012; asset-to-equity ratio)



Sources: Financial reports and ECB calculations.
Note: Leverage ratios refer to assets over shareholder equity.

diverging behaviour across institutions, with substantial reductions by certain banks (up to 29%) being offset by the expansion of others (up to 25%). Recent deleveraging efforts since June 2012 have been driven to a greater extent by asset reductions (-3%), with only a modest increase in capital recorded (1%) (see chart).

Banks' asset reductions to date have largely targeted non-domestic capital-intensive assets. In order to meet capital targets, LCBGs have made significant efforts to reduce their risk-weighted assets (see Box 4). Regarding non-domestic assets, BIS data on all euro area banks indicate they reduced their claims towards all regions except Latin America over the crisis period. From the end of 2008 to the third quarter of 2012 euro area banks' international claims fell by 26% (USD 3.5 trillion). Over half of the reduction was towards other euro area countries, reflecting financial fragmentation and also the high share of claims (42%) towards other Member States. Reductions towards the United States and Asia were also disproportionately high. Claims on the United States fell by 38%¹, perhaps reflecting difficulties securing US dollar funding and efforts to de-risk balance sheets by reducing US dollar-denominated investment banking and trading assets. Withdrawals from Asia (-42%), in particular Japan (-57%), have also been significant perhaps owing to the short-term nature of banks' exposures there.

Developments across the broader euro area banking sector are in line with those of LCBGs, namely while deleveraging over the crisis has largely been driven by equity increases, recent developments show an increased focus on asset reductions. Banks located in the euro area issued €133 billion in quoted shares from December 2008 to March 2013, while assets remain close to 2008 levels.² However, from June 2012 to March 2013 assets of banks located in the euro area fell by €1.3 trillion (-3.8%) with only a modest issuance of shares (€4 billion) recorded. Balance sheet reductions reflect improved confidence as banks reduced deposits held with the Eurosystem and repaid over a quarter of their LTRO debts. Reductions in remaining assets (a category largely composed of derivatives) also accounted for a significant proportion of the decrease. The decline also reflected some reduction in credit to the non-financial private sector, although this has been proportionally low (1.1%). Moreover, one should not consider reductions in the loans on banks' balance sheets as indicative of a reduction of lending to the real economy. For example, since June 2012 on-balance-sheet loans to the euro area non-financial private sector fell by €205 billion, while loans to firms adjusted for sales and securitisations only declined by €66 billion.

A number of large and medium-sized euro area banks have announced plans for asset-side reductions amounting to around €800 billion by the end of next year. The lion's share of this figure – around €600 billion of the total – refers to restructuring agreed between banks and

Euro area bank deleveraging: upper bound and mitigating factors for the period 2013-14

(EUR trillions)

	Lower range	Upper range
Wholesale freeze	0.17	0.20
Deposit outflow	0.01	0.03
Capital constraint	0.46	0.46
Restructuring plans	0.23	0.38
Loan/deposit ratio constraint	0.19	0.32
Net take-up of 3-year LTROs (mitigation)	0.11	0.08
Gross deleveraging	0.95	1.30
Mitigating factors:		
Capital raising/injections	0.40	0.30
Assets taken over by other EU banks	0.23	0.24
Natural run-off/lower demand	0.22	0.32
Effective deleveraging	0.10	0.45
Pecking-order loan impact	0.02	0.07

Sources: ECB, EBA, Dealogic, banks' reports and ECB calculations.

1 Although claims towards the United States only accounted for 17% of international claims at end-2008.

2 According to ECB MFI balance sheet item statistics.

authorities either in the context of state-aid rules or EU/IMF programmes. While the aggregation of such plans is illustrative, it clearly has limitations, as not all banks will publish their planned asset reductions, while others may adjust plans should conditions change. A more encompassing assessment of potential deleveraging requires accounting for a myriad of conditioning factors. Taking into account a subset of these³ leads to an upper bound of €0.9-1.3 trillion by end-2014 (see table) – more “cyclical” funding constraints account for deleveraging needs of €180-230 billion, capital constraints account for another €460 billion, and structural funding constraints amount to some €190-320 billion. For some banks, the imposed funding and capital-related constraints result in deleveraging needs below the banks’ announced asset reduction plans. In those cases, in what follows, the difference between announced plans and imposed constraints is referred to as restructuring plans (which amount to €230-380 billion).

This upper bound, while illustrative, is almost certain to never be met in practice given a number of mitigating factors: banks’ ability to raise new capital, the expansion of other banks, asset-side reduction that might arise due to lower loan demand and positive externalities (e.g. measures aimed at strengthening capital may also reduce reliance on wholesale funding). Taking these factors into account, effective loan deleveraging would be only a fraction of the upper bound – and could even fall to as little as €20-70 billion (or around 0.1-0.6% of the outstanding loan book). These latter calculations reflect four additional assumptions. First, it is assumed that between 50% and 75% of the estimated capital shortfall will be filled by raising (or injecting) new equity.⁴ Second, it is assumed that those banks not facing a need to deleverage will acquire some of the assets to be shed by the deleveraging banks. Third, it is assumed that instead of outright sales of assets (to avoid selling at fire-sale prices) many banks will simply let their assets run off as they mature. Fourth, it seems reasonable to assume that banks will take a pecking-order approach, as seen in the past, to their deleveraging by first shedding non-core and non-domestic assets and only as a last resort cutting back on lending to retail customers.

The calculations in this box illustrate that deleveraging calculations are highly variable and surrounded by considerable uncertainty, and are largely determined by the various (mostly ad hoc) assumptions made. Importantly, any conclusions to be drawn from such deleveraging estimates (especially as regards potential real economic implications) should reflect actions that banks are likely to take to counter the deleveraging pressures. It is to be expected that such mitigating actions will substantially reduce the amount of deleveraging that will effectively take place compared with widely cited gross estimates. Consequently, the real economic implications of bank deleveraging actions over the next couple of years are surrounded by significant uncertainty and may, under some assumptions, turn out to be much more muted than is commonly perceived. Furthermore, significant heterogeneity in deleveraging trajectories can be expected.

3 These include potential cyclical funding constraints (e.g. wholesale funding access and deposit outflows), structural funding constraints (e.g. a loan-to-deposit ratio target) and a capital constraint (e.g. a 9% core Tier 1 capital ratio threshold by end-2014). Specific assumptions on the cyclical funding constraints to arrive at an illustrative figure are calibrated on the basis of the historical distribution of rollover rates observed since 2007 and by allocating banks in different countries according to the sovereign credit rating. Different percentiles of the observed distribution have been applied for the lower and upper ranges, respectively. The capital constraints have been derived with the ECB’s macro-stress-testing framework using the European Commission’s autumn 2012 forecast. Announced restructuring plans were assumed to be either fully completed (upper range) or only partially completed (lower range) as at end-2014. Different degrees of gradualism in complying with imposed loan-to-deposit ratio targets (determined by the sovereign credit rating) were applied for the lower to upper ranges.

4 In view of the predominant role of capital-raising actions in reducing bank leverage ratios since the beginning of the financial crisis, this assumption is likely to be rather conservative. It should furthermore be noted that nominal increases in the level of capital should also help to fill some of the funding gaps. The effects from such positive externalities have not been incorporated and hence the effective deleveraging estimates are likely to be biased upwards.

BANKING SECTOR OUTLOOK AND RISKS

OUTLOOK FOR THE BANKING SECTOR ON THE BASIS OF MARKET INDICATORS

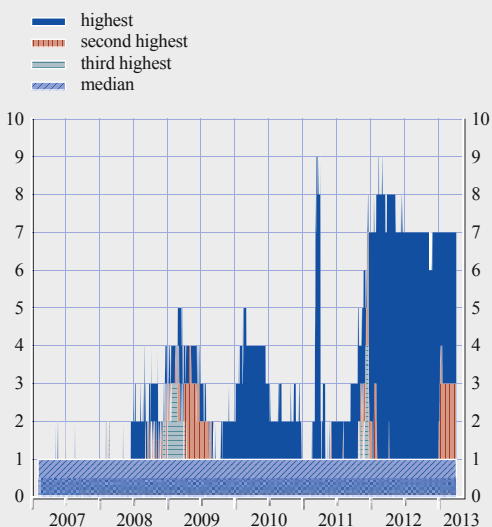
Volatility in market-based indicators during the first quarter of 2013 suggests considerable uncertainty related to the outlook for euro area banks. At the beginning of the year, these indicators suggested a strong improvement in the risk outlook for euro area LCBGs resulting from improved perceptions of sovereign risk and bank funding conditions. This improvement came to a halt in February and March in the context of rising political uncertainty in some euro area countries and the announcement of a package of official assistance for Cyprus. Looking through this volatility, it would seem that concerns are lingering about banks' asset quality and earnings and the weaker outlook for both earnings and growth. Indeed, the implied volatility of euro area bank stock indices remains significantly higher than that of general market indices (see Chart S.2.11), indicating that uncertainty regarding the outlook for the banking sector is relatively high compared with, for instance, that for non-financial sectors. Stock borrowing fees, which serve as a good summary measure of the dynamics of the stock lending market and investor sentiment, continue to indicate that investor concerns are institution-specific and there is no evidence of extensive short-selling of institutions' stocks (see Chart 3.9). As can be seen from Chart 3.8, stock borrowing fees have remained low for most euro area LCBGs, with higher borrowing fees only in some isolated cases.

Volatility in market indicators and lingering concerns

At the same time, a key systemic stress measure drawing on market-based pricing suggests systemic risk within euro area banks is at its lowest level in two years (see Chart 3.10). A recent slight increase in this indicator, which uses bank credit default swap (CDS) spreads to capture the interdependence of risk across euro area banks, follows a marked decline since mid-2012.

Chart 3.9 Cost of borrowing stocks of selected euro area large and complex banking groups

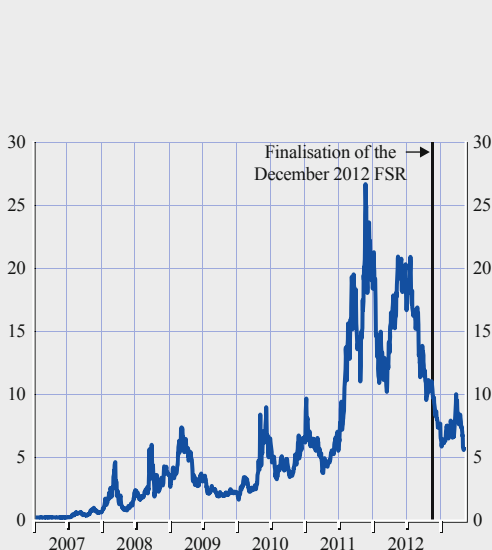
(Jan. 2007 – May 2013; cost-of-borrowing score based on seven-day stock borrowing fees)



Sources: Data Explorers and ECB calculations.
Notes: Data include 11 euro area LCBGs. The cost-of-borrowing score is a number from 1 to 10 that indicates the cost of borrowing particular securities, based on seven-day fees, with 1 the cheapest and 10 the most expensive.

Chart 3.10 Probability of a simultaneous default by two or more large and complex banking groups, as measured by the systemic risk measure

(Jan. 2007 – May 2013; probability; percentages)



Sources: Bloomberg and ECB calculations.
Notes: The systemic risk measure covers a sample of 15 banks and uses a one-year horizon. See Box 8 in ECB, *Financial Stability Review*, June 2012, for further details.

*Further deterioration
in the credit risk
outlook...*

At the individual bank level, median CDS spreads have followed a similar pattern. In particular, bank CDS spreads widened in March in the wake of developments in Cyprus, but retreated thereafter (see Chart S.3.31). The dispersion of CDS spreads, while narrowing in recent months, remained wide, partly highlighting financial fragmentation and also indicating differences in the asset quality outlook.

CREDIT RISKS EMANATING FROM BANKS' LOAN BOOKS

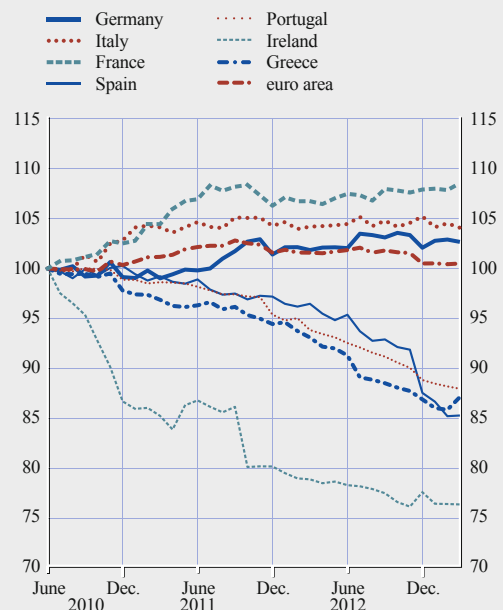
The level of **credit risk** confronting the euro area banking sector has increased since the finalisation of the last Financial Stability Review (FSR) as weak economic conditions increasingly took a toll on banks' asset quality. In addition, a large degree of cross-country heterogeneity across the euro area still prevails, reflecting to a large extent differing fortunes of non-financial corporates and households across the various euro area countries, as described in Section 1.2 of this Review.

MFI lending to the non-financial private

sector in the euro area has remained subdued since the December 2012 FSR. On average, total lending to households stayed broadly stable over the review period, while lending to non-financial corporations (NFCs) continued to decline. Again, developments differed considerably across the

Chart 3.11 Euro area MFI lending to the non-financial private sector

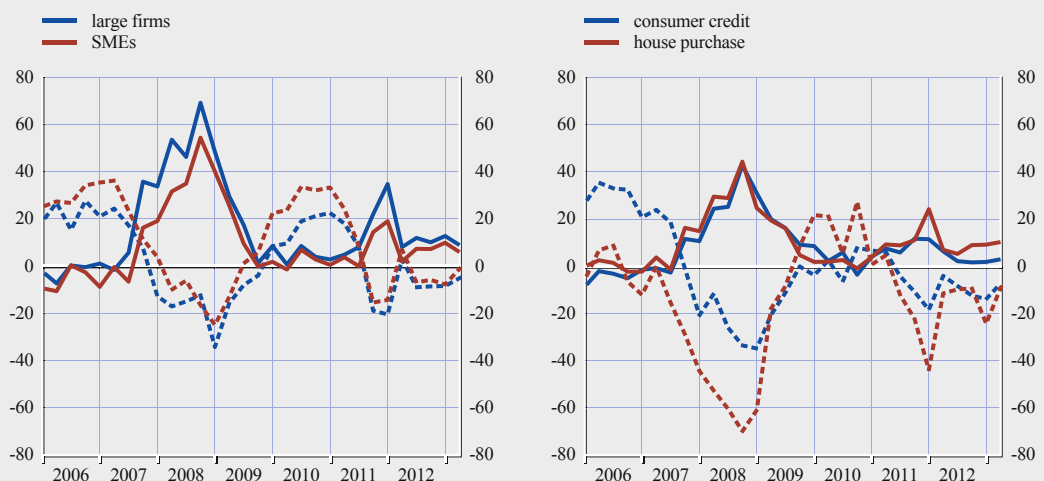
(June 2010 – Mar. 2013; index: June 2010 = 100)



Source: ECB.
Note: Published country-level loan data are not adjusted for loan sales and securitisation.

Chart 3.12 Credit standards and demand conditions in the non-financial corporate and household sectors

(Q1 2006 – Q2 2013; weighted net percentages; solid lines: credit standards; dotted lines: demand)



Source: ECB.

euro area, with the continued strong declines in lending volumes recorded in countries under stress being partly offset by moderate lending growth in most other countries (see Chart 3.11). The results of the ECB's January and April 2013 bank lending surveys suggest that deteriorating expectations regarding general economic activity were the main driver of the tightening of bank credit standards (see Chart 3.12), with the April survey results showing some moderation in the net tightening of credit standards. By contrast, on average, supply-side factors – such as funding or capital constraints – appear to have played a diminished role, although they still affect credit conditions in some countries. This development has also been accompanied by a drop in net demand for loans as a result of continued weak investment activity and low consumer confidence.

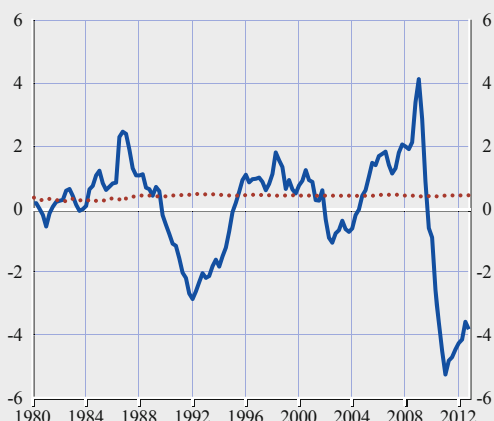
These subdued developments in credit growth remain part of a broader phenomenon among advanced economies since the onset of the crisis. Indeed, credit conditions across OECD economies have remained remarkably weak compared with historical norms. Despite some further improvement over the course of 2012, credit growth remained well below its early warning threshold for costly asset price booms in the fourth quarter of 2012 (see Chart 3.13).

Credit conditions have, however, continued to diverge widely across euro area countries. The price terms of loans to non-financial private sector borrowers vary greatly, indicating not only marked differences in default risk across the main categories of the loan book but also to some extent a risk premium at the country level (see Chart 3.14). Perhaps most notably, small and medium-sized enterprises (SMEs) in countries under stress have faced particularly tight credit conditions, as illustrated by the persistently wide gap between rates on small-sized loans, a proxy for SME lending rates, in core countries and countries under stress.

... particularly affecting borrowers in stressed countries

Chart 3.13 Global credit gap and optimal early warning threshold

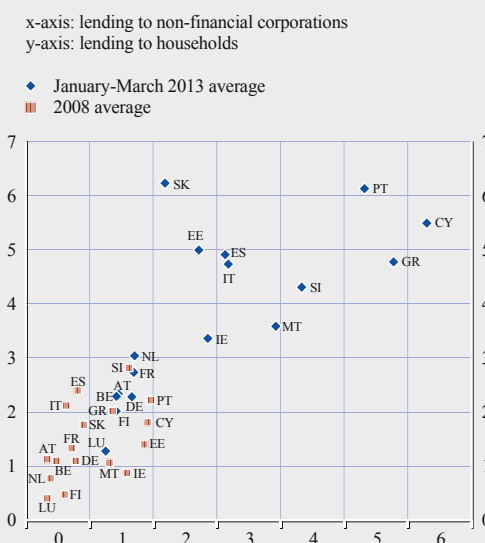
(Q1 1980 – Q4 2012; percentages)



Sources: ECB and ECB calculations.
Notes: For details, see L. Alessi and C. Detken, “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), pp. 520-533, September 2011.

Chart 3.14 Lending spreads of euro area MFIs on euro-denominated new business loans

(percentage points)



Source: ECB.
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.

Asset quality outlook remains negative

Property-related exposures are high in some countries

Risks to financial stability remain elevated given weak economic conditions...

A weakening macroeconomic environment was the main factor underlying increasing credit risks in the loan book. Weak conditions in goods and labour markets at the euro area level translated into higher income and earnings risks for households and NFCs. This, combined with still high levels of private sector indebtedness and ongoing corrections in residential and commercial property markets in some countries, was detrimental to borrowers' debt servicing capacities.

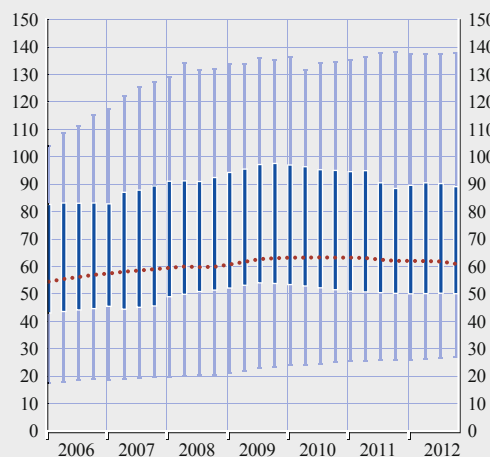
Adverse property price developments continue to represent a risk to banks' balance sheets, in particular where exposures to property-related activities are high. Indeed, residential and commercial property-related lending of MFIs (i.e. lending to households for house purchase, as well as lending to construction companies and other property-related activities) amounts on average to some 61% of GDP in the euro area, but the country-level dispersion is high, ranging from 27% of GDP to nearly 140% of GDP (see Chart 3.15). In most euro area countries, the bulk of property-related MFI lending is directed towards households for house purchase, but in some countries exposures to NFCs constitute close to or more than half of total property-related MFI lending.

Having said this, it is important to note that property loans are collateralised, so that the risks related to the level of banks' property-related exposure largely depend on the volatility of asset valuation and the loan-to-value ratios applied. In this regard, the risks for euro area financial stability stemming from property markets are also closely interrelated with the state of different property markets and the domestic economic outlook. On the one hand, in countries where property prices have increased in recent years and where signs of overvaluation are being observed, the main concern stems from the potential for sharp corrections. This may imply the need for eventual mark-downs of the value of property loan portfolios that could have an impact on banks' balance sheets. This risk is particularly high in countries with high bank exposures towards property. On the other hand, in countries where property values stand well below previous peaks, the main financial stability concerns relate to refinancing risks, in particular for loan-financed investors. Both of these vulnerabilities could be triggered if economic activity were to deteriorate significantly, which would additionally reduce borrowers' debt servicing capacities.

A rise in non-performing loans (NPLs) has been particularly visible in countries under stress (see Chart 3.4). Available data on the sectoral breakdown of bad loans suggest that the rise in NPLs was mostly driven by NFCs and less so by a deterioration in credit quality in the household segment. Rising NPLs and provisioning needs are expected to weigh on bank profitability as banks seek to strengthen their profitability base and make cost savings.

Chart 3.15 MFI property-related lending exposures in the euro area

(Q1 2006 – Q4 2012; percentage of GDP; maximum, minimum interquartile distribution and average)



Sources: ECB and ECB calculations.

Notes: Property-related exposures comprise MFI lending to households for house purchase and to non-financial corporations for real estate activities and construction. Data for Estonia, Luxembourg and Slovenia are not included.

... that may lead some banks to delay loss recognition

In this environment of weak economic growth, banks may be inclined to exploit low funding costs to take a wait-and-see attitude, and therefore engage in **forbearance**.³ Relatively low write-off rates in both the corporate and household sectors would support such a hypothesis (see Chart 3.16), particularly when adjusting for a one-off spike in NFC loan write-offs at end-2012 mainly attributable to the transfer of NPLs to the Spanish “bad bank” Sareb. Such forbearance may be helpful to the extent that it helps debtors facing purely temporary difficulties. This, however, might be only part of the story – indeed, to the extent that forborne loans will eventually remain non-performing, such a process merely delays the clean-up of banks’ balance sheets. More worryingly, it might even constrain lending to more productive borrowers. Ultimately, if the problem loans remain unresolved, such practices may adversely affect economic growth, in particular if they go hand in hand with increasing lending rates, thereby exacerbating an adverse feedback loop between macroeconomic dynamics and banks’ asset quality (see Chart 3.17).⁴ To counter such forces, banks should aim for prudent asset valuation and stricter loan loss recognition to provide more transparency on asset quality, while authorities should continue to foster the cleaning-up of bank balance sheets by removing legal and judicial obstacles to NPL resolution and to enhance transparency by identifying and disclosing forbearance.

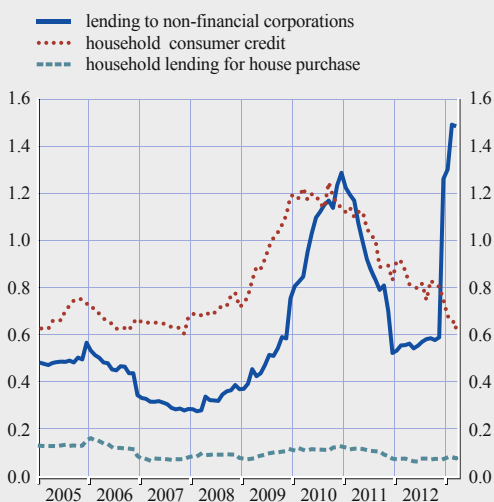
COUNTERPARTY CREDIT RISK

The median cost of protection against the default of a euro area LCBG, as reflected by CDS spreads, was somewhat lower in mid-May 2013 than in late November 2012, despite a Cyprus-

Perceived counterparty credit risk of euro area LCBGs has somewhat declined

Chart 3.16 Write-off rates on euro area MFI loans to the non-financial private sector

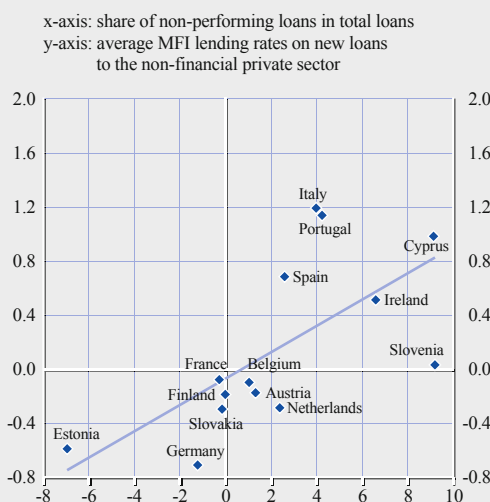
(Jan. 2005 – Mar. 2013; percentages)



Source: ECB.
Note: Write-off rates are calculated as the ratio of write-offs (12-month moving sum) to loans outstanding in the respective loan category.

Chart 3.17 Changes in non-performing loans and lending rates on new loans for selected euro area countries

(percentage point change between June 2010 and December 2012)



Sources: ECB and IMF.

3 EBA, “Report on Risks and Vulnerabilities of the European Banking Sector”, July 2012.

4 It should be noted though that the increase in lending rates may also reflect other important factors, such as the strong increase in banks’ funding costs and related pressures on their net interest margin, as well as the pressures on income arising from mortgage loans which are indexed to the EURIBOR and have fixed spreads.

related jump in March 2013 (see Chart S.3.31). The spread between unsecured euro area interbank and repo rates has been relatively stable in 2013 (see Chart S.2.3). At the same time, a positive difference between the median CDS spreads of euro area and non-euro area LCBGs (see Chart S.3.32) has been on a widening trend, suggesting that market participants viewed euro area LCBGs as increasingly less creditworthy than their non-euro area counterparts.

Non-price credit terms for wholesale non-bank clients appear to have tightened, whereas price terms eased

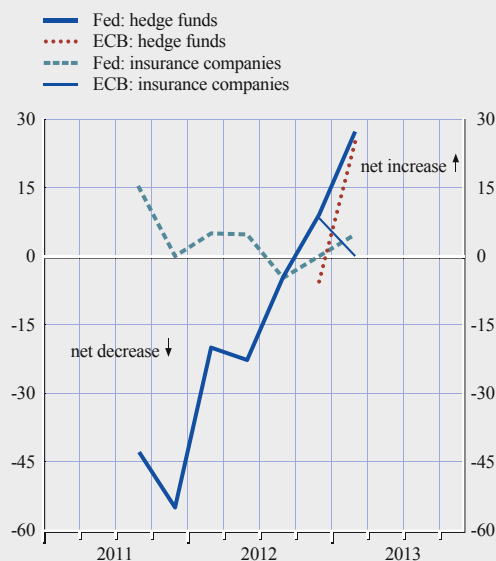
Against the background of higher financial asset prices and other improvements in financial market functioning stemming from subsided euro area sovereign debt crisis-related tensions, price terms (such as financing spreads) offered by large banks for the important types of counterparties covered in the new qualitative quarterly ECB survey on credit terms and conditions in euro-denominated securities financing and OTC derivatives markets (SESFOD)⁵ remained unchanged, on balance, over the three-month period ending in February 2013. Nevertheless, modest net shares of respondents reported easier price terms for large banks and dealers, insurance companies and investment funds, pension plans and other institutional investment pools (see Chart C.1 in Special Feature C). By contrast, some overall net tightening was reported for non-price terms; although the net percentages of banks that reported tightening were small, they were also smaller than in the previous December 2012 survey.

The ongoing releveraging of the hedge fund sector needs to be monitored closely

The ongoing releveraging of hedge funds needs to be monitored closely, as the survey data of both the ECB and the Federal Reserve suggest an increased use of leverage by these important and usually very active leveraged non-bank counterparties (see Chart 3.18).⁶ While timely public data on hedge fund leverage are scarce, various information sources suggest that the leverage of hedge funds is still somewhere between the pre-crisis peak in 2007 and the post-crisis trough in 2009, but it has nevertheless been gradually getting closer to the pre-crisis levels (see Chart 3.19), not least because of higher risk tolerance by prime-broker banks and low benchmark interest rates, which together with a spread make up an effective borrowing rate. The year-to-date investment performance of the hedge fund sector has been positive in 2013 (see also Section 2.2), taking the estimated proportion of hedge funds breaching triggers of cumulative total decline in net asset value (NAV)⁷ – an indicator of stress in the hedge fund sector – further down below its longer-term median (see Chart 3.20).

Chart 3.18 Changes in the use of leverage by hedge funds

(Q3 2011 – Q1 2013; net percentage of respondents reporting increased use of leverage over the past three months)



Sources: ECB and Federal Reserve Board.

Notes: The net percentage is defined as the difference between the percentage of respondents reporting “increased considerably” or “increased somewhat” and those reporting “decreased somewhat” or “decreased considerably”.

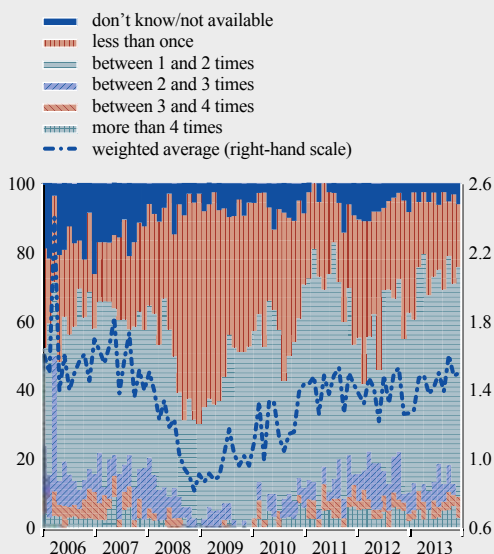
5 See Special Feature C in this Review and ECB, “New ECB survey on credit terms and conditions in euro-denominated securities financing and OTC derivatives markets (SESFOD)”, press release on 30 April 2013.

6 Federal Reserve Board, “Senior Credit Officer Opinion Survey on Dealer Financing Terms”, March 2013.

7 NAV triggers can be based on a cumulative decline in either total NAV or NAV per share. They allow creditor banks to terminate transactions with a particular hedge fund client and seize the collateral held. As opposed to NAV per share, a cumulative decline in total NAV incorporates the joint impact of both negative returns and investor redemptions.

Chart 3.19 Hedge fund leverage

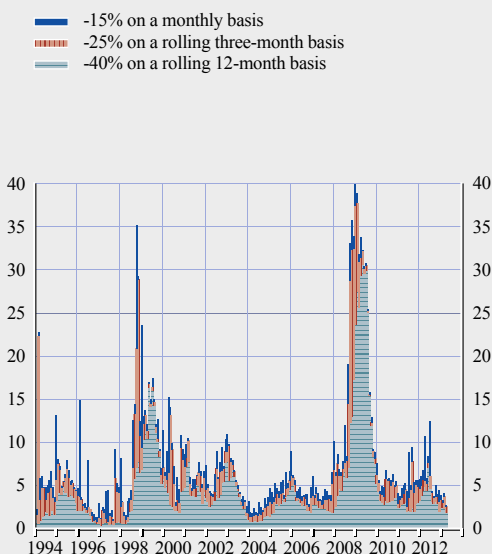
(June 2006 – May 2013; percentage of responses and weighted average leverage)



Sources: Bank of America Merrill Lynch, “Global Fund Manager Survey”.
Notes: Leverage is defined as a ratio of gross assets to capital. In 2012 and 2013 the number of responses varied between 32 and 48.

Chart 3.20 Estimated proportion of hedge funds breaching triggers of cumulative total NAV decline

(Jan. 1994 – Apr. 2013; percentage of total reported NAV)



Sources: Lipper TASS database and ECB calculations.
Notes: Excluding funds of hedge funds. Net asset value (NAV) is the total value of a fund’s investments less liabilities (also referred to as capital under management). For each point in time, estimated proportions are based only on hedge funds which reported respective NAV data and for which NAV change could thus be computed. If several typical total NAV decline triggers were breached, then the fund in question was only included in the group with the longest rolling period. If, instead of one fund or sub-fund, several sub-fund structures were listed in the database, each of them was analysed independently. The most recent data are subject to incomplete reporting.

The resources and attention devoted to the management of counterparty credit exposures to central counterparties (CCPs) have continued to increase. The main driver of this has been the forthcoming mandatory central clearing of standardised over-the-counter (OTC) derivatives contracts, which may lead to large concentrated exposures to a number of key CCPs and will require market participants to post initial margin, thereby increasing demand for eligible collateral assets. In order to be able to estimate and prepare for potentially volatile collateral needs, firms have been stepping up their initial margin modelling capabilities. Such initial margin computations will also be relevant for OTC derivatives transactions that will remain non-centrally cleared. The near-final regulatory proposal envisages that the phasing-in of margining requirements for such derivatives should start in 2015.⁸

FUNDING LIQUIDITY RISK

In early 2013 market-based **bank funding conditions** continued on the improving trend seen since mid-2012, both in terms of breadth of access and cost. This has brought back a traditional competitive advantage in funding markets, whereby the average cost of issuing bank bonds has remained below that of bonds issued by investment-grade corporates since mid-2012 (see Chart 3.21).

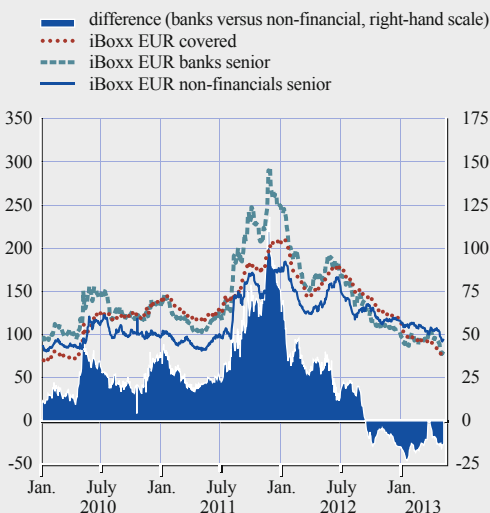
Increased focus on CCP exposures and initial margin computations

Funding stresses showed signs of further easing in early 2013...

⁸ Basel Committee on Banking Supervision and Board of the International Organization of Securities Commissions, “Margin requirements for non-centrally cleared derivatives”, Second Consultative Document, February 2013.

Chart 3.21 Spreads on bank and non-financial senior debt and covered bonds

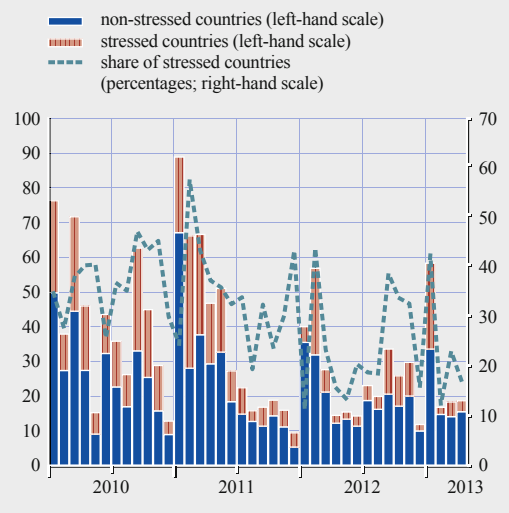
(Jan. 2010 – May 2013; basis points)



Source: Markit.

Chart 3.22 Monthly issuance of medium and long-term debt securities by euro area banks

(Jan. 2010 – Apr. 2013)



Source: Dealogic.
Notes: Excludes retained deals. “Stressed countries” refer to Cyprus, Greece, Ireland, Italy, Portugal and Spain.

Improved funding conditions have suggested some easing in country fragmentation, which has been broad based across major funding sources. First, bond-based financing has shown improvement, in particular in January 2013 when the issuance of medium and long-term debt securities picked up significantly. Encouragingly, the share of medium and long-term debt issued by banks located in countries under stress increased significantly, suggesting improving access to funding markets (see Chart 3.22). Second, there has been a sizeable rebound in customer deposits in banks in countries under stress according to the latest MFI balance sheet data (see Chart 3.23). Third, there has been a pick-up in repo market activity of Spanish and Italian banks since late 2012 (see Section 2). These positive developments have also allowed banks in stressed countries to reduce their reliance on Eurosystem funding.

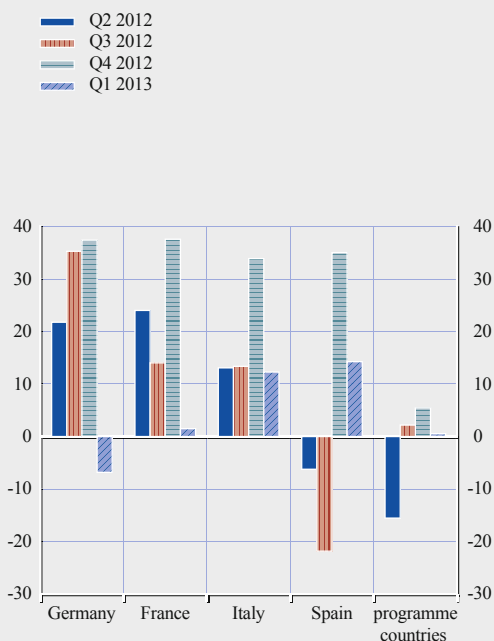
Fourth, there was an important improvement in funding market sentiment in an area which has been a sort of bellwether for foreign sentiment, in the form of **US prime money market fund (MMF) exposure** towards euro area banks. Following the marked decline in US MMF investments in euro area banks in early 2011, there has been some reversal of this decline since mid-2012 (see Chart 3.24). In terms of exposure type, unsecured investments (such as certificates of deposit, commercial paper and time deposits) experienced the largest decrease (see Chart 3.24). Secured exposures, including traditional repos (i.e. repurchase agreements collateralised by government/agency debt or cash), represented the second largest source of MMF financing. For euro area and other European banks, this category proved to be more stable thanks mainly to the high quality of the collateral that protects MMFs against a decline in the creditworthiness of the counterparty.

Notwithstanding these positive developments, access to longer-term funding at sustainable costs remains a challenge for a number of euro area banks. First, debt issuance by euro area banks has slowed down significantly since February, partly reflecting increased volatility in credit markets in the run-up to the Italian election and, in particular, following the announcement of the official sector assistance for Cyprus. While issuance showed some signs of recovery in April and in the first half

... but increased volatility has led to lower debt issuance since February...

Chart 3.23 Deposit flows in selected euro area countries

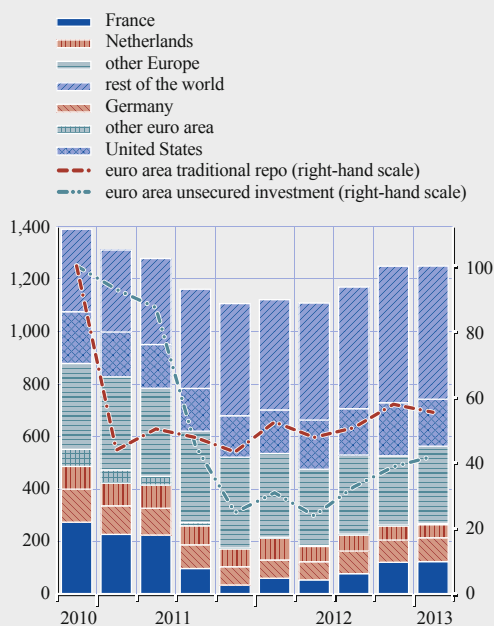
(Q2 2012 – Q1 2013; EUR billions)



Source: ECB.
Note: Figures refer to flows of deposits from households and non-financial corporations.

Chart 3.24 US prime MMFs' bank exposure by geographical area and exposures to the euro area by main instrument type

(Q4 2010 – Q1 2013; bars: USD billions; lines: index, Q4 2010 = 100)



Sources: US Securities and Exchange Commission and ECB.
Notes: "Other euro area" includes Austria, Belgium, Ireland, Italy, Luxembourg and Spain. "Other Europe" includes Norway, Sweden, Switzerland and the United Kingdom.

of May, at least when compared with its levels a year earlier, these recent episodes of heightened volatility served as a reminder that recent funding market improvements may be susceptible to setbacks, for instance due to the reassessment of credit risk premia.

Second, whilst declining, **fragmentation in bank funding costs** remains significant, with banks from stressed countries still having to pay a significant premium on bank debt compared with their peers in core countries (see Chart 3.25). The segmentation of funding markets can also be observed in terms of the ability to obtain senior unsecured debt funding according to bank size. This is illustrated by markedly different issuance patterns of LCBGs and other banks, reflecting the difficulties of mid-sized and smaller banks in accessing senior unsecured debt markets (see Chart 3.26).

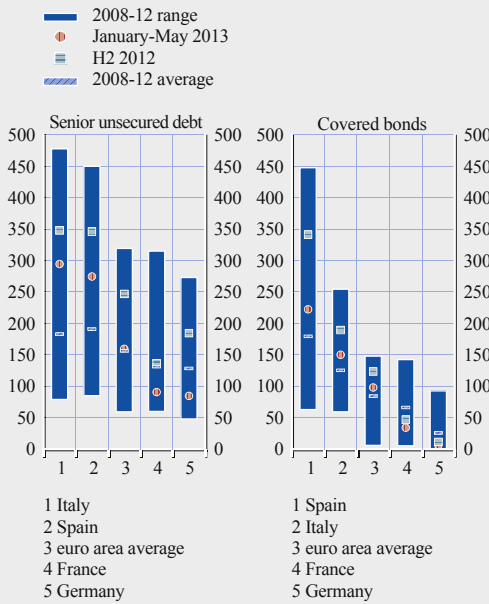
Third, the net issuance of debt securities continued to be negative in most countries (see Chart 3.27). While in some countries this partly reflects long-standing structural changes in the bank debt markets, in particular the secular trend towards a declining supply of public sector covered bonds by German banks, it also highlights the challenges created by reduced debt market access for a number of banks.

Assessing the relevance of these funding challenges is complicated by ongoing structural developments amongst euro area banks. Importantly, ongoing bank balance sheet deleveraging and, in particular, subdued or weak lending activity are reducing funding needs. Furthermore, the large negative net issuance of debt securities is partly due to banks' increased efforts to strengthen their

... and fragmentation in funding markets remains

Chart 3.25 Spreads on senior unsecured debt and covered bonds in selected euro area countries

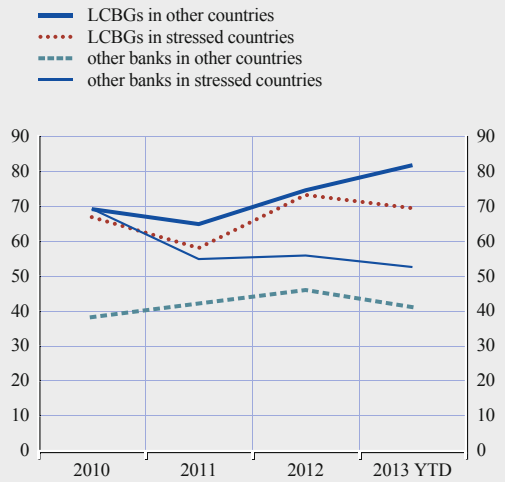
(Jan. 2008 – May 2013; basis points; spread over swaps)



Sources: Dealogic and ECB calculations.
Notes: Based on EUR-denominated fixed rate deals with an issue size of at least €250 million. For covered bonds, only mortgage-backed bonds are included. Excludes retained deals and government-guaranteed debt.

Chart 3.26 Share of unsecured debt issuance by euro area LCBGs and other euro area banks

(Jan. 2010 – May 2013; percentage of total debt issuance)



Sources: Dealogic and ECB calculations.
Note: Excludes retained deals.

deposit base. Coupled with weak or negative loan growth, this has also resulted in a further decline in banks' loan-to-deposit ratios (see Chart 3.8).

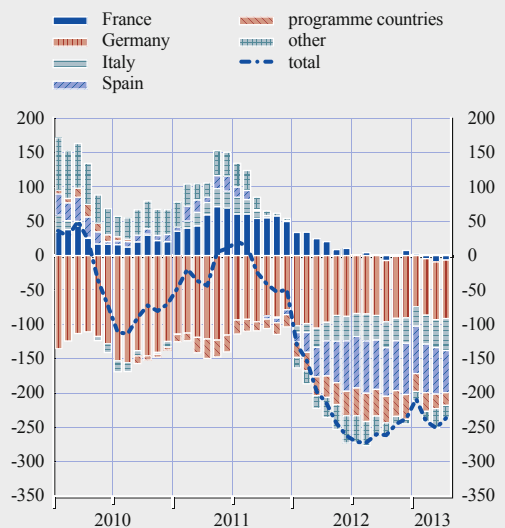
Interest rate risk increased slightly

MARKET-RELATED RISKS

Banks' interest rate risk has increased slightly since the publication of the December 2012 FSR. The latest financial reports of euro area LCBGs suggest a slight increase in median interest rate value at risk (VaR) in the fourth quarter of 2012. This increase comes despite banks' efforts to reduce their trading book and market risk-weighted assets (see Box 5 on euro area bank deleveraging). Although volatility remains at very low levels, the continued declines represent a disconnect with rising policy uncertainty (see Chart 2.14). The temporary increase in volatility from end-February to March (following the Italian election results and developments in Cyprus) highlights the sensitivity of markets to uncertainty regarding reform progress at the European and national levels.

Chart 3.27 Net issuance of medium and long-term debt securities by euro area banks

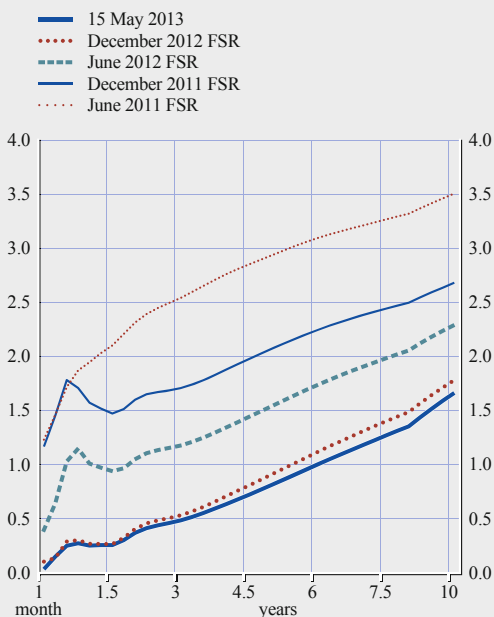
(Jan. 2010 – Apr. 2013; 12-month rolling sum; EUR billions)



Source: Dealogic.
Note: Excludes retained deals.

Chart 3.28 Developments in the euro area yield curve

(percentages)



Source: ECB.

Following an initial steepening in early 2013, the yield curve had flattened slightly by mid-May when compared with its structure at the time of finalisation of the December 2012 FSR (see Chart 3.28). Specifically, rates at the long end declined somewhat, while rates on bonds with shorter maturities experienced only a slight decline or remained broadly unchanged.

Data on MFIs' holdings of government debt show a continuation of the expansion of domestic government debt holdings for banks located in the large euro area countries (see Chart 3.29). However, the degree to which these increased holdings reflect an increase in banks' holdings of domestic sovereign debt varies. For MFIs located in countries often characterised as safe havens where interest rates remain rather depressed, exposure to domestic government debt is limited. By contrast, exposure to domestic sovereign debt is 9% of total assets in Italy and 7% of total assets in Spain – relatively high by euro area standards but not necessarily by historical or international standards.

Banks' have increased government bond holdings...

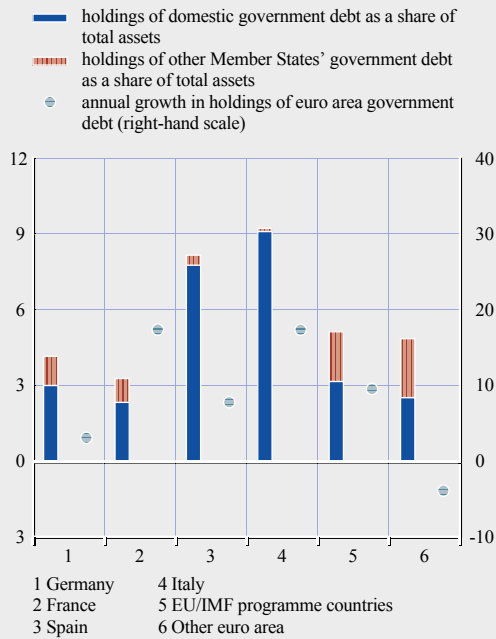
Perhaps reflecting the growing search for yield, banks have been increasing their holdings of equities and euro area non-financial corporate debt, although they remain limited as a share of the total balance sheet, according to MFI country-level data. MFI data indicate that banks located in euro area countries increased their holdings of euro area NFC debt by 7% on an annual basis in the fourth quarter of 2012, although the exposure of euro area banks to this debt is limited at only 0.5% of total assets. Growth rates of NFC debt holdings varied greatly across euro area countries with substantial increases observed in Dutch (133%), Spanish (115%) and Italian (47%) banks' holdings, albeit from very low levels, contrasting with declines in MFIs' exposure in other euro area countries (see Chart 3.30). Although MFI data imply that the direct impact of a sharp adjustment in risk premia would be limited at the aggregate level, the indirect or second-round effects could be large (e.g. increased corporate defaults, higher uncertainty).

... as well as holdings of equities and corporate debt

Volatility in equity markets has fallen considerably since the start of 2013, according to the Dow Jones EURO STOXX volatility index. The median equity VaR of euro area LCBGs decreased slightly as a share of shareholder equity in the fourth quarter of 2012. MFI statistics on share holdings indicate that euro area banks have continued to increase their exposure to this asset class, but it remained limited at only 2.3% of total euro area MFI assets in March 2013 (see Chart 3.31). Although volatility remains low, market sentiment remains fragile, as evident from the increase in volatility following the Italian election results and developments in Cyprus. Indeed, the slope of the volatility term structure indicates that markets expect higher volatility in the months ahead (see Chart 3.32).

Chart 3.29 MFI holdings of domestic and other euro area sovereign debt by country

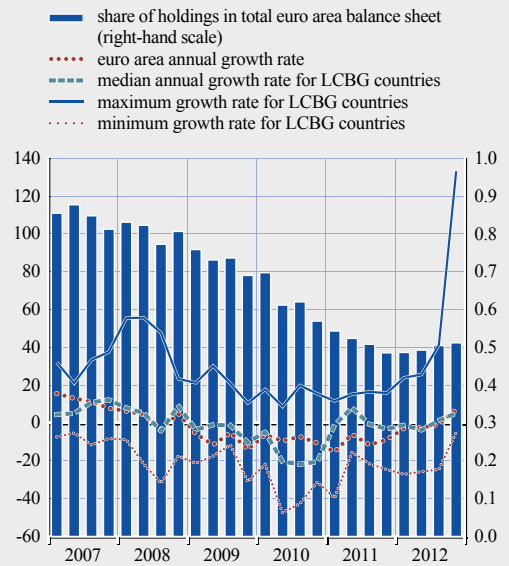
(Mar. 2012 – Mar. 2013; percentage of total assets; annual growth rate)



Source: ECB.

Chart 3.30 Annual growth rate of MFI holdings of NFC debt and share of euro area MFI holdings of NFC debt in total assets

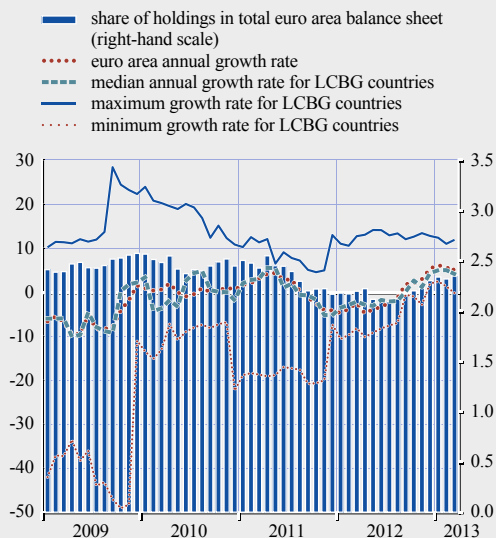
(Q1 2004 – Q4 2012; percentage change per annum; share of total balance sheet)



Source: ECB.

Chart 3.31 MFI holdings of shares and other equity

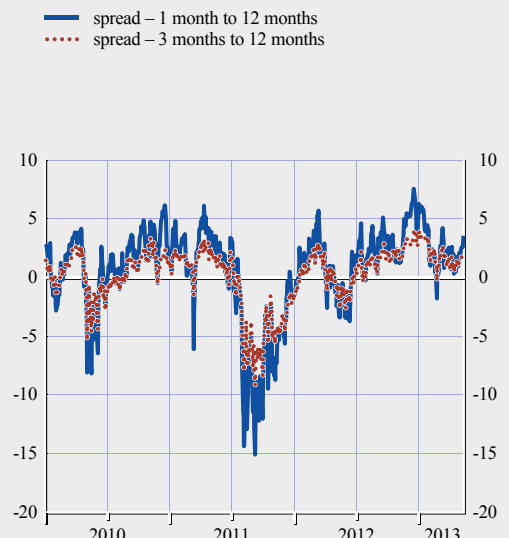
(Jan. 2009 – Mar. 2013; percentage change per annum; share of total balance sheet)



Source: ECB.

Chart 3.32 The slope of the Dow Jones EURO STOXX 50 volatility index futures curve

(Jan. 2010 – May 2013)



Source: Bloomberg.

Box 6

MEASURING SYSTEMIC RISK CONTRIBUTIONS OF EUROPEAN BANKS

A clear lesson of the global financial crisis has been the propensity for company-specific risk to spill over to other firms. In fact, it is not just a company's size and idiosyncratic risk but also its interconnectedness with other firms which determine its systemic relevance. This realisation has underpinned not only a growing set of tools to capture such systemic risk, but also numerous regulatory initiatives to limit and mitigate it.

Of the multiple methodologies which have gained prominence to date in capturing systemic risk contributions of individual institutions, few have touched upon the time-varying nature of this process. This box illustrates a novel methodology that builds on the concept of value at risk (VaR) and can explicitly account for the time-varying interconnectedness within the banking sector. For each bank, the underlying statistical approach identifies the relevant tail-risk drivers as the minimum set of macro-financial fundamentals, firm-specific characteristics and risk spillovers from other banks driving its VaR. Detecting with whom and how strongly any institution is connected allows the estimation and construction of a tail-risk network of the financial system. A bank's contribution to systemic risk is then defined as the effect of an increase in its individual tail risk on the VaR of the entire system, conditional on the bank's position within the financial network as well as overall macro-financial conditions. The analysis¹ is based on publicly available market and balance sheet data and is applied to a sample of 51 large European banks.

The proposed concept is related to the widely used systemic risk measure of CoVaR.² However, the methodology outlined in this box does not constrain time variation in systemic risk to variation in idiosyncratic risk. More importantly, neither CoVaR nor alternative approaches to quantifying systemic risk contributions, such as marginal expected shortfall or distressed insurance premia, explicitly consider network interconnections, which are key determinants of banks' systemic risk contributions.³ Such approaches cannot detect spillover effects driven by the topology of the risk network and thus might underestimate the systemic importance of smaller but very interconnected banks.

The empirical implementation of the statistical model is based on a two-stage quantile regression. In the first step, bank-specific VaRs are estimated as functions of firm characteristics, macro-financial state variables as well as tail-risk spillovers of other banks. Hereby, the major challenge is to shrink the high-dimensional set of possible cross-linkages among all banks to a feasible number of relevant risk connections. Novel Least Absolute Shrinkage and Selection Operator (LASSO) techniques⁴ address this issue and allow the identification of the relevant tail-risk drivers for each bank in a fully automatic way. The resulting tail dependence network can be represented in terms of a network graph as illustrated in Chart A, which shows some indications of fragmentation of the European interbank market, as the banks in the programme countries are estimated to be disconnected from the other European banks. Moreover, during the European sovereign debt crisis, the tight interconnections between banks and sovereigns have played an important role. To account for this, sovereign bond yields are modelled (under an alternative

1 The analysis is based on F. Betz, N. Hautsch, T. Peltonen and M. Schienle, "Measuring systemic risk contributions of European banks", *ECB Working Paper Series*, forthcoming – building on N. Hautsch, J. Schaumburg and M. Schienle, "Financial Network Systemic Risk Contributions", SFB 649 Discussion Paper 2012-053, available at <http://sfb649.wiwi.hu-berlin.de/papers/pdf/SFB649DP2012-053.pdf>, 2012.

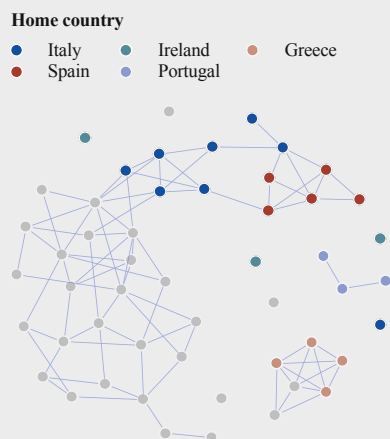
2 T. Adrian and M. Brunnermeier, "CoVaR", *Federal Reserve Bank of New York Staff Reports*, No 348, September 2011.

3 ECB, "Analytical models and tools for the identification and assessment of systemic risk", *Financial Stability Review*, June 2010.

4 A. Belloni and V. Chernozhukov, "l1-penalized quantile regression in high-dimensional sparse models", *Annals of Statistics*, Vol. 39, No 1, pp. 82-130, 2011.

Chart A Estimated tail dependency network for 51 large European banks

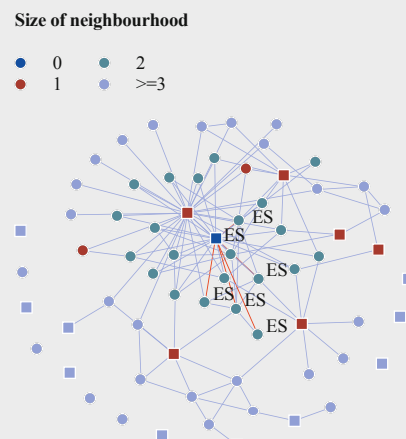
(2010 – 2012)



Sources: F. Betz, N. Hautsch, T. Peltonen and M. Schienle, “Measuring systemic risk contributions of European banks”, *ECB Working Paper Series*, forthcoming.
 Note: Banks in euro area countries under stress are marked with varying colours, while banks in other countries are marked in grey.

Chart B Visualisation of sovereign-bank interconnection using an estimated tail dependency network for 51 large European banks

(2010 – 2012; Spanish sovereign and banks are highlighted)



Sources: F. Betz, N. Hautsch, T. Peltonen and M. Schienle, “Measuring systemic risk contributions of European banks”, *ECB Working Paper Series*, forthcoming.
 Notes: Rectangles denote European sovereigns and circles large European banks. Petrol blue denotes banks directly connected to the Spanish sovereign (blue), reddish brown denotes banks and sovereigns connected to the Spanish sovereign through a bank, while light blue denotes banks and sovereigns where the connection to the Spanish sovereign is through two or more banks.

specification) as tail-risk drivers instead of state variables, and thus are also incorporated into the estimated tail dependency network (see Chart B).

In the second step of the empirical modelling strategy, to measure a bank’s systemic impact, the VaR of the financial system is regressed on the bank’s estimated VaR, while controlling for the pre-identified bank-specific risk drivers as well as macro-financial state variables.

A bank’s systemic risk contribution is determined as the marginal effect of its individual VaR on the VaR of the system and is called the systemic risk beta. It corresponds to the system’s marginal risk exposure due to changes in the tail of a firm’s loss distribution. The systemic risk beta is a function of firm-specific characteristics, such as leverage, maturity mismatch and size. To compare the systemic relevance of banks across the financial system, however, it is necessary to compute the total increase in systemic risk. Thus, banks are ranked according to their “realised” systemic risk beta, corresponding to the product of a bank’s systemic risk beta and its VaR, given by the fitted value of the first-stage regression. Accordingly, a bank’s balance sheet structure can affect its marginal systemic relevance, even though its individual risk level might be identical at different points in time.

The empirical analysis reveals a high degree of tail-risk interconnectedness among large European banks. In particular, it is found that the network risk interconnection effects are important drivers of individual risk, while an institution’s idiosyncratic risk is clearly a poor proxy of its systemic importance. The systemic risk assessment is complemented by the systemic risk networks, which yield qualitative information on potential risk channels and the roles of individual banks within the financial system. Moreover, the analysis also gives an interesting insight into banks’ contributions

to systemic risk during the European sovereign debt crisis. As illustrated in Charts A and B, the methodology is able to reproduce the fragmentation of the European interbank market and the tight interconnection between sovereigns and banks during the European sovereign debt crisis.

3.2 THE EURO AREA INSURANCE SECTOR: OVERALL RESILIENCE AMID INVESTMENT INCOME RISKS

FINANCIAL CONDITION OF LARGE INSURERS⁹

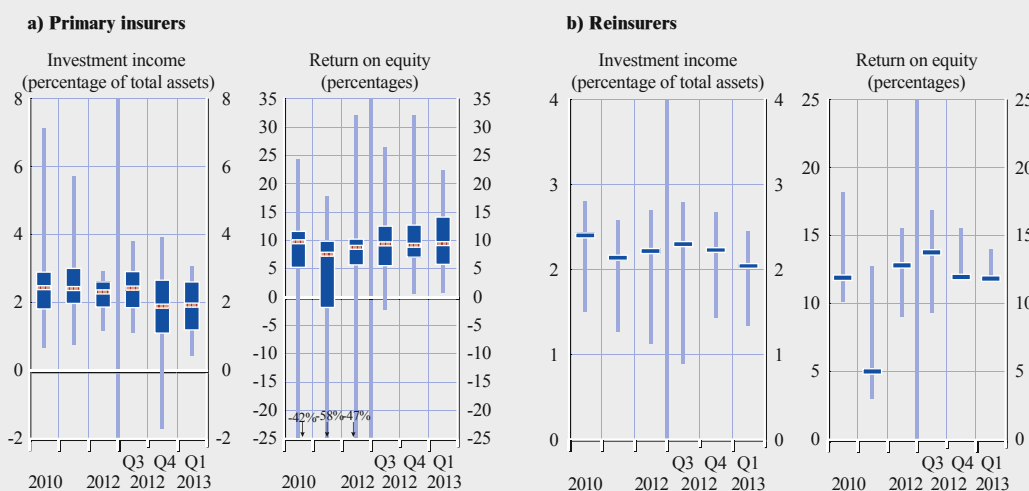
The performance of large euro area insurers remained stable despite the financial and economic crisis. Both profitability and capital positions remained steady owing to a good full-year underwriting result and investment income in 2012 (see Chart 3.33). Indeed, investment income was positive for almost all of the insurers in the sample, partly on account of gains from the sales of highly valued fixed income assets in particular in the fourth quarter of 2012. Hurricane Sandy was the biggest loss event of 2012, with estimated insured losses of USD 25 billion, and dented the fourth-quarter underwriting result of some primary insurers and reinsurers. However, combined ratios (incurred losses and expenses as a proportion of premiums earned) remained below 100% for all the insurers in the sample for the last quarter of 2012 and the first quarter of 2013, thereby signalling profitable underwriting activity (see Chart S.3.27). That said, new business declined on average in the first quarter of 2013 on account of weak economic activity, with insurers in countries experiencing economic contractions often exhibiting the most pronounced declines in gross premiums written (see Chart S.3.26). Although natural catastrophe, motor and marine insurance saw high demand and price increases, competitive pressures persisted in European property and casualty insurance in general, and life insurance continued to suffer from competition from other savings vehicles in an environment of subdued pricing possibilities.

Insurers' performance remained modest but stable

Chart 3.33 Investment income and return on equity for selected large euro area insurers

(2010 – Q1 2013; maximum, minimum, interquartile distribution and median)

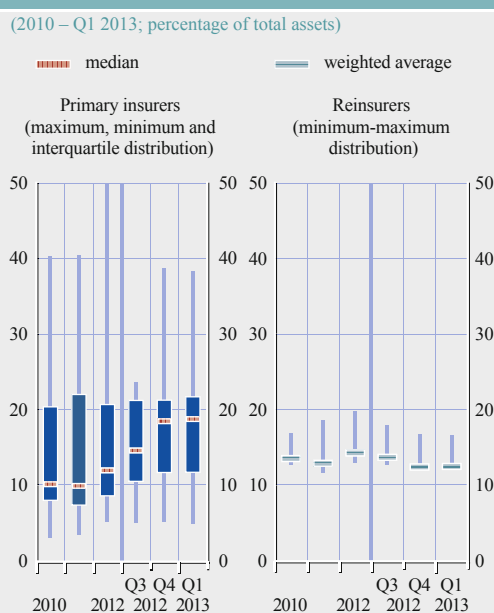
(2010 – Q1 2013; minimum-maximum distribution and weighted average)



Sources: Bloomberg, individual institutions' financial reports and ECB calculations.
Note: The quarterly data are annualised.

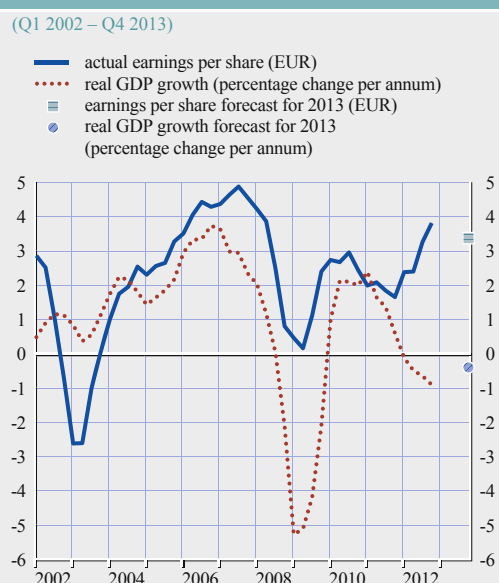
9 The analysis is based on a sample of 19 listed primary insurers with total combined assets of about €4.3 trillion, representing 60% of the gross premiums written in the euro area insurance sector, and on a sample of three reinsurers with total combined assets of about €346 billion, representing about 30% of total global reinsurance premiums. Quarterly data were only available for a sub-sample of these insurers.

Chart 3.34 Capital positions of selected large euro area insurers



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.

Chart 3.35 Earnings per share of selected large euro area insurers and real GDP growth



Sources: European Commission, Thomson Reuters and ECB calculations.

Capital buffers comfortable, although possibly inflated

The stable performance has enabled large euro area insurers to continue accumulating capital buffers through retained earnings, with the exception of a few reinsurers which released capital which they considered excessive (see Chart 3.34). However, the capital positions also partly reflect accounting effects, as low yields on highly rated government bonds inflate insurance assets, and because liabilities are not marked to market in most jurisdictions in the euro area.¹⁰

Overall outlook stable but heterogeneous

INSURANCE SECTOR OUTLOOK AND RISKS

In contrast to the volatility seen in the banking sector, the financial situation of large euro area insurers is expected to remain resilient on aggregate, albeit with a high level of heterogeneity across institutions and countries. This resilience can be attributed to the long-term nature of the traditional insurance business model, in which assets are generally held until maturity with a long-term view which looks through market volatility. At the same time, medium-term issues require monitoring, including a low-yield environment that is weighing on the profitability outlook of the sector. In the short term, volatility in government bond yields could impact balance sheet valuations and, therefore, capital, the direction of the impact depending on the liability valuation rules of the jurisdiction. Insurers may also be tempted to search for yield from more lucrative investments or non-core activities, which is a development that warrants continuous monitoring. The potentially higher capital needs of the risk-based requirements of the forthcoming Solvency II framework, the limited opportunities for capital raising and the bleak investment income outlook are likely to keep many insurers in a capital-conserving mode in the near future.

¹⁰ Large, listed euro area insurers generally follow International Financial Reporting Standards (IFRSs), which provide for a uniform treatment of financial assets (depending on their respective accounting classification), but (currently) not for like treatment of insurance liabilities.

Earnings outlook

Analysts expect insurance earnings to remain at comfortable levels in 2013 (see Chart 3.35), an outlook confirmed by market-based indicators for insurers such as credit default swap (CDS) spreads and equity prices (see Charts S.3.33 and S.3.36).

Although earnings are expected to benefit from a more favourable pricing of selected insurance products, this upside is likely to be offset by muted economic growth and prospects of a low investment return. Weak economic growth translates into sluggish demand for primary insurance, limited pricing opportunities and potentially increased credit risk in corporate bond markets. Persistent low yields on highly rated government bonds – a mainstay of large insurers’ traditional investment strategies – clearly serve to erode investment income over time. Although large euro area insurers are in general well diversified in geographical and business terms and many have also already significantly adjusted their business models to the new environment, some life insurers may be squeezed by a thin or even negative margin between investment returns and minimum guarantees made to policyholders in the past. Finally, high yields on lower-rated euro area government bonds also incorporate profitability risks for life insurers insofar as competition for clients from other available savings products results in higher guarantees on new policies and exposure to yield volatility in the future. So far, the modest developments in gross premiums written and anecdotal evidence point towards cautious granting of guarantees, which also suggests subdued demand in the near future.

Main solvency risks

The most important solvency risks for the insurance sector emanate from investment activity, which remains concentrated in government and corporate bond markets. There have been some signs of substitution recently, with some insurers clearly moving from government bond exposures towards corporate bonds and vice versa, although there has been little aggregate increase in exposure to other assets such as equity, structured credit or commercial property. The substitution may be a reflection of the prevailing high uncertainty in the government bond markets in particular, as the companies most affected by the low-yield environment seek other sources of investment income (see Charts 3.36 and 3.37).

The divergence in **government bond** yields and differences in the accounting treatment of liabilities across jurisdictions imply that the short-term solvency risks differ from country to country. The investment profile of each institution, together with the extent of maturity mismatch, hedging strategies and product design, also play a decisive role in how the risks outlined below affect an individual institution. That said, many insurers are vulnerable to a sudden rise in yields, which could imply a significant decrease in asset valuation. Any observed impact on solvency may be significant in the absence of an immediate reaction in the discount rate for liabilities, a case which applies for most euro

Analysts expect stable earnings

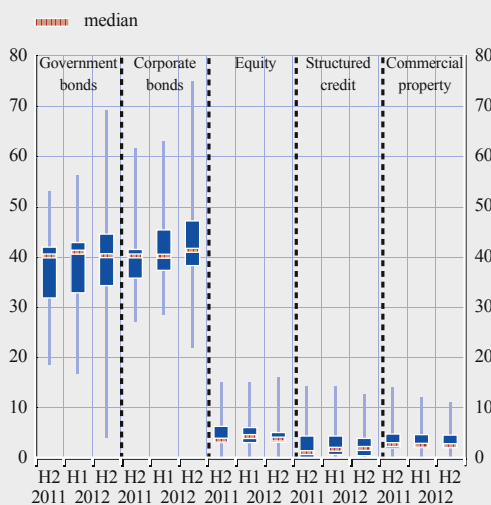
Improved pricing, but risks to growth and investment income

Government and corporate bond markets key for investment risk

Although market developments and accounting rules fragment the risk landscape...

Chart 3.36 Investment mix for selected large euro area insurers

(H2 2011 – H2 2012; percentage of total investments; maximum, minimum and interquartile distribution)



Sources: JPMorgan Cazenove, individual institutions’ financial reports and ECB calculations.
Notes: Based on consolidated financial accounts data. The equity exposure data exclude investment in mutual funds.

... low yields are the key risk in the medium term

area jurisdictions owing to the use of historical liabilities accounting under the current rules (Section 3.3 presents a rough estimate of the impact in economic terms when a swap curve is used for the discount rate). It should be noted, however, that insurers can mitigate the impact of a sudden increase in yields in many ways, for example through hedging or by shifting assets into the held-to-maturity portfolio.

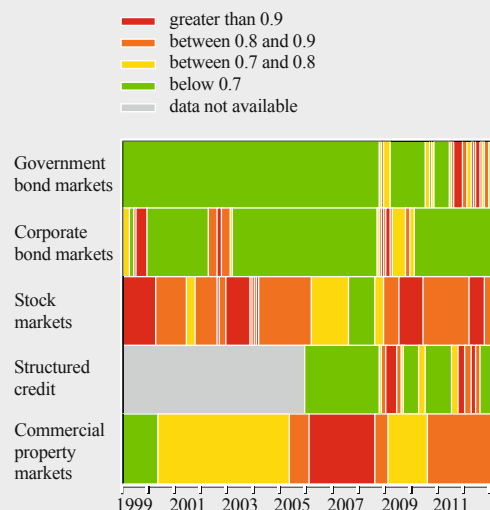
Low yields on highly rated government bonds constitute the key underlying solvency risk in the medium term – and an immediate potential problem in those jurisdictions where they coincide with a market-consistent approach to the treatment of liabilities (where solvency is, in addition to reduced profitability, squeezed through a balance sheet impact as the value of liabilities is high when yields are low). Although currently limited to only a few euro area countries, the liability effect will gain in importance on the eve of the introduction of the Solvency II regime. In the light of the persisting low-yield environment and the need to adjust to the forthcoming regulatory framework, the European Insurance and Occupational Pensions Authority (EIOPA) recently recommended that national supervisors intensify their monitoring of risks related to low yields and potentially unsustainable business models that are based on investment income, irrespective of the accounting regime of the jurisdiction.¹¹

Portfolio shift towards corporates

With a fragmented and in some cases low-yielding government bond market, **corporate bond** portfolios of large euro area insurers are growing. This rise on average indicates a possible shift in investment strategy. For some of the insurers in the sample, the move appears to have been induced by the low-yield environment and the good selling opportunities for certain government bonds in the fourth quarter of 2012.¹² Although corporate bond market conditions do not appear to give rise to immediate concern (see Chart 3.37), the lull seen in the market along with yields at historical lows may point to a hunt for yield-driven underpricing of credit risk (see Section 2). Insurers' increasing exposure to this asset class, together with a weakening macroeconomic outlook and potential rating downgrades, may imply an increased market and credit risk in the future. Within the class of corporates, insurers remain particularly exposed to developments in the financial sector (see the next section on interlinkages).

Chart 3.37 Investment uncertainty map for euro area insurers

(Jan. 1999 – Apr. 2013)



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

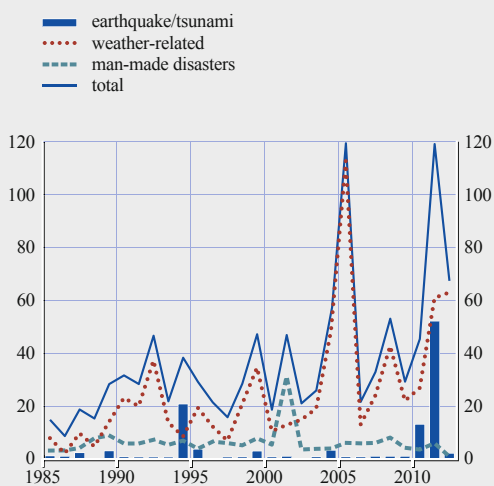
Notes: The chart shows the level of each indicator in comparison with its "worst" level (i.e. its highest or lowest level, depending on what is worse from an insurer's perspective regarding investment) since January 1999. An indicator value of one signifies the worst conditions in that market since January 1999. "Government bond markets" represent the euro area ten-year government bond yield and the option-implied volatility of ten-year government bond yields in Germany; "Corporate bond markets" the average of euro area A-rated corporations' bond spreads and European speculative-grade corporations' actual and forecast default rates; "Stock markets" the average of the index level and the price/earnings ratio of the Dow Jones EURO STOXX 50 index; "Structured credit" the average of euro area residential mortgage-backed securities and European commercial mortgage-backed securities spreads; and "Commercial property markets" the average of average euro area commercial property capital values and value-to-rent ratios. For further details on how the uncertainty map is created, see Box 13 in ECB, *Financial Stability Review*, December 2009.

¹¹ See the EIOPA Opinion of 28 February 2013 on the supervisory response to a prolonged low interest rate environment (available at <https://eiopa.europa.eu>).

¹² As long-term investors, insurers typically hold investments until maturity in the absence of exceptionally attractive selling opportunities. To some extent, such opportunities have materialised lately in the government bond portfolios of some insurers.

Chart 3.38 Insured catastrophe losses

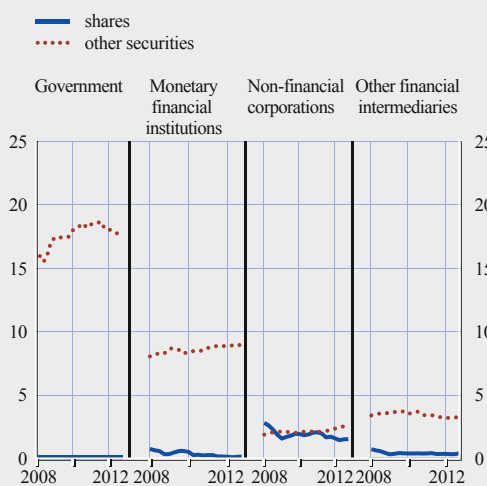
(1985 – 2012; USD billions)



Sources: EQECAT, Munich Re, Swiss Re and ECB calculations.

Chart 3.39 Financial assets of euro area insurance companies and pension funds

(Q1 2008 – Q4 2012; percentage of total financial assets)



Source: ECB.

A search for more profitable investment opportunities has the potential to push insurers beyond traditional activities – be it in terms of geographical exposure or asset classes. In particular, European insurers may seek to shift some funds towards emerging market economies as they search for yield, diversify and pursue a strategy of underwriting activities in less mature markets. Insurers are also becoming increasingly active in project and infrastructure financing as well as lending. While these activities may yield diversification benefits, they may also imply new channels of risk requiring close monitoring.

Solvency risks related to **insurance underwriting** remain moderate in the context of comfortable capital buffers following a year of relatively low insured losses (see Chart 3.38). The comfortable level of capitalisation is likely to have contributed to the modest overall increases in price levels. The recent price increases in some sectors have nevertheless improved the potential for generating capital through retained earnings during the coming quarters. For life insurers, the improved funding conditions of banks have reduced the risk of forced asset sales by insurers on account of a liquidity squeeze that could impact solvency.

Moderate underwriting risks

Interlinkages with the banking sector

Investment by insurers in bank bonds has remained robust during the financial crisis (see Chart 3.39) and fears that certain features of the expected calibration of the risk-based capital requirements in the Solvency II framework reduce incentives for investment in bank bonds have so far not materialised.¹³ Bank bonds accounted for 23% of insurers' and pension funds' total holdings of debt securities, and for 9% of their total financial assets, in the fourth quarter of 2012. The low yields on highly rated government bonds might also continue to spur investment in bank bonds in the next six to twelve months.

Insurers remain important for bank funding

13 Current Solvency II proposals include a differentiated treatment of bank bonds, which may partly explain the behaviour observed in Chart 3.39. In particular, although the long-term bank bonds may receive a stricter treatment, the bulk of the bank bond investment by insurers lies in the bracket of 3-5 years and would not be greatly affected by the current proposals. Covered bonds also retain attractive risk weights according to the proposals.

*Risks from credit
risk protection
remain small*

More direct linkages – either through insurance sector assumption of credit risk or through financial groups – have been stable. Credit risk protection selling has remained modest, as part of a decreasing trend since 2009. While limited, financial stability risks related to these activities warrant continued monitoring. Perhaps the tightest direct link, however, is through the “bancassurance” model, popular in Europe as many insurers have close ties with banks through financial groups (see Box 7).

Box 7

FINANCIAL STABILITY AND BANCASSURANCE GROUPS – LESSONS FROM THE EURO AREA EXPERIENCE DURING THE FINANCIAL CRISIS

A popular financial services model in Europe is a melding of banking and insurance activities together under one roof – or so-called bancassurance groups. These arrangements can yield many benefits, including economies of size and scope, and sectoral diversification can reduce income and balance sheet volatility.¹ The financial crisis, however, also highlighted the fragilities of this model, with recourse to state aid by several financial groups with significant banking and insurance activities. First, the complexity and the inherent opacity of the structure pose challenges in terms of risk management, market discipline and supervisory control. Second, the multiple use of regulatory capital may overstate the capacity of a group to absorb losses – either across the various regulated entities within the group (double or multiple gearing) or through the use of debt issued at the holding company level to acquire equity stakes in subsidiaries (double leverage). Third, intra-group transactions may lead to risk transfers and contagion channels within the group. Finally, the various units of a group may individually build up risk positions, which may lead to an uncontrolled concentration of risk at the group level. In the European Union, bancassurance groups are subject to supplementary supervision concentrating on these risks, provided that they match the criteria stipulated in the Financial Conglomerates Directive (FiCoD).²

An analysis of bancassurance groups that suffered distress during the financial crisis can offer several insights into potential fragilities of this business model. To begin with, it is notable that many euro area bancassurance groups that received state aid in the context of the financial crisis did not qualify for the supplementary supervision under FiCoD (see Chart A).

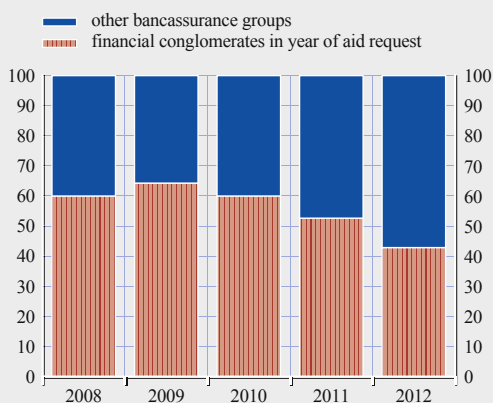
An analysis of the causes of state-aid requests gives rise to three immediate observations (see Chart B). First, the number of cross-border and/or cross-sectoral cases underlines the importance of further enhancing group-level control and supervision – both at a euro area and at a global level (given a plethora of cross-border issues). Indeed, many of the state-aid requests at the start of the crisis were related to impairments in US entities. Concrete cases of cross-sectoral problems include in particular correlated exposures across the units and double leverage – such as the case of SNS Reaal, where a first request for state aid in 2008 was triggered by pressure on the capital of the insurance arm, with considerable group-level difficulties related to double leverage. The recent rescue further underlined the risks related to double leverage, as disentangling parts out of the group proved impossible owing to the need to repay the loans taken out by the holding company.

1 See F. Dierick, “The supervision of mixed financial services groups in Europe”, *ECB Occasional Paper Series*, No 20, August 2004.

2 Broadly speaking, a financial conglomerate has to operate in the insurance sector and also have other (banking or investment) activities, and the extent of the activities should exceed the minimum thresholds.

Chart A Composition of euro area bancassurance groups having received financial crisis-related state aid

(2008 – 2012; percentage of the cumulative number of bancassurance groups having received state aid)

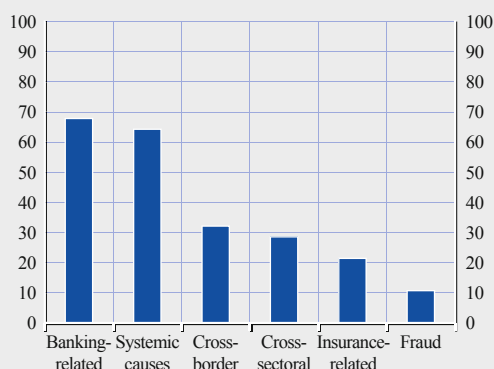


Sources: List of identified financial conglomerates, European Commission and national ministries of finance.

Note: The sample consists of 28 cases of state aid to financial groups with both banking and insurance activities for which sufficient information was available.

Chart B Main contributors to financial crisis-related state-aid requests for euro area bancassurance groups

(percentages)



Sources: European Commission, national ministries of finance and ECB calculations.

Notes: Multiple entries are possible. Cross-sectoral contributors include multiple gearing, double leverage, intra-group contagion, and concentrated exposures across sectors. Systemic causes include, inter alia, requirements to raise capital above regulatory minima owing to a general loss of confidence, and are included only when they are considered to have had a decisive impact on the aid request.

Second, the need for state aid seems to have originated predominantly from the banking units of the groups. The causes include in particular reliance on short-term funding and excessive mortgage or commercial property lending during the years preceding the crisis. Requests originating from the insurance arms have typically related to mark-to-market valuation declines in investments, sometimes combined with non-standard business features that have allowed policyholders to withdraw policies at low cost (e.g. Ethias). Despite these high-profile cases of difficulties with conglomerates, it should be acknowledged that many other cases have underlined the benefits of diversification (such as the case of Irish Life & Permanent Group).

Third, the majority of cases involve systemic causes, a result that underlines the importance of improved macro-prudential supervision and policies to maintain general confidence and contain accumulations of system-wide risks.

The number of cases of distress and their heterogeneity have culminated in a regulatory push to enhance the supervision of financial conglomerates. This includes measures to strengthen financial stability in four areas. First, the identification of conglomerates will be improved with the introduction of risk-based assessments in addition to quantitative thresholds as part of the first review of FiCoD by mid-2013, alongside enhanced transparency for legal and operational structures.³ Second, the same legislation will see the introduction of living wills

³ A second review has also already been initiated, motivated inter alia by the need to further improve the identification of financial conglomerates and the potential systemic issues related to them. The conclusion of the review will take place once the new sectoral legislation has become applicable.

for conglomerates, which should facilitate the separation of units in resolution cases in the future.⁴ Third, elements of improved group supervision (e.g. with regard to the double counting of holdings in insurance subsidiaries, corporate governance and remuneration policies) are included in the new sectoral legislation, in particular CRD IV and Solvency II. Finally, the single supervisory mechanism (SSM) will inevitably improve cross-border supervision in the participating countries. The macro-prudential aspects of supervision will be strengthened by the mandate of the SSM. The SSM is also expected to take over the supplementary supervision of bank-led conglomerates.

All in all, the analysis of euro area bancassurance groups that experienced distress during the financial crisis suggests that contagion has more often taken place from the banking units towards the insurance units than vice versa. This implies that the close ownership ties with banks do have an impact on the performance of the sector. Close monitoring of potential contagion channels within financial groups, including via liquidity swaps, is thus important for the stability of the sector – which several ongoing regulatory initiatives should help to address.⁵

4 The living wills requirement will be further reinforced by the European Bank Recovery and Resolution Framework.

5 A recent EIOPA survey highlighted the risks related to liquidity swaps. Although the extent of such activity was found to be low, careful consideration of intra-group swaps was recommended as they may not be motivated by the business needs of the insurer. See EIOPA, *Financial Stability Report 2012 – Second half-year report*, December 2012.

3.3 A QUANTITATIVE ASSESSMENT OF THE IMPACT OF SELECTED MACRO-FINANCIAL SCENARIOS ON FINANCIAL INSTITUTIONS

A quantitative assessment of macro-financial scenarios mapping systemic risks...

This section provides a quantitative assessment of four macro-financial scenarios that map the main systemic risks identified in the analysis presented in the previous sections of this Financial Stability Review (FSR) (see Table 3.1):¹⁴

- (i) *a further decline in bank profitability, linked to credit losses and a weak macroeconomic environment* – materialising through negative shocks to aggregate demand and aggregate supply in a number of EU countries;
- (ii) *the risk of renewed tensions in euro area sovereign debt markets due to low growth and slow reform implementation* – materialising through an increase in long-term interest rates and declining stock prices;
- (iii) *bank funding challenges in stressed countries* – reflected by reduced access to wholesale debt financing and deposit outflows in distressed countries with detrimental effects on loan supply;
- (iv) *the risk of a reassessment of risk premia in global markets* – reflected by a sharp increase in investor risk aversion worldwide, leading to falling stock and corporate bond prices and lower euro area external demand.

14 The assessment is based on a macro-prudential simulation exercise involving top-down stress-testing tools. The results are not comparable with those of micro-prudential stress tests used for supervisory purposes, which analyse the solvency of individual financial institutions. The tools employed are: (i) a forward-looking solvency analysis, similar to a top-down stress test, for euro area LCBGs; and (ii) a forward-looking analysis of the assets and liabilities side of the euro area insurance sector. The results are based on publicly available data up to the fourth quarter of 2012 (or a few quarters earlier) for individual banks and insurance companies, as well as bank exposure data disclosed in the 2011 EU-wide stress test and the 2011 EU capital exercise, as coordinated by the European Banking Authority (EBA).

Table 3.1 Mapping main systemic risks into adverse macro-financial scenarios

Risk	Scenario	Key assumptions driving impact on GDP
Decline in bank profitability, linked to credit losses and a weak macroeconomic environment	Economic growth scenario	Shocks to investment and consumption as well as user cost of capital and nominal wages
Renewed tensions in euro area sovereign debt markets due to low growth and slow reform implementation	Sovereign debt crisis scenario	An aggravation of the sovereign debt crisis fuelling interest rate increases and stock price declines
Bank funding challenges in stressed countries	Funding stress scenario	Restricted access to funding fuelling bank deleveraging and restricting loan supply
Reassessment of risk premia in global markets	Risk aversion scenario	A shock to confidence and rise in risk aversion worldwide fuelling stock price declines and corporate bond yield increases and eventually affecting euro area external demand

MACRO-FINANCIAL SCENARIOS AND THE IMPACT ON GDP

The four adverse scenarios described below and summarised in Tables 3.1 and 3.2 display the key driving factors at play, as well as the overall impact on euro area GDP, with the latter giving an indication of the scenario impact on the whole spectrum of macro-financial model variables that respond to the shocks set in each scenario. The impact of the adverse scenarios is assumed to be felt from the first quarter of 2013 onwards, reflecting the fact that the bank balance sheet data used in the solvency analysis refer to the fourth quarter of 2012.¹⁵

Adverse euro area growth

A clear thread throughout this Review is the detrimental impact of weakening macroeconomic activity on both the macro-financial environment and financial institutions. In order to capture the risk of weaker than anticipated domestic economic activity in many euro area countries, this scenario involves country-specific negative shocks to aggregate demand, via a slowdown in fixed investment and private consumption, and to aggregate supply, via increases in the user cost of capital and nominal wages. The calibration of the country-specific shocks was based on a quantitative and qualitative ranking of the most pertinent risks at the country level. The effect on GDP is derived using “stress-test elasticities”.¹⁶

These assumptions result in an overall impact on euro area real GDP growth, expressed in percentage point deviations from baseline growth rates, of -0.4 percentage point in 2013 and -0.9 percentage point in 2014. The real economic impact varies considerably across euro area countries, with countries under sovereign stress being the most negatively affected.

To illustrate the strong interconnections between the sovereign debt crisis, economic activity and the banking sector, a further joint scenario combining the sovereign debt shock and the adverse economic growth shock is also considered. Under such a combined scenario, the impact on euro area real GDP growth, expressed in percentage point deviations from baseline growth rates, amounts to -0.5 percentage point by the end of 2013 and -1.2 percentage points by the end of 2014, again with considerable variation across countries.

¹⁵ The 2012 shock sizes have been “de-annualised” to account for the fact that only the last quarter of the year is relevant when calculating the impact on the banks’ income and losses and ultimately on their solvency.

¹⁶ Stress-test elasticities are a simulation tool based on impulse response functions (taken from ESCB central banks’ models) of endogenous variables to predefined exogenous shocks. They incorporate intra-EU trade spillovers.

The first scenario is based on a shock to aggregate demand and supply

Under the second scenario, euro area sovereign bond yields rise to abnormally high levels...

... accompanied by a sharp decline in stock prices, an increase in short-term interest rates and an increase in sovereign CDS spreads

This implies losses in the trading book and an increase in banks' cost of funding and credit risk

Increased funding difficulties in some countries...

Aggravation of the sovereign debt crisis

Sovereign stresses have been at the heart of the crisis. This scenario attempts to capture such stresses, envisaging a rise in euro area sovereign bond yields to elevated levels, while taking into account dependencies with other asset prices (stock prices in particular). The shocks are assumed to emanate from euro area countries particularly vulnerable to possible further contagion from euro area EU/IMF programme countries.¹⁷

The design of this shock is predicated on the following assumptions. First, a permanent shock to long-term government bond yields, at the cut-off date, is assumed for all euro area countries except Greece and Cyprus, which are outliers in this regard, ranging from no impact to up to 370 basis points. Second, the slope of national yield curves at the cut-off date is used to transpose the simulated shock to other maturities. Third, the shock to bond yields has spillover effects on stock prices, ranging from 0% to -38% across the euro area countries, with the strongest negative impact observed in Spanish and Italian stock markets. The simulated shocks to bond yields and stock prices lead to an immediate and persistent increase in short-term market interest rates.¹⁸ Lastly, the calibrated shocks to ten-year government bond yields determine country-specific shocks to sovereign credit default swap (CDS) spreads.¹⁹

These factors lead to a varied rise in sovereign bond yields, depending on the country, resulting in marking-to-market valuation losses on euro area banks' sovereign exposures in the trading book,²⁰ while the increase in sovereign credit spreads also raises the cost of euro area banks' funding. The country-specific shocks to interest rates and stock prices also have direct implications for the macroeconomic outlook, which in turn affects banks' credit risk. Ultimately, the average impact on euro area real GDP – assuming unchanged monetary policy and expressed in percentage point deviations from baseline growth rates – amounts to -0.3 percentage point at the end of 2013 and -0.6 percentage point at the end of 2014.²¹

Renewed funding stress

A third key risk relates to the potential for pronounced funding difficulties for banks in countries where the sovereign is under stress which could seriously hamper credit intermediation, for example by inducing banks to restrain their lending. To account for the diverse stress factors affecting bank funding markets in some euro area countries, a number of shocks are considered. First, some deposit outflows from banks in the more distressed euro area countries

17 The selection of countries that are potentially vulnerable to further contagion is based on a systematic shock simulation to identify the countries/markets that are most influential in the sense of causing the most widespread responses when being shocked themselves. Smaller countries, e.g. Cyprus and Slovenia, have not been considered as countries from which shocks may emanate since their sovereign bonds outstanding are insufficient or their data quality is inadequate for carrying out a robust analysis. The calibration of the sovereign bond yield shock is based on daily compounded changes in ten-year government bond yields and stock prices observed since January 2011. These observations are used to simulate a joint, multivariate forward distribution of yields and stock prices 60 days ahead. In the simulation, long-term interest rates and stock prices in countries that are currently perceived by market participants as being particularly vulnerable to possible further contagion are shock-originating markets, with the shocks assumed to occur with a 1% probability. The response for all other markets/countries is computed using a non-parametric model consistent with the shock probability assumption. The resulting shock sizes are in principle dependent on the selected sample period. However, sensitivity analyses show that the shocks do not materially change by, for instance, reducing the sample size by using a cut-off date in mid-2011.

18 The same simulation procedure as that used for calibrating long-term bond yield shocks across euro area countries has been applied for the three-month EURIBOR.

19 They are based on estimated regressions of sovereign CDS spreads on long-term government bond yields.

20 By contrast, securities held in the available-for-sale portfolio and in the banking book are assumed to be unaffected by the asset price shock, in line with the treatment in the EBA 2011 EU-wide stress test. The valuation haircuts are calibrated to the new levels of government bond yields, using the sovereign debt haircut methodology applied in the EBA 2011 stress-test exercise.

21 The impact of these shocks on euro area economic growth was derived using the stress-test elasticities.

are assumed.²² Second, banks are assumed to roll over only part of their wholesale debt maturing over the next two years, reflecting differences across banks in terms of their access to wholesale funding markets and a more system-wide drive to gradually reduce reliance on (especially short-term) wholesale funding.²³ Third, country-specific loan-to-deposit ratio targets are imposed to reflect a more general need to reduce reliance on wholesale funding (also in the light of upcoming Basel III liquidity requirements).²⁴

To capture how funding constraints restrain loan supply, banks' announcements concerning ongoing restructuring plans are taken into account and are seen as a lower bound for banks' minimum deleveraging. For many banks, the estimated impact of funding stress on deleveraging exceeds the short-term liquidity shortages that were addressed by the two three-year longer-term refinancing operations (LTROs).

A pecking order of deleveraging is assumed to derive quantitative constraints on lending (loan supply shocks). Banks are first expected to shed more liquid assets (such as non-domestic sovereign bonds and interbank exposures) and foreign credit exposures, and reduce their domestic loan book only as a last resort. These loan supply shocks are applied to a dynamic stochastic general equilibrium (DSGE) model, which includes a household sector subject to borrowing constraints (linked to the value of their collateral) and a capital-constrained profit-optimising banking sector to account for the direct feedback effect on real economic activity.²⁵ The size of the loan supply shocks ranges from slightly negative in a few countries to close to -10% of the outstanding loan book in the countries affected most.

Overall, the funding stress scenario impacts average real GDP growth in the euro area by -1.6 percentage points at the end of 2013 and by -0.3 percentage point at the end of 2014, again with significant differences across countries.

Increased risk aversion

The fourth adverse scenario concerns the potential for a mis-pricing of risk across various market segments around the world and is modelled as an abrupt decrease in investor confidence and increase in risk aversion worldwide. More specifically, a negative confidence and stock price-driven shock emanating from the United States is assumed. This would lead to a recession in the United States and – via trade and confidence spillovers – have negative implications for the global economic outlook, including euro area foreign demand. This also includes the impact of endogenously derived increases in oil and other commodity prices, as well as an appreciation of the euro exchange rate against the US dollar. The impact on euro area foreign demand is derived

... with deposit outflows and limited access to wholesale markets in some countries...

... combined with deleveraging and resulting loan supply shocks...

... forcing banks to shed assets, leading to a feedback effect on the real economy

Abrupt decrease in investor confidence, leading to a stock price-driven shock emanating from the United States...

22 Deposit outflows have been calibrated on the basis of observed outflows between mid-2011 and December 2012, with countries being grouped according to sovereign risk, using prevailing credit ratings. The assumed deposit outflows range from 15% of outstanding volumes for banks in countries rated below investment grade to 2% for banks in AA-rated countries.

23 Banks are assumed to roll over between 60% and 90% of their maturing wholesale debt in 2013 and 2014 depending on the level of sovereign distress in the country where the bank has its headquarters. These percentages correspond to the 25th and 75th percentiles respectively of the monthly wholesale funding rollovers of European banks observed since January 2007. The resulting funding gap is corrected for individual banks' take-up of the three-year LTROs, taking into account LTRO usage to redeem maturing debt.

24 More stringent loan-to-deposit ratio targets are assumed for countries facing greater distress, also reflecting explicit requirements under ongoing EU/IMF programmes. Hence, loan-to-deposit ratio targets are assumed to be 110% for banks in countries with credit ratings below BBB, 125% for BBB-rated countries, 150% for A-rated countries, 165% for AA-rated countries and 175% for AAA-rated countries.

25 See M. Darracq Pariès, C. Kok and D. Rodríguez Palenzuela, "Macroeconomic propagation under different regulatory regimes: an estimated DSGE model for the euro area", *ECB Working Paper Series*, No 1251, October 2010, also published in the *International Journal of Central Banking* in December 2011.

... with a negative impact on euro area external demand and eventually euro area GDP

Table 3.2 Overall impact on euro area GDP growth under the baseline and the adverse scenarios

(2013 – 2014; percentages; percentage point deviations from baseline growth rates)

	2013	2014
Baseline (European Commission spring 2013 forecast; annual growth rate)	-0.4%	1.2%
<i>Percentage point deviations from baseline growth rates:</i>		
Economic growth scenario	-0.4	-0.9
Sovereign debt crisis scenario	-0.3	-0.6
Joint debt crisis and economic growth scenario	-0.5	-1.2
Funding stress scenario	-1.6	-0.3
Risk aversion scenario	-0.6	-0.5

Sources: ECB and ECB calculations.

with the National institute Global Economic Model (NiGEM). Lastly, the increase in risk aversion is assumed to lead to a marked increase of corporate bond spreads from their current low levels.²⁶

On the basis of these assumptions, the US stock price shock amounts to -16% in the first quarter of 2013, with US stock prices assumed to gradually recover but to remain -8% below the baseline at the end of 2014. The resulting negative impact on euro area external demand, expressed in percentage changes from baseline levels, amounts to -2.4% at the end of 2013 and -2.9% at the end of 2014. The simulated shock to corporate bond prices corresponds on average to a haircut of around -4.5% on banks' corporate bond holdings.

The impact of the external demand shock on the euro area economies is derived using the stress-test elasticities. The average overall impact on euro area real GDP, expressed in percentage point deviations from baseline growth rates, is -0.6 percentage point by the end of 2013 and -0.5 percentage point by the end of 2014. The real economic impact differs considerably across the euro area countries depending in particular on their export orientation and exchange rate sensitivity.

BANK SOLVENCY RESULTS

Bank solvency impacts are broken down into both *individual* profit and loss results, and also impacts stemming from cross-institutional *contagion*.

The impact on euro area banks' profit and loss accounts (and solvency positions) from the four scenarios is obtained from a projection of the main variables determining banks' solvency, such as the credit risk parameters, profits and risk-weighted assets.²⁷ Details of the technical assumptions for all relevant variables are contained in Table 3.3. Having computed the effects of the various shocks on the above-mentioned balance sheet components, the overall impact is expressed in terms of changes to banks' core Tier 1 capital ratios.

Under the **baseline scenario**, euro area LCBGs' core Tier 1 capitalisation is projected to increase on average from 11.2% in the fourth quarter of 2012 to 11.3% by the end of 2014 (see Chart 3.40).

Under the baseline scenario, the average core Tier 1 capital ratio is projected to increase from 11.2% to 11.3% at the end of 2014

26 The corporate bond rate shock has been calibrated using the same simulation approach as that applied to government bond yields under the sovereign debt crisis scenario.

27 The balance sheet and profit and loss data are based on banks' published financial reports, while also taking into account the supervisory information (in particular, the granular geographical breakdowns of exposures at default) that was disclosed in the context of the EBA 2011 EU-wide stress test and the EBA 2011 EU capital exercise. To the extent possible, the data have been updated to cover the period up until the fourth quarter of 2012, i.e. including capital buffers accumulated in the context of the EBA 2011 EU capital exercise as well as more recent capital injections (e.g. in Belgium, Greece and Spain). The sample includes 17 euro area LCBGs. Data consolidated at the banking group level are used. Bank balance sheets are assumed to remain unchanged over the simulation horizon, except when explicitly assumed otherwise, e.g. in the funding stress scenario.

Table 3.3 Technical assumptions regarding the individual risk drivers of banks' solvency ratios

Credit risk	Changes to probabilities of default (PDs) and loss given default (LGD) estimated by exposure types (i.e. loans to non-financial corporations, retail and commercial property loans). ¹ Projected changes at the country level applied to bank-specific loss rates to calculate the expected losses. ² For exposures to sovereigns and financial institutions, provisioning is based on rating-implied PDs, similar to what was done in the EBA's exercise. ³
Net interest income	Based on a loan-deposit margin multiplier approach to assess the impact of interest rate changes. ⁴ Changes in short-term loan and deposit rates are then multiplied by the outstanding amounts of loans and deposits for each bank at the beginning of the horizon. To account for a marginal pricing of deposit rates, which have risen sharply in many euro area countries in recent years, changes in the short-term rate have been adjusted by adding the spread between the three-month money market rate and new business time deposit rates at country level as of end-December 2012.
Other operating income	Trading income developments correspond, for each bank, to its average trading income over the period 2007-12 under the baseline, and to the average of the three years of severe financial crisis (2008-10) under the adverse scenarios. Fee and commission income is assumed to remain constant in nominal terms.
Taxes and dividends	Tax and dividend assumptions are bank-specific, using the average ratio of positive tax payments to pre-tax profits over the period 2008-10 and the median dividend-to-net income ratio over the same period.
Risk-weighted assets	Risk-weighted assets are calculated at the bank level, using the Basel formulae for IRB banks and assuming fixed LGDs. ⁵

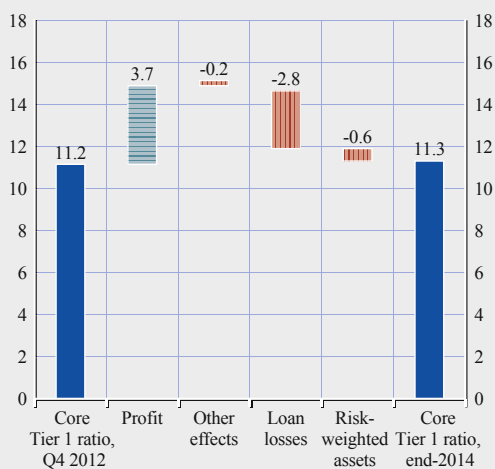
Source: ECB.

Notes:

- 1) For the forecasting methodology applied, see ECB, "2011 EU-wide EBA stress test: ECB staff forecasts for probability of default and loss rate benchmark", 4 April 2011.
- 2) More technically, the range from the starting levels of both the PDs and LGDs to the maximum of actual 2011 provisioning rates for the non-financial corporate, retail and commercial property sector was calibrated conservatively.
- 3) See EBA, "2011 EU-wide Stress Test: Methodological Note – Additional Guidance", 9 June 2011.
- 4) See Box 7 of the December 2010 FSR and Box 13 of the June 2009 FSR for further details.
- 5) Risk-weighted assets are defined according to the so-called Basel 2.5 (or CRD III) framework, including higher risk weights on re-securitisations in the banking book and certain market risk elements in the trading book.

Chart 3.40 Average contribution of profits, loan losses and risk-weighted assets to core Tier I capital ratios of euro area LCBGs under the baseline scenario

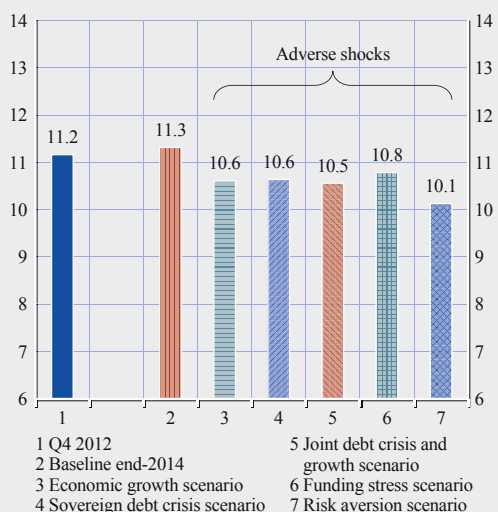
(percentage of the core Tier I capital ratio and percentage point contribution)



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

Chart 3.41 Average core Tier I capital ratios of euro area LCBGs under the baseline and adverse scenarios

(2012 – 2014; percentages; average of euro area banks)



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

Combining the sovereign debt crisis and the economic growth scenarios leads to an average core Tier 1 capital ratio of 10.5% at the end of 2014

This mainly results from an expected improvement in pre-provision profits, which is sufficient to offset negative influences, predominantly from projected loan losses. The average development of euro area banks' solvency positions, however, masks substantial variation across individual banks and euro area countries. Increases in loan losses and higher risk-weighted assets are mitigated by positive retained earnings.

All four distinct **adverse scenarios** discussed above would have a notable adverse impact on euro area banks' solvency, with average core Tier 1 capital ratios declining by 0.5 percentage point or more in comparison with the baseline scenario by the end of 2014 (see Chart 3.41). Under the sovereign debt crisis scenario and the low economic growth scenario, euro area banks' core Tier 1 ratios would decline, on average, to 10.6% by the end of 2014. A somewhat milder adverse impact is found under the funding stress scenario (10.8%). The global risk aversion scenario and the combined sovereign debt crisis and economic growth scenario would produce the most negative results: the average euro area core Tier 1 capital ratio would decline to 10.1% and 10.5%, respectively, by the end of 2014.

The main driving factors under all scenarios are the increase in loan losses and lower or negative retained earnings with respect to the baseline. Notably, under the sovereign debt crisis, the funding stress and the returning risk aversion scenarios, the decline in profits is relatively strong, owing to marking-to-market and fire-sale losses. Under the low economic growth scenario, the adverse impact largely originates from high loan losses. Under the sovereign debt crisis scenario, results are mainly driven by marking-to-market valuation losses, whereas the relatively mild GDP impact (see Table 3.2) contributes to only limited loan losses.

In general, the decline in banks' core Tier 1 capital ratios under the adverse scenarios is relatively mild given that euro area LCBGs are in general better capitalised than smaller banks. Nonetheless, there is considerable dispersion across euro area countries in terms of banking sector recapitalisation needs under the adverse scenarios (for a complementary approach to the forward-looking solvency analysis presented in this section, see also Box 8 below).

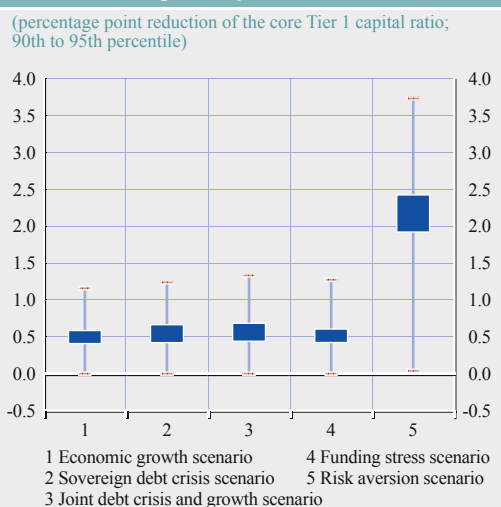
POTENTIAL INTERBANK CONTAGION DUE TO BANK FAILURES

Adverse shocks to individual banks' solvency positions can lead to contagion effects via interbank liabilities

The deterioration in a given bank's solvency position under the adverse scenarios may spill over to other banks in the system. This can happen if, for example, the failure of a bank to comply with a threshold capital level (e.g. a targeted core Tier 1 ratio of 6%) would imply losses for interbank creditors – resulting in additional system-wide losses.

Interbank contagion effects could be further amplified if, in response to distressed interbank loans, banks sell their securities holdings to fill the gap in their balance sheets. This may give rise to fire-sale losses, which may adversely

Chart 3.42 “Worst case” percentage point reduction in the core Tier 1 capital ratio of EU banks due to interbank contagion: dispersion across simulations



Sources: Individual institutions' financial reports, EBA, ECB and ECB calculations.
Note: The distributions, illustrated for each scenario, are based on individual banks' reactions to 20,000 randomly generated interbank networks.

affect the marking-to-market valuation of their securities portfolios and further depress their capacity to fully honour interbank liabilities. If these actions are taken by many banks at the same time, they would magnify the implied impact on market prices of the assets being sold.

In the absence of detailed data on interbank exposures, publicly available information is used to generate prospective instances through dynamic network modelling where one (or more) financial entity can have contagious effects throughout the financial system.²⁸ The interbank contagion results, derived by applying such a methodology to the four adverse scenarios considered above, are illustrated in Chart 3.42.

In 90% of the randomly generated interbank networks, contagion losses are marginal. This highlights the highly non-linear nature of interbank network structures. Substantial contagion effects are only observed in the upper percentiles of the distribution of randomly simulated interbank networks, in particular when allowing for a fire-sale impact. For a small number of the simulated networks, however, system-wide core Tier 1 capital reductions could reach around 3.5 percentage points, with some countries being much more severely affected.

²⁸ This exercise is based on a sample of 89 banks that were also covered in the 2011 EU-wide stress-testing exercise conducted by the EBA. An interbank network is randomly generated based on banks' interbank placements and deposits, taking into account the geographical breakdown of banks' activities. Once the distribution of interbank networks has been calibrated, the system can be shocked to assess how specific shocks are transmitted throughout the system and to gauge the implications for the overall resilience of the banking sector. The shock is typically a given bank's default on all its interbank payments. The model consists of three main building blocks: the interbank probability map, the random interbank network generator and the equilibrium interbank payments. For a more detailed description of the methodology, see G. Halaj and C. Kok, "Assessing interbank contagion using simulated networks", *ECB Working Paper Series*, No 1506, 2013.

Box 8

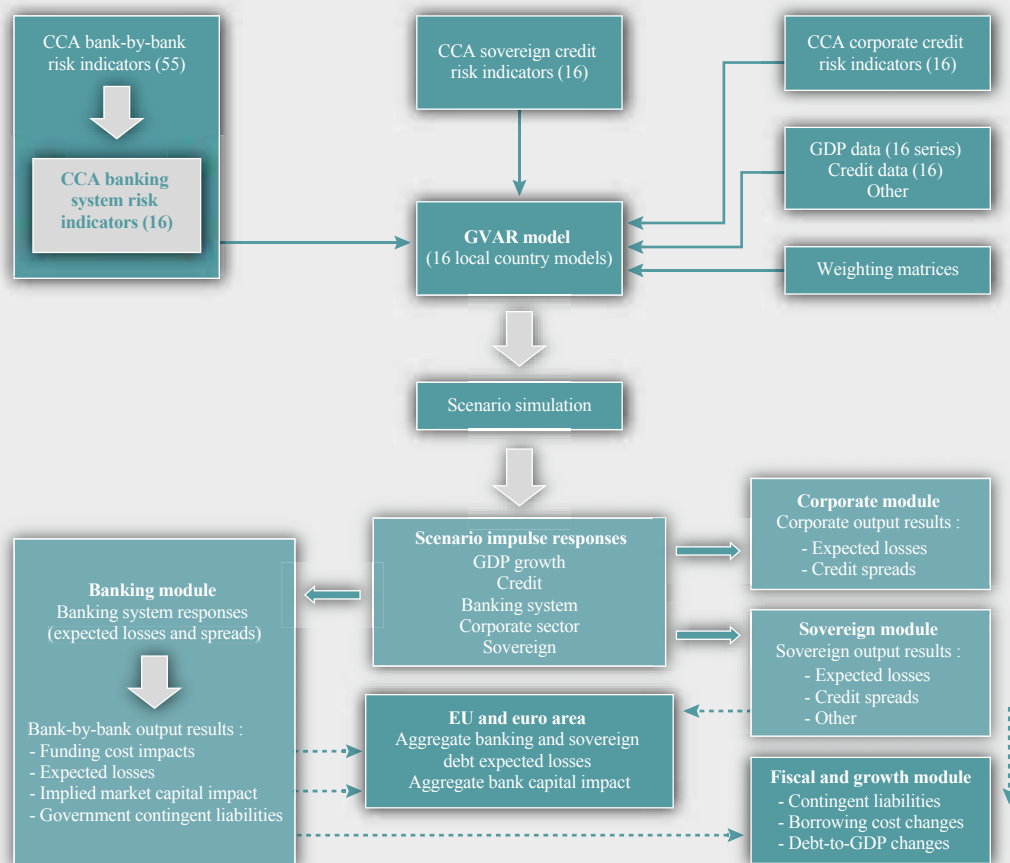
MODELLING THE JOINT DYNAMICS OF BANKING, SOVEREIGN, MACRO AND CORPORATE RISK

While the global financial crisis has seen many phases, a main feature has been the interplay of risks across various economic and financial sectors, even culminating in outright risk transfer in some cases. Prominent examples have included the spillover of fragilities from the financial sector to the broader economy and from the banking sector to the sovereign sector. In monitoring the propensity for such phenomena to occur and in evaluating their impact, direct (i.e. accounting) linkages tend to understate risks. Earlier and more robust signals of the possibility for cross-sectoral linkages to cause systemic stress can be obtained via contingent claims analysis (CCA), which augments cross-sectoral linkages on the basis of the main tenets of financial option pricing.¹

This box applies such a methodology to the joint dynamics among three sectors that are key in crisis propagation (the banking, sovereign and corporate sectors), along with real economic

¹ Contingent claims analysis is a risk-adjusted balance sheet approach for banks, corporates and sovereigns, where the value of liabilities is derived from assets and assets are uncertain. The value of assets equals the value of equity plus risky debt, where risky debt is the default-free value of debt minus the expected loss due to default. CCA balance sheets are very useful as they incorporate forward-looking credit risk, which is non-linear, and can analyse risk transmission between banks, corporates, sovereigns and the macroeconomy. CCA balance sheets are calibrated using the value and volatility of equity plus accounting information on debt in an option-theoretic framework. For a summary of the main research in this field, see D. Gray and S. Malone, *Macrofinancial Risk Analysis*, John Wiley & Sons, 2008.

Chart A CCA-GVAR modelling framework



Source: ECB.

activity and credit growth in a Global Vector Autoregressive (GVAR) model.² The model, which allows for explicit cross-sectoral (and cross-country) interactions, is set up for 13 EU countries as well as Norway, Switzerland and the United States and has been estimated based on a sample period from January 2002 to December 2012.³ The model is used to assess the same scenarios that are analysed by means of a solvency analysis earlier in this section of the FSR. The advantage of the CCA-GVAR approach is that it allows for an endogenous reaction of all relevant sectors in the economy. The analysis relies on three forward-looking risk indicators derived from CCA: (i) fair-value spreads⁴, which pool multiple sources of default risk, including the market price of risk; (ii) loss given default; and (iii) the expected default frequency. The main difference between the CCA-GVAR model approach and the forward-looking solvency analysis, as presented earlier in this section, is that the CCA-GVAR framework operates with

2 See Table 3.2 for the GDP shocks that were used as input to the CCA-GVAR model (note that monthly GDP data are obtained via interpolation). For a detailed description of the methodology, see D. Gray, M. Groß, J. Paredes and M. Sydow, "Modeling Banking, Sovereign and Macro Risk in a CCA Global VAR", *IMF Working Paper*, forthcoming.

3 The model sample includes nine euro area countries, namely Austria, Belgium, France, Germany, Ireland, Italy, the Netherlands, Portugal and Spain. Other euro area countries have been excluded from the sample due to data limitations regarding available historical time series.

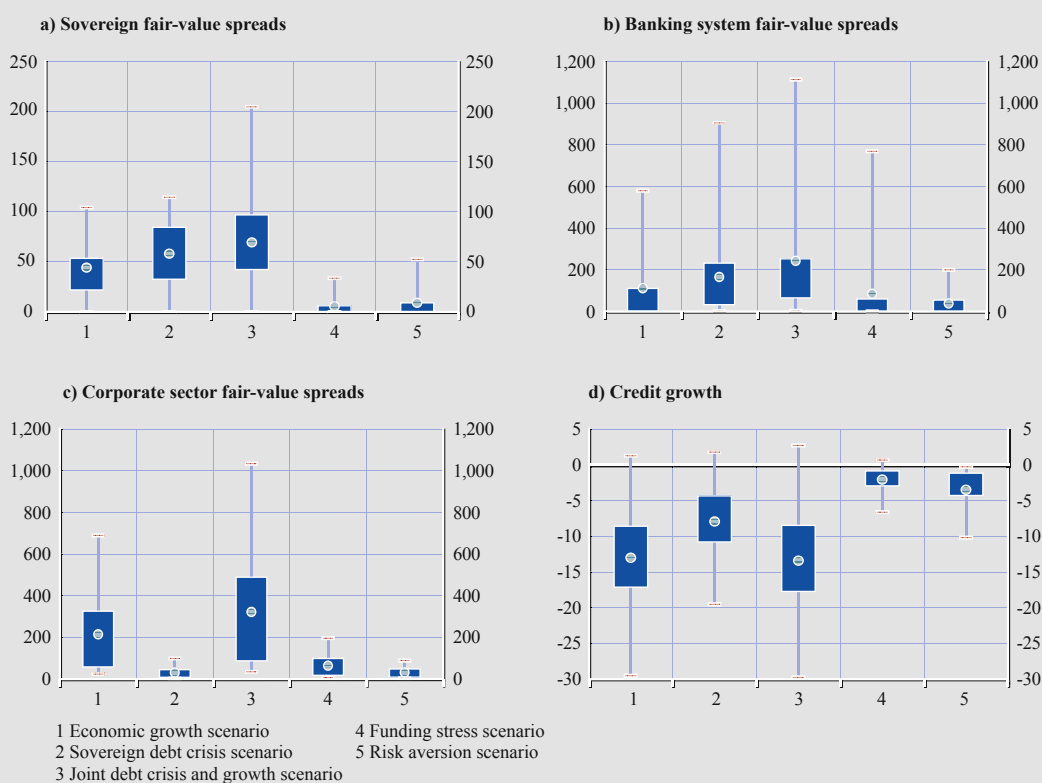
4 Historically, fair-value spreads exhibit differences in terms of magnitude compared with CDS spreads, e.g. for some banks in the sample, fair-value spreads can be a multiple of the corresponding CDS spread.

broad balance sheet items (i.e. assets, liabilities and equity capital) aggregated at the country level. In that sense, it has a “macro” perspective to the balance sheet, instead of the “micro” view that the solvency analysis takes, which involves specific models for various bank balance sheet components (such as interest income, interest expense, loan losses, mark-to-market valuation losses, etc.) that are then applied at a bank-by-bank level. Chart A presents a schematic overview of the overall modelling framework.

The results suggest that a joint sovereign debt crisis and growth shock scenario is the most potent for inducing stress for sovereigns, banks and the corporate sector – with other shocks being more sector-specific (see Chart B). For *sovereigns*, the average maximum cumulative response over two years is significant, approaching 70 basis points in terms of changes in fair-value spreads. Regarding other scenarios, the sovereign debt crisis, growth and risk aversion shock scenarios carry the largest impacts, with a fair degree of positive skew towards higher impacts in selected countries. For the *banking sector*, the cross-country distributions are even more strongly skewed, with average fair-value spread responses under all five scenarios being close to the upper quartiles, meaning that there are a few banking systems that are particularly severely hit (with fair-value spread responses surpassing 1,000 basis points for some banking systems).

Chart B Distribution of country-specific responses under different adverse shock scenarios

(2013 – 2014; cumulative; basis points; maximum, minimum, interquartile distribution and average)



Sources: ECB, Moody's Analytics and ECB calculations.

Notes: Responses are the maximum cumulative deviation from end-sample (December 2012) spread levels over a two-year forward horizon. For panels a)-c), an increase in spreads reflects a higher level of risk perception. The following countries are covered in this analysis: Austria, Belgium, Denmark, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

It is striking that credit spread responses for banks are more pronounced than the sovereign risk measures, on average by a factor of approximately three across scenarios and countries. Again, the strongest average spread responses can be found under the joint sovereign debt crisis and growth shock scenario, with the average maximum cumulative response for the banking system fair-value spreads approaching 250 basis points. For the *corporate sector*, the responses are somewhat more pronounced than those of the banking sector, with average fair-value spread responses under the joint sovereign debt crisis and contagion scenario approaching 320 basis points. Moreover, it is worth highlighting that across countries for all remaining scenarios the corporate sector is mainly affected by the economic growth scenario. With regard to *credit growth*, the joint sovereign debt crisis and economic growth scenario leads on average to a 13% reduction in credit, with less pronounced effects under the sovereign debt crisis and risk aversion scenarios. The impact conditional on the funding stress scenario appears to be small indeed.

Under all scenarios, euro area countries are more strongly affected by the adverse shocks than the other countries that are part of the sample.

The finding that the joint sovereign debt crisis and economic growth scenario has the most adverse implications for the banking sector is fairly consistent with the solvency analysis in this section of the FSR based on more traditional stress-testing tools, where this scenario is ranked second in terms of severity.⁵ In terms of policy implications, this underscores a key role for both economic growth (and stabilisation) as well as measures to limit the contagious forces that are central to the crisis.

5 In the CCA-GVAR analysis, the impact of the risk aversion scenario is smaller than the one under the joint sovereign debt crisis and economic growth scenario, the reason being that only a partial set of features that characterise the scenario, specifically the GDP growth assumptions (see Table 3.2 for an overview of GDP growth impacts under all scenarios), are used to feed the CCA-GVAR model. Specifically, the risk aversion scenario envisages further sources of risk that are not reflected in GDP responses and, therefore, not reflected in the results from the CCA-GVAR model output, in particular the impact on corporate bond holdings from the initial corporate bond yield shock.

Major risks are quantified using a market-consistent approach for the assets and liabilities side...

ASSESSING THE RESILIENCE OF EURO AREA INSURERS

The assessment of the impact of the four main euro area financial stability risks on large euro area insurers is conducted using publicly available data for 13 major euro area insurance groups up to the fourth quarter of 2012. It relies on a market-consistent approach to the quantification of risks and ignores the heterogeneity of current institutional settings and accounting practices among jurisdictions. It is applied to both the *assets* and the *liabilities* side of insurance corporations' balance sheets. Rather than trying to gauge the impact in terms of prudential solvency ratios, given the strong heterogeneity of the individual reporting in this sector, the approach aims to spell out the main risks in economic terms.²⁹

The following market, credit and underwriting risks are assessed: (i) an increase in interest rates; (ii) a fall in equity and property prices; (iii) a deterioration in the creditworthiness of borrowers through a widening of credit spreads for marketable instruments; (iv) lapse rate³⁰ increases; and (v) an increase in loss rates on loan portfolios.

29 The exercise is not related to the EU-wide stress test in the insurance sector coordinated by the European Insurance and Occupational Pensions Authority.

30 The lapse rate is defined as the proportion of contracts prematurely terminated by policyholders.

Table 3.4 The parameters for the assessment of euro area insurers

	Baseline	Economic growth scenario	Sovereign debt crisis scenario	Joint debt crisis and growth scenario	Funding stress scenario	Risk aversion scenario
Average euro area increase in long-term government bond yields (basis points)	0	0	208	208	0	0
Average add-on in corporate bond yields (basis points)	0	0	172	172	0	0
Shock to equity prices	0%	0%	-22%	-22%	0%	-16%
Shock to property prices	0%	0.0%	-1.4%	-0.6%	0%	0%
Cumulative loss rates over two years	0.3%	0.4%	0.8%	0.9%	0.4%	0.4%
Average add-on in lapse rates	0%	0.6%	0.5%	0.9%	0.6%	0.6%

Source: ECB calculations.

Using the same adverse scenarios as those for banks in the previous section, the risks for insurance companies are transmitted through three channels, namely: (i) valuation effects on financial securities and liabilities owing to changes in sovereign yields and swap rates; (ii) sales of assets due to unforeseen payments resulting from increased lapse rates; and (iii) changes in the credit quality of loan portfolios.

A number of simplifying assumptions had to be made for this exercise. First, decreases in market values of insurance corporations' holdings of shares, bonds and property are assumed to occur instantaneously, before institutions have an opportunity to adjust their portfolios (see Table 3.4 for an overview across scenarios). This implies that no hedging or other risk-mitigation measures³¹ were taken into account; consequently, losses might be overestimated. Second, available granular data (e.g. on investment in sovereign bonds, broken down by jurisdiction, on investment in corporate bonds and on loans, broken down by credit ratings, as well as on liabilities and debt assets, broken down by maturity) were used wherever possible, but broad aggregates of financial investments were used in some instances. The relative weights of various investments, broken down by instrument, are shown in Chart 3.36. Third, all income and expenses related to the underwriting business are assumed to be fixed. For example, reduced demand for insurance products is not taken into account and each maturing contract is expected to be replaced, so that the underwriting income of each insurer remains constant. The underwriting component of income is stressed only in the form of increasing lapse rates. Details of the technical assumptions for all relevant variables are given in Table 3.5.

The results confirm the importance of credit risks, although the vulnerability to the materialisation of macro-financial risk is very heterogeneous across individual insurance groups (see Chart 3.43).

The sovereign debt crisis scenario and the joint debt crisis and low growth scenario result in the most significant asset changes for insurance companies – where losses mainly originate from credit risk (mainly corporate) amounting on average to 1.4% of their assets.³²

By contrast, the rising yields under the adverse scenarios do not have an adverse impact on the economic solvency of the insurers in the sample. An increase in net assets by 2.5% is explained

31 For example, interest rate risk hedging, asset-liability matching techniques and counter-cyclical premia (to dampen the effect of temporary adverse interest rate shocks through offsetting changes in the valuation of liabilities).

32 Expressed as a percentage of net assets (assets – liabilities) the effect would be equal to 19.5%.

... under the macro-financial scenarios set out earlier

Simplifying assumptions necessary

The joint sovereign debt crisis and economic growth scenario has a stronger impact

Rising yields have no adverse impact on insurers' economic solvency

Table 3.5 Technical assumptions regarding the individual risk drivers of insurers' balance sheets

Credit risk	Credit risk assessment carried out using (i) breakdowns by rating or region, depending on data availability, and (ii) loss-rate starting levels, which are stressed using the same methodology as that applied for assessing the resilience of euro area banks.
Interest rate risk transmission	Sensitivities to interest rate changes computed for each interest rate-sensitive asset and liability exposure. Relevant yield curves used to project asset and liability cashflow streams, to calculate internal rates of return, and to discount the cash flows using yield curve shocks.
Haircut definition	Haircuts for <i>debt securities</i> derived from changes in the value of representative securities implied by the increase in interest rates under each scenario and uniformly applied across the sample of large euro area insurers. Valuation haircuts on <i>government bond portfolios</i> estimated on the basis of representative euro area sovereign bonds across maturities. Haircuts for <i>corporate bonds</i> derived from a widening of credit spreads.
Lapse risk	Lapse risk quantified by projecting insurers' cash flows over a two-year horizon, assuming a <i>static composition</i> of contracts and the reinvestment of maturing assets without a change in the asset allocation. Lapse rates linked to macroeconomic variables. ¹⁾ Unexpected component of lapses ²⁾ leads to <i>surrender payments</i> . ³⁾ In case of negative cash flows from surrender payments, insurer obliged to use cash reserves or sell assets to meet obligations. Lapse risk equals the cash or other assets needed to cover surrender payments.
Other assumptions specific to the sensitivity of investment income	Investment income earned from <i>reinvested assets</i> shocked on the basis of investment income earned at the beginning of the simulation horizon. <i>All other assets</i> assumed to earn the initial investment income throughout the simulation horizon. Maturing fixed income assets reinvested retaining the initial asset composition. <i>Underwriting business component</i> of operating profit assumed to remain constant throughout the simulation horizon. No distribution of <i>dividends</i> assumed.

Source: ECB calculations.

Notes:

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

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

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

by the longer duration of liabilities and, consequently, their greater sensitivity to the applied discount rate. Clearly, prudential solvency ratios would likely decrease on average, as most insurers in the sample belong to jurisdictions where liabilities are not marked-to-market.³³ Variations in equity price losses are largely related to the heterogeneity in the volume of such investments. The impact of an adverse equity price shock on assets reaches 0.3% on average.³⁴ Additionally, adverse macroeconomic developments lead to average lapse risk-related losses amounting to 0.15% of assets.³⁵

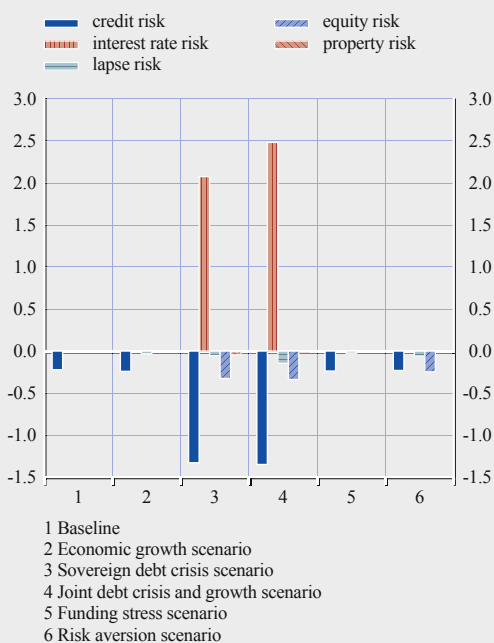
33 Regarding interest rate risk, the forthcoming Solvency II regime is expected to replace the current practices with a uniform approach consisting of using the swap curve for the discount rate. To gauge the rough impact of such a regime, a projected swap curve, calculated using a model linking swap rates to sovereign yields, was used to discount liabilities. Under the joint sovereign debt crisis and economic growth scenario, the application of Solvency II valuation would lead to a reduction in assets of 4.1%, on average, as the adverse valuation effects in insurers' fixed income portfolio would not be offset by respective movements on the liabilities side since the swap rate would remain decoupled from sovereign yields. It is important to note that the effect of any counter-cyclical instruments under Solvency II, which are currently under discussion, was not included in this exercise. Consequently, the negative impact in this exercise is likely to appear significantly more pronounced than it would be under a fully defined Solvency II regime.

34 Owing to data availability, gross equity exposures (gross of unit-linked exposures) were used and, consequently, the equity risk may be overestimated.

35 A sensitivity analysis of the impact of a property price shock is also conducted. An additional house price shock is calibrated with reference to a simulated forward distribution, using the same non-parametric simulation technique that is employed to calibrate financial market shocks. A shortfall measure conditional on a 1% percentile is computed based on the resulting forward distribution. The calibrated shock amounts to an 8.6% decrease in property prices. The losses associated with such a shock are found to represent 0.2% of insurers' assets on average.

Chart 3.43 Asset value changes for large euro area insurers under different scenarios

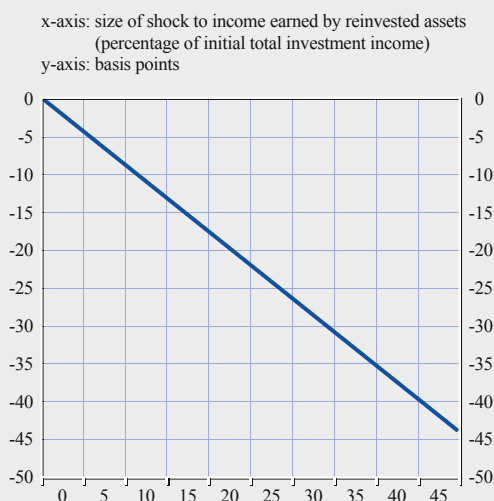
(Q4 2012 – Q4 2014; percentage of total assets)



Source: Individual institutions' financial reports and ECB calculations.

Chart 3.44 Sensitivity of total investment income to shocks to the yields on newly invested assets for large euro area insurers

(Q4 2012 – Q4 2014)



Sources: Individual institutions' financial reports and ECB calculations.

The materialisation of risks under the remaining scenarios leads to milder effects on insurers' balance sheets.

Another risk faced by insurers is a continuation of the current low-yield environment or a further weakening of their investment income. Chart 3.44 depicts the change in total investment income as a function of the shock to income earned from newly invested assets relative to the income earned by existing assets over a two-year horizon. If, for instance, the income earned on newly invested assets is halved, the total investment income would be lowered on average by approximately 45 basis points. A comparison with the current average investment income of euro area insurers (see the previous section) suggests, however, that in itself such a scenario does not imply a key challenge for the solvency of the sector.³⁶

Halving the income on newly invested assets leads to a 45 basis point reduction in total investment income

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

The regulatory and supervisory framework for financial institutions, markets and infrastructures continued to be overhauled in the first half of 2013, both at the global and at the EU level. The December 2012 FSR provided a concise overview of the implementation of certain key elements

The regulatory framework continued to be overhauled both globally and at the EU level during the first half of 2013

³⁶ The result is in line with earlier contributions concluding that insurance companies can cope with the low-yield scenario in the medium term. See e.g. A. Kablau and M. Wedow, "Gauging the impact of a low-interest rate environment on German life insurers", *Discussion Paper Series 2: Banking and Financial Studies*, No 02/2011, Deutsche Bundesbank, 2011.

Table 3.6 Selected legislative proposals in the EU for the banking sector

Initiative	Description	Current status
Banking union	A single supervisory mechanism (SSM) with strong ECB powers (in cooperation with national competent authorities) for the supervision of all banks in participating Member States (euro area as well as non-euro area Member States which join the system). Further components of the proposal: a single bank resolution mechanism (SRM) and a common deposit guarantee scheme.	On 18 April 2013 the Permanent Representatives Committee approved a compromise agreed with the European Parliament on the establishment of the SSM. If the Parliament votes accordingly, the Council will approve the text without further discussion. A Commission proposal on the SRM is expected in June 2013.
Capital Requirements Regulation and Directive (CRR/CRD IV)	The proposal implements Basel III standards in the EU. The overarching goal is to strengthen the resilience of the EU banking sector, while ensuring that banks continue to finance economic activity and growth. The proposal consists of a Directive, which relates primarily to the national supervisory process, and a Regulation, which sets prudential standards for financial institutions.	The European Commission's proposal was published in July 2011. On 27 March 2013 the Permanent Representatives Committee reached a political agreement on a compromise text on stricter capital requirements for banks. The European Parliament approved the text on 16 April. The Council is expected to approve the text without further discussion.
Bank Recovery and Resolution Directive	The proposed framework sets out the necessary steps and powers to ensure that bank failures across the EU are managed in a way which avoids financial instability and minimises costs for taxpayers. The proposed tools are divided into powers relating to "prevention", "early intervention" and "resolution".	The European Commission's proposal was published in June 2012. Negotiations between the Commission and the Council are ongoing, with the aim of reaching an agreement by June 2013.
Directive on Deposit Guarantee Schemes	The legislative proposal deals mainly with the harmonisation and simplification of protected deposits, a faster payout, and an improved financing of schemes.	The European Commission's proposal was published in July 2010.

of the global regulatory reform agenda within the European Union (EU).³⁷ Tables 3.6-3.8 provide an update of the major regulatory initiatives in the EU, followed by a short discussion of selected policy measures from the perspective of financial stability and macro-prudential policy.

The proposal for a banking union aims to set up, inter alia, a single supervisory mechanism within the EU

The Commission's proposal for a **banking union** aims, inter alia, to set up a single supervisory mechanism (SSM) for participating Member States, including euro area as well as non-euro area Member States which join the system, with specific micro- and macro-prudential tasks being conferred upon the ECB. According to the proposed SSM Regulation, the power to initiate and implement macro-prudential measures will primarily remain with the national authorities, subject to a notification and coordination mechanism vis-à-vis the ECB. Moreover, any national competent or designated authority may propose to the ECB to act in order to address the specific situation of the financial system and the economy in its Member State.

An important feature of the proposed SSM Regulation is that the ECB may, if deemed necessary, also apply macro-prudential measures, subject to the conditions and procedures specifically set out in the Capital Requirements Directive (CRD IV) and the Capital Requirements Regulation (CRR).

The **Capital Requirements Regulation and Directive (CRR/CRD IV)** aim to implement the Basel Committee's capital and liquidity framework for internationally active banks (so-called Basel III)

The CRR/CRD IV aims to implement the Basel III capital and liquidity framework in the EU

³⁷ See ECB, *Financial Stability Review*, December 2012, as well as Financial Stability Board, "Overview of Progress in the Implementation of the G20 Recommendations for Strengthening Financial Stability", available at http://www.financialstabilityboard.org/publications/r_120619a.pdf, and Basel Committee on Banking Supervision, "Report to G20 Leaders on Basel III implementation", available at <http://www.bis.org/publ/bcb220.pdf>.

in the EU. The framework is the spearhead of global financial reform efforts and it is regarded by the ECB as key for increasing the resilience of the banking system, restoring market confidence and providing a level playing field for the banking industry. The CRR/CRD IV proposal envisages an application scope of the framework that covers all credit institutions and investment firms in the EU and incorporates several provisions that are relevant for macro-prudential policy-making.

In this regard, the Regulation will enable Member States to impose, in cooperation with European authorities, stricter macro-prudential requirements on domestically authorised institutions in order to address increased risks to financial stability. These stricter measures can be applied on a temporary basis, covering inter alia the level of own funds, liquidity requirements, large exposure requirements, the level of the capital conservation buffer, public disclosure requirements, intra-financial sector exposures, and risk weights for targeting asset bubbles in the property sector.

The Directive will be transposed into national law by the Member States. In line with Basel III, it will introduce measures that are of particular relevance for macro-prudential policy, such as additional requirements for a capital conservation buffer of common equity Tier 1 (CET 1) capital, identical for all institutions in the EU, as well as an institution-specific counter-cyclical capital buffer. Moreover, Member States will have the possibility to introduce a systemic risk buffer of additional CET 1 capital for the financial sector, or subsets of it, or ad hoc buffers for selected institutions. In addition, specific buffer requirements will be mandatory for global systemically important institutions (G-SIIs³⁸) in the EU, and voluntary for other institutions at EU or domestic level (O-SIIs). On the basis of their systemic importance, G-SIIs will be subject to progressive additional CET 1 capital surcharges.

With regard to liquidity regulation, the CRR/CRD IV currently foresees implementation of the liquidity coverage ratio (LCR) by 2018. The LCR requires banks to hold a minimum level of high-quality liquid assets to withstand a stress scenario lasting 30 days. Similarly to Basel III, the LCR will be gradually phased in, starting in 2015. Full implementation is planned by 2018. This schedule implies a swifter implementation than currently envisaged by the Basel Committee, which agreed to reach the minimum requirement by 2019. However, the CRR/CRD IV also allows modifications to the implementation schedule including a deferment to 2019. The European Banking Authority (EBA), after consulting the European Systemic Risk Board, is tasked with assessing and reporting on the need for any modification to the LCR schedule to the European Commission by 30 June 2016. Moreover, the EBA will also have to report on the possible unintended consequences of the LCR on the EU economy, financial markets and the conduct of monetary policy by 31 January 2014.

Finally, the agreed CRR/CRD IV text also includes a number of new provisions on corporate governance, in particular regarding the restrictions imposed on variable remuneration.

The proposal for a Directive setting up an EU framework for the **recovery and resolution** of credit institutions and investment firms will, once it has been finalised and adopted, provide common and efficient tools and powers for addressing a banking crisis pre-emptively and managing bank failures in an orderly way in all Member States. For this purpose, the range of powers available to the relevant authorities consists of three elements: (i) preparatory steps and plans to minimise the risks of potential problems; (ii) in the event of emerging problems, powers to halt a bank's deteriorating situation at an early stage in order to avoid a failure (early intervention); and (iii) if an institution is failing or likely to fail, clear means to reorganise or wind down the bank in an orderly fashion while

38 Not to be confused with global systemically important insurers (also referred to as "G-SIIs" by the Financial Stability Board and the International Association of Insurance Supervisors).

Solvency II will harmonise insurance regulation in the EU and introduce a new regime of capital requirements for insurers

preserving its critical functions and limiting the impact on taxpayers, given that normal insolvency proceedings present a concern in terms of the general public interest. As stated in the ECB opinion on the proposed Directive³⁹, the ECB fully supports the development of a recovery and resolution framework and is of the view that the Directive should be adopted rapidly.

Concerning recovery and resolution for financial market infrastructures (FMIs), the European Commission published in October 2012 a consultation on a possible recovery and resolution framework for financial institutions other than banks. At the same time, work is ongoing at the global level where the Committee on Payment and Settlement Systems and the International Organization of Securities Commissions are currently in the process of finalising their recommendations on recovery and resolution of FMIs.

With regard to the revision of the **Directive on Deposit Guarantee Schemes (DGS)**, the overarching objectives are to maintain financial stability by strengthening depositor confidence and protecting their wealth in order to avoid bank runs in times of financial stress. The pursuit of these objectives is, in addition, driven by the need to further harmonise depositors' protection so as to enhance the internal market. The Directive sets a maximum ceiling of €100,000 for deposit protection in Europe. The DGS Directive and the Bank Recovery and Resolution Directive are important to achieve clear and harmonised frameworks in the EU and to make further progress towards the banking union.

Some technical progress on **insurance regulation in Europe** was made in the first half of 2013, but final decisions are expected only later this year. The Solvency II Directive and the Omnibus II Directive aim to harmonise the fragmented insurance regulation and will introduce, inter alia, a new regime of common capital requirements for insurers. The capital requirements of the current Solvency I regime are not risk-based and this absence of risk sensitivity in solvency calculations constitutes a significant drawback of the regime, as accounting valuations may mask true market and credit risks. What is more, the significant leeway that jurisdictions and insurers currently have in their solvency calculations implies that solvency ratios are not comparable across institutions or jurisdictions. While the forthcoming Solvency II regime will introduce a harmonised regime with risk-based capital ratios and an economic valuation of the balance sheet, it will also contain the impact of excessive market volatility. In order to reduce this "artificial" excessive volatility in the balance sheet, the "trialogue"

Table 3.7 Selected legislative proposals in the EU for the insurance sector

Initiative	Description	Current status
Solvency II	The Solvency II Directive aims to harmonise the different regulatory regimes for insurance corporations in the European Economic Area.	The Directive was adopted in November 2009. In July 2012, a short amending Directive was adopted by the European Commission that will move the date for implementation by Member States to 30 June 2013, and the date for application by companies to 1 January 2014. The Omnibus II Directive will set the date of entry into force of the Solvency II regime.
Omnibus II	The initial proposal will, inter alia, amend the Solvency II Directive.	The European Commission's proposal was published in January 2011. The key vote of the European Parliament is scheduled for October 2013. EIOPA will publish the results of the impact assessment of rules on insurance products offering long-term guarantees in June 2013, followed by "trialogue" negotiations between the Commission, Parliament and Council.

³⁹ Opinion of the European Central Bank of 29 November 2012 on a proposal for a directive establishing a framework for recovery and resolution of credit institutions and investment firms (CON/2012/99), available at http://www.ecb.int/ecb/legal/pdf/en_con_2012_99_f_sign.pdf.

Table 3.8 Selected legislative proposals in the EU for financial markets

Initiative	Description	Current status
The European Market Infrastructure Regulation (EMIR)	The Regulation aims to bring more safety and transparency to the over-the-counter (OTC) derivatives market.	The Regulation entered into force in August 2012. Related Commission Implementing and Delegated Regulations entered into force in January and March 2013, respectively. According to EMIR transitional provisions, trade repositories and central counterparties will have to apply for registration, authorisation or recognition (as appropriate) by mid-September 2013.
Regulation on improving the safety and efficiency of securities settlement in the EU and on central securities depositories (CSDR)	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 European Commission's proposal was published in March 2012. The proposal is currently being negotiated within the European Parliament, the European Council and the European Commission. In its opinion the ECB, inter alia, recommended that the proposed regulation and the corresponding implementing acts be adopted prior to the launch of TARGET2-Securities (T2S) in June 2015.
Review of the Markets in Financial Instruments Directive and Regulation (MiFID II/MiFIR)	The proposals, consisting of a Directive and a Regulation, aim to make financial markets more efficient, resilient and transparent, and to strengthen the protection of investors. The new framework will also increase the supervisory powers of regulators and provide clear operating rules for all trading activities.	The European Commission's proposal was published in October 2011. The proposals are currently being negotiated by the Council and the Commission and they are likely to be adopted by the end of 2013, with subsequent implementation by Member States and adoption of Level 2 technical standards. MiFIR will enter into force within 32 months of the adoption of the Level 1 acts, save where differently provided for.
Regulation on short selling and certain aspects of credit default swaps	The Regulation aims to establish a specific regulatory framework that can avoid the creation of obstacles to the proper functioning of the internal market. It harmonises the fragmented rules across Europe, confers powers on the European Securities and Markets Authority and aims to reduce the risk of settlement failures and market volatility.	The Regulation was adopted in March 2012. Both the Regulation and the implementation measures entered into force on 1 November 2012.
Revision of the Directive relating to undertakings for collective investment in transferable securities (UCITS V)	The proposal aims to ensure the safety of investors and the integrity of the financial markets.	The European Commission's proposal was published in July 2012. The proposal is currently being negotiated by the Council and the Commission.
Proposals on credit rating agencies (CRA III)	The general objective of the proposal is to contribute to reducing risks to financial stability and restoring the confidence of investors and other market participants in financial markets and the quality of ratings.	The European Commission's proposal was published in November 2011. The proposal was approved by the European Parliament on 16 January 2013.

parties agreed to request that the European Insurance and Occupational Pensions Authority (EIOPA) conduct an assessment of various countermeasures that could impact products with long-term guarantees. EIOPA will report the results of its assessment to the trialogue parties in June 2013.

In addition to the legislative proposals listed in the above tables, further regulatory initiatives are being considered by policy-makers in the EU. In this regard, on 14 February 2013 the European Commission published a proposal for implementing a **financial transaction tax (FTT)** in 11 euro area Member States⁴⁰ via enhanced cooperation.

40 Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia and Spain.

According to the proposal, the FTT is intended to: (i) enhance financial stability by curbing speculative trading; (ii) obtain a significant contribution from the financial sector for past and future crisis resolution; (iii) generate revenue; (iv) reap the benefits of the Single Market; and (v) compensate for the exemption of the sector from value added tax. In addition, the European Commission seeks to establish the FTT as an independent source of revenue to finance the EU budget.

The proposal is based on the residence principle complemented by the issuance principle, i.e. a transaction in a financial instrument is taxable if at least one of the parties in the transaction is established in one of the Member States participating in the enhanced cooperation or if the issuer of the financial instrument is located in a participating Member State. The Member State where the financial institution is established is the primary collector of the tax revenue. The proposed FTT is aimed at a broad scope of financial institutions and transactions, also including OTC transactions.

The impact of an FTT on financial stability is ambiguous. An FTT may curb high-frequency trading effectively if it is charged at the trading rather than at the settlement part of the securities transaction chain. However, the impact of high-frequency trading on overall financial stability is disputed. While an FTT will reduce the trading volume, in particular in derivatives markets, the evidence about the link between volume and volatility is inconclusive and contradictory. In the short term, volume and volatility are positively correlated, mainly because a large part of trading volume reflects the new arrival of information, which is incorporated in prices over time. However, a high trading volume may also in some circumstances produce its own volatility beyond that based on fundamentals.

In the field of **banking structures**, the High-level Expert Group on reforming the structure of the EU banking sector, chaired by Erkki Liikanen, presented its report to the European Commission on 2 October 2012. Considering the next steps, the Commission will look into the impact of these recommendations both on growth and on the safety and integrity of financial services in the course of 2013 and present legislative proposals.

With respect to **shadow banking**, the Financial Stability Board (FSB) is developing recommendations aimed at strengthening the oversight and regulation of this segment of the financial system, in order to address the systemic risks that stem from maturity and liquidity transformation, excessive leverage and regulatory arbitrage. Following a public consultation launched in November 2012, focused on (i) shadow banking entities other than money market funds and (ii) securities lending and repos, the FSB is expected to deliver a final package of policy recommendations in September 2013.

The FSB is expected to issue final policy recommendations on shadow banking in September 2013



SPECIAL FEATURES

A EXPLORING THE NEXUS BETWEEN MACRO-PRUDENTIAL POLICIES AND MONETARY POLICY MEASURES¹

The financial crisis highlighted the importance of systemic risks and of policies that can be employed to prevent and mitigate them. Several recent initiatives aim at establishing institutional frameworks for macro-prudential policy. As this process advances further, substantial uncertainties remain regarding the transmission channels of macro-prudential instruments as well as the interactions with other policy functions, and monetary policy in particular. This special feature provides an overview and some illustrative model simulations of the macroeconomic interdependence between macro-prudential instruments and monetary policy.

INTRODUCTION

A key lesson emerging from the financial crisis that erupted in 2007 was the inadequacy of the institutional policy frameworks prevailing at the time to deal with the build-up and materialisation of systemic risks. In particular, micro-prudential supervision proved to fall short by not accounting for the externalities associated with the activity of individual banks, i.e. their impact on the risk in the financial system as a whole. This led to the recognition of the importance of having macro-prudential policy arrangements in place to complement other policies, such as monetary and fiscal policy and micro-prudential supervision.

In response to these experiences, substantial efforts have been made to improve institutional arrangements for dealing with systemic risks. Macro-prudential oversight bodies have been set up in all the major economies (such as the European Systemic Risk Board in the EU, the Financial Stability Oversight Committee in the United States and the Financial Policy Committee in the United Kingdom).

Moreover, in the EU, a number of macro-prudential policy instruments are embedded in the legislative texts transposing the Basel III regulatory standards into EU law.² Furthermore, the introduction of the single supervisory mechanism (SSM) will partly lift macro-prudential policy-making to the supranational level, as the ECB-centred SSM will have the ability to implement macro-prudential measures set out in the EU legal acts (i.e. the CRD IV and the CRR).³ Specifically, with the establishment of the SSM, both national competent authorities and the ECB will be the designated authorities for macro-prudential policy for the euro area as well as for countries participating in the SSM. An important element of the SSM regulation is that, if deemed necessary for addressing systemic or macro-prudential risks, the ECB will be empowered to apply higher requirements for capital buffers and other macro-prudential measures beyond those applied by authorities of participating Member States.⁴

The instruments covered by the EU legal texts include counter-cyclical capital buffers, systemic risk buffers, capital surcharges for systemically important financial institutions (SIFIs), sectoral capital requirements/risk weights, leverage ratios, liquidity requirements and large exposure limits

The macro-prudential orientation of financial supervision in the euro area means authorities have effective instruments to intervene in the financial cycle

1 Prepared by Giacomo Carboni, Matthieu Darracq Pariès and Christoffer Kok.

2 Namely the new Capital Requirements Directive (CRD IV) and the Capital Requirements Regulation (CRR).

3 According to the SSM draft regulation. Macro-prudential measures not contained in the CRD IV and CRR will remain in the remit of national authorities.

4 Importantly, the SSM legislation recognises the role of national authorities in the conduct of macro-prudential policy in the EU. Specifically, whenever appropriate or deemed necessary, and without prejudice to the tasks conferred upon the ECB, the competent or designated authorities of the participating Member States shall apply the CRD IV/CRR measures, subject to the requirement of prior notification of their intention to do so to the ECB.

Table A.1 Key macro-prudential instruments

CRD IV	CRR	In addition to the legal texts
Counter-cyclical capital buffer (Art. 124)	Leverage ratio (as of 2019)	Margin and haircut requirements
Systemic risk buffer (Art. 124d)	Liquidity coverage ratio (as of 2015)	Loan-to-value ratio caps
Capital surcharge for SIFIs (Art. 124a)	Net stable funding ratio (as of 2019)	Levy on non-stable funding
Sectoral capital requirements/risk weights (Art. 119)	Sectoral capital requirements/risk weights (Art. 160, 443)	Loan-to-income ratio caps
	Large exposure limits (Art. 443a)	Loan-to-deposit ratio caps
	Increased disclosure requirements (Art. 443a)	

Source: ECB.

(see Table A.1). In addition, a number of macro-prudential instruments not covered by the legal texts are envisaged, such as caps on loan-to-value ratios⁵ or loan-to-income ratios, margin and haircut requirements and loan-to-deposit ratio thresholds.⁶ This broad array of macro-prudential instruments is intended to ensure that the goal of macro-prudential policy, namely of reducing systemic risk, is achieved. Systemic risk is an elusive and multi-layered concept, which can, at a minimum, be characterised along both a time dimension and a cross-section dimension,⁷ and hence it is generally recognised that multiple macro-prudential policy instruments may be needed to prevent the materialisation of systemic risks.

Notwithstanding these advances in the institutional set-up and the identification of relevant policy tools, substantial uncertainties surround the practical implementation of macro-prudential policies in the EU, including how to assess their potential impact on the financial system and the real economy. First of all, there is relatively limited practical experience with macro-prudential policies, at least in the major advanced economies.⁸ Likewise, while substantial conceptual work on defining systemic risk and how to address it has taken place in recent years, a broad consensus still needs to be formed on what the specific policy objectives of the macro-prudential policy-maker should be and how macro-prudential policy should interact with other policy functions (such as monetary policy and micro-prudential supervision). In this context, the Committee on the Global Financial System (2012) distinguishes between two main objectives of macro-prudential policies, namely: (i) increasing the resilience of the financial sector; and (ii) “leaning against the financial cycle”.⁹

Central in the definition of systemic risk is its pervasive nature, as well as its interaction with, and its impact on, the macroeconomic environment. Therefore, in addition to the obvious interrelation with the micro-prudential supervisory tasks of the SSM, due consideration will need to be given to how macro-prudential interventions in the euro area will interact with the conduct of monetary policy. Institutional frameworks are being established with separate decision-making, accountability and

5 One impediment related to using loan-to-value ratio caps on a euro area-wide basis is, however, the persisting differences across euro area countries with regard to the definition of these ratios and methods of collecting and aggregating relevant data. These discrepancies hamper the comparison of loan-to-value ratios and could hinder macro-prudential policy coordination among the euro area countries in the future. It would accordingly be opportune to enhance efforts to harmonise statistics in this field.

6 See also the forthcoming Recommendation of the European Systemic Risk Board on intermediate objectives and instruments of macro-prudential policy for an overview of envisaged macro-prudential instruments in the EU and ECB, “Macro-prudential policy objectives and tools”, *Financial Stability Review*, June 2010.

7 For a detailed discussion on the concept of systemic risk, see ECB, “The concept of systemic risk”, *Financial Stability Review*, December 2009.

8 Lim et al. (2011) provide an overview of lessons from country experiences with macro-prudential policies. In general, emerging market economies have made more extensive use of macro-prudential policies than advanced economies; see C. Lim, F. Columba, A. Costa, P. Kongsamut, A. Otani, M. Saiyid, T. Wezel and X. Wu, “Macroprudential policy: What instruments and how to use them? Lessons from country experiences”, *IMF Working Paper Series*, WP/11/238, International Monetary Fund, 2011.

9 See Committee on the Global Financial System, “Operationalising the selection and application of macroprudential instruments”, *CGFS Papers*, No 48, 2012.

communication structures. But formidable challenges lie ahead with regard to understanding and appropriately exploiting the macroeconomic interdependence between macro-prudential and monetary policies.

Against this background, this special feature surveys the recent literature on the conduct of macro-prudential policy and, in particular, explores its nexus with monetary policy, focusing on the objective of stabilising the financial cycle. It points towards some of the challenges and issues the SSM will face once it takes on its responsibilities as a macro-prudential policy-maker. In investigating the interaction between monetary and macro-prudential policies, the assessment is organised around two distinct, but interrelated dimensions. First, the focus is on the transmission mechanism of individual macro-prudential instruments from a system-wide perspective. Second, the emphasis is placed on the strategic complementarities in leaning against the financial cycle as well as in exceptional crisis circumstances.

THE MACROECONOMIC EFFECTS OF MACRO-PRUDENTIAL INSTRUMENTS: EXISTING EVIDENCE

Before embarking on macro-prudential interventions it will be crucial to conduct a thorough impact assessment. A useful starting point would be the stylised facts that emerge from the empirical literature on how changes in financial regulation affect banks and the wider financial and economic system. In general, policy measures affecting banks' balance sheets are likely to lead to adjustments in bank behaviour.

While there is some empirical evidence of the impact of changing capital requirements on bank loan supply and economic growth, evidence relating to the real economic impact of changes to liquidity requirements as well as asset-side regulation (such as loan-to-value ratios and loan-to-income ratios) is more limited.¹⁰

As regards the impact of changes to bank capital, a number of recent empirical studies suggest that banks typically react in a number of ways. A general finding is that banks, when faced with higher capital requirements (or capital shortfalls), are likely to adjust not only their equity levels (via retained earnings and the raising of capital), but also their lending decisions and credit conditions.¹¹ It is assumed that the reason for such adjustments is that banks target a specific capital (or leverage) ratio and hence deviations from this target will trigger balance sheet adjustments.¹² Such behaviour may, however, vary across individual banks and business models, which suggests that decisions on capital-related macro-prudential interventions should take into account information about the heterogeneity of the banks affected.¹³ Furthermore, analysing the experience with dynamic loan

This special feature explores the nexus between macro-prudential and monetary policies

Regulatory changes provide some indirect evidence of the impact of macro-prudential instruments

Policy measures affecting bank balance sheets are likely to lead to adjustments in bank behaviour...

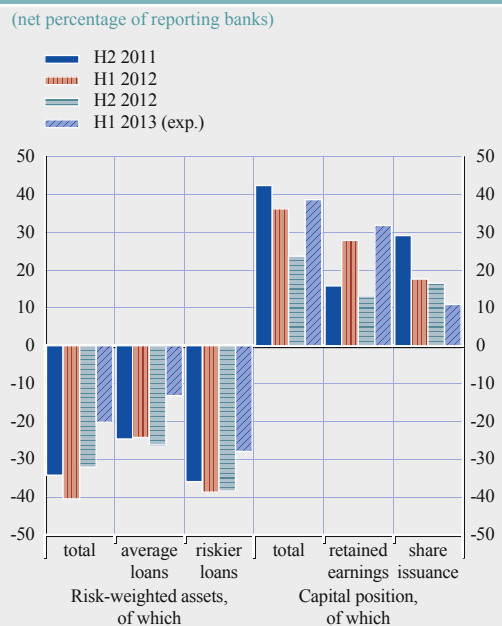
10 For some recent reviews of the literature on the transmission of macro-prudential policies, see IMF, "The interaction of monetary and macroprudential policies: Background paper", 2012, and CGFS, *op. cit.*

11 See, for example, J.M. Berrospide and R.M. Edge, "The effects of bank capital on lending: What do we know, and what does it mean?", *International Journal of Central Banking*, December 2010, W.B. Francis and M. Osborne, "Capital requirements and bank behavior in the UK: Are there lessons for international capital standards?", *Journal of Banking & Finance*, Vol. 36(3), 2012, pp. 803-816, L. Maurin and M. Toivanen, "Risk, capital buffer and bank lending: A granular approach to the adjustment of euro area banks", *ECB Working Paper Series*, No 1499, 2012 and G. Schepens and C. Kok, "Bank reactions after capital shortfalls", paper presented at the EBA research workshop on banks' business models after the crisis, November 2012.

12 See, for example, A.N. Berger, R. DeYoung, M. Flannery, D. Lee and O. Oztekin, "How do large banking organizations manage their capital ratios?", *Journal of Financial Services Research*, Vol. 34(2-3), 2008, pp. 123-149, M. Flannery and K.P. Rangan, "What caused the bank capital build-up of the 1990s?", *Review of Finance*, Vol. 12(2), 2008, pp. 391-429 and R. Gropp and F. Heider, "The determinants of bank capital structure", *Review of Finance*, Vol. 14(4), 2010, pp. 587-622.

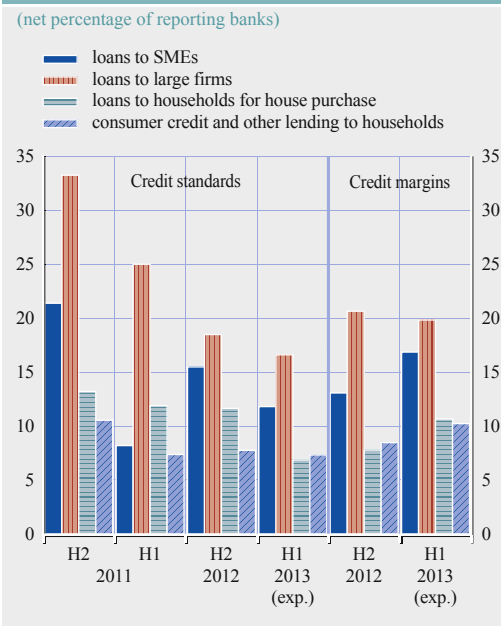
13 See, for example, A. Martin-Oliver, S. Ruano and V. Salas-Fumás, "Banks' equity capital frictions, capital ratios, and interest rates: Evidence from Spanish banks", *International Journal of Central Banking*, March 2013.

Chart A.1 Impact of CRD IV and other changes in regulatory requirements on banks' risk-weighted assets and capital position



Source: ECB's bank lending survey.

Chart A.2 Contribution of CRD IV and other changes in regulatory requirements to the tightening of credit standards



Source: ECB's bank lending survey.

provisioning in Spain, Jimenez et al. (2012) find that counter-cyclical capital buffer requirements (as reflected in the dynamic provisioning) tend to smoothen the credit cycle and can have positive real economic effects.¹⁴

... this is confirmed by the bank lending survey results...

These empirical findings are corroborated by results from the ECB's January 2013 bank lending survey which included responses from participating banks in the euro area on how the CRD IV and other changes in regulatory requirements had affected their balance sheets and credit standards. According to the banks' responses, these regulatory changes had induced a number of the banks to reduce their risk-weighted assets (especially related to riskier loans) and to increase nominal capital levels (via retained earnings and the raising of new capital) (see Chart A.1). At the same time, a number of banks indicated that the new and more stringent regulatory requirements had contributed to the net tightening of their credit standards (and the increase in lending margins) observed over the past two years (see Chart A.2).

...as well as by some recent empirical studies

Overall, much of the available empirical evidence indicates that changes to banks' capital (and liquidity) positions, and the impact thereof on lending behaviour in particular, can potentially have considerable real economic costs, at least in the transition phase. However, these short-term costs should ideally be outweighed by the long-term benefits arising from the policy interventions in terms of reducing the probability of a crisis. Much will depend on the extent to which regulatory

¹⁴ See G. Jiménez, S. Ongena, J.-L. Peydro and J. Saurina Salas, "Macroprudential policy, countercyclical bank capital buffers and credit supply: Evidence from the Spanish dynamic provisioning experiments", *European Banking Center Discussion Papers*, No 2012-011, 2012.

changes are of a transitory or permanent nature, and if the latter, the length of the transition period towards the “steady state” will play an important role.¹⁵

Turning to **asset-side macro-prudential instruments**, there is some (albeit limited) evidence that they can increase the resilience of banks by improving the creditworthiness of borrowers. Specifically, several studies find that tighter loan-to-value ratio caps reduce the sensitivity of households to income and property price shocks.¹⁶

Finally, Lim et al. (2011) suggest that several of the commonly used macro-prudential instruments reduce pro-cyclicality in the financial system.¹⁷ The analysis also suggests that the type of shock matters. Different types of risk call for the use of different instruments.

THE TRANSMISSION MECHANISM OF SELECTED MACRO-PRUDENTIAL INSTRUMENTS

The propagation of macro-prudential instruments is likely to interact with the transmission mechanism of monetary policy decisions, not least as they both affect the behaviour of financial intermediaries.¹⁸ In supporting the stability of the financial system and in seeking to dampen its pro-cyclical tendency, macro-prudential instruments generally involve significant balance sheet adjustments within the financial sector, with effects on credit provision, asset prices and overall financing conditions for households and firms. Those factors may influence the transmission of the monetary policy stance and, ultimately, the outlook for price stability. Conversely, monetary policy will be relevant for macro-prudential oversight as it can affect agents’ decisions on risk-taking, leverage and the composition of assets and liabilities. For instance, the risk-taking channel of monetary policy transmission underlines how protracted loose monetary conditions can foster incentives for financial institutions to take on more risk, thus encouraging leverage and paving the way to the build-up of financial imbalances.¹⁹ More broadly, changes in the monetary policy stance influence borrowers’ decisions on taking on debt by affecting the tightness of their borrowing constraints via the impact on asset prices and borrowers’ net worth and hence on the cost of external financing for borrowers.

A first step in exploring the interaction between macro-prudential oversight and monetary policy is to analyse the macroeconomic propagation of selected macro-prudential instruments, namely: (i) system-wide bank capital requirements; (ii) sectoral capital requirements; and (iii) loan-to-value ratio restrictions.²⁰ Intuitively, the aim of system-wide capital requirements is to increase the resilience of the banking system as a whole by ensuring adequate buffers to cope with potential sizeable losses.

The macroeconomic effects of selected macro-prudential instruments which may be used to lean against the financial cycle...

... interact significantly with interest rate decisions by central banks

15 In this regard, two frequently cited studies are the macroeconomic assessment of the transitory costs during the implementation phase of the Basel III framework carried out by the Macroeconomic Assessment Group of the Financial Stability Board and the Basel Committee on Banking Supervision and the Basel Committee on Banking Supervision’s long-term economic impact study weighing the long-run costs and benefits of the new capital and liquidity requirements embedded in the Basel III proposal; see Financial Stability Board and Basel Committee on Banking Supervision, “Assessing the macroeconomic impact of the transition to stronger capital and liquidity requirements: Final report”, 2010 and Basel Committee on Banking Supervision, “An assessment of the long-term economic impact of the new regulatory framework”, 2010.

16 See, for example, E. Wong, T. Fong, K.-F. Li and H. Choi, “Loan-to-value ratio as a macroprudential tool – Hong Kong’s experience and cross-country evidence”, *Hong Kong Monetary Authority Working Papers*, No 01/2011, 2011.

17 See Lim et al., op. cit.

18 An important limitation regarding the analysis presented in this special feature is that it focuses exclusively on the impact of monetary and macro-prudential policies on the banking sector. While in the euro area, banks are the most important part of the financial system, it is conceivable that macro-prudential policies (and monetary policy) could also affect financial intermediation of non-bank financial institutions.

19 See, for example, G. Jiménez, S. Ongena, J.-L. Peydró and J. Saurina, “Credit supply and monetary policy: Identifying the bank balance-sheet channel with loan applications”, *American Economic Review*, Vol. 102(5), 2012, pp. 1-30.

20 In so doing, the assessment abstracts from normative considerations related to how macro-prudential (and monetary) policy should be conducted, and focuses instead on the positive perspective of the impact of macro-prudential instruments and their interaction with the monetary policy stance.

Sectoral capital requirements, on the other hand, make lending to certain classes of borrowers more costly and hence prompt banks to reduce their activity in that segment. Third, restrictions on loan-to-value ratios pertain to the assets side of the banking system, directly affecting the borrowing constraints of banks' customers, and hence make the banking system less vulnerable to borrower defaults.

The academic literature assessing the impact of macro-prudential policy has been promising of late, but the knowledge gap in this respect remains substantial (see Box A.1 for a partial survey of existing studies). In this special feature, a tentative illustration of the transmission mechanism associated with these three key macro-prudential tools is provided using a medium-scale dynamic stochastic general equilibrium (DSGE) model comprising a relatively rich characterisation of the banking sector.²¹ Monetary policy in the model is formalised in terms of an interest rate rule that prescribes a response to inflation, output growth and asset prices.

First, faced with an *increase in system-wide capital requirements* (calibrated as a 1.5 percentage point change in the capital ratio), banks react by charging higher margins on new loans and curtailing the provision of credit symmetrically to both households and non-financial corporations, albeit to different extents (see Chart A.3). In addition, the resulting contraction in both investment and consumption expenditure depresses capital and house prices, which exacerbates the propagation effects through financial accelerator mechanisms (as the decline in collateral values tightens borrowing constraints). The impact on economic activity and inflation is mitigated by significant monetary policy accommodation. Therefore, monetary policy may provide a significant shield for macroeconomic allocations, provided it has scope to respond to bank balance sheet adjustment at times of increasing capital buffers. Conversely, a concomitant increase in capital requirements and the monetary policy rate can be expected to effectively curb bank lending and slow down economic activity.

Second, an *increase in sectoral capital requirements* makes the price of lending to the targeted sector relatively more expensive.²² This triggers relative price and asset price adjustments together with substitution effects in bank lending, whereby loans decline in the target sector while lending to the non-target sector increases (see Chart A.3). Overall, the effects on real GDP and inflation are influenced by the intensity of this substitution and the sectoral distribution of the transmission mechanism. In relative terms, capital requirements targeting loans to non-financial corporations appear to have stronger multipliers on real GDP and consumer price index inflation, thereby leading to a more accommodative monetary policy. Capital requirements targeting housing loans lead to a less clear-cut macroeconomic configuration for monetary policy.

Finally, a *lower cap on loan-to-value ratios* on loans to households constrains the maximum loan that a bank is willing to grant against collateral.²³ The transmission mechanism features some similarities with the case of sectoral capital requirements on housing loans. However, the adverse impact on housing investment and then on output and inflation is more pronounced, partly mitigated by a prompt loosening of the monetary stance (see Chart A.3).

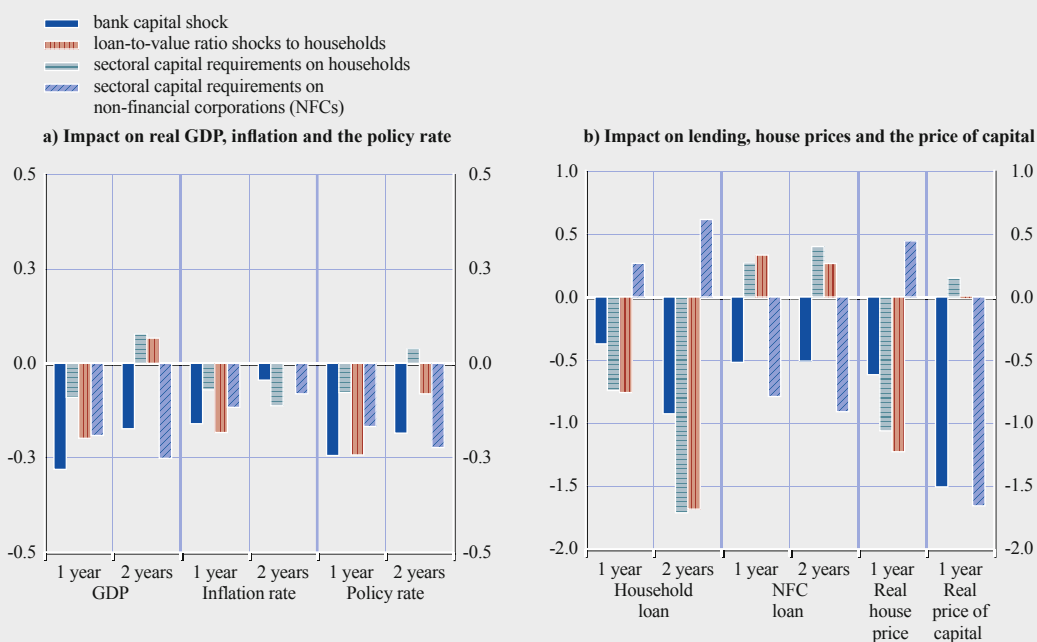
21 See M. Darracq Pariès, C. Kok and D. Rodriguez-Palenzuela, "Macroeconomic propagation under different regulatory regimes: evidence from an estimated DSGE model for the euro area", *International Journal of Central Banking*, December 2011.

22 The shocks to the sectoral capital requirement scenarios are calibrated so as to imply an increase in the lending spread for the target sector (i.e. lending rate minus the deposit rate, where the latter is the interbank rate) which is the same as the increase in the spread in the bank capital shock (in essence, the overall shock in the two sectoral capital requirement scenarios combined is equal to the bank capital shock).

23 The loan-to-value ratio shocks for households are calibrated so as to imply the same peak impact on household loans (in the second year) as the one underpinning the corresponding sectoral capital requirement scenarios.

Chart A.3 Transmission mechanism of selected macro-prudential instruments under endogenous monetary policy

(percentage point difference from baseline)



Source: ECB calculations.

Note: Simulations are carried out using the model developed by Darracq et al. (2011).

Notably, the illustration of the real economic implications derived from these simulations reflects the effects of introducing each of the macro-prudential instruments in isolation, but does not account for the strategic complementarities between macro-prudential instruments and the benefits of combining them.

Box A.1

ACADEMIC PROGRESS IN ASSESSING THE TRANSMISSION MECHANISM OF MACRO-PRUDENTIAL INSTRUMENTS

There is a small but resurgent body of literature on macro-prudential policy impact assessments. Some prominent early contributions identified the relevance of incorporating system-wide financial stability aspects into the overall institutional policy framework governing the monetary and financial system.¹ This insight was rooted in the recognition that financial systems are inherently pro-cyclical and the fact that financial cycles in general are longer than real business

¹ Crockett (2000) provided an early seminal contribution; see A. Crockett, "Marrying the micro- and macro-prudential dimensions of financial stability", *BIS Review* 76/2000, Bank for International Settlements, 2000. See also C. Borio, C. Furfine and P. Lowe, "Procyclicality of the financial system and financial stability: Issues and policy options", *BIS Papers*, No 1, Bank for International Settlements, 2001 and C. Borio, "Towards a macroprudential framework for financial supervision and regulation?", *BIS Working Paper Series*, No 128, Bank for International Settlements, 2003.

cycles.² Hence, there is a risk that financial developments become detached from fundamental real economic developments, which may lead to the build-up of unsustainable financial imbalances whose unravelling (“sudden busts”) could have detrimental short and long-run implications for economic growth. This, it is argued, provides a role not only for monetary policy, but also for macro-prudential policy to mitigate the risks of such divergences between the real and financial cycles.³

The pro-cyclicality of the financial system can be traced to the various distortions inherent in financial relationships stemming from the existence of asymmetric information (e.g. between banks and their borrowers), resulting in adverse selection and moral hazard problems, and limited enforcement technologies, whereby borrowing is constrained by the loss given default and leads to collateral constraints. This combination can result in distorted individual behaviour, whereby intermediaries do not internalise the impact that their default could have on the system and thus may give rise to excessive risk-taking and pro-cyclicality.⁴ In other words, there can be an endogenous build-up of imbalances within the financial system that, in the case of an adverse event, could give rise to a systemic event.⁵ Similarly, once built-up imbalances start to unravel and banks’ balance sheets become impaired, banks and their micro-prudential supervisors may react by shrinking the assets side, but in the process may fail to internalise that this could give rise to a credit crunch and asset fire sales that are likely to further amplify the initial shock.⁶ In the light of these insights, the role of macro-prudential policy should be to pursue a “general equilibrium” and, in doing so, constrain ex ante the risk-taking incentives underlying financial relationships in order to reduce systemic risks over the cycle and across institutions.⁷

Since, as mentioned above, systemic risks can take many forms, the macro-prudential toolkit requires several policy instruments. These tools should be able to cover both the time dimension and the cross-section dimension of systemic risk. Most of the existing literature evaluating the transmission and impact of macro-prudential policies, however, tends to focus on the time dimension,⁸ whereas studies on the cross-section dimension are much less widespread.⁹ In particular, many studies have focused on the effectiveness of counter-cyclical macro-prudential instruments in stabilising the credit cycle, alongside and interacting with the monetary policy function.

2 See, for example, M. Drehmann, C. Borio and K. Tsatsaronis, “Characterising the financial cycle: Don’t lose sight of the medium term!”, *BIS Working Paper Series*, No 380, Bank for International Settlements, 2012.

3 Arguably, however, the identification of financial cycles (and booms in particular) is inherently difficult, which in turn implies that the operationalisation of macro-prudential policies targeting financial cycle stabilisation is challenging.

4 For a few recent references, see G. Lorenzoni, “Inefficient credit booms”, *Review of Economic Studies*, Vol. 75(3), 2008, pp. 809-833, E. Mendoza, “Sudden stops, financial crises, and leverage”, *American Economic Review*, Vol. 100(5), 2010, pp. 1941-66, J. Bianchi, “Credit externalities: Macroeconomic effects and policy implications”, *American Economic Review*, Vol. 100(2), 2010, pp. 398-402 and T. Adrian and H.S. Shin, “Procyclical Leverage and Value-at-Risk”, *Federal Reserve Bank of New York Staff Reports*, No 338, 2008.

5 See, for example, M. Brunnermeier and Y. Sannikov, “A macroeconomic model with a financial sector”, Princeton University, manuscript, 2012 and F. Boissay, F. Collard and F. Smets, “Booms and systemic banking crises”, *ECB Working Paper Series*, No 1514, 2013.

6 See, for example, A. Shleifer and R.W. Vishny, “Unstable banking”, *Journal of Financial Economics*, Vol. 97(3), 2010, pp. 306-318, D. Diamond and R. Rajan, “Fear of fire sales, illiquidity seeking, and credit freezes”, *Quarterly Journal of Economics*, Vol. 126(2), 2011, pp. 557-591 and S.G. Hanson, A.K. Kashyap and J.C. Stein, “A macroprudential approach to financial regulation”, *Journal of Economic Perspectives*, Vol. 25(1), 2011, pp. 3-28.

7 See also IMF, 2013, op. cit.

8 Angelini et al. (2012) provide a comprehensive overview of existing modelling approaches to macro-prudential policy analysis; see P. Angelini, S. Nicoletti-Altimari and I. Visco, “Macroprudential, microprudential and monetary policies: Conflicts, complementarities and trade-offs”, *Banca d’Italia Occasional Papers*, No 140, 2012.

9 A notable exception is C.A.E. Goodhart, A.K. Kashyap, D.P. Tsomocos and A.P. Vardoulakis, “Financial regulation in general equilibrium”, *NBER Working Papers*, No 17909, 2012.

A common thread among these recent studies, while being subject to concrete model specifications overall, seems to be that macro-prudential and monetary policies in many instances can be expected to complement and support each other (as also mentioned above). However, there is also potential for a conflict of interest, or at least trade-offs, between them, such as a monetary policy that is too loose amplifying the financial cycle or, conversely, a macro-prudential policy that is too restrictive having detrimental effects on credit provision and hence monetary policy transmission. This underlines the need to ensure an appropriate institutional framework with effective coordination mechanisms among the different policy functions, with clear delineations of responsibility.¹⁰

¹⁰ See also S.G. Cecchetti and M. Kohler, “When capital adequacy and interest rate policy are substitutes (and when they are not)”, *BIS Working Paper Series*, No 379, Bank for International Settlements, 2012 and K. Ueda and F. Valencia, “Central bank independence and macroprudential regulation”, *IMF Working Paper Series*, WP/12/101, International Monetary Fund, 2012.

MACRO-PRUDENTIAL INTERVENTIONS TO LEAN AGAINST FINANCIAL IMBALANCES: IMPLICATIONS FOR MONETARY POLICY

In principle, price stability and financial stability are complementary and can be mutually reinforcing. Price stability contributes to financial stability by eliminating inflation-related distortions in financial markets, by containing the propagation of shocks via well-anchored inflation expectations and by mitigating pro-cyclicality in the economy. Financial stability facilitates a central bank’s task of maintaining price stability by containing excessive accumulation of credit, limiting unsustainable developments in asset prices and mitigating the pro-cyclical reinforcing loop between real and financial variables. At the same time, as also underscored by the developments prior to the global financial crisis, price stability, while being a necessary precondition, is not sufficient for financial stability. Indeed, in the run-up to the crisis, excessive risk-taking and the accumulation of financial imbalances proceeded together with, and were possibly amplified by, a seemingly favourable perception of risk, contained macroeconomic volatility and remarkable price stability.

The central banking community has long favoured the view that it may be ill-advised for monetary policy to mechanically counteract asset price misalignments and financial imbalances. At the same time, the depth of the current financial crisis calls into question this approach of a “benign neglect” of asset price misalignments and financial imbalances in the conduct of monetary policy. In essence, central banks should consider the possibility of responding to the financial cycle under certain circumstances, in particular if asset price movements are driven by capital flows and credit dynamics are based on unrealistic market expectations.

The ECB’s monetary policy strategy has two distinctive features aimed at preventing the neglect of credit and financial imbalances in its monetary policy actions, namely its medium-term orientation and the prominent role of monetary analysis. Regarding the latter, the ECB’s two-pillar strategy is a strategic device that contributes to limiting the tendency of monetary policy to be pro-cyclical in good times. By exploiting the association between asset price dynamics and monetary and credit developments, the monetary analysis indirectly incorporates asset price developments into policy conduct. By constantly monitoring developments in asset markets and cross-checking them with developments in the credit market and with the evolution of a number of liquidity indicators, the ECB can, at an early stage, contribute to limiting the potential of unreasonable expectations about asset prices developing further. As the recent crisis has illustrated, this monetary policy orientation is a necessary, but not sufficient, precondition for crisis prevention.

In line with the respective mandates and institutional arrangements...

... both macro-prudential interventions and monetary policy can effectively contribute to limiting the build-up of financial imbalances

The ECB’s monetary policy strategy already incorporates information about credit and financial imbalances

Therefore, in principle, monetary policy could certainly complement macro-prudential oversight in limiting the build-up of financial risk, curbing risk incentives and addressing excessive credit growth and leverage. In practice, the precise interaction between the conduct of monetary and macro-prudential policy is likely to be influenced by the degree of concordance between real and financial cycles, which is ultimately related to the underlying shocks driving the economy and the specificities in the transmission mechanism. In a euro area context, another important issue relates to the role of macro-prudential policy in dealing with heterogeneity in credit (and other financial) cycles within a monetary union. For instance, a loose monetary policy in an economy with booming credit and asset markets may encourage excessive risk-taking and fuel imbalances. Against this background, macro-prudential policy may be a valuable tool for aligning incentives in a counter-cyclical direction as well as for addressing country-specific developments that the single monetary policy is not specifically geared towards.

The time dimension of macro-prudential policy and its interaction with monetary policy...

From a research perspective, the investigation of the strategic interaction between macro-prudential and monetary policy has predominantly been carried out using DSGE models incorporating financial frictions. A general conclusion emerging from this literature is that counter-cyclical macro-prudential tools – such as time-varying capital requirements, counter-cyclical capital buffers and caps on loan-to-value ratios – can play a useful role in dampening the volatility of business cycles and can thus potentially be welfare enhancing.²⁴ For instance, the early contribution by Angeloni and Faia (2013) finds that, in a DSGE model where banks can be subject to runs, the optimal policy mix offers some role for monetary policy to lean against asset prices or bank leverage in combination with a counter-cyclical capital buffer rule.²⁵ However, the specific calibration (design and magnitude) of the macro-prudential rule determines its effectiveness in contributing to macroeconomic stabilisation. Angelini et al. (2011) likewise find that the mutual interaction of monetary policy and macro-prudential policy can be beneficial, especially during times when the economy is subject to large shocks, while a lack of coordination between the two policy functions can lead to conflicts of interest.²⁶ Beau et al. (2012) in turn emphasise that the extent to which monetary policy and macro-prudential oversight conflict largely depends on the nature of the underlying shocks affecting the economy at a given juncture.²⁷ Moreover, Lambertini et al. (2011) suggest that using a lean-against-the-wind monetary policy or a counter-cyclical macro-prudential policy can have different welfare implications for different economic agents (e.g. borrowers vs. lenders).²⁸ Darracq et al. (2011) find that macro-prudential policy can be more effective than monetary policy in addressing destabilising fluctuations in the credit markets, thereby alleviating somewhat the need for monetary policy to lean against the wind.²⁹

... has primarily been studied using DSGE models

Results vary depending on whether the macro-prudential policy targets the real economic cycle or the financial cycle

To shed some light on these issues, counterfactual simulations are conducted for the euro area economy assuming two alternative configurations for the systematic response of macro-prudential policy, where the latter is modelled in terms of counter-cyclical capital

24 As current state-of-the-art DSGE models are linear in nature and typically operate with representative agents, they have difficulties encompassing the multi-dimensional and potentially non-linear nature of systemic risk. This limits the scope for carrying out welfare analysis on simulated macro-prudential policies within this model set-up.

25 See I. Angeloni and E. Faia, “Capital regulation and monetary policy with fragile banks”, *Journal of Monetary Economics*, Vol. 60(3), 2013, pp. 311-324. An earlier version of the paper was published as a Kiel Institute for the World Economy Working Paper (No 1569). Another early paper, which focused on housing bubbles, is P. Kannan, P. Rabanal and A. Scott, “Monetary and macroprudential policy rules in a model with house price booms”, *IMF Working Paper Series*, WP/09/251, International Monetary Fund, 2009.

26 See P. Angelini, S. Neri and F. Panetta, “Monetary and macroprudential policies”, *Banca d’Italia Working Papers*, No 801, 2011.

27 See D. Beau, L. Clerc and B. Mojon, “Macro-prudential policy and the conduct of monetary policy”, *Banque de France Working Paper Series*, No 390, 2012; for a similar finding see I. Christensen, C. Meh and K. Moran, “Bank leverage regulation and macroeconomic dynamics”, *Bank of Canada Working Papers*, No 2011-32, 2011.

28 See L. Lambertini, C. Mendicino and M.T. Punzi, “Leaning against boom-bust cycles in credit and housing prices”, *Journal of Economic Dynamics and Control*, forthcoming.

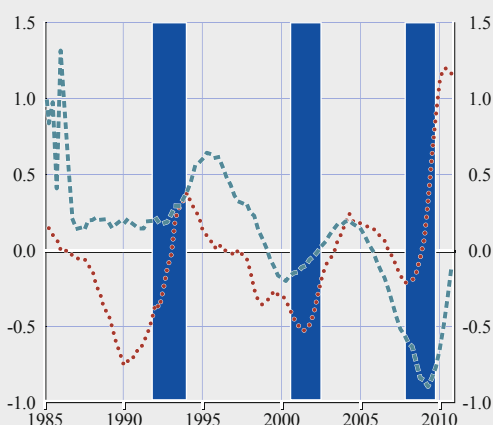
29 See Darracq et al., op. cit.

Chart A.4 Model counterfactuals under alternative systematic responses of macro-prudential policy

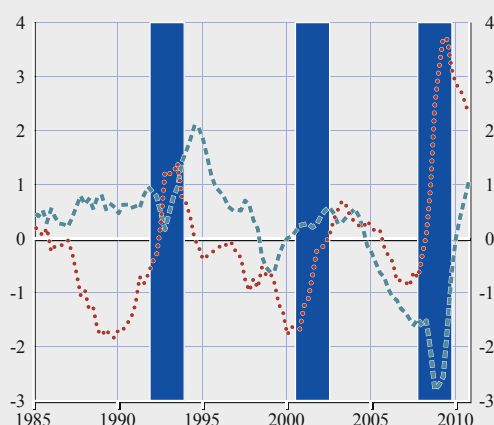
(percentage point deviation from baseline)

- euro area recessionary episodes
- counterfactual under capital rules based on the real cycle
- - - counterfactual under capital rules based on the financial cycle

a) Impact on real GDP



b) Impact on real MFI loans to non-financial corporations



Source: ECB calculations.

Notes: Simulations are carried out using the model developed by Darracq et al. (2011). MFI stands for monetary financial institution.

requirements.³⁰ Specifically, the capital requirements tool is assumed to respond in one configuration to standard real economy variables (such as real GDP and inflation) and in a second configuration to financial-related variables (such as leverage and asset prices). Monetary policy is allowed to respond endogenously to economic developments by adjusting the stance. Overall, two considerations stand out. First, throughout the regular business cycle, the impact of alternative macro-prudential configurations on GDP remains contained overall, while their effects on loans are more pronounced (see Chart A.4, panels a and b respectively). This is particularly evident in the case where the macro-prudential tool is a response to the financial cycle during the run-up to the latest financial crisis. Second, during the first part of the financial crisis (see the shaded areas furthest to the right in panels a and b of Chart A.4), the type of macro-prudential response that is effective in leaning against the financial cycle implies, however, a more adverse drop in loans to non-financial corporations and hence in real GDP. Intuitively, this is due to the change in capital requirements to account for the increase in leverage and in indebtedness ratios in the first part of the crisis.

THE SCOPE FOR MACRO-PRUDENTIAL INTERVENTIONS IN EXCEPTIONAL TIMES OF CRISIS

Once a credible macro-prudential framework has been developed and is understood by market participants, it may be appropriate and feasible to relax macro-prudential tools in times of financial stress. Indeed, the buffers built up during the upturns can be released to mitigate the reinforcing mechanisms at play in the downturn. At the same time, central banks have turned out to be the first line of defence against the risks of financial meltdown and the severe economic downturn

Macro-prudential policy could also play a useful role in macroeconomic stabilisation during crisis times...

³⁰ The counterfactual is conducted using the DSGE model of Darracq et al. (2011), on the basis of the historical shocks extracted from the model estimation over the sample from the first quarter of 1980 to the second quarter of 2008. Notably, this implies that the estimation period only partially covers the period of the financial and sovereign debt crises, during which monetary policy conduct has arguably been different from “normal” times.

... and could thus alleviate some pressure on monetary policy

experienced since 2008. While macro-prudential policy should strengthen the resilience of the financial system to economic downturns and other adverse aggregate shocks, monetary policy actions and notably non-standard measures remain very effective crisis management instruments in the context of specific disturbances affecting the functioning of the financial sector. Some research studies support this point. Applying a financial macroeconomic model for Japan, Kawata et al. (2013) find that, while macro-prudential policy is useful in reducing economic fluctuations by preventing the build-up of imbalances, it would need to be complemented by other policies to stimulate the economy during a contraction phase.³¹

At the current juncture, riskier borrowing segments in the euro area, and notably small and medium-sized enterprises (SMEs), are most vulnerable to bank credit supply constraints and excessive risk aversion on the part of lenders. Given the importance of SMEs for the euro area economy, the deterioration of their financial health, especially in stressed euro area countries, and their difficulties in accessing external financing is of particular concern in terms of the impact on capital expenditure and broad economic prospects.

For example, a relaxation of capital requirements may limit the economic contraction resulting from crisis-related financial amplification effects

Taking a theoretical standpoint, we attempt to illustrate how macro-prudential instruments could be considered to address the risk of rationing in some borrowing segments in a situation of heightened bank risk aversion.³² The model simulation is calibrated based on a one percentage point increase in expected default frequencies for non-financial corporations over a three-year horizon. It assumes that macro-prudential policy takes the form of sectoral capital requirements, while monetary policy is allowed to respond endogenously to economic developments. The macroeconomic implications of higher borrower riskiness hinge on the response of the banking system and bank lending policies. First, higher corporate borrower riskiness is priced by banks into the lending rate on new loans. This rise in the cost of financing for firms weighs on capital expenditure by triggering an adverse real-financial feedback loop, whereby weaker investment dynamics and economic growth depress asset prices, further aggravate the financial vulnerabilities of firms and thus lead to additional tightening of financing conditions. Second, it is assumed that lenders also respond to temporarily higher borrower risk by durably increasing their capital buffers to cope with unexpected losses misperceived as being long-lasting. This channel is meant to capture excessive risk aversion of lenders, which in turn leads to further capital constraints and hence deleveraging pressures for banks. In a nutshell, the pro-cyclicality inherent in borrowing constraints and the excessive risk aversion on the part of banking institutions lead to adverse amplification effects above and beyond the impact of higher corporate borrower riskiness per se. It is precisely this amplification mechanism that macro-prudential policy could aim to contain.

Specifically, one may assume that the combined impact of corporate credit risk shocks and bank capital constraints on macroeconomic variables could be partly mitigated by macro-prudential intervention to relax sectoral capital requirements on non-financial corporation loans (see Chart A.5). This policy response is effective in mitigating the large drop in the price of capital and thus contains the adverse reinforcing feedback loop between asset prices, tightening financing conditions and contracting corporate investments.³³ It should be recognised, however, that such a relaxation of macro-prudential requirements could be subject to potential conflicts of interest with micro-prudential supervisors who might have a preference for keeping solvency levels high to

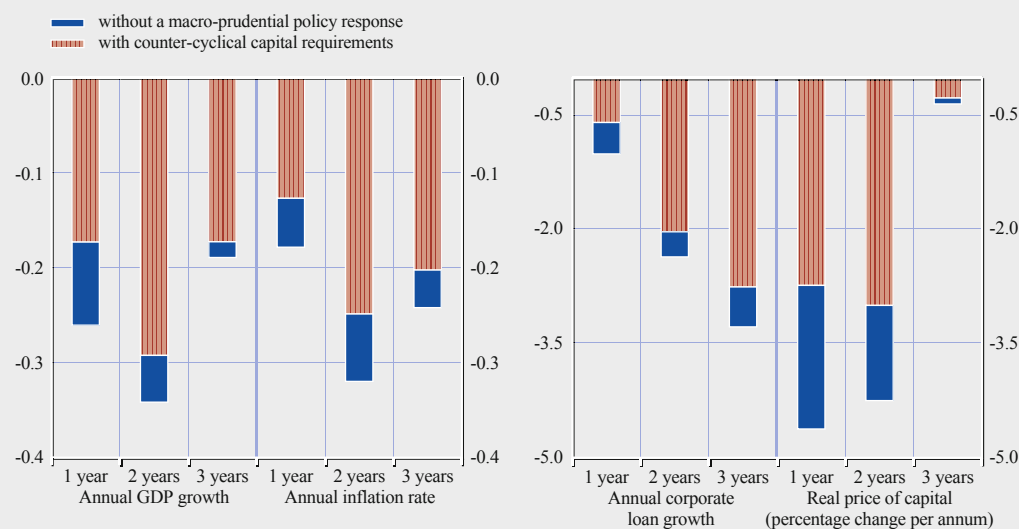
31 H. Kawata, Y. Kurachi, K. Nakamura and Y. Teranishi, "Impact of macroprudential policy measures on economic dynamics: Simulation using a financial macro-econometric model", *Bank of Japan Working Paper Series*, No 13-E-3, 2013.

32 The underlying assumption in this example is that the tightening of credit standards for risky borrowers goes beyond what could be perceived as reasonable based on borrower creditworthiness fundamentals.

33 Macro-prudential policy takes the form of setting the target for bank capital ratios, adjusted over the cycle depending on a set of macroeconomic variables.

Chart A.5 Macroeconomic implications of corporate credit risk shocks

(percentage point difference from baseline)



Source: ECB calculations.

Note: Simulations are carried out using the model developed by Darracq et al. (2011).

accommodate further shocks. Furthermore, it will be challenging to manage market expectations in an uncertain environment, and this will require a careful communication strategy.

CONCLUDING REMARKS

Macro-prudential policy has emerged from the recent financial crisis as a new important policy function. This has been reflected in the establishment of new macro-prudential bodies in the major advanced economies and macro-prudential instruments have also been enshrined in the legislative proposals implementing the Basel III regulatory framework. Furthermore, a clear macro-prudential policy role is envisaged for the ECB in the legislation establishing the SSM.

These developments notwithstanding, much work still needs to be carried out to improve our understanding of the transmission channels of macro-prudential policies, how macro-prudential policy interacts with other policy functions and its effectiveness both in terms of risk prevention and of risk absorption. This special feature has attempted to shed some light on these issues. It has to be recognised, however, that macro-prudential policy-making is still in its infancy and substantial uncertainties about its functioning remain.

With these uncertainties in mind, a key challenge when setting up institutional frameworks for macro-prudential policy-making will be to acquire sufficiently deep knowledge about the effectiveness and impact of alternative macro-prudential policy tools, including how they interact with other policies. Ultimately, a proper impact assessment of macro-prudential interventions is crucial for the precise design and calibration of the instruments.

The establishment of macro-prudential policy functions is an important step forward in preventing and minimising future crises...

... substantial efforts will be needed to deepen knowledge of the transmission and impact of macro-prudential instruments



B ASSET SUPPORT SCHEMES IN THE EURO AREA¹

Asset management companies (AMCs) have been established in a number of euro area countries to resolve large stocks of impaired bank assets following the financial crisis. This special feature describes some of the fundamental characteristics of such entities from a financial stability perspective. In particular, it reviews some of the lessons learned from the AMCs' establishment and early operations, notably regarding the eligibility of banks and assets, which has implications for the size and capital structure of an AMC, as well as the valuation of assets to be transferred, strategies for their management and disposal and other operational issues.

INTRODUCTION

The financial crisis has led to burgeoning levels of non-performing loans and other impaired claims at European banks. As traditional workout mechanisms have all too often proved to be ineffective in materially reducing bad claims, particularly during a systemic crisis, policy-makers have resorted to asset separation and guarantee schemes. Where established, AMCs have relieved banks of problematic claims in exchange for state-guaranteed bonds and other assurances. The exchange of assets for such bonds has typically provided some capital relief by reducing risk weights. Prominent country cases include the National Assets Management Agency (NAMA) in Ireland, the Sociedad de Gestión de Activos Procedentes de la Reestructuración Bancaria (SAREB) in Spain, and the Bank Asset Management Company (BAMC) in Slovenia, established in 2009, 2012 and 2013 respectively. Other forms of asset support have also been implemented, including tailored schemes for individual banks, such as the Swiss National Bank's stabilisation fund, special purpose vehicles in Germany and the United Kingdom's Asset Protection Agency.

While it remains too early to discuss the long-term merits of these schemes, not least given their relatively long expected lifespans, some central challenges and trade-offs have emerged, notably concerning which institutions and assets to include as well as the transfer price methodology and which business strategy to adopt.

OBJECTIVES AND MODALITIES OF ASSET SUPPORT SCHEMES

An overarching objective of official asset support schemes is to minimise the cost to the public of resolving impaired bank claims. By managing the assets until market conditions have improved, a higher sales price may be achieved, thus averting or minimising losses.

As with any policy instrument, clear objectives in considering asset separation are critical, not just in terms of the design of any scheme, but also to inform the key principles underlying that design. A number of relatively universal objectives have emerged, although the priority of these objectives may shift depending on the individual circumstances of the target banks, the nature of the support scheme, and the situation of the sovereign sponsoring it. While maintaining financial stability and restoring a healthy flow of credit to the economy is a priority for central banks, containing the impact of asset support measures on public finances and safeguarding a level playing field may also be critical considerations.

There are two main approaches to asset support which differ in terms of the management and ownership of problematic assets, the form of risk-sharing between government and the participating

Asset management companies have been created to deal with stocks of impaired assets...

... although challenges and trade-offs have emerged

Clear objectives are important for the design of support schemes

Two main approaches exist

¹ Prepared by Edward O'Brien and Torsten Wezel.

banks, and the time profile of the costs that arise from the scheme. These are: i) asset removal schemes; and ii) asset insurance or asset protection schemes.

Asset removal schemes involve separating the distressed assets of participating banks and moving them to an independent AMC.² This transfer allows banks to concentrate on running the healthy parts of their businesses and to possibly access funding on more favourable terms, while the distressed assets are managed by independent specialists. At the same time, participating banks typically record losses stemming from a transfer of assets at below book value. From a financial stability perspective, an asset removal scheme may be preferable where there is a high probability of a continued impairment of asset values.

In turn, asset insurance or protection schemes, such as the one set up in the United Kingdom, aim to isolate distressed, typically illiquid assets on a bank's balance sheet. They effectively establish a lower limit for valuation losses by invoking a government insurance scheme until market conditions and asset values recover. Although the assets remain formally on the bank's balance sheet, in practice the assets are typically ring-fenced in an internal workout unit and managed separately from the rest of the bank's assets. The main benefit of asset insurance schemes is that, despite the large contingent government liability, the scheme requires no initial public spending, nor do the banks have to report materialised losses as the assets are not sold.

This special feature focuses on asset removal schemes, and in particular on issues related to AMCs that are established to deal with the impaired assets of multiple banks.³

When may an asset removal scheme be necessary or desirable?

Before considering the specificities of asset removal schemes, it is worth exploring the key triggers that motivate the establishment of such a scheme. Setting up an AMC to receive bank claims generally represents a market intervention. At first sight, it appears less invasive to follow the strategy of placing impaired assets in an internal restructuring unit in conjunction with appropriate recapitalisation. However, under certain conditions a centralised AMC may be beneficial. These are outlined below.

Depressed market prices and collateral values: Asset support delivers relief through the value of time. A forced workout of problem assets, including property held as collateral, may further drive down market prices and set off a race to the bottom. Typically with an AMC, a long time span is envisaged for asset disposal, to be undertaken in a measured fashion and in line with normalisation of market conditions. NAMA and SAREB, for example, operate under the expectation of 10 and 15 year time spans respectively.

Loss of market access: A large portfolio of non-paying illiquid claims implies reduced cash flows that may lead to funding problems, particularly in the wholesale market. The transfer of assets to an AMC may provide banks with liquid, and possibly Eurosystem eligible, collateral. As sovereign-backed bonds, their holding typically has no capital charge and a relatively low funding cost.

Asset removal schemes involve the transfer of assets to an AMC...

... while asset insurance schemes protect against tail risks

AMCs have clear merits under certain conditions...

² There are a number of variants of such schemes. For example, an AMC may be established to warehouse the assets of just one participating bank or it may act as an aggregator, receiving assets from a number of banks.

³ Issues concerning special purpose vehicles or other spin-off entities tailored to address individual problem institutions are beyond the scope of this article.

... although recent research, while confirming these merits, also points to pitfalls

ECB published principles for such schemes in 2009...

Lack of capacity: Beneficiary banks may lack the resources to work out large quantities of impaired assets, whereas an AMC could attract the needed skills and be more productive in the management and workout of assets.

Low economies of scale: An orchestrated approach through the establishment of a single AMC may combine larger quantities of similar assets and is likely to lead to a better resolution of problem assets at lower cost.

Weak credit origination: The transfer of impaired assets to an AMC allows banks to better use their resources and refocus on lending activities rather than working out high stocks of non-performing loans. It also may facilitate the disposal of non-core assets that may be mandated by compulsory restructuring efforts, as a result of a state aid ruling.

Adverse incentives: If the workout process is protracted owing to the leniency of banks towards their borrowers to protect business relationships, an AMC can help speed up the process as it can act more decisively in the public interest.

Recent research tends to corroborate the potential benefits of an AMC, notably better access to funding and the expansion of lending following the capital relief provided, but also points to some challenges. In theory, for a bank to participate voluntarily in an asset removal scheme, the transfer value must more than compensate for opportunity and “stigma” costs. Specifically, the AMC option may entice the distressed bank to offload legacy assets only if the amount of safe assets received in return exceeds the value of the return on the bad assets under adverse conditions. Should the AMC lack the expertise to extract the full value of the transferred assets, however, a lump-sum subsidy in the form of a capital injection may have the same effect at lower cost.⁴ This course of action may create an element of moral hazard, however: were banks to foresee that a high stock of bad assets could eventually be offloaded to an AMC, they may become more risk-prone in the run-up to a crisis.⁵ In practice, however, the recently created AMCs have typically overcome these concerns by mandating involuntary participation and transferring assets at steep discounts.

GUIDING PRINCIPLES FOR ASSET SUPPORT SCHEMES

In considering the establishment of an asset removal scheme or an asset support scheme, a number of broad and generalised guiding principles of importance to policy-makers have emerged. In 2009 the ECB published a set of guiding principles for asset support schemes.⁶ The most relevant in the context of this discussion include those outlined below.

Institutions: The scope of institutions eligible to participate in a scheme is important. In the light of the objective of maintaining a level playing field, a scheme, which may be voluntary in nature, should as a principle remain open to all institutions with a large share of eligible assets. However, from a public finance perspective, carefully chosen criteria may be applied to limit participation to certain institutions such as those with large concentrations of impaired assets or with systemic relevance. The criterion for institutional eligibility in NAMA was guided by exposure to eligible

4 See A. Hauck, U. Neyer and T. Vieten, “Reestablishing stability and avoiding a credit crunch: comparing different bad bank schemes”, *Düsseldorf Institute for Competition Economics Discussion Papers*, No 31, 2011 and D. Dietrich and A. Hauck, “Government interventions in banking crises: effects of alternative schemes on bank lending and risk taking”, *Scottish Journal of Political Economy*, Vol. 59, No 2, 2012.

5 See C. Ilgmann and U. van Suntum, “Bad banks: a proposal based on German financial history”, *European Journal of Law and Economics*, March 2011.

6 ECB, “Guiding principles for bank asset support schemes”, February 2009.

assets, whereas for SAREB, the criterion for inclusion was the receipt of state aid. In both cases, participation was mandatory, subject to these criteria.

Assets: Given the differences in individual institutions' balance sheets, business models and financial conditions, a pragmatic case-by-case approach to selecting eligible assets is preferable. In each case, a decision should be made on the type of asset to be transferred and whether performing loans are also eligible, meaning that entire loan segments can be transferred. For both SAREB and NAMA, a relatively narrow scope of assets was identified and focused in large part on credits to the development and commercial real estate sectors.

Valuation: The valuation of eligible assets is a complex issue that is crucial for the ultimate success of any asset support scheme. Third-party expert valuations, preferably based on micro-level inputs and taking into account the asset types, should be used to arrive at reasonable haircuts and so yield the best estimate of the long-run value of the assets as well as the cost of the support measures. In practice, banks participating in AMCs in recent years have been subject to the European competition authority's rulings on state aid. These rulings have influenced the transfer price methodology, which is based on the concept of real economic value.

Risk-sharing: An adequate degree of risk-sharing is a necessary element of any asset support scheme so as to limit the cost to the public, provide the right incentives, minimise the risk of moral hazard and maintain a level playing field across institutions. This is particularly evident in the capital structure of a scheme. The extent and features of risk-sharing may be best decided on a case-by-case basis, although past experience may provide useful guidance.⁷

Governance: Commercial business criteria should be a key factor underlying the governance of asset support schemes, regardless of whether the scheme has resulted from outright bank nationalisation or not. Schemes that envisage well-defined exit strategies should be favoured, notwithstanding the fact that some schemes may have a long lifespan. These considerations may, for example, influence the design, especially in the case of asset removal schemes.

Conditionality: A key aim of asset support is to assist banks in restoring an adequate flow of lending with the support of private sector equity capital. Asset support measures may, therefore, be conditioned on commitments to continue meeting credit demand according to commercial criteria. Such conditionality might be needed because the self-interest of the privately-owned banks could otherwise lead them to focus on preserving and rebuilding their own equity.⁸

Duration: Finally, the duration of any scheme should be sufficiently long, taking into account the nature and maturity structure of the eligible assets. A sufficiently long duration tends to guard against losses otherwise incurred in the premature sale of acquired assets. Duration considerations may also affect the scope of eligible assets, particularly where the maturity profile of potential asset classes is significantly greater than the preferred duration of the AMC.

Since the guidelines were first published, a number of asset removal schemes have, as mentioned, been established in the euro area, allowing for a comparison with these guidelines and for a reflection on how these issues can be addressed in a practical manner. Ireland and Spain are two

... and recently established AMCs are broadly in line with these principles

⁷ In the Irish case, any residual losses incurred by NAMA at liquidation may be recovered through a special surcharge on participating banks, while the rewards to NAMA equity holders are capped.

⁸ On the other hand, research has shown that such conditionality may lead to overinvestment in risky assets under certain conditions and so lead to adverse outcomes (see Dietrich and Hauck, 2012).

countries in which an AMC has been established to deal with exposures relating to real estate. Overall, the frameworks chosen for these AMCs can be seen to be broadly in line with the guiding principles.

INSTITUTIONAL FRAMEWORK AND OPERATIONAL ISSUES

Devising an institutional framework for AMCs is important...

Policy-makers face a number of decisions when devising the institutional framework for an AMC, but they also have to address a number of operational challenges to ensure its proper functioning. The salient institutional issues may include the legal personality of the AMC, along with modalities for ownership, governance and capital structure, as well as the envisaged size of the AMC, the appropriate extent of bank participation and the eligibility of assets for transfer. Operational issues comprise the calculation of appropriate transfer prices in view of the characteristics of the assets and EU state aid rules, the management and disposal of acquired assets, and services provided by the AMC.

... and includes a number of decisions pertaining to...

The institutional framework typically establishes whether there should be a single AMC for the entire banking sector or multiple entities linked to beneficiary banks (special purpose vehicles). A single AMC is preferable if the transferred assets are fairly homogeneous – such as loans to a certain sector – or if a number of similarly affected banks will need to participate in the scheme. Conversely, bank-specific vehicles may be tailored to the characteristics of the beneficiary bank, including its impaired assets. The framework also determines the AMC's legal form as well as its ownership and capital structure. AMCs have been established as corporate entities that are either fully state-owned or have a majority participation of private investors. Moreover, an AMC may also be able to provide interim financing against strict criteria.⁹ Other modalities covered by the framework may include governance of the AMC, the range of services envisaged, as well as modalities for its termination and possible burden-sharing.¹⁰

... the size of an AMC...

The ultimate size of any asset removal scheme may need to be limited for a number of reasons. From a **fiscal perspective**, if the resultant AMC were to be state-controlled, the capacity of the state to absorb the increase in debt would have to be assessed, along with the need to provide adequate capital for the vehicle to operate. Furthermore, capital shortfalls that may arise in beneficiary banks as a result of transferring assets to the AMC at real economic value (i.e., below book value) may require the state to recapitalise the banks, putting further stress on the fiscal outlook. Naturally, the larger the AMC, the greater the potential for large capital shortfalls to emerge. A privately-owned AMC may be classified outside the government sector, and therefore not result in an increase in government debt, provided a number of conditions are met.¹¹ However, a number of challenges arise in achieving such a status, stemming from the size of the entity. The vehicle will have to

9 Theoretically, an AMC could be given a banking license to facilitate the provision of credit to third parties. However, this would likely subject the AMC to bank regulation and supervision as well as stricter disclosure requirements, which may obstruct the discharge of its responsibilities. Granting an AMC a banking license may risk corrupting its primary function and may have an adverse impact on the design parameters of the entity, as forbearance could be a means by which the AMC could mask losses. Furthermore, a state-controlled bank established in times of financial sector stress may not be well-disciplined and sufficiently commercially oriented. None of the three recently created AMCs have obtained a banking license.

10 The design of an AMC may include "claw-back" provisions so that losses incurred by the AMC may be recouped from the participating banks in the future. With ill-conceived claw-back provisions, there may be less effort to perfect valuations on transfer and to maximise the value of the assets.

11 According to the rules by which Eurostat compiles government deficit and debt statistics, an AMC which is majority privately-owned may be classified as outside the government sector, even if its liabilities have received a government guarantee, provided that it is established for a temporary duration, has the sole purpose of addressing the financial crisis and its expected losses are small in comparison with the total size of its liabilities. See also Eurostat guidance on such structures in Section IV.5 of the Manual on Government Deficit and Debt, available at http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-13-001/EN/KS-RA-13-001-EN.pdf. Both NAMA and SAREB are classified as being outside the government sector.

be adequately capitalised in order to satisfy statistical authorities that any losses incurred by the AMC will not ultimately have to be borne by the state. Furthermore, the requirement of majority private ownership effectively limits the likely size of any such vehicle, as the potential for raising private capital may be limited. Finally, while it may be desirable for an AMC to be classified as being outside the government sector, insofar as its liabilities are guaranteed, the AMC remains a contingent liability of the state and adverse developments may have an impact on its status. This again raises the discussion on size, as a very large entity relative to the state may pose risks, perceived or otherwise.

From the **perspective of an AMC**, there are also a number of reasons to consider limiting size. Primarily, the greater the amount of assets to be managed by the AMC, the more challenging the operational task. Of course, an appropriate organisational structure may mitigate such concerns, including the establishment of more than one AMC. However, market distortion concerns may also arise if an AMC were to absorb large proportions of assets from a given system. From the central bank perspective, a very large AMC may also be undesirable.

The capital structure adopted by an AMC is subject to the ownership structure. Typically, the main portion of AMC liabilities are government-guaranteed senior bonds. The eligibility of such bonds for Eurosystem credit operations by participating banks has been a crucial aspect of the success of these schemes. As mentioned previously, if the AMC is to be classified as a financial corporation, rather than within the government, then sufficient private capital must be raised from private participants to assure majority private ownership and adequate loss-absorbing capacity before government guarantees are called. Private capital may be in the form of equity and subordinated debt and complemented by the aforementioned government-guaranteed bonds, as in the case of NAMA and SAREB. Beyond these general considerations, the financial structure of an AMC may be tailored to specific circumstances, as evidenced by the different approaches taken by NAMA and SAREB. Flexibility may be desirable to ensure that the entities can evolve over time to take advantage of market developments and other changing circumstances.

Beyond size, the scope of eligible assets is another key consideration, although it may be difficult to effectively separate decisions on scope from decisions on size. AMCs may have a greater chance of success if they acquire high-value assets and if those assets are relatively homogeneous in nature. For example, in this respect, NAMA primarily acquired large exposures relating to land, development and other commercial property assets. SAREB accepted similar assets, as well as foreclosed residential properties.¹² The inclusion of small, granular assets may be best avoided, given that the intensity of the workout may not be commercially viable. In addition, social sensitivities should not be overlooked either in the choice of eligible assets, suggesting perhaps that residential mortgage loans should not be transferred.

Another consideration is the inclusion of performing loans in addition to non-performing loans.¹³ For example, both NAMA and SAREB took on performing claims from participating banks. The inclusion of such assets may result from requirements on banks as part of compulsory state aid restructuring plans that aim to terminate non-core activities, typically requiring the transfer of entire asset classes. However, a balance needs to be struck to ensure that such requirements respect the objectives and principles underlying the design of the AMC. Furthermore, certain performing

... the capital structure...

... and the scope of assets eligible for transfer...

... which may include assets that are still performing but are problematic

¹² The impact of holding these more granular, lower value assets will be mitigated, however, by the fact that the banks that originated these assets will utilise their own resources (e.g. branch network) to sell the properties, relieving SAREB of that task.

¹³ This may be particularly troubling for syndicated loans, where the impairment of such loans through transfer to the AMC may result in entire projects becoming impaired and thereby also generating impairments for other banks that may or may not be participating in the AMC.

loans may have a high probability of becoming impaired in the near term and on that basis may warrant inclusion in the scheme, particularly if the transfer of assets to the AMC is envisaged to be a one-off event. In such cases, it would be better to transfer all problematic assets within the envisaged transfer window, whether or not they are considered to be impaired at that point in time. In general, a single asset transfer window may also be preferable in order to bring some degree of certainty to the process and to avoid an ongoing series of transfers and subsequent recapitalisations by participating banks. Furthermore, if there are any doubts surrounding the classification of assets on banks' balance sheets, or if there are concerns that forbearance has been used by banks to avoid recognising impairments, it may also be wise to transfer exposures to problematic sectors to the AMC, as they may later be shown to be impaired after the transfer window has closed. On the other hand, the transfer of performing claims may be seen as detrimental in that it reduces participating banks' cash flows and revenue and severs long-term business relationships. Moreover, performing loans transferred to the AMC, particularly commercial loans with bullet repayments, may become non-performing solely because the AMC could become unable to extend additional credit. Conversely, it has been argued that a certain share of non-performing loans should be left in the beneficiary banks to safeguard a level playing field with non-participating institutions, although the likely difference in the evolution of non-performing loans across banks also needs to be considered.

Proper pricing of transfers is key for the success of a scheme...

Once the eligible banks and assets are selected, appropriately pricing the asset transfers becomes critical for the entire operation, including for banks and the sovereign. If the transfer price is too high relative to the ultimate sales price, the scheme will be loss-making and the operation will ultimately have resulted in a net transfer to participating banks; too low and those banks will face larger capital shortfalls, the cost of which is most likely to be borne by the taxpayer, although the AMC may then go on to be profitable over its lifetime. EU regulations prescribe a general pricing concept, that of "real economic value" (REV), as AMC operations will necessitate the provision of state aid to beneficiary banks, and competition authorities have a key role in overseeing the implementation of this concept.

... and needs to be in line with real economic value...

Past cases have shown that a conservative approach based on long-term economic value can satisfy these requirements. REV is the transfer value that reflects the underlying long-term economic value of an asset on the basis of observable market inputs and realistic and prudent assumptions about future cash flows.¹⁴ Using REV rather than market or fair value is deemed to adequately counterbalance temporary market exaggerations fuelled by crisis conditions. REV can be estimated as the sum of the discounted expected cash flows until the maturity of the asset, which corresponds to the payment stream's net present value.¹⁵ Notwithstanding this definition, REV is notoriously difficult to calculate as several parameters such as expected loss – derived from applying the probability of default, the loss given default and a discount factor to projected cash flows – need to be calibrated. Using historical values may no longer be valid in the presence of structural change. The uncertainty surrounding REV has led policy-makers to apply conservative haircuts to asset values and occasionally burden-sharing mechanisms for retroactively adjusting the transfer value or recouping eventual losses. In cases where AMC bonds are exchanged for the transferred assets, another important factor in determining total transfer value is the coupon rate on those bonds.

¹⁴ See European Commission, "Communication from the Commission on the Treatment of Impaired Assets in the Community Banking Sector", 2009.

¹⁵ For more details, see Y. Boudghene and S. Maes, "Relieving Banks from Toxic or Impaired Assets: The EU State Aid Policy Framework", *Journal of European Competition Law & Practice*, October 2012.

*... which likely
leads to conservative
valuations*

*Other operational
elements are
critical as well*

In terms of the structure of an AMC, achieving a classification of being outside the government sector may require that a suitably conservative REV approach be taken to ensure that the expected losses arising in the vehicle will be relatively small. In practical terms, a number of options have been pursued in this regard. NAMA relied on tranche-by-tranche due diligence of the loan assets. SAREB, on the other hand, applied a contemporary stress-testing exercise, subject to some methodological adjustments. In this case, however, a follow-up due diligence exercise is also part of the process.¹⁶

A number of other critical elements affect the design and implementation of an AMC. State aid considerations may spill over into participation incentives. A bank which may not need state aid, but still wishes to participate in a centralised AMC may be dissuaded from doing so. Participation will require a state aid ruling and a subsequent restructuring plan being agreed with competition authorities. In order to maintain a level playing field, the financial stability dimension needs to be borne in mind, giving some weight to the argument for making participation in any such scheme mandatory, so as to ensure that certain asset classes are cleanly removed from the system as a whole, or at least from a significant subset of that system. Lastly, from a practical perspective, a number of operational issues may typically arise, against which appropriate measures can be taken.

Level playing field: In the case of a partially privately-owned AMC, there is a resource transfer from a less affected part of the sector to a participating bank, which may benefit the owners of the bank as well as its bondholders. Presuming an appropriate transfer value, this benefit consists in capital relief through the reduction of risk-weighted assets and the provision of liquid bonds that possibly have a relatively high risk-adjusted yield. Both of these compromise the level playing field. Corrective arrangements to counterbalance this subsidy may include profit-sharing with or direct compensation of non-beneficiary banks as well as bailing in junior bondholders of the participating banks. In some cases, the large haircuts imposed on transferred assets may also be motivated by the desire to attain an adequate return on equity for the private shareholders of the AMC.

Asset management and disposal: The framework also lays out the AMC's strategy for managing and eventually disposing of the acquired assets. In this, the AMC needs to strike a balance between the preference for quick disposals and avoiding losses. More specifically, it faces the trade-off between selling the assets quickly with a higher likelihood of a loss-making sales price and binding resources while waiting for market conditions to further normalise. If the lifespan of the AMC is relatively short, a wait-and-see strategy may lead to a high degree of state ownership in private corporations.

Liquidity management and debt redemption: To ensure that an AMC's overarching goal – the timely wind down of its portfolio – is achieved and not diverted, strict guidelines should be laid down to ensure that an AMC reduces its outstanding liabilities at every reasonable opportunity, bearing in mind the natural priority of the capital structure, and does not run up large cash buffers.

Vendor financing: To facilitate the efficient wind-down of the entity, agreements should be put in place to ensure that vendor financing is available to potential buyers of AMC assets, at market conditions. Without such financing, and in the context of what may be tight credit conditions, an AMC may have difficulties selling assets. In addition, it may be beneficial, albeit under strict criteria, for an AMC to provide interim financing, for example, to real estate developers so that ongoing projects may be finished in a timely manner.

¹⁶ Stress tests alone cannot be sufficient to value assets for transfer to an AMC, as only asset-by-asset due diligence can ensure the quality of information and, for example, ensure legal title to collateral.

External servicing: A number of reasons may make it impractical for the AMC to consider managing all of its assets, namely the sheer number of assets, the resources required to carry out such tasks or a lack of specific knowledge of the assets. Each of these can be overcome by agreements with the participating banks so that they continue servicing the assets they have transferred to the AMC in return for appropriate fees. Alternatively, servicing through third-party providers may be considered. To be successful, these agreements must be appropriately prescriptive, have quantifiable benchmarks in terms of performance and take into account the incentives of the stakeholders.

CONCLUDING REMARKS

This special feature has described some of the fundamental characteristics of asset removal schemes, within the broader field of asset support measures, from a financial stability perspective. A review of objectives and modalities for asset removal, particularly through the use of AMCs, suggests that several metrics are important in the design of such schemes. Decisive factors in designing an effective AMC include size, scope, governance and participation incentives. Practical experiences to date suggest that such schemes can be very helpful in strengthening the banking sector; indeed, recent initiatives have illustrated how a comprehensive banking sector clean-up in the case of legacy issues can be an effective means of fostering a more efficient and resilient banking sector.

C NEW ECB SURVEY ON CREDIT TERMS AND CONDITIONS IN EURO-DENOMINATED SECURITIES FINANCING AND OVER-THE-COUNTER DERIVATIVES MARKETS (SESFOD)¹

In the run-up to the global financial crisis that began in mid-2007, leverage and risk-taking in the financial system increased substantially, in particular in the shadow banking system. This increase was facilitated by an erosion of credit terms in securities financing and over-the-counter (OTC) derivatives markets, which served as important conduits for leverage in the financial system. Recognising the lack of information on such developments, a number of major central banks, including the ECB, have started to conduct regular qualitative surveys on changes in credit terms and conditions in these wholesale credit markets.

This special feature presents the key features and some of the first results of the recently launched quarterly ECB survey on credit terms and conditions in euro-denominated securities financing and OTC derivatives markets (SESFOD). It also discusses how the survey could be used for macro-prudential monitoring purposes.

INTRODUCTION

In April 2013 the ECB published the first results of the new qualitative quarterly survey on credit terms and conditions in euro-denominated securities financing and OTC derivatives markets (SESFOD).² The SESFOD has been developed as part of an international initiative following a recommendation by the Committee on the Global Financial System's study group that macro-prudential authorities "consider the value of regularly conducting and disseminating a predominantly qualitative survey of credit terms used in these markets, including haircuts, initial margins, eligible pools of collateral assets, maturities and other terms of financing".³ In addition to the ECB, the Bank of Canada, the Bank of England⁴ and the Federal Reserve System⁵ also conduct similar surveys, but at the time of writing only the ECB and the Federal Reserve were disseminating aggregate results publicly.

MOTIVATION FOR THE SURVEY

The financial crisis highlighted the importance of the shadow banking system – which refers to credit intermediation involving entities and activities (fully or partially) outside the regular banking system – as a conduit for leverage and maturity/liquidity transformation and as a source of contagion risk stemming from increased interconnections in the financial system. The SESFOD covers both securities financing (lending collateralised by securities) and OTC derivatives transactions not only because of this conduit role, but also because derivatives in many cases are close substitutes for securities financing transactions – for example, derivatives can be and have been used to replicate a repo transaction through a "synthetic" repo.⁶ Furthermore, the financial crisis and the ensuing regulatory initiatives prompted a greater preference for the collateralisation of credit exposures, including a shift from unsecured to secured lending, thereby elevating the importance of collateral management and collateralised markets for funding purposes.

The recently launched SESFOD has been developed to monitor...

... the role of covered wholesale market segments as conduits for leverage in the financial system

1 Prepared by Tomas Garbaravičius.

2 See http://www.ecb.int/press/pr/date/2013/html/pr130430_1.en.html.

3 See Committee on the Global Financial System, "The role of margin requirements and haircuts in procyclicality", *CGFS Papers*, No 36, March 2010.

4 See <http://www.bankofengland.co.uk/financialstability/Pages/survey/Qualitative.aspx>.

5 See <http://www.federalreserve.gov/econresdata/releases/scoos.htm>.

6 See Bank of England, *Quarterly Bulletin*, Vol. 50, No 4, Q4 2010.

The survey will shed more light on the various associated potential risks to financial stability...

... and should serve as a systematic and valuable market intelligence and monitoring tool

For monetary policy, funding conditions in interbank and repo markets are important

The qualitative nature of the survey has a number of advantages

The survey should benefit financial stability monitoring in two ways. First, it will shed more light on the various potential risks associated with securities financing and derivatives markets, including, among others, a build-up of excessive financial leverage, increased interconnectedness, vulnerability to pro-cyclicality and “repo runs”.⁷ In particular, information on changes in credit terms for the important types of counterparty, collateral and derivatives should support empirical research on euro-denominated markets, which at least in the case of euro repo markets so far has been less advanced than for US dollar repos.⁸

Second, by drawing attention to significant changes in credit terms and conditions, the survey should also serve as a valuable monitoring and potential early warning tool to support risk identification and risk surveillance processes. The survey can be characterised as a systematic, high-quality and timely market intelligence and surveillance tool allowing for comparisons over time. During the build-up of financial vulnerabilities, survey findings should signal rising leverage, lower haircuts, increasing willingness to take counterparty credit risk and a stronger risk appetite more generally. Closer to the beginning of a financial dislocation, survey results may warn about pending problems through, for example, increased valuation disputes or a significant tightening of financing terms. Indeed, during the recent financial crisis, an increase in valuation disputes proved a good leading indicator of stress within the financial system.⁹

For monetary policy, information on changes in the cost and availability of funding in wholesale markets, and in repo markets in particular, will support the analysis of monetary policy transmission and interbank funding conditions. In this respect, the survey is a natural analogue to well-established bank lending surveys capturing supply and demand conditions for bank loans to the real economy.

Despite limitations inherent to all qualitative surveys, the SESFOD is a very useful complement to still rather limited quantitative data on the covered markets.¹⁰ It is fairly comprehensive and timely: in the future its results should be published around one month after each three-month reference period. Credit terms, such as collateral and margin requirements, are subject to changes in market practices and involve a large number of parameters, all of which, and some in particular, may not be easy to capture quantitatively. By contrast, a qualitative assessment can provide a strong directional indication without requiring the collection of quantitative details of the specific terms.¹¹ It would also be quite difficult and costly to monitor quantitatively changes in various non-price terms, such as credit limits or covenants and triggers. The experience during the financial crisis suggests that changes in non-price terms that affect the availability of funding, often in a binary way (for example, through cuts in credit limits or narrower lists of eligible collateral), usually have a much more adverse impact than changes in price terms, haircuts or initial margin requirements.

7 For an enumeration and description of risks associated with securities financing, see Section 1 in Financial Stability Board, “Consultative document: Strengthening oversight and regulation of shadow banking – A policy framework for addressing shadow banking risks in securities lending and repos”, November 2012.

8 For a review of the academic literature on securities financing transactions, see Annex 3 in Financial Stability Board, “Securities lending and repos: Market overview and financial stability issues”, April 2012.

9 See M. J. Eichner and F. M. Natalucci, “Capturing the evolution of dealer credit terms related to securities financing and OTC derivatives: Some initial results from the new Senior Credit Officer Opinion Survey on dealer financing terms”, *Federal Reserve Board Finance and Economic Discussion Series*, No 2010-47, September 2010.

10 As in the case of OTC derivatives markets, a consensus among policy-makers has emerged that a centralised collection of information, e.g. through trade repositories, is the preferred way of ensuring adequate high-frequency data on securities financing markets. See V. Constâncio, “Shadow banking – The ECB perspective”, speech given on 27 April 2012, Annex 2 in Financial Stability Board, “Consultative document: Strengthening oversight and regulation of shadow banking – A policy framework for addressing shadow banking risks in securities lending and repos”, November 2012 and ECB, “Enhancing the monitoring of shadow banking”, *Monthly Bulletin*, February 2013.

11 See M. J. Eichner and F. M. Natalucci, op. cit.

SCOPE AND COVERAGE

The SESFOD is intended to monitor financing conditions and risk appetite in securities financing and OTC derivatives markets that are of particular relevance for the Eurosystem and, therefore, its focus is on credit terms for euro-denominated instruments. In the same vein, the Bank of Canada and the Federal Reserve surveys cover Canadian and US dollar-denominated instruments respectively. The Bank of England, however, given the role of London as a financial centre, asks respondents to cover three currencies, namely the pound sterling, the euro and the US dollar, but only for significant activities conducted from respondents' UK offices. By contrast, other central banks ask reporting institutions to report about their global credit terms so as to maintain a consolidated perspective on the applied price and non-price credit terms.

SESFOD respondents are large banks active in targeted euro-denominated markets. They report changes in credit terms from the perspective of the firm as a supplier of credit to customers (rather than as receiver of credit from other firms). This pragmatic focus on the largest banks, both within and outside the euro area, ensures that the SESFOD covers as large a part of euro-denominated markets as practically feasible. To some extent, such a focused reporting approach is even necessary as survey responses are not weighted – the costs of designing a weighting scheme and of regularly collecting the required information for such a scheme may outweigh its benefits given the potential complexities involved.

The survey includes the responses of 29 large banks, 14 of which are euro area banks and the remaining 15 have their head offices outside the euro area. Institutions headquartered in the euro area report to the central bank of the country in which they have their headquarters, which in turn submits data to the ECB. Banks with head offices outside the euro area report directly to the ECB.

STRUCTURE AND QUESTIONS

The survey consists of three main parts and also envisages the possibility of adding special ad hoc questions that are of relevance at that particular point in time. The first group of questions covers credit terms for the various important types of counterparty across the entire spectrum of securities financing and OTC derivatives transactions.¹² The second group of questions focuses on financing conditions for the various collateral types, with a differentiation also made between credit terms offered to most-favoured and other clients. The third and last group of questions focuses on credit terms applicable to transactions involving various types of non-centrally cleared OTC derivatives, using underlying asset classes (underlyings) as a distinguishing criteria. The full version of SESFOD consists of 342 questions, although not all of them will be relevant for all participating banks if certain market segments are only of marginal importance for their business, and some of the questions will have to be answered only if a change in credit terms was reported.¹³

The SESFOD questions largely mirror questions in the Federal Reserve's Senior Credit Officer Opinion Survey (SCOOS)¹⁴ on dealer financing terms for US dollar-denominated transactions and also include nearly all of the questions included in the "international" set of questions developed in order to allow for a possible construction and publication of global aggregates by the Bank for International Settlements. Many large global banks report to several central banks conducting

Focus on euro-denominated financial instruments...

... and large banks and dealers active in targeted financial markets

The survey consists of three main parts...

... and largely mirrors questions in the similar survey conducted by the Federal Reserve...

¹² No differentiation is made between counterparties based on their residency.

¹³ The detailed list of all questions and further information is available in the survey guidelines, see http://www.ecb.int/press/pr/date/2013/html/pr130430_1.en.html

¹⁴ See <http://www.federalreserve.gov/econresdata/releases/scoos.htm>.

similar surveys and thus, in order to keep the reporting burden low, it is desirable that the central banks involved align their surveys as much as possible.

... although it was adapted to the euro area situation/needs

The SESFOD questions are nonetheless tailored in some aspects so as to better reflect the situation and needs in the euro area and therefore differ in part from those of the SCOOS and the international set of questions, mainly in relation to a few different types of counterparty, collateral and derivatives. By contrast, the surveys of the Bank of England and the Bank of Canada are largely confined to and thus much more closely aligned with the international set of questions. The SESFOD has also benefited from consultations with banks, which took place in the summer of 2012. Banks, for example, suggested, and the suggestion was accepted, adding sovereigns as an important counterparty type – some of the banks had non-negligible (uncollateralised) exposures to sovereigns through OTC derivatives trades and/or through securities financing transactions.

FIRST RESULTS: SELECTED HIGHLIGHTS

Two surveys have already been conducted

The December 2012 and March 2013 surveys, the first two that were conducted, collected qualitative information on changes over the three-month reference periods ending in November 2012 and February 2013 respectively – during this time frame, conditions in financial markets had been improving amid easing concerns about the euro area sovereign debt crisis. A review of the responses to the March 2013 survey suggests a number of important findings that are presented below.

In the March 2013 survey a very small overall net tightening of credit terms for wholesale counterparties was reported

In the March 2013 survey, banks indicated that offered price terms (such as financing rates/spreads) had remained basically unchanged, on balance, for the important types of counterparty covered in the survey over the three-month reference period. Nevertheless, modest net percentages of respondents¹⁵ reported eased price terms for large banks and dealers, insurance companies and investment funds, pension plans and other institutional investment pools. In the case of non-price terms, including, for example, the maximum amount of funding, haircuts, covenants and triggers and other documentation features, the net shares of banks that reported tightening were small and also smaller than in the previous December 2012 survey. All in all, a small net tightening of non-price terms for a sub-group of covered client types outweighed the net easing of price terms for some client groups, resulting, on balance, in a marginal overall net tightening of credit terms (see Chart C.1). Furthermore, and as in the previous survey, respondents expected that price and non-price credit terms would continue tightening for each of the covered client types over the next three months.

The use of leverage by hedge funds had somewhat increased

Both the use and availability of additional financial leverage under agreements currently in place with hedge fund clients were reported to have somewhat increased by one-quarter and one-tenth of respondents respectively. By contrast, the use of financial leverage by insurance companies and investment funds had remained unchanged.

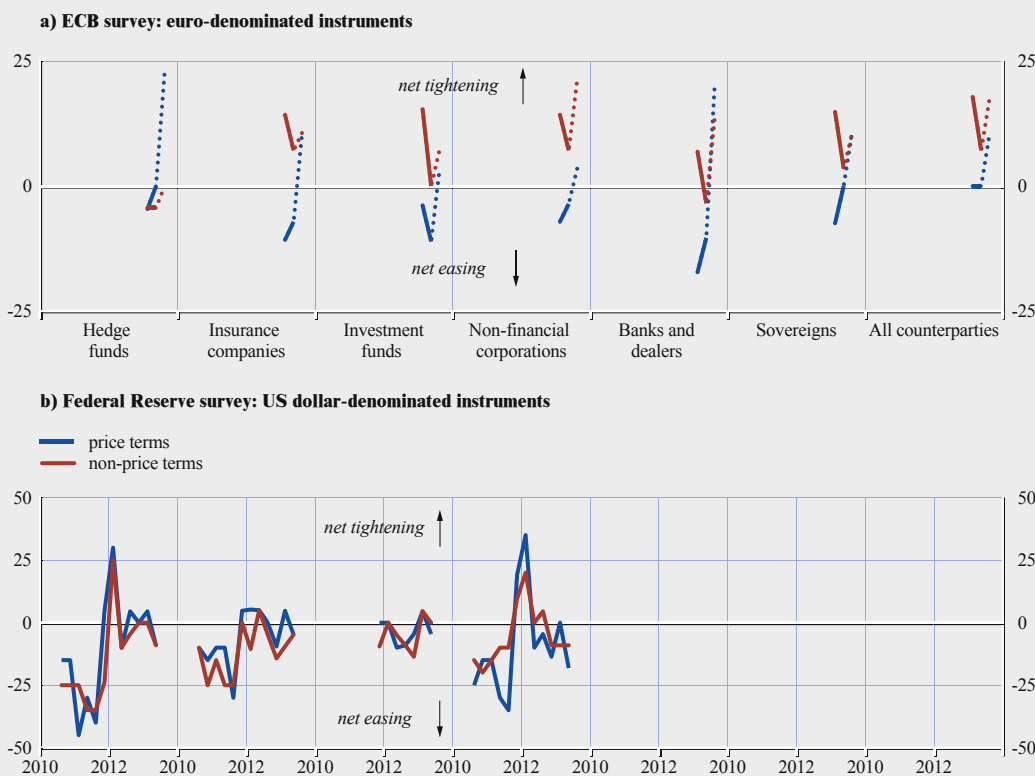
Financing rates/spreads at which securities are funded had decreased, on balance

With a few exceptions and amid some improvement in market liquidity and functioning, respondents indicated that financing rates/spreads at which securities are funded had decreased, on balance, for the various collateral types covered in the survey, but especially so for euro-denominated government bonds, high-quality financial and non-financial corporate bonds and covered bonds. For each type of collateral included in the survey, the net percentages of banks that reported changes in financing rates/spreads were largely the same for both average and most-favoured clients.

¹⁵ The net percentage is defined as the difference between the percentage of respondents reporting tightening/deterioration and those reporting easing/improvement.

Chart C.1 Actual and expected changes in credit terms for selected counterparty types

(Q2 2010 – Q2 2013; net percentage of respondents; dotted lines refer to expected changes)



Sources: ECB, Federal Reserve System and ECB calculations.

Notes: The net percentage is defined as the difference between the percentage of respondents reporting “tightened considerably” or “tightened somewhat” and those reporting “eased somewhat” or “eased considerably”. In the Federal Reserve survey, up to the second quarter of 2011 the “hedge funds” group also included private equity firms and other similar private pools of capital, while the “insurance companies” group included pension funds and other institutional investors. In the ECB survey, “investment funds” also include pension plans and other institutional investment pools, whereas in the Federal Reserve survey, this group refers to “mutual funds, exchange-traded funds, pension plans and endowments”.

About one-fifth of respondents indicated that demand for the funding of euro-denominated government bonds and asset-backed securities had increased, on balance, over the three-month reference period, while less marked, but nevertheless across-the-board, increases were also reported for other collateral types. Furthermore, the net shares of banks that noted increased demand for funding were larger than in the December 2012 survey for all types of collateral covered in the survey. In addition, for many types of collateral, the net percentages of banks that reported higher demand for funding were larger for maturities greater than 30 days.

Except for convertible securities and equities, liquidity and market functioning for the various types of collateral included in the survey were reported to have improved over the three-month reference period. Between one-fifth and one-third of banks indicated an improvement, on balance, for euro-denominated government bonds and high-quality corporate bonds.

For most types of non-centrally cleared derivatives contract included in the survey, banks reported that their liquidity and trading had slightly deteriorated, on balance, over the three-month reference period. This deterioration, however, was less pronounced than in the December 2012 survey.

Demand for funding of various types of collateral increased...

... as did the liquidity of most collateral types

Liquidity and trading of most OTC derivatives deteriorated

Credit terms were tighter, often considerably, than at the end of 2006

Responses to the special questions on the current stringency of credit terms relative to the end of 2006 were rather unanimous as the majority of respondents indicated that current credit terms applicable for the covered types of counterparty, collateral and OTC derivatives were tighter, often considerably, than at the end of 2006. This information provides some context for interpreting the main questions, especially at the time of the start of the survey. In the future, such special questions about the stringency of credit terms relative to those a year ago could be repeated every year – this would provide some information about the cumulative impact of reported quarterly changes.

The frequency of reported changes and disagreement among respondents...

In order to understand better the economic and signalling significance of survey responses for monitoring purposes, it is useful to compare the frequency of reported changes across different sets of questions. Some non-price terms do not change frequently and thus the average share of “no change” responses for such questions should be relatively high. In addition, the disagreement among respondents on trends may also vary by type of question or covered market segment. As can be seen in Chart C.2, this has indeed been the case, and thus the interpretation of quarterly results should take such longer-term patterns into account.

... should be taken into account when interpreting quarterly results

Banks did not often report changes when answering questions relating to OTC derivatives and this is not surprising given that, in addition to some questions on market functioning issues, the bulk of these questions refer to changes in non-price terms and trading agreements that do not tend to occur frequently and require time to implement. By contrast, both the frequency of reported changes and the disagreement among respondents tended to be higher for the questions in the other two main parts of the survey that focus on credit terms offered to important client groups and financing conditions for various collateral types respectively.¹⁶ It is also noteworthy that for the last two three-month reference periods ending in November 2012 and February 2013, there was a lot more disagreement among SESFOD participants than among respondents to the SCOOS for the matched sample of identical questions in both surveys.¹⁷

Differences between reported changes for average and most-favoured clients...

Differences between reported changes for average and most-favoured clients may provide additional information regarding the severity of a market dislocation or, on the contrary, the willingness of market participants to take on higher risk. For instance, a joint and significant tightening of credit terms for both average and most-favoured counterparties could be interpreted as a sign of a serious market disruption, whereas a tightening for average clients only would be rather indicative of a moderate market shock that was not severe enough to prompt changes in credit terms for most-favoured clients. The same logic, but in the opposite direction, could be applied for an easing of credit terms where a joint and significant easing of credit terms for both average and most-favoured clients could be a symptom of an excessively buoyant risk appetite.

... could be used as an indicator of the severity of market stress or, vice versa, as a symptom of excessive risk appetite

Each reference period may be different and require a separate analysis, but certain information presented in Chart C.3 provides some tentative support for the case of using differences between changes in credit terms for average and most-favoured clients as an indicator of market stress.

¹⁶ For each question and for each reference period, disagreement among respondents was measured using an ordinal dispersion measure described in M. Lacy, “An explained variation measure for ordinal response models with comparisons to other ordinal R^2 measures”, *Sociological Methods and Research*, Vol. 34, 469-520, 2006. To calculate Lacy’s ordinal dispersion measure, the shares of respondents reporting “tightened considerably” or “tightened somewhat” were combined into one group, as were the shares of those reporting “eased somewhat” or “eased considerably”. Then the computed measure was normalised using its maximum value (4/9th) for three categories (“tightened”, “unchanged” and “eased”) to get a scale-free disagreement index ranging between 0 (full agreement) and 1 (full disagreement).

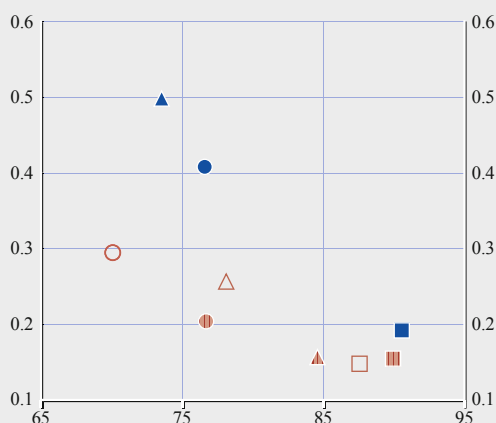
¹⁷ The SCOOS includes the responses of 22 banks and there is some overlap between the banks that provide responses to the SCOOS and those that provide responses to the SESFOD.

Chart C.2 Frequency of reported changes and disagreement among respondents by question type

(Q2 2010 – Q1 2013; x-axis: average percentage share of “remained basically unchanged” responses; y-axis: average disagreement as measured by the normalised Lacy’s ordinal dispersion of response)

x-axis: percentage share of “remained basically unchanged” responses
y-axis: disagreement index (normalised Lacy’s ordinal dispersion measure)

- ▲ ECB: securities financing
- ECB: counterparty types
- ECB: OTC derivatives
- ▲ FED: securities financing
- FED: counterparty types
- FED: OTC derivatives

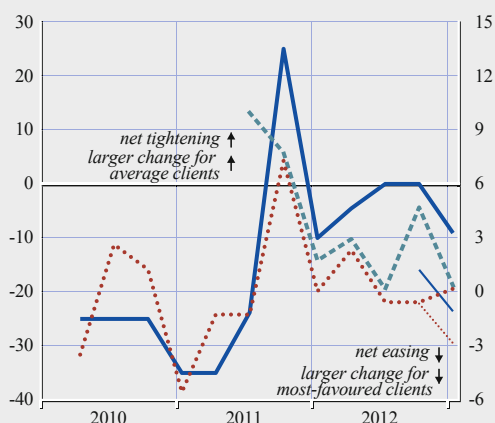


Sources: ECB, Federal Reserve System and ECB calculations. Notes: The analysis is based on a matched sample of 66 identical questions found in both the ECB and Federal Reserve surveys, which focus on financial instruments denominated in euro and US dollars respectively. 13 of these 66 questions are taken from the “securities financing” group and relate to the funding of high-yield bonds and equities, 35 questions are taken from the “counterparty types” group, and 18 questions from the “OTC derivatives” group. Filled data points refer to averages computed using data for the last two quarters, namely the fourth quarter of 2012 and the first quarter of 2013, whereas unfilled data points are averages for the last 12 quarters, i.e. since the inception of the Federal Reserve survey. See footnote 16 for a description of the disagreement index.

Chart C.3 Market conditions and differences between changes in credit terms for average and most-favoured clients

(Q2 2010 – Q1 2013; left-hand axis: net percentage of respondents; right-hand axis: the modified difference between the net percentages of respondents for average and most-favoured clients)

- FED: net percentage of respondents reporting tighter non-price terms for hedge funds
- FED: securities financing (right-hand scale)
- - - FED: OTC derivatives (right-hand scale)
- ECB: securities financing (right-hand scale)
- ECB: OTC derivatives (right-hand scale)



Sources: ECB, Federal Reserve System and ECB calculations. Notes: The analysis is based on a matched sample of 15 identical questions found in both the ECB and Federal Reserve surveys, which focus on financial instruments denominated in euro and US dollars respectively. Eight of these 15 questions are taken from the “securities financing” group and relate to the funding of high-yield bonds and equities, and seven questions are taken from the “OTC derivatives” group and relate to initial margin requirements. The modified difference between the net percentages of respondents for average and most-favoured clients is equal to the difference between absolute net percentages if the latter are of the same sign, or to the sum of absolute net percentages when they are of a different sign.

According to the SCOOS results covering changes over the three-month period ending in November 2011, i.e. before the ECB’s announcement of the three-year longer-term refinancing operations in early December 2011, credit terms had tightened for hedge funds and other important client groups. In addition, credit terms under which US dollar-denominated high-yield bonds and equities were funded tightened for both average and most-favoured clients, but a larger net fraction of banks reported tightening for average than for most-favoured clients. Similar differential developments were also reported for changes in initial margin requirements for OTC derivatives contracts, but in this case terms for most-favoured clients did not change much, on balance. In this context and given a very small overall net tightening of credit terms for covered client groups in the March 2013 SESFOD, it is somewhat unexpected that, on balance, more SESFOD respondents reported tightening for most-favoured rather than for average clients.

Relationship between changes in price and non-price terms deserves further investigation

Another noteworthy aspect that deserves further investigation relates to the relationship between changes in price and non-price terms, despite the low (quarterly) frequency of SESFOD data. Non-price terms may often take more time to alter than price terms, and so one could expect that changes in price terms could lead changes in non-price terms. A visual inspection of Federal Reserve data presented in Chart C.1b reveals that changes in price and non-price terms for a specific type of counterparty usually occur in parallel, but not always. In some – albeit infrequent – cases, the net percentages of respondents for price and non-price terms were changing in different directions. Furthermore, there were also cases when changes in price and non-price terms for a client group were suggesting diverging developments – for example, the net percentage of respondents indicated a tightening of price terms for a certain group of counterparties, whereas an easing, on balance, was reported for non-price terms. It seems that an analysis of bank-level responses may be needed to fully explore these issues.

CONCLUDING REMARKS

The rich set of SESFOD questions provides plenty of research possibilities

The rich set of SESFOD questions should make a significant contribution to a better understanding of developments in euro-denominated securities financing and non-centrally cleared OTC derivatives markets, both of which are important conduits for leverage in the financial system. Some of the SESFOD questions, such as those on credit limits, liquidity and market functioning, differential terms for average and most-favoured clients and reasons behind changes in credit terms, provide qualitative information that would be quite difficult to track in a quantitative way. As the length of SESFOD time series data increases, this should spur research on the early warning properties of survey responses, their usefulness for monitoring purposes in general, and their links with related but currently still limited quantitative data on these wholesale financial markets. The first SESFOD results were broadly in line with other, albeit limited, available information on developments in targeted euro-denominated markets and, among other findings, pointed to some better financing conditions for euro-denominated government bonds.

The SESFOD should become an important data source and monitoring tool

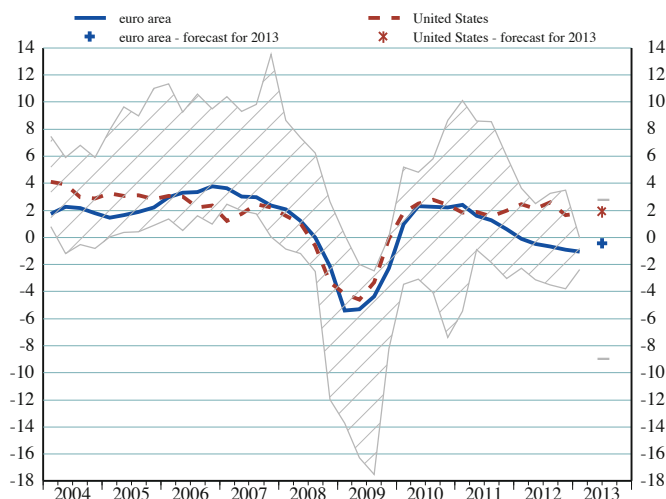
All in all, the SESFOD represents a substantial step forwards in improving the monitoring of euro-denominated securities financing and OTC derivatives markets and, importantly, has the potential to become a useful source of information on credit terms and conditions in these wholesale financial markets.

STATISTICAL ANNEX

I. MACRO-FINANCIAL AND CREDIT ENVIRONMENT

S.1.1 Actual and forecast real GDP growth

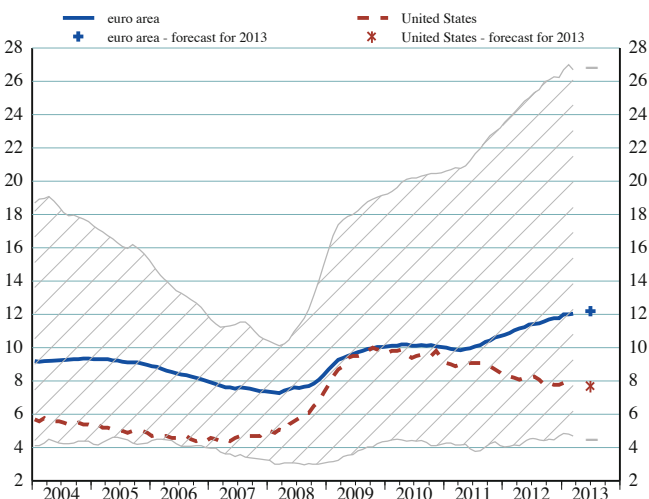
(Q1 2004 - Q1 2013; annual percentage changes)



Sources: Eurostat and European Commission (AMECO, spring 2013 forecast). Note: The hatched area indicates the minimum-maximum range across euro area countries.

S.1.2 Actual and forecast unemployment rates

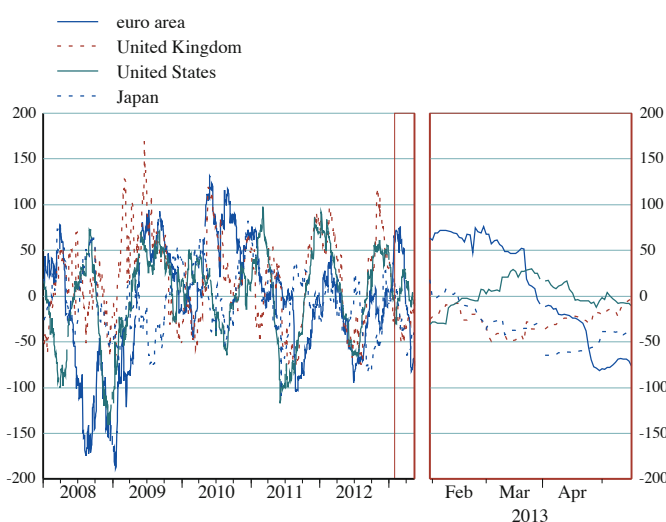
(Jan. 2004 - Mar. 2013; percentage of the labour force)



Sources: Eurostat and European Commission (AMECO, spring 2013 forecast). Note: The hatched area indicates the minimum-maximum range across euro area countries.

S.1.3 Citigroup Economic Surprise Index

(1 Jan. 2008 - 15 May 2013)



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

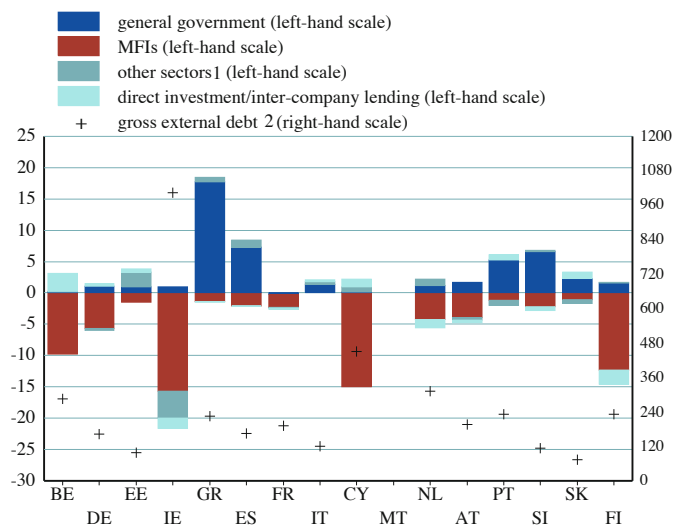
(1 Jan. 2007 - 15 May 2013; units of national currency per euro)



Sources: Bloomberg and ECB calculations.

S.1.5 Quarterly changes in gross external debt

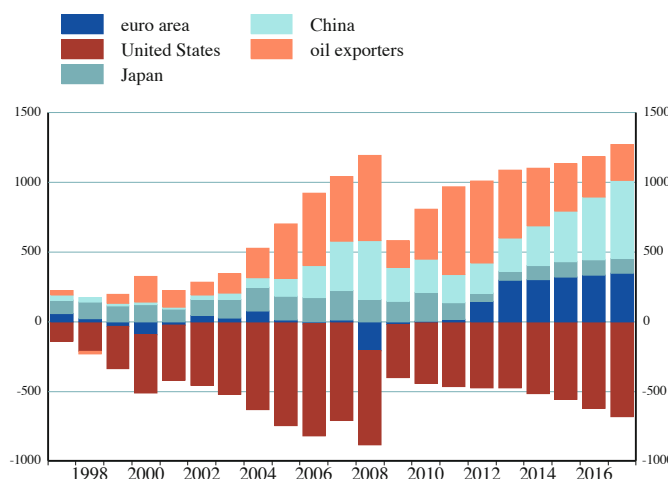
(2012 Q4; percentage of GDP)



Source: ECB.
 Notes: For Luxembourg, quarterly changes were 0.26% for general government, -26.7% for MFIs, 141% for other sectors and 12% for direct investment/inter-company lending. Gross external debt was 4,509% of GDP.
 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

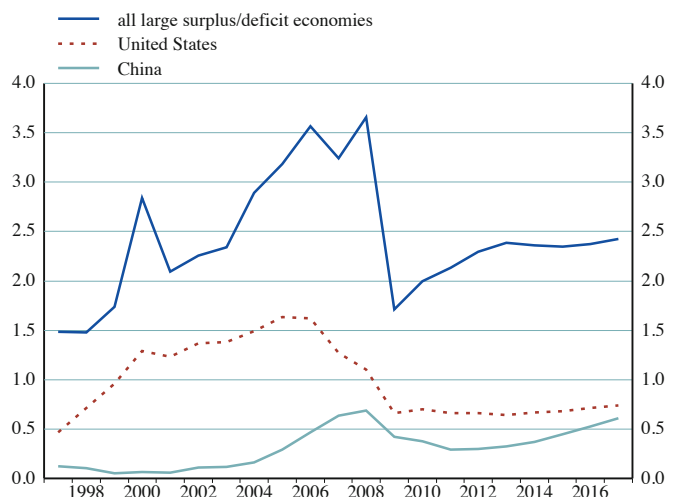
(1997 - 2017; USD billions)



Source: IMF World Economic Outlook.
 Notes: Oil exporters refers to the OPEC countries, Indonesia, Norway and Russia. Figures for 2013 to 2017 are forecasts.

S.1.7 Current account balances (in absolute amounts) in selected external surplus and deficit economies

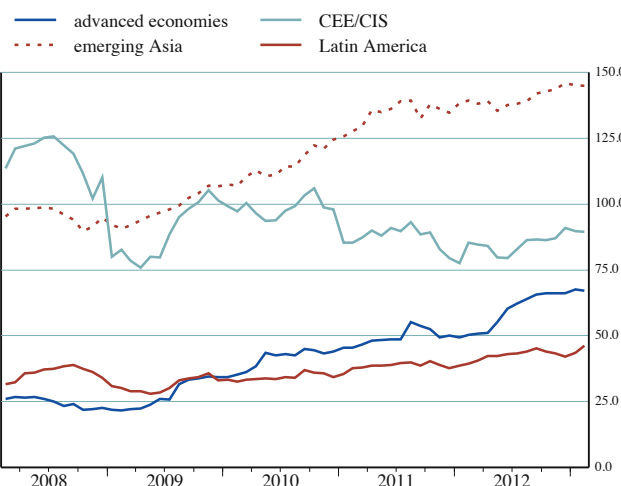
(1997 - 2017; percentage of world GDP)



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 2013 to 2017 are forecasts.

S.1.8 Foreign exchange reserve holdings

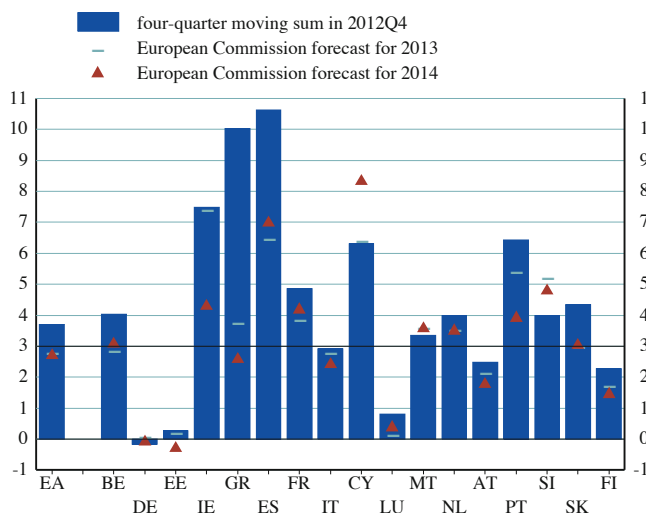
(Feb. 2008 - Feb. 2013; percentage of 2009 GDP)



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)

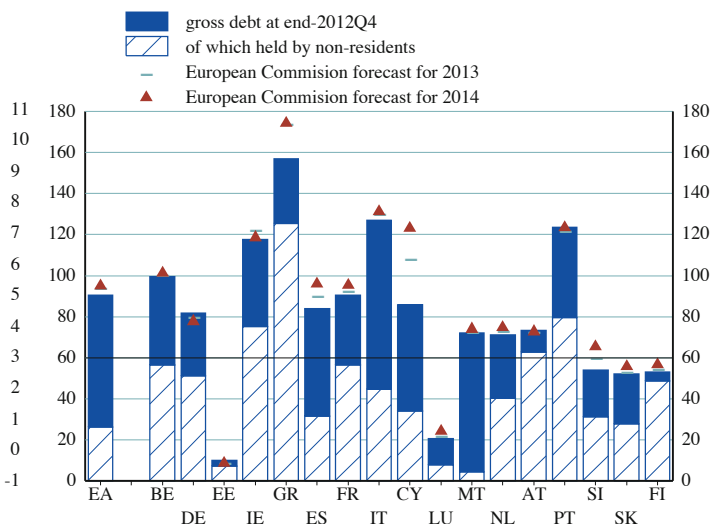


Sources: National data, European Commission (AMECO, Spring 2013 forecast) and ECB calculations.

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

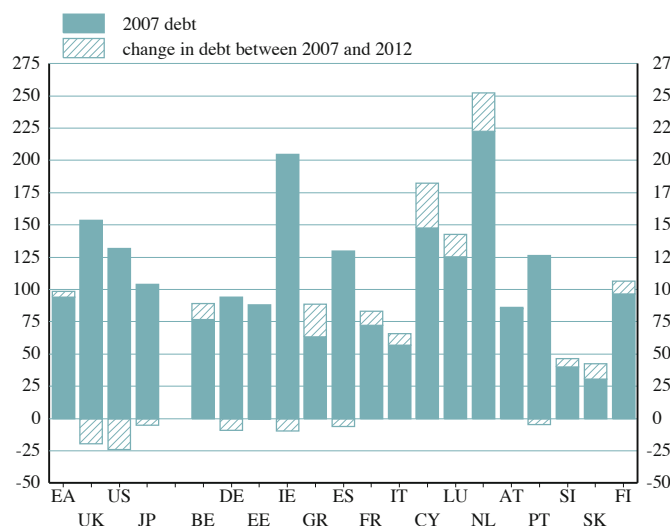
(percentage of GDP, end of period)



Sources: National data, European Commission (AMECO, Spring 2013 forecast) and ECB calculations.

S.1.11 Household debt-to-gross disposable income ratio

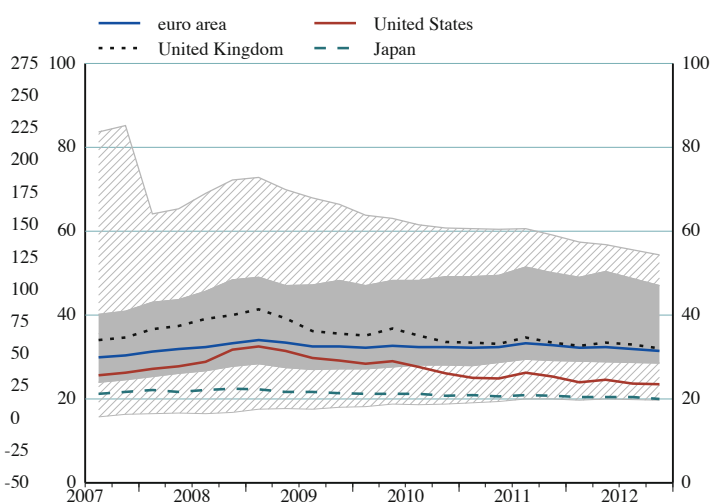
(percentage of disposable income)



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 2011. Change in debt for Japan, Estonia, Greece, Cyprus, Slovenia and Slovakia refers to 2007 and 2011. Data for Malta is not available.

S.1.12 Household debt-to-total financial assets ratio

(Q3 2007 - Q4 2012; percentages)

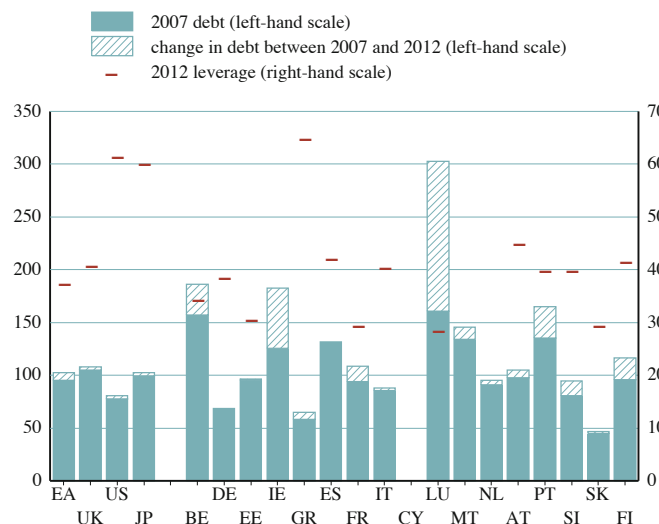


Sources: ECB and ECB calculations, Eurostat, US Bureau of Economic Analysis and Bank of Japan.

Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across euro area countries.

S.1.13 Corporate debt-to-GDP and leverage ratios

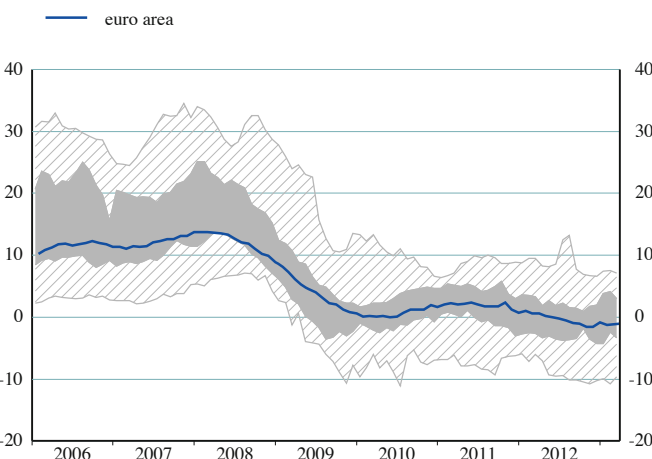
(percentages)



Sources: ECB, Eurostat, US Bureau of Economic Analysis and Bank of Japan.
 Note: Leverage data for Cyprus, Ireland, the Netherlands and Malta are not available. Corporate debt-to-GDP data for Cyprus are not available. Change in debt for Malta refer to change between 2007 and 2011.

S.1.14 Annual growth of MFI credit to the private sector in the euro area

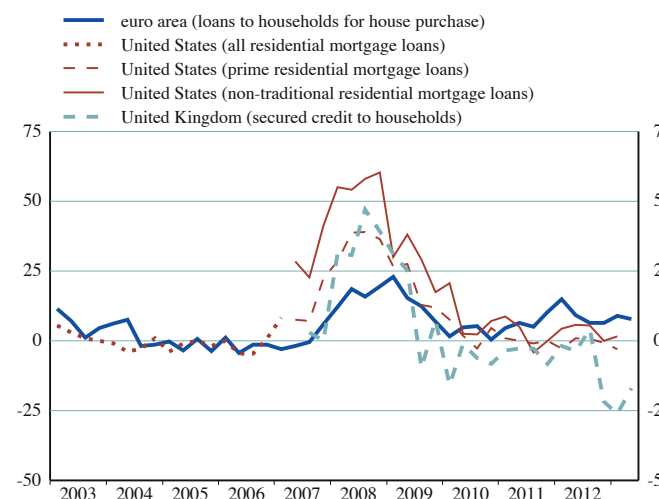
(Jan. 2006 - Mar. 2013; percentage change per annum)



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

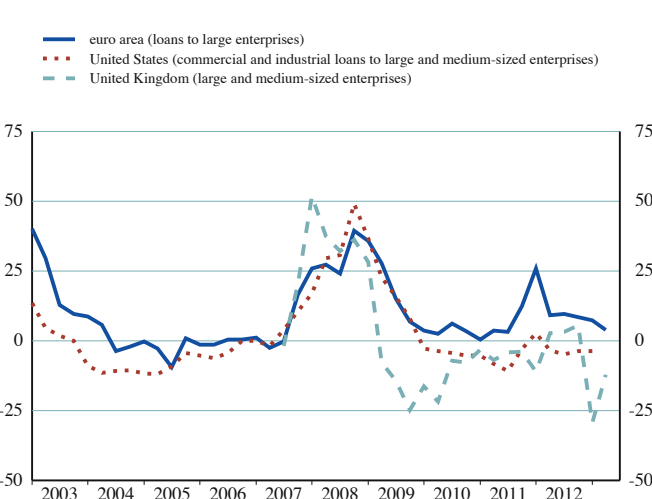
(Q1 2003 - Q2 2013; percentages)



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

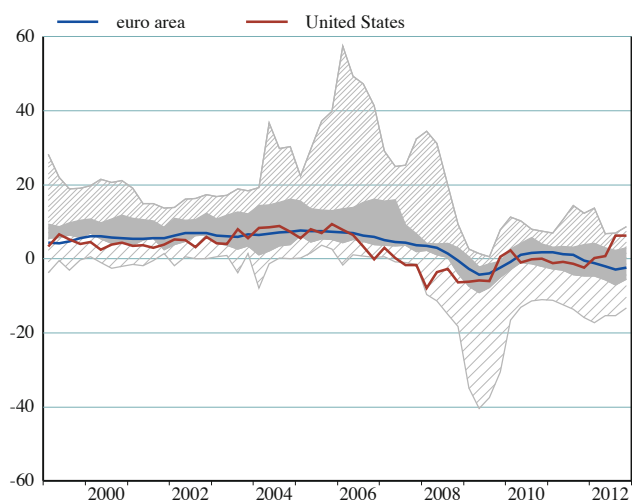
(Q1 2003 - Q2 2013; percentages)



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 - Q4 2012; annual percentage changes)

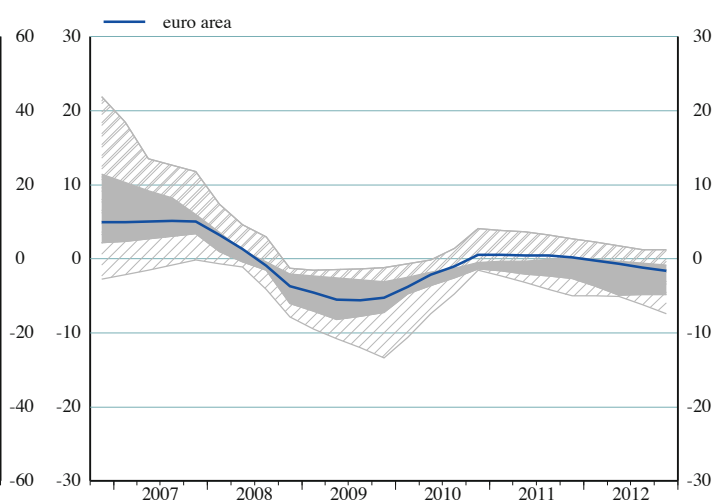


Sources: National data and ECB calculations.

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

(Q4 2006 - Q4 2012; real capital value; annual percentage changes)



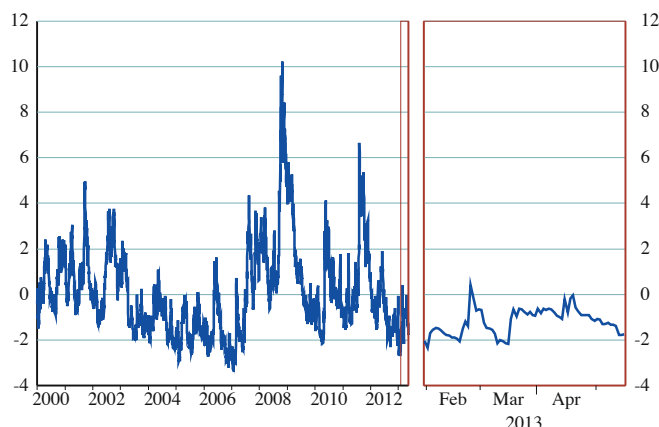
Sources: ECB experimental estimates based on Investment Property Databank data.

Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across euro area countries, excluding Estonia, Greece, Cyprus, Luxembourg, Malta, Slovenia, Slovakia and Finland.

2 FINANCIAL MARKETS

S.2.1 Global risk aversion indicator

(3 Jan. 2000 - 15 May 2013)

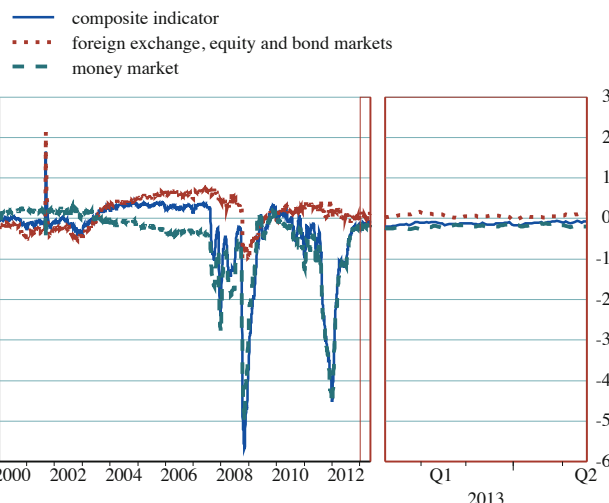


Sources: Bloomberg, Bank of America Merrill Lynch, UBS, Commerzbank and ECB calculations.

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 - 15 May 2013)

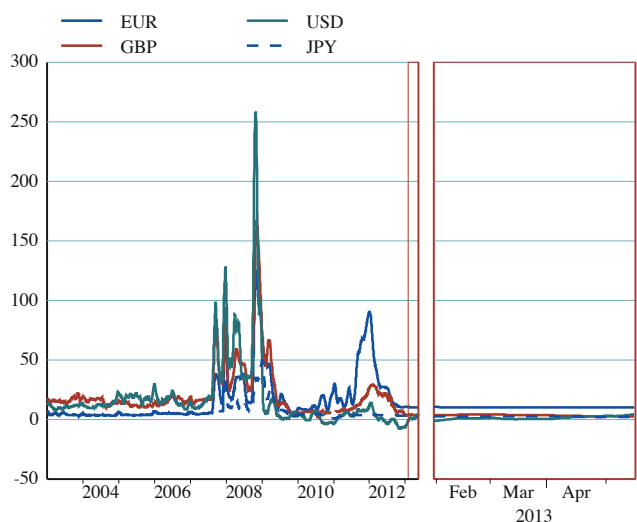


Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.

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

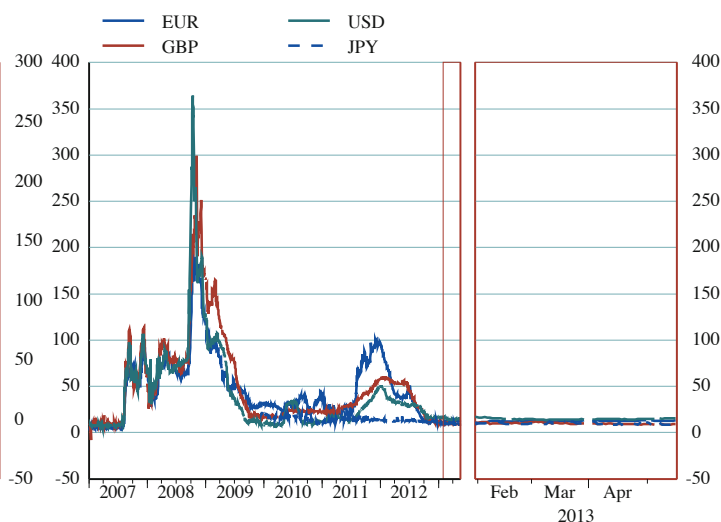
(3 Jan. 2003 - 15 May 2013; basis points; 1-month maturity; 20-day moving average)



Sources: Thomson Reuters, Bloomberg and ECB calculations.

S.2.4 Spreads between interbank rates and overnight indexed swap rates

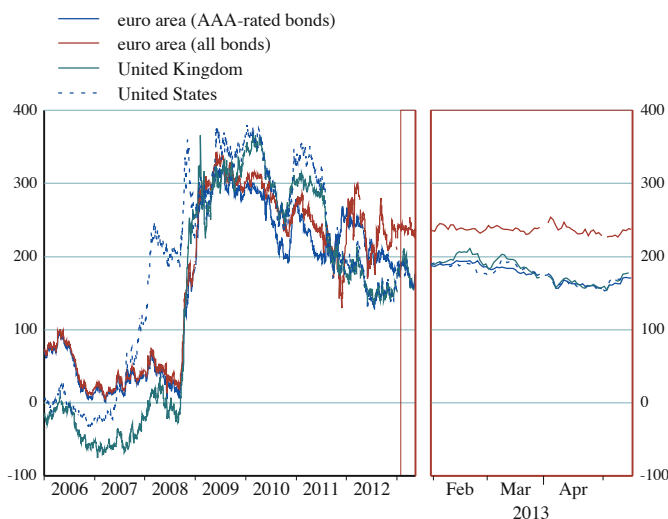
(1 Jan. 2007 - 15 May 2013; basis points; 3-month maturity)



Sources: Thomson Reuters, Bloomberg and ECB calculations.

S.2.5 Slope of government bond yield curves

(2 Jan. 2006 - 15 May 2013; basis points)

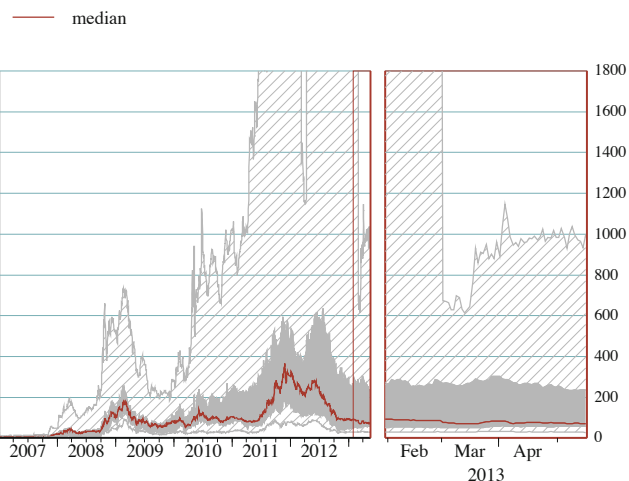


Sources: European Central Bank, Bank for International Settlements, Bank of England and Federal Reserve System.

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.2.6 Sovereign credit default swap spreads for euro area countries

(1 Jan. 2007 - 15 May 2013; basis points; senior debt; five-year maturity)

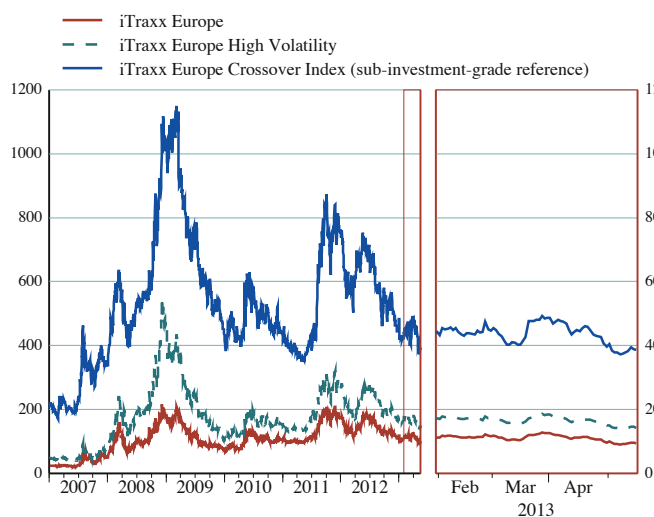


Sources: Thomson Reuters and ECB calculations.

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. Since 1st of March 2013 Greek sovereign CDS is not available due to lack of contributors. For presentational reasons, this chart has been truncated.

S.2.7 iTraxx Europe five-year credit default swap indices

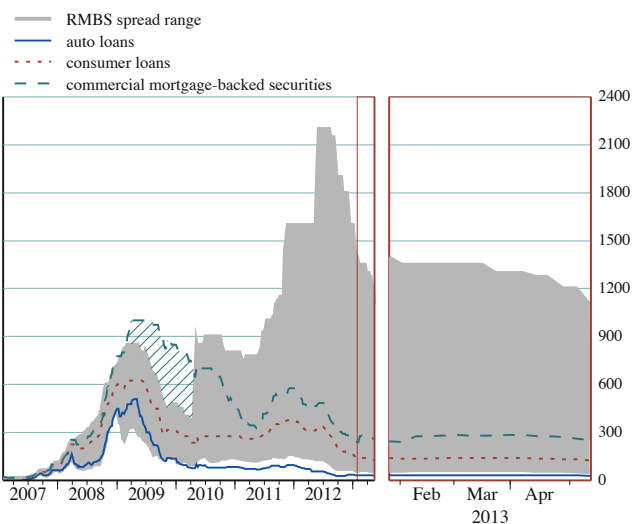
(1 Jan. 2007 - 15 May 2013; basis points)



Source: Bloomberg.

S.2.8 Spreads over LIBOR of selected European AAA-rated asset-backed securities

(26 Jan. 2007 - 10 May 2013; basis points)

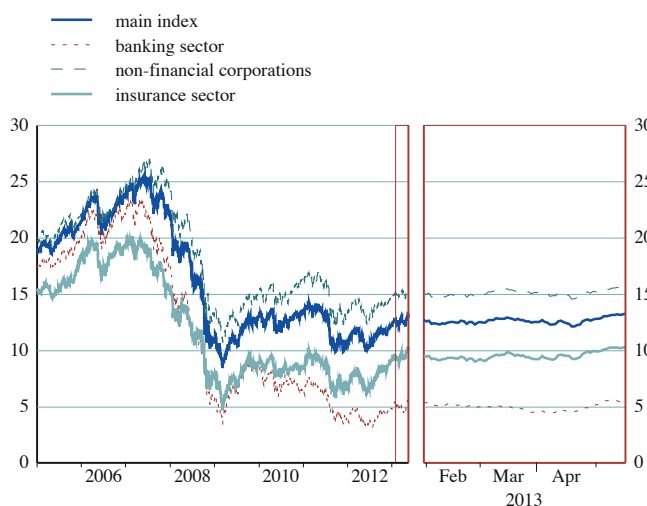


Source: JPMorgan Chase & Co.

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

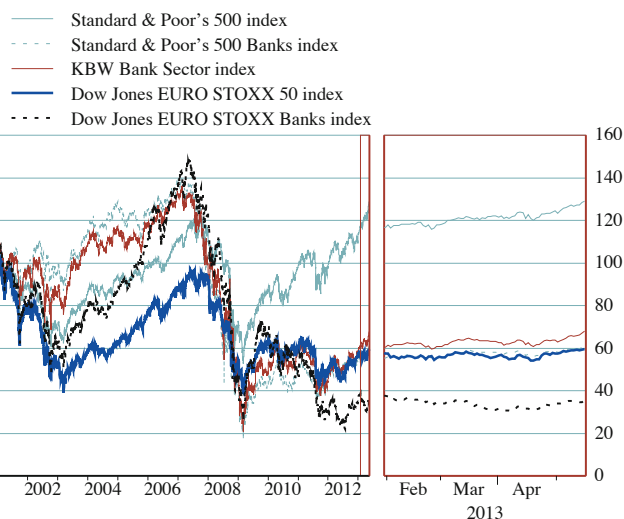
(3 Jan. 2005 - 15 May 2013; ten-year trailing earnings)



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

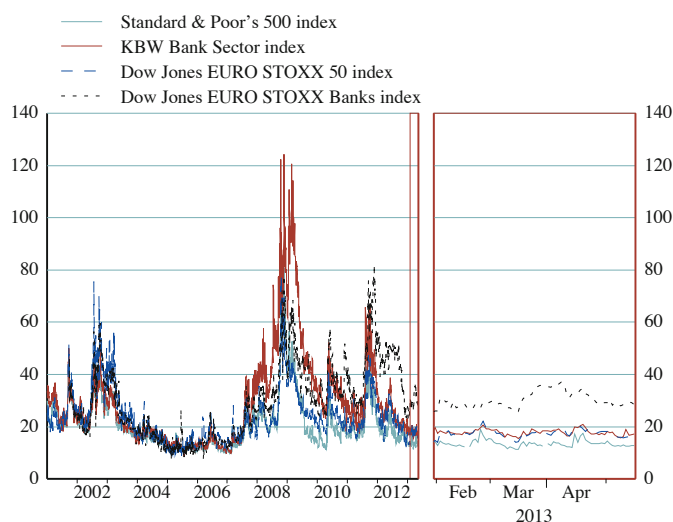
(2 Jan. 2001 - 15 May 2013; index: Jan. 2001 = 100)



Source: Bloomberg.

S.2.11 Implied volatilities

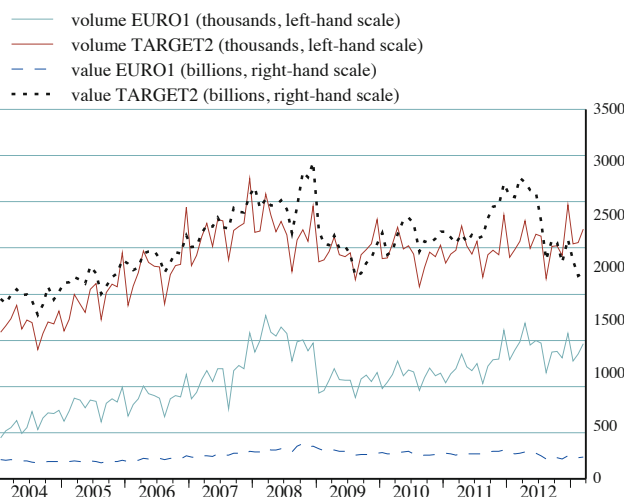
(2 Jan. 2001 - 15 May 2013; percentages)



Source: Bloomberg.

S.2.12 Payments settled by the large-value payment systems TARGET2 and EURO1

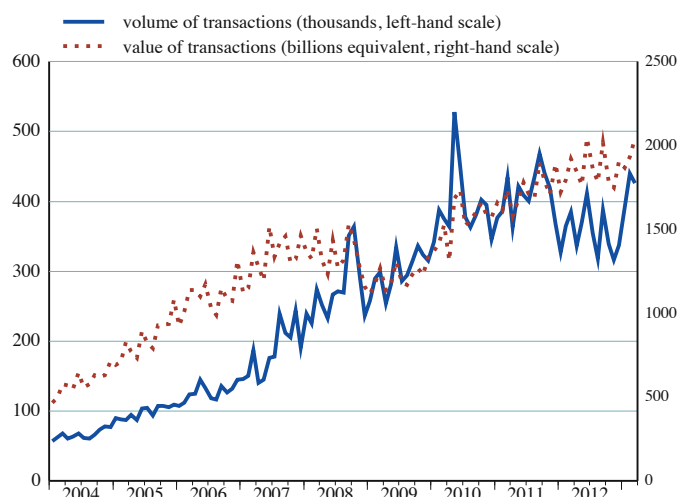
(Jan. 2004 - Mar. 2013; volumes and values)



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 - Mar. 2013; volumes and values)

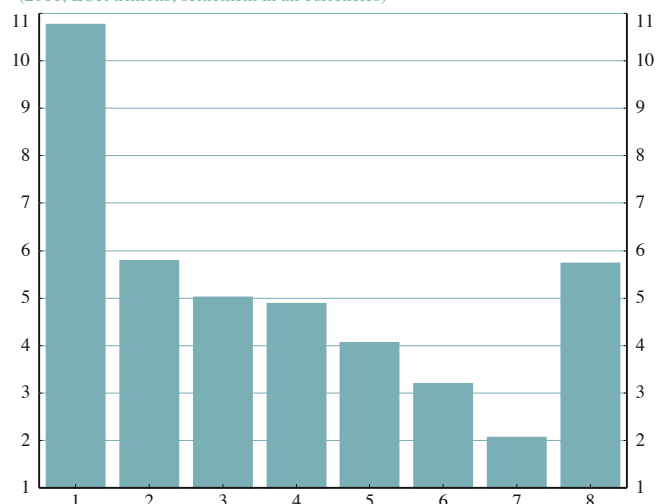


Source: ECB.

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

(2011; EUR trillions; settlement in all currencies)

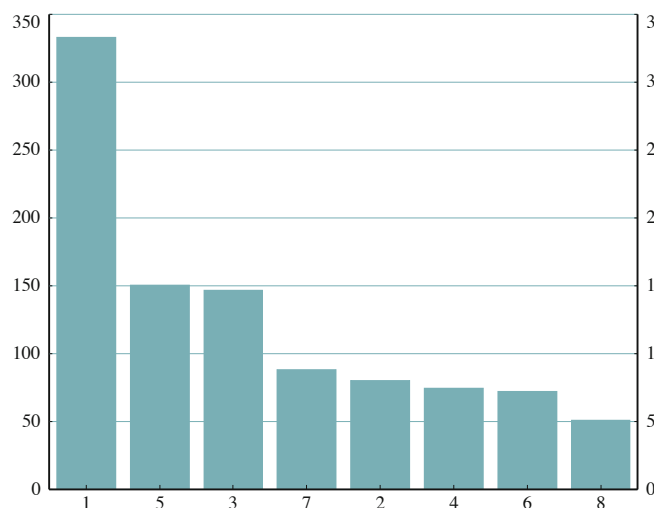


Source: ECB.

Notes: CSDs stands for central securities depositaries and ICSDs for international central securities depositaries. 1 - Euroclear Bank (BE); 2 - Euroclear France; 3 - Clearstream Banking Luxembourg-CBL; 4 - CRESTCo (UK); 5 - Clearstream Banking Frankfurt - CBF (DE); 6 - Monte Titoli (IT); 7 - Iberclear (ES); 8 - Remaining 18 CSDs in the euro area.

S.2.15 Value of securities settled by CSDs and ICSDs

(2011; EUR trillions; settlement in all currencies)

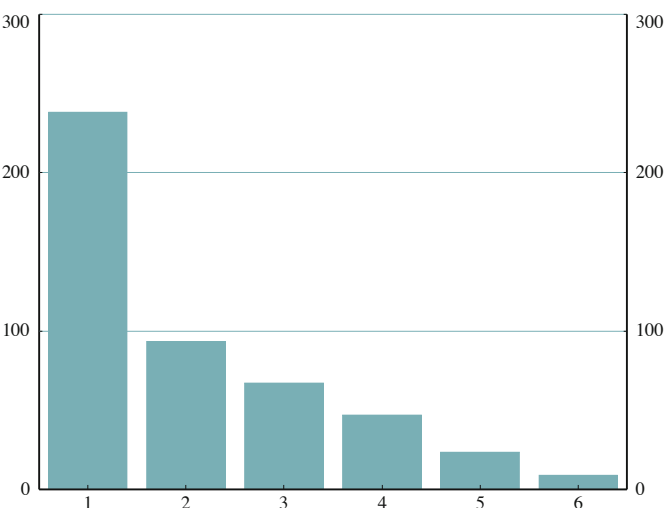


Source: ECB.

Note: See notes of Chart S.2.14.

S.2.16 Value of transactions cleared by central counterparties

(2011; EUR trillions)



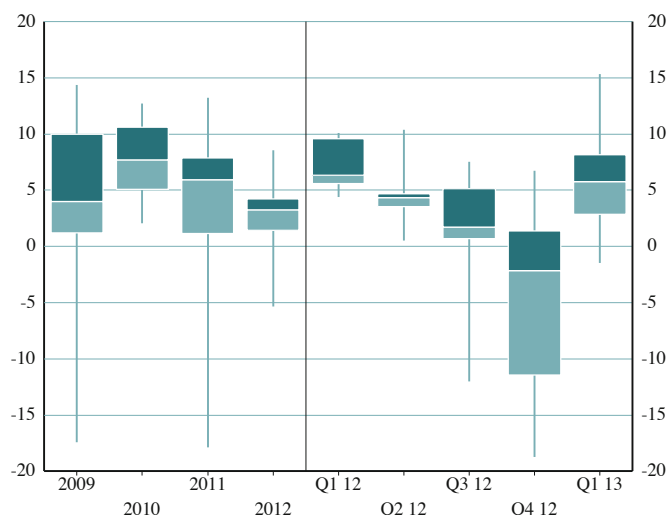
Source: ECB.

Notes: 1 - LCH.Clearnet Ltd (UK, 2009 data); 2 - EUREX Clearing AG (DE); 3 - LCH Clearnet SA (FR); 4 - CC&G (IT); 5 - ICE Clear Europe (UK); - 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 large and complex banking groups

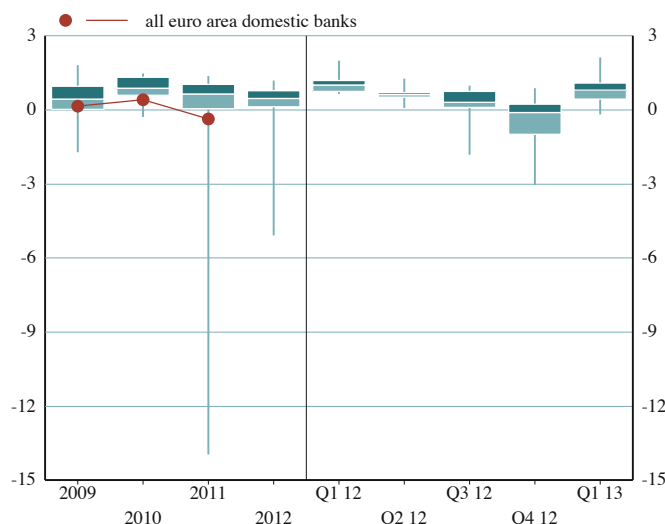
(2009 - Q1 2013; percentages; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg and ECB calculations.
Notes: Quarterly figures are annualised. Annual and quarterly data are based on common samples of 13 and 10 large and complex banking groups in the euro area, respectively.

S.3.2 Return on risk-weighted assets for euro area large and complex banking groups

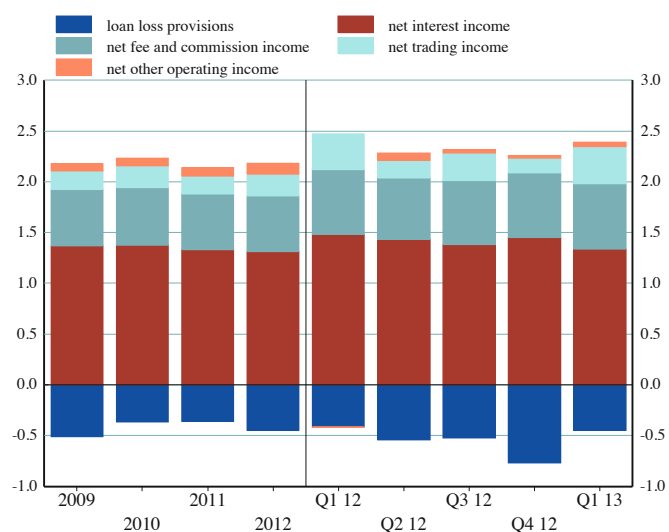
(2009 - Q1 2013; percentages; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.
Notes: Quarterly figures are annualised. Annual and quarterly data are based on common samples of 16 and 11 large and complex banking groups in the euro area, respectively. Data for all euro area domestic banks are consolidated across borders and sectors, excluding insurers and non-financial corporations.

S.3.3 Breakdown of operating income for euro area large and complex banking groups

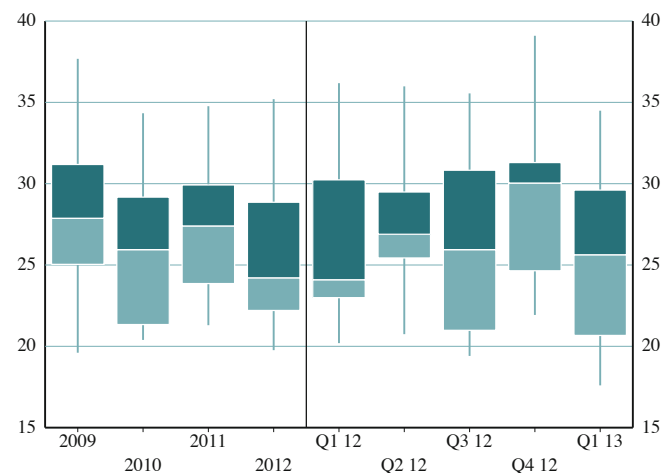
(2009 - Q1 2013; percentage of total assets; weighted average)



Sources: Individual institutions' reports, Bloomberg and ECB calculations.
Note: Quarterly results are annualised. Annual and quarterly indicators are based on common samples of 14 and 7 large and complex banking groups in the euro area, respectively.

S.3.4 Diversification of operating income for euro area large and complex banking groups

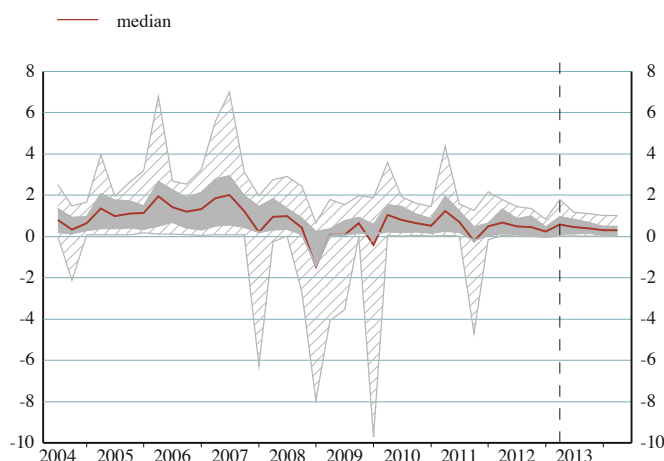
(2009 - Q1 2013; individual institutions' standard deviation dispersion)



Sources: Individual institutions' reports, Bloomberg, and ECB calculations.
Notes: 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 14 and 7 large and complex banking groups in the euro area, respectively.

S.3.5 Earnings per share and earnings per share forecasts for euro area large and complex banking groups

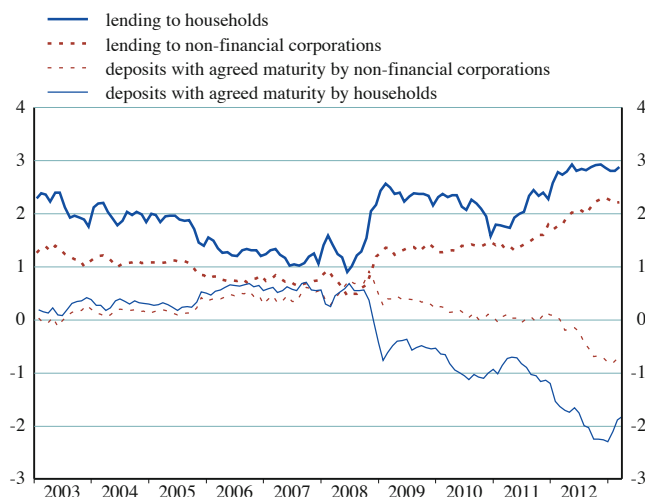
(Q2 2004 - Q1 2014; EUR)



Sources: Bloomberg and ECB calculations.
Notes: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across earnings per shares of selected large and complex banking groups in the euro area.

S.3.6 Lending and deposit spreads of euro area MFIs

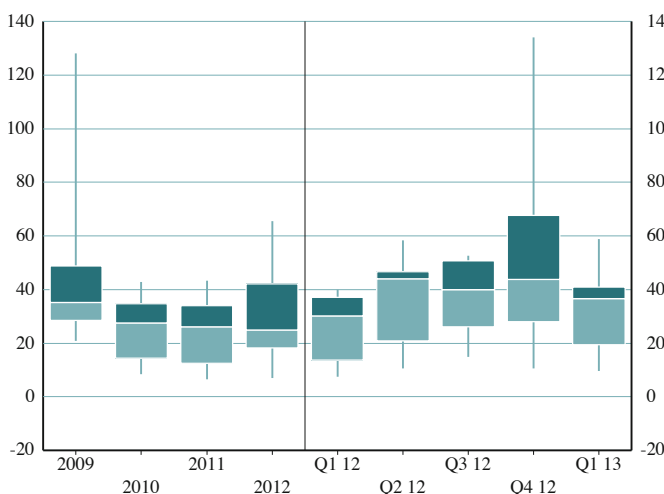
(Jan. 2003 - Mar. 2013; percentage points)



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 large and complex banking groups

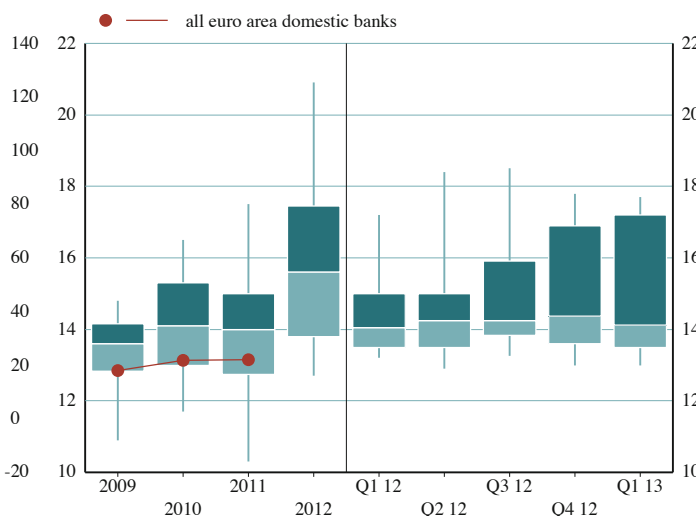
(2009 - Q1 2013; percentage of net interest income; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg and ECB calculations.
Notes: Annual and quarterly data are based on common samples of 14 and 7 large and complex banking groups in the euro area, respectively.

S.3.8 Total capital ratio for euro area large and complex banking groups

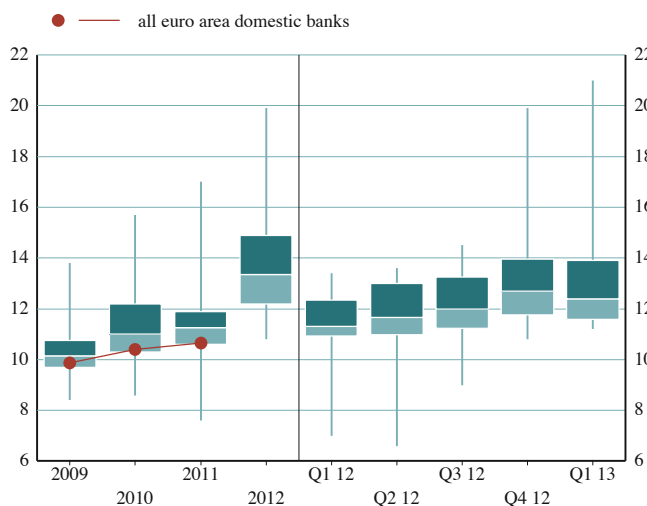
(2009 - Q1 2013; percentages; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.
Notes: Annual and quarterly data are based on common samples of 15 and 10 large and complex banking groups in the euro area, respectively. Data for all euro area domestic banks are consolidated across borders and sectors, excluding insurers and non-financial corporations.

S.3.9 Tier I capital ratio for euro area large and complex banking groups

(2009 - Q1 2013; percentages; minimum, maximum and interquartile distribution)

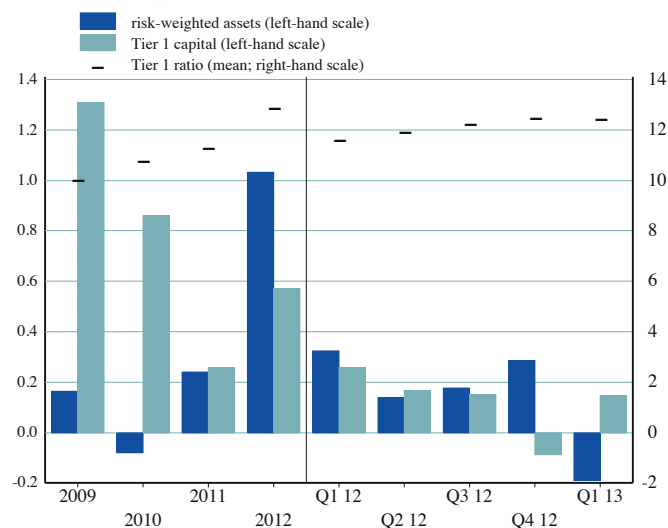


Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.

Notes: Annual and quarterly data are based on common samples of 18 and 12 large and complex banking groups in the euro area, respectively. Data for all euro area domestic banks are consolidated across borders and sectors, excluding insurers and non-financial corporations.

S.3.10 Tier I capital ratio components' contribution to ratio changes for euro area large and complex banking groups

(2009 - Q1 2013; percentages)

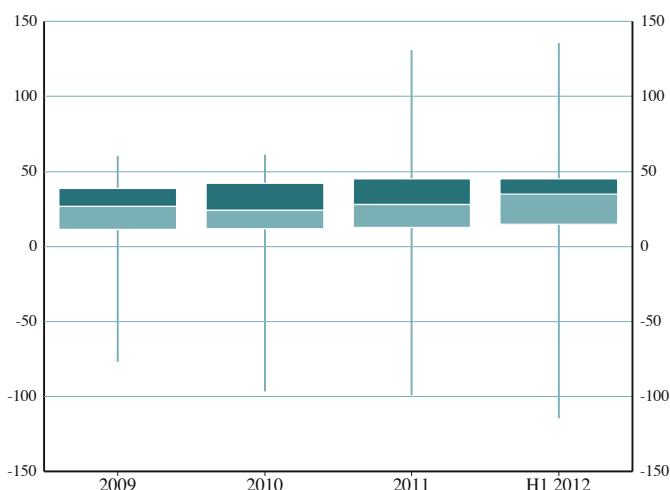


Sources: Individual institutions' reports, Bloomberg and ECB calculations.

Notes: Annual and quarterly data are based on common samples of 16 and 11 large and complex banking groups in the euro area, respectively.

S.3.11 Net non-performing loan ratios for euro area domestic banks

(2009 - H1 2012; percentage of total own funds for solvency purposes; minimum, maximum and interquartile distribution)

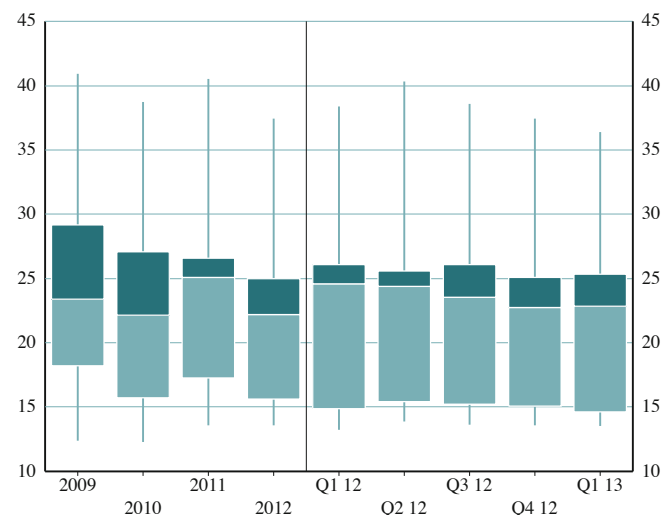


Source: ESCB.

Notes: All euro area domestic banks consolidated across borders and sectors, excluding insurers and non-financial corporations. Data refers to net total doubtful and non-performing loans (net of provisions). The dispersion of ratios is across euro area countries.

S.3.12 Leverage ratio for euro area large and complex banking groups

(2009 - Q1 2013; multiple; minimum, maximum and interquartile distribution)

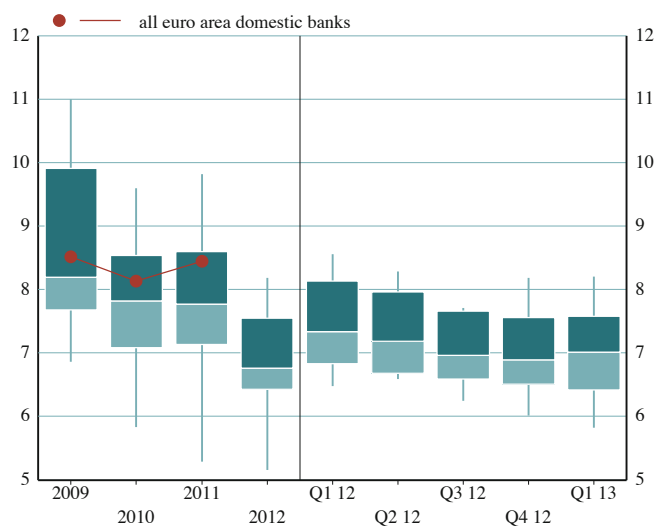


Sources: Individual institutions' reports, Bloomberg and ECB calculations.

Notes: Leverage is defined as the ratio of total assets to shareholders' equity. Annual and quarterly data are based on common samples of 13 and 10 large and complex banking groups in the euro area, respectively.

S.3.13 Risk-adjusted leverage ratio for euro area large and complex banking groups

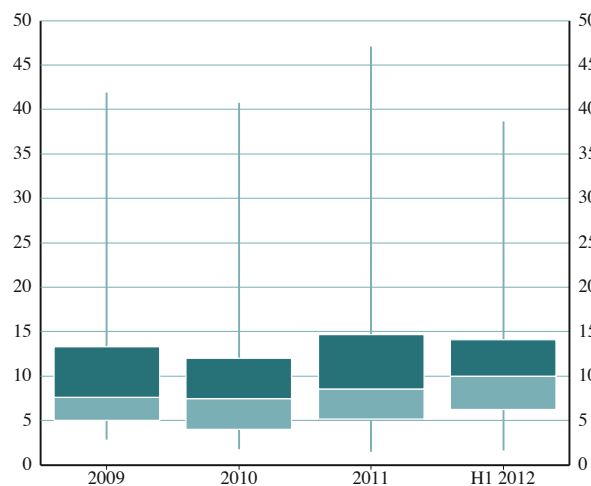
(2009 - Q1 2013; multiple; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.
Notes: Risk-adjusted leverage is defined as the ratio of risk-weighted assets to shareholders' equity. Annual and quarterly data are based on common samples of 13 and 10 large and complex banking groups in the euro area, respectively. Data for all euro area domestic banks are consolidated across borders and sectors, excluding insurers and non-financial corporations.

S.3.14 Liquid assets ratio for euro area domestic banks

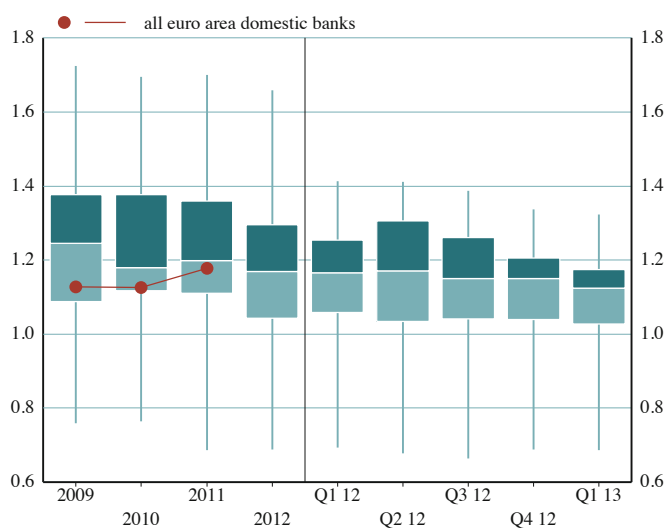
(2009 - H1 2012; percentage of total assets; minimum, maximum and interquartile distribution)



Source: ESCB.
Notes: All euro area domestic banks consolidated across borders and sectors, excluding insurers and non-financial corporations. Liquid assets comprise cash and trading assets. The distribution of the ratios is across euro area countries.

S.3.15 Customer loan-to-deposit ratios for euro area large and complex banking groups

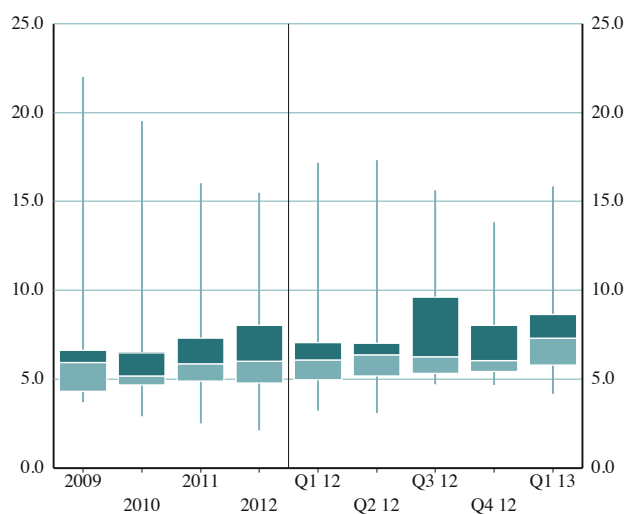
(2009 - Q1 2013; multiple; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.
Notes: Annual and quarterly data are based on common samples of 13 and 10 large and complex banking groups in the euro area, respectively. For presentational reasons, a bank with an extreme value was excluded from the sample. Data for all euro area domestic banks are consolidated across borders and sectors, excluding insurers and non-financial corporations.

S.3.16 Interbank borrowing ratio for euro area large and complex banking groups

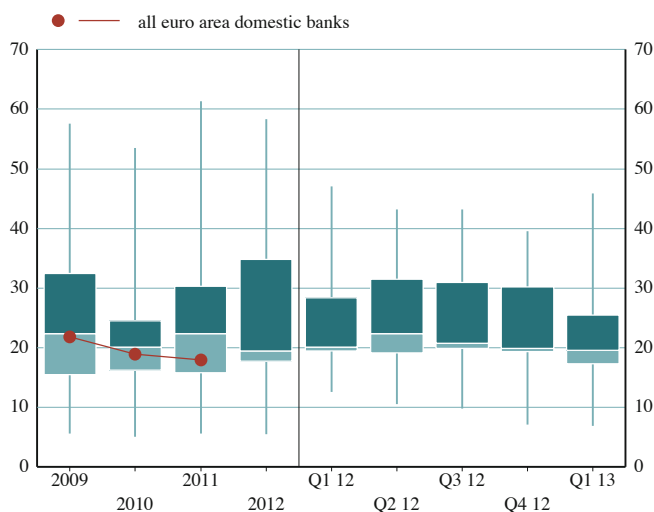
(2009 - Q1 2013; percentage of total assets; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg and ECB calculations.
Note: Annual and quarterly data are based on common samples each with 10 large and complex banking groups in the euro area, respectively.

S.3.17 Ratio of short-term funding to loans for euro area large and complex banking groups

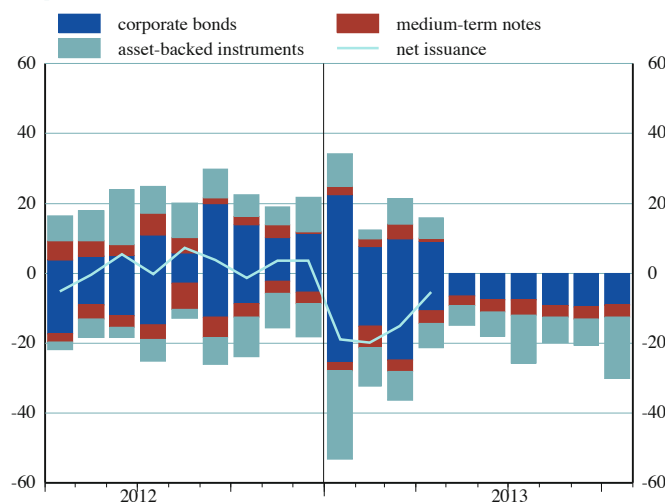
(2009 - Q4 2012; percentages; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.
Notes: Interbank funding is used as the measure of short-term funding. Annual and quarterly data are based on common samples of 11 and 9 large and complex banking groups in the euro area, respectively. Data for all euro area domestic banks are consolidated across borders and sectors, excluding insurers and non-financial corporations.

S.3.18 Issuance profile of long-term debt securities for euro area large and complex banking groups

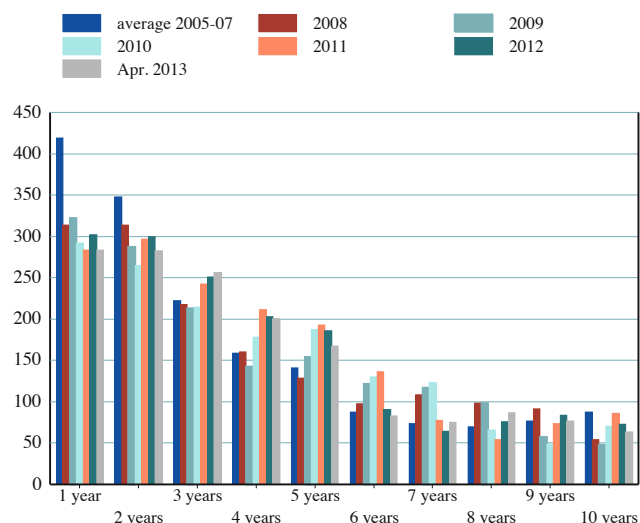
(Apr. 2012 - Oct. 2013; EUR billions)



Sources: Dealogic DCM Analytics and ECB calculations.
Notes: Net issuance is the total gross issuance minus scheduled redemptions. Dealogic does not trace instruments following their redemptions and therefore some of these instruments might 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 large and complex banking groups

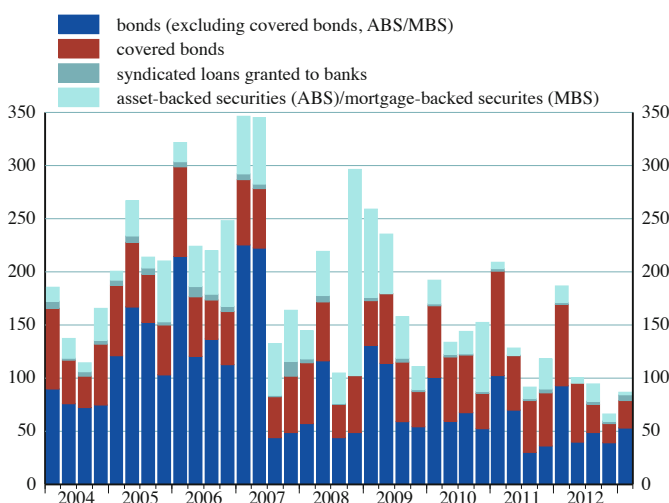
(2005 - Apr. 2013; EUR billions)



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 Syndicated loans and bonds issuance for euro area banking groups

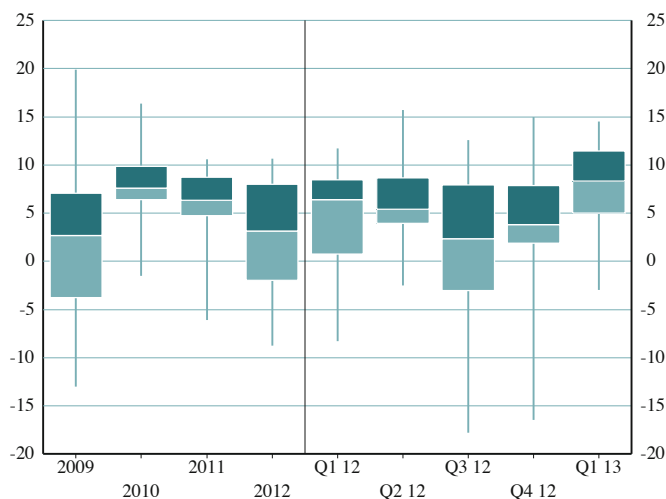
(Q1 2004 - Q1 2013; EUR billions)



Sources: Dealogic DCM Analytics, Thomson Reuters and ECB calculations.

S.3.21 Return on shareholders' equity for global large and complex banking groups

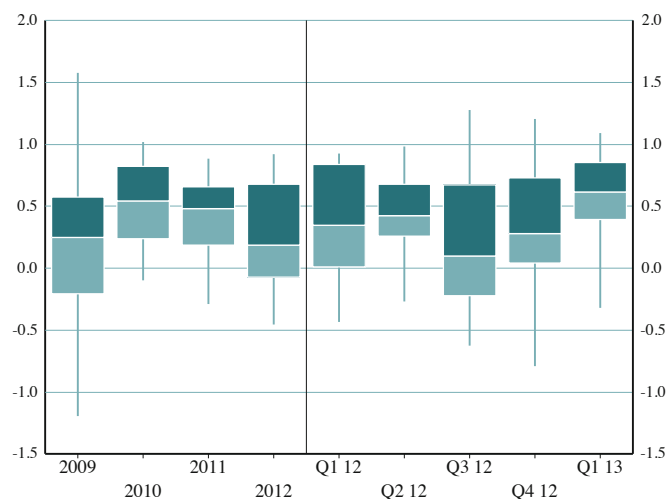
(2009 - Q1 2013; percentages; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg and ECB calculations.
Notes: Quarterly figures are annualised. Annual and quarterly data are based on common samples of 13 and 12 global large and complex banking groups respectively.

S.3.22 Return on total assets for global large and complex banking groups

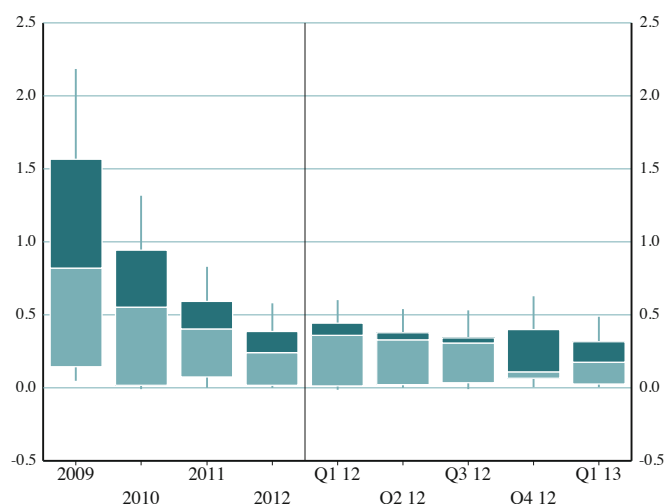
(2009 - Q1 2013; percentages; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.
Notes: Quarterly figures are annualised. Annual and quarterly data are based on common samples of 13 and 12 global large and complex banking groups respectively.

S.3.23 Net loan impairment charges for global large and complex banking groups

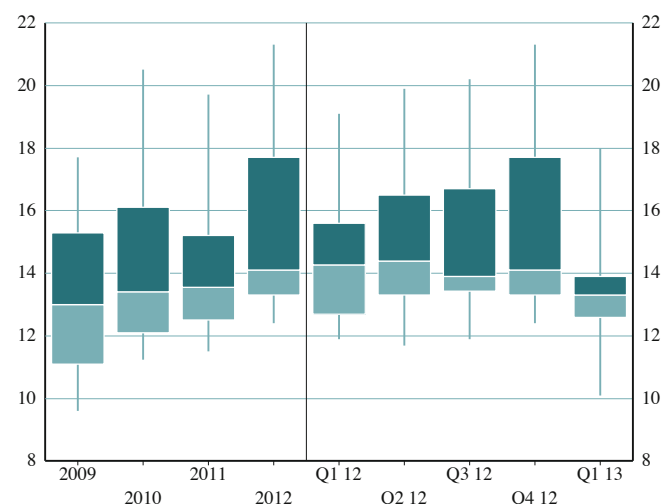
(2009 - Q1 2013; percentage of total assets; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg and ECB calculations.
Notes: Annual and quarterly data are based on common samples of 11 and nine global large and complex banking groups respectively.

S.3.24 Tier I capital ratio for global large and complex banking groups

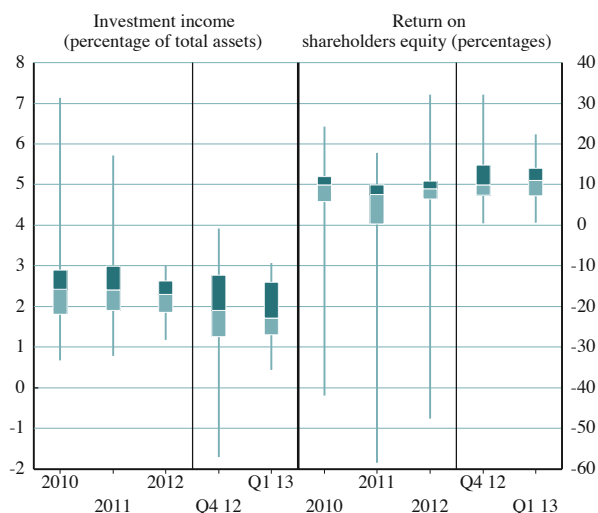
(2009 - Q1 2013; percentages; minimum, maximum and interquartile distribution)



Sources: Individual institutions' reports, Bloomberg, ESCB and ECB calculations.
Notes: Quarterly figures are annualised. Annual and quarterly data are based on common samples of 13 and 12 global large and complex banking groups respectively.

S.3.25 Investment income and return on equity for a sample of large euro area insurers

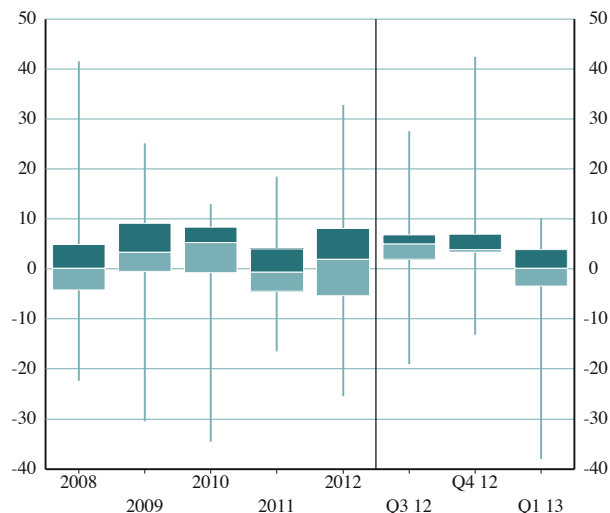
(2010 - Q1 2013; percentages; minimum, maximum and interquartile distribution)



Sources: Bloomberg, individual institutions' reports and ECB calculations.
Notes: Based on available figures for 20 euro area insurers and 4 euro area reinsurers.

S.3.26 Gross-premium-written growth for a sample of large euro area insurers

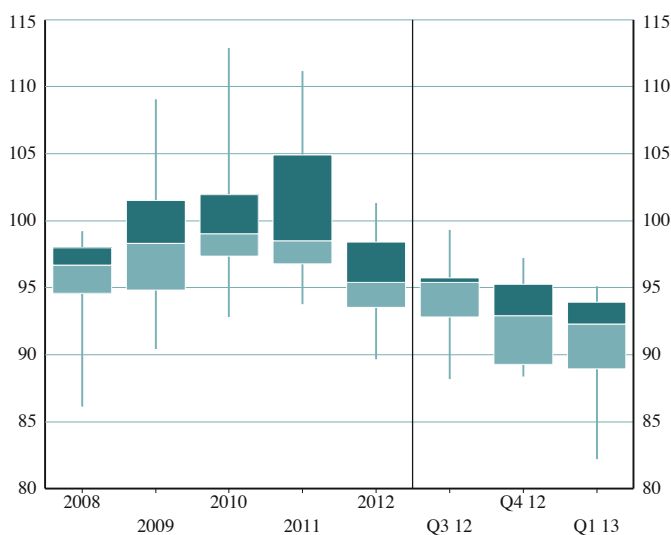
(2008 - Q1 2013; percentage change per annum; minimum, maximum and interquartile distribution)



Sources: Bloomberg, individual institutions' reports, and ECB calculations.
Note: Based on available figures for 20 euro area insurers and 4 euro area reinsurers.

S.3.27 Distribution of combined ratios for a sample of large euro area insurers

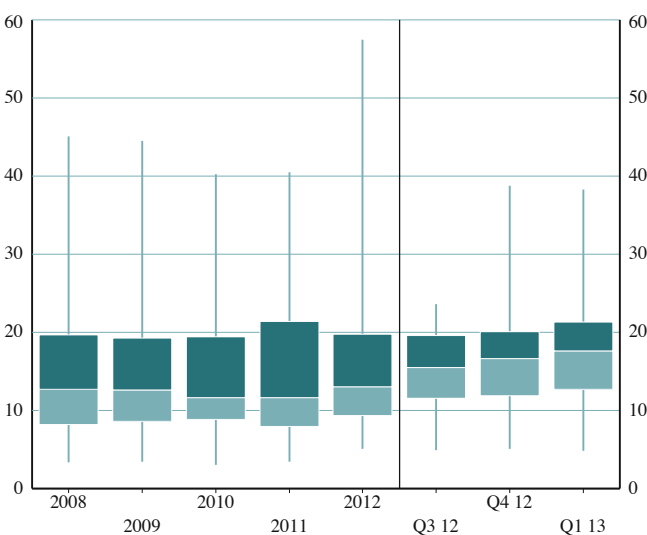
(2008 - 2008; percentages; minimum, maximum and interquartile distribution)



Sources: Bloomberg, individual institutions' reports and ECB calculations.
Notes: Based on available figures for 20 euro area insurers and 4 euro area reinsurers.

S.3.28 Capital distribution for a sample of large euro area insurers

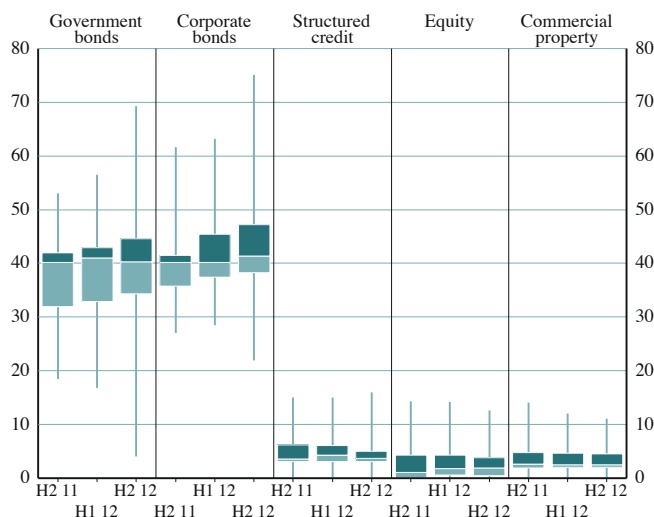
(2008 - Q1 2013; percentage of total assets; minimum, maximum and interquartile distribution)



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 20 euro area insurers and 4 euro area reinsurers.

S.3.29 Investment distribution for a sample of large euro area insurers

(H1 2011 - H1 2012; 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.3.30 Expected default frequency for large and complex banking groups

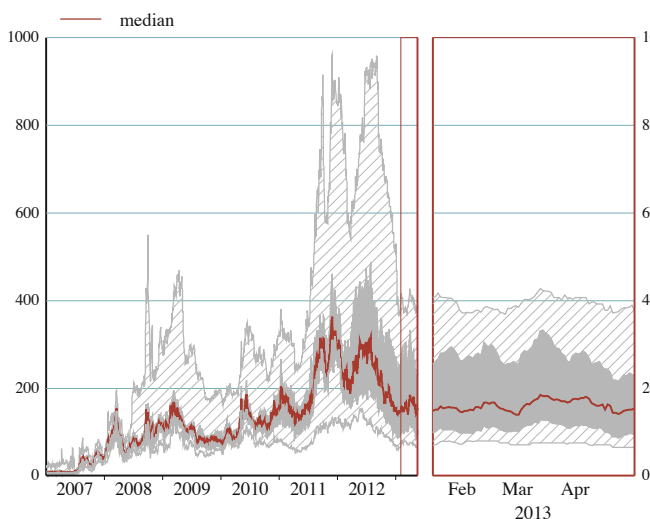
(Jan. 2003 - Mar. 2013; weighted average)



Sources: Moody's KMV and ECB calculations.
Note: The weighted average is based on the amounts of non-equity liabilities.

S.3.31 Credit default swap spreads for euro area large and complex banking groups

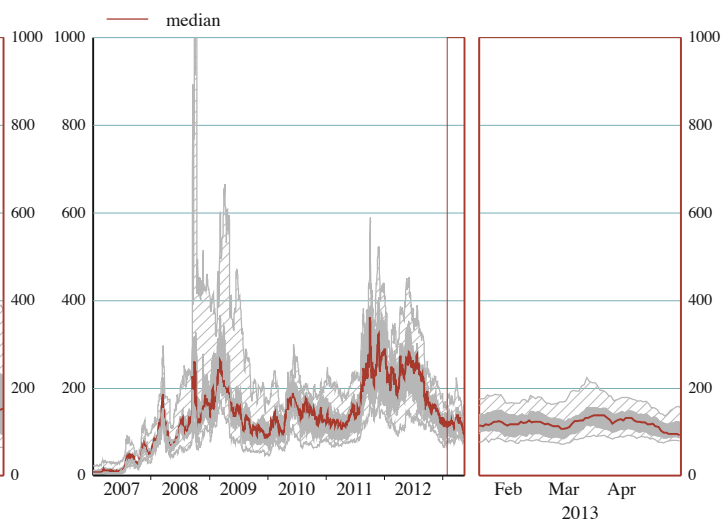
(3 Jan. 2007 - 15 May 2013; basis points; senior debt; five-year maturity)



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.

S.3.32 Credit default swap spreads for global large and complex banking groups

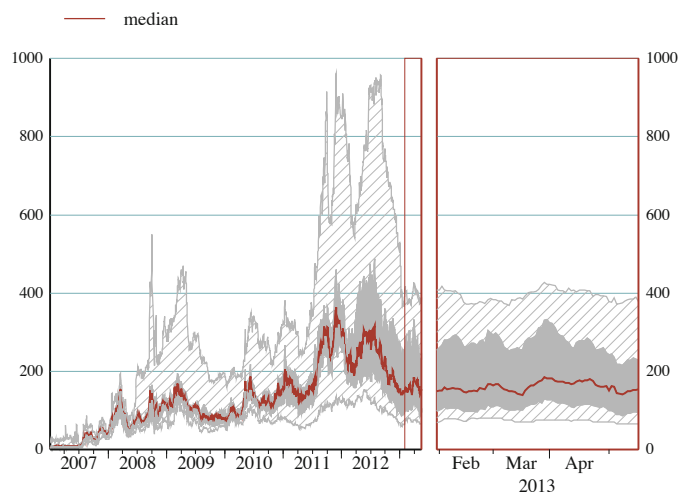
(3 Jan. 2007 - 15 May 2013; basis points; senior debt; five-year maturity)



Sources: Thomson Reuters, Bloomberg and ECB calculations.
Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges for the CDS spreads of selected large banks.

S.3.33 Credit default swap spreads for a sample of large euro area insurers

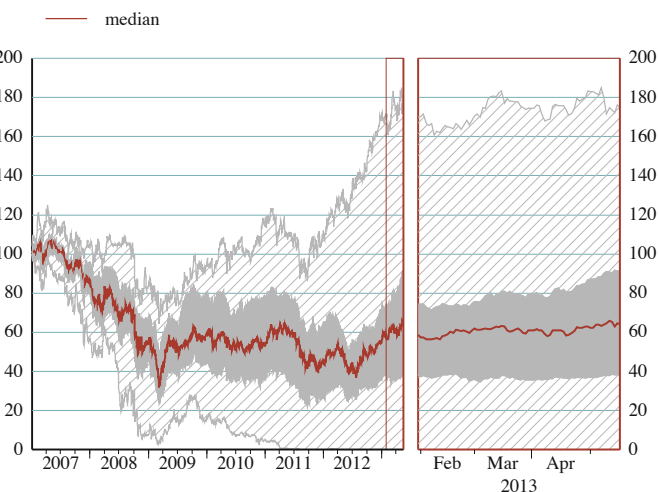
(3 Jan. 2007 - 15 May 2013; basis points; senior debt; five-year maturity)



Sources: Thomson Reuters, Bloomberg and ECB calculations.
 Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across equities of selected large banks.

S.3.34 Stock performance for euro area large and complex banking groups

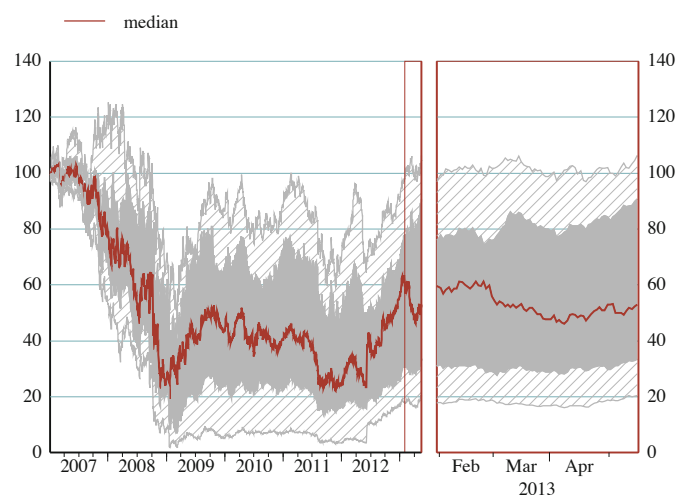
(3 Jan. 2007 - 15 May 2013; index: 2 Jan. 2007 = 100)



Sources: Thomson Reuters, Bloomberg and ECB calculations.
 Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges across the CDS spreads of selected large insurers. For presentational reasons, this chart has been truncated.

S.3.35 Stock performance of global large and complex banking groups

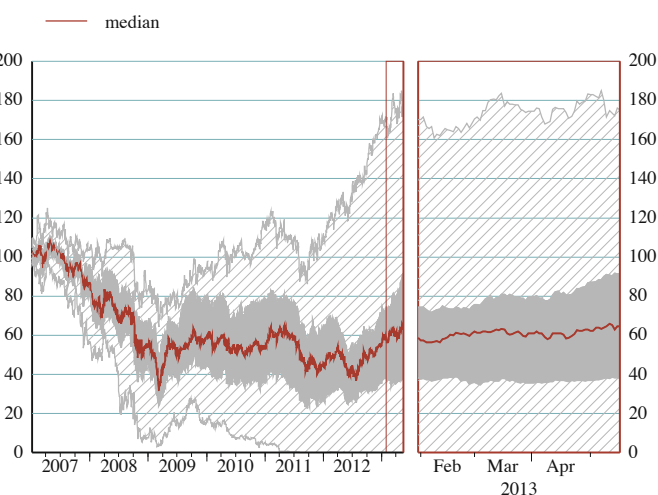
(3 Jan. 2007 - 15 May 2013; index: 3 Jan. 2007 = 100)



Source: Thomson Reuters, Bloomberg and ECB calculations.
 Note: The hatched/shaded areas indicate the minimum-maximum and interquartile ranges for equities of selected large banks.

S.3.36 Stock performance for a sample of large euro area insurers

(3 Jan. 2007 - 15 May 2013; 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.

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