



EUROPEAN CENTRAL BANK

EUROSYSTEM

# FINANCIAL STABILITY REVIEW

JUNE 2011

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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.





## I OVERVIEW

### OVERALL ASSESSMENT OF THE OUTLOOK FOR FINANCIAL STABILITY IN THE EURO AREA

Despite improving global and euro area economic and financial conditions, the overall outlook for financial stability has remained very challenging in the euro area. In particular, important decisions to introduce concrete policy measures at the EU level to strengthen backstop mechanisms aimed at mitigating financial vulnerabilities have not been sufficient to overcome all difficulties. For the third successive year since the intensification of the financial turmoil in the autumn of 2008, risks are still prevailing across major sectors of the euro area economy, which poses challenges not dissimilar to those in many other advanced economies. In particular, concerns of financial market participants regarding the interplay between sovereign and financial sector risk remain elevated. In view of challenges related to the implementation of the consolidation programme in Greece, which have grown since the publication of the last Financial Stability Review (FSR) in December 2010, market concerns have risen as evidenced, for example, by an inversion of its sovereign credit default swap curve. In light of the potentially very dangerous implications of sovereign debt restructuring for the debtor country, including its banking system, a determined and unwavering focus on improving fundamentals through both macroeconomic and structural policy reforms in vulnerable countries is required and within reach. In fact, programmes of adjustment, negotiated with the European authorities and the IMF, are now in place and should be rigorously implemented.

More generally, however, tensions in countries that have culminated in requests for EU/IMF support contrast with a positive development in the form of indications that sovereign risk can be contained. Confidence is being strengthened, in particular in other euro area countries that had been exhibiting high government bond yields, reflecting not only efforts made to push forward bank restructuring and transparency with respect to the state of the banking system as a whole, but also efforts undertaken to strengthen fiscal and macroeconomic fundamentals. Such efforts are crucial for the effective containment and mitigation of risks relating to sovereign debt in the euro area. Another positive element is the improving fundamentals of the aggregate euro area banking sector, evident in the evolution of key profitability indicators and solvency statistics for numerous large and complex banking groups (LCBGs) in the euro area – which should contribute to increased general resilience in terms of absorbing any prospective future losses. The latest available data for LCBGs indicate that all main income sources improved in 2010 and in early 2011, while a reduction of loan loss provisions had a major impact on profits. Regulatory (Tier 1) capital ratios amounted to 11.4% on average at the end of 2010, up from 7.7% in 2007. The results of the stress tests undertaken by the European Banking Authority (EBA) should yield further insights into the health of the euro area banking system and will, in particular, shed further light on banks' shock-absorption capacity. Despite the beneficial developments in banking sector resilience, notably the fact that banks' reliance on wholesale funding decreased further in 2010 and in early 2011, funding vulnerabilities continue to be an Achilles heel for many euro area banks, in particular those resident in countries facing acute fiscal challenges. At the same time, the heterogenous impact of the crisis has, in turn, led to divergent macroeconomic recovery and expansion paths across countries not only within the euro area, but also at the global level. These divergences contribute to a further exacerbation of the risks emanating from large international capital flows, global imbalances and their root causes.

*Major financial stability challenges remain as a legacy of the crisis...*

*... although several encouraging signs are emerging*



*Despite improving banking sector transparency and resilience, there are five key risks to financial stability*

*Robustness of the financial system in the context of strengthened oversight*

*Fiscal and financial sector challenges remain despite a forceful policy response*

Overall, there has been a broad-based improvement in banking sector resilience since the last FSR, evident, for instance, in the evolution of profitability and solvency indicators such as those reported above, while the transparency of euro area banking sector vulnerabilities will be enhanced through EU-wide stress tests. At the same time, several pockets of risk for euro area financial stability remain, ranging from macroeconomic and credit risks to liquidity and solvency issues for the euro area banking and insurance sectors. While such pockets of risk are manifold, some key aspects can be singled out in view of their clear generalised and systemic nature. First and foremost, the interplay between the vulnerabilities of public finances and the financial sector, with their potential for adverse contagion effects, arguably remains the most pressing concern for euro area financial stability at the moment, despite several encouraging signs of containment. But other key risks with strong systemic implications prevail as well. These relate to bank funding vulnerabilities, property price developments, the prospect of an unexpected and sudden, market-driven rise in long-term interest rates, and a disorderly unwinding of global imbalances. All these risks are closely intertwined and, indeed, could even reinforce one another in many ways.

Notwithstanding the varying probability of a materialisation of these key risks, any assessment of their prospective impact would need to take into account the improving robustness of the euro area financial system and its related shock-absorption capacity. In this respect, numerous policy initiatives, macro and micro-prudential in nature, have contributed to an enhanced resilience of the euro area financial sector. In this vein, it must be acknowledged that the financial crisis, in addition to the wide-ranging effects that are still being felt, has also brought forth a strengthened commitment to effective macro and micro-prudential oversight within the EU, which will make a decisive contribution to safeguarding current and future financial stability in the euro area.

#### FIVE KEY RISKS TO FINANCIAL STABILITY

Although there are still manifold risks to financial stability in the euro area, five broad sources of risk can be seen to be key from a euro area perspective in the current environment (see the table below). First, a key prevailing risk to euro area financial stability concerns the interplay between the vulnerabilities of public finances and the financial sector with their potential for adverse contagion effects. For the euro area, this risk has been manifested in applications for EU/IMF financial assistance from three countries, albeit countries with a particularly malign set of vulnerabilities in the form of intertwined fiscal, macroeconomic and banking sector issues. At the same time, the severity of this risk – and its potential for contagion – has to be assessed through the lens of numerous wide-ranging policy initiatives that have been taken to support financial stability, not only at the national, but also at the euro area and EU level. In particular, further progress was

##### Five key risks to euro area financial stability

1. The interplay between the vulnerabilities of public finances and the financial sector with their potential for adverse contagion effects
2. Bank funding vulnerabilities and risks related to the volatility of banks' funding costs
3. Losses for banks stemming from persistently subdued levels of, or a further decline in, commercial and residential property prices in some euro area countries
4. Risk of a market-driven unexpected rise in global long-term interest rates, with possible adverse implications for the profitability of vulnerable financial institutions
5. Tensions related to international capital flows, asset price growth in emerging countries and the risks associated with a re-emergence of global imbalances

made in extending both the temporal and the financial scope of the European Stability Mechanism at the EU level, while the ECB's non-standard monetary policy measures, notably the provision of unlimited liquidity (at a fixed rate against available collateral) and the interventions under the Securities Markets Programme in 2010 and early 2011, have proven to be pivotal not only to maintain price stability but also to foster financial stability. Such measures benefit financial stability in the short term, but are temporary in nature. The EU stress tests coordinated by the newly established European Banking Authority (EBA) and European Insurance and Occupational Pensions Authority (EIOPA) will also contribute to enhancing the transparency of financial institutions' capitalisation needs, for which decisive follow-up action will then be needed. Furthermore, the newly established European Systemic Risk Board (ESRB), which has been meeting since the beginning of the year, will fill a previously existing gap in the architecture for an effective prevention and mitigation of systemic risks to EU financial stability. Notwithstanding the wide-ranging breadth and scope of these coordinated policy initiatives, which have contributed to putting off the prospective impact of recent tensions in sovereign debt markets, they appear to have been insufficient, for the time being, to allay concerns about fiscal vulnerabilities in the euro area. It has to be recognised, though, that European crisis management was not fully in place initially and its subsequent implementation has been fraught with some detrimental shortcomings. The severe market reaction and the excessively pro-cyclical behaviour of rating downgrades led to high government bond spreads that have fuelled adverse feedback effects, especially with respect to the three euro area countries that have requested EU/IMF support. That said, the potential for contagion is limited by the particularly acute set of idiosyncratic country-specific vulnerabilities of the countries that have applied for EU/IMF assistance.

A second key risk, which is not completely independent from the first, relates more specifically to banks' funding vulnerabilities. Notwithstanding some improvements in their financial condition, banks' funding risks continue to be one of the key vulnerabilities of the euro area banking sector, especially against the background of banks' sizeable refinancing needs in the next few years and the volatility of banks' wholesale funding costs. On the one hand, there has been a general improvement in funding conditions in the euro area financial sector. Access to wholesale funding markets has improved for most euro area LCBGs in recent months. A continued normalisation of the unsecured interbank market in the euro area has been accompanied by a significant pick-up in debt issuance, in particular in covered bond markets. On the other hand, in contrast to these developments for LCBGs, debt issuance by other euro area banks declined significantly at the beginning of 2011. Moreover, while the rise in the share of covered bond issuance was apparent for both groups, it was more pronounced for non-LCBGs. This suggests an increasing reliance of several medium-sized and smaller banks on this funding source, particularly in the context of a still subdued market for securitised products. Banks resident in countries with fiscal vulnerabilities face particularly challenging financing conditions, given that issuance by small and medium-sized banks has dropped in comparison with the same period of last year, with a few countries actually recording no (distributed) issuance at all.

A third key risk stems from property price developments, both residential and commercial, which continue to pose risks for financial stability, despite some recent improvement. Concerns derive from potential losses resulting from a need to adjust the book value of depressed property valuations to prevailing market conditions, with a continued potential for further declines and the associated deterioration of the related credit quality in some euro area countries. An improving macroeconomic outlook should contribute to improving economic resilience and the associated credit risk, although due consideration needs to be given to the fact that economic development has been uneven across countries. Indeed, while property prices in some countries have shown signs of stabilisation,

*Bank funding challenges remain, despite numerous improvements*

*Property price adjustment appears incomplete*

*Vulnerabilities related to an unexpected and sudden rise in long-term interest rates*

or even increases, the risks involved are very heterogeneous, depending on geographical, property and loan characteristics. At the same time, it must be acknowledged that the impact of property price declines on credit quality is complex, depending on a multitude of country-specific factors, such as the loan-to-value ratios, the national legal frameworks and exposure to macroeconomic risk, to name but a few.

A fourth key risk is the possibility of a market-driven unexpected rise in global long-term interest rates with possible adverse implications for the profitability of those financial institutions less equipped to absorb such a development. An unexpected and significant rise in long-term interest rates would adversely affect the stability of the euro area financial system through a variety of channels. First, financial institutions would be subject to losses on account of their trading exposures to debt securities, as well as to other assets that are likely to be revalued once the discount rate for future cash flows is increased. Trading losses could be non-negligible as the incentives for maturity transformation-based carry trades have shown a tendency to rise since the end of last year. Furthermore, banks in jurisdictions under strain might have only restricted access – or, in some cases, even no access at all – to derivatives markets and other tools that would contribute to hedging exposures. Second, an increase in bond yields could trigger credit losses originating in virtually all economic sectors, potentially including self-fulfilling concerns about the sustainability of some euro area issuers' sovereign debt. These two channels might be either reinforced or alleviated by a changing slope of the yield curve, depending on the structure of the banking sector and, in particular, the structural characteristics of the loan books (notably including the prevalence of fixed versus floating rate loans). If short-term interest rates were to exhibit a commensurate rise, so that the yield curve slope would change little, banks with assets linked predominantly to flexible short-term rates would even stand to profit as lending rates would probably rise faster than the funding costs. However, if the yield curve were instead to steepen further as a result of rising long-term rates, banks in countries where rates are predominantly linked to the long end of the yield curve could have the possibility of cushioning any losses incurred through the materialisation of market and credit risk by raising their net interest margins on new loans – depending on competitive pressures. There are many possible scenarios that could trigger the materialisation of the risk of rising bond yields. One of the more likely scenarios in the current environment might be a general reassessment of global benchmark interest rates (an unexpected and sudden rise in benchmark government bond yields as a result of, for example, a reassessment of fundamentals and/or the related risk perception). Public sector imbalances in large advanced economies, in particular, pose a major risk in connection with the potential for rises in benchmark interest rates that are generally seen to be free of risk, with concomitant effects on borrowing costs across the globe.

*Disorderly unwinding of global imbalances*

A final risk concerns the implications of persistently strong private capital flows to emerging economies adding to overheating pressures, contributing to credit booms and leading to unsustainable asset price developments. These developments, in turn, could raise the risk of boom/bust cycles in one or more countries over the medium term – cycles that could have a strong potential to create severe disruptions in global financial markets. In addition, surging private capital inflows to emerging markets might lead to an accelerated accumulation of reserves as a result of exchange rate appreciation pressure, thereby adding to the factors that would contribute to a re-emergence of global imbalances. A disorderly unwinding of these global imbalances could lead to excessive exchange rate and asset price volatility, and to potential funding pressures in large advanced capital-importing economies.

## OTHER RISKS, WHILE LESS MATERIAL, NONETHELESS REQUIRE CLOSE MONITORING

While the five aforementioned risks remain key for euro area financial stability at present, numerous other developments, while less material, warrant close monitoring in view of their prospective impact on euro area financial stability. These risks are multifaceted, but can be seen to fit into some broad categories, namely risks in particular financial market segments (including the expansion of financial markets into relatively new areas of the real economy, such as commodities), risks in the non-financial sector, and implications of financial innovation and/or structural change.

In view of the fragility of the financial market recovery and its vulnerability to uncertainties, some general classes of risk require close monitoring. While a comprehensive elucidation of all risks in this vein could yield many vulnerabilities, at least two can be highlighted. First, foreign currency risk warrants close monitoring, given the exposures of euro area banks to developments outside the euro area. This concerns, in particular, some reliance of euro area banks on US dollar funding, as well as the foreign currency lending that has been prevalent in some central and eastern European economies in the last few years. In the latter case, some EU countries face a major challenge with the substantial currency mismatch on private sector balance sheets, in particular those of households, as a result of a large proportion of unhedged outstanding foreign currency debt. Potential domestic currency depreciation could add significantly to the debt burdens of exposed households or unhedged companies, in particular in view of potentially volatile exchange rates. For the time being, however, such risks appear to be limited, given that the overall indebtedness and debt service requirements in those EU countries in which such a risk is relevant seem to be contained. Second, several challenges that are not dissimilar to those facing the banking sector, given several common determinants, have emerged within the euro area insurance sector. Perhaps most notable among these challenges have been insured losses caused by recent natural disasters. While the capacity to absorb recent insured losses appears adequate to prevent immediate difficulties, the events have eroded the capital buffers available for dealing with any further adverse developments. In addition, insurers face the dual difficulty of having to absorb the impact on their portfolios of any unexpected and significant increase in bond yields and dealing with the balance sheet challenges associated with a low interest rate environment.

The financial sector in the euro area is not alone in its ongoing balance sheet adjustment, given that households and non-financial corporations in many economic areas are also in the process of deleveraging and reducing vulnerabilities – albeit with heterogeneous prospects across euro area countries. The associated macroeconomic and credit risks are areas that require monitoring to the extent that their scope or breadth may entail systemic consequences. For households, the improving macroeconomic environment has not been sufficient to fully compensate for a high debt burden and the associated vulnerabilities. Beyond credit risk from property prices already identified as a key risk, greater than expected credit losses on housing and other household debt could result not only in the event of sudden changes in financing conditions, but also if unemployment remains high for a prolonged period, or rises sharply. Within the non-financial corporate sector, an overall improvement in macroeconomic activity has contributed to a further slight improvement of profitability, although the financial condition of some segments of the small and medium-sized companies sector remains fragile.

Developments in relation to at least three financial innovations warrant close attention, not least given the prominent role such phenomena played in the recent global financial crisis. First, strong growth of new financial products usually requires close monitoring. One example in this regard are exchange-traded funds (ETFs), which have grown at the global level by, on average, 40% per

*Other risks also require close monitoring*

*Other financial sector risks...*

*... as well as other risks in the non-financial corporate sector*

*A continued need to closely monitor financial innovation...*



annum over the past ten years. In light of this very rapid expansion, the risks need to be monitored closely – in particular, both counterparty and liquidity risks. Second, financial innovation in the form of an expansion of asset classes into areas that featured less clearly on the radar screen in the past, such as commodities, warrants close monitoring. Apart from the potential impact that high and rising commodity prices have on financial stability through their effects on macroeconomic growth, their “financialisation”, and the potentially related increased correlation of commodity prices with other asset prices, could present some risks, including those related to portfolio concentration. Such a development could imply that, compared with historical correlations, expected hedging from portfolio diversification might be much lower than expected. That said, recent developments suggest that the correlation between commodity and share prices may have fallen somewhat, while previous spikes in this correlation, often triggered by strong fluctuations of the business cycle, have generally been self-correcting thus far. Third, there is a risk that the forthcoming tightening of capital and liquidity requirements under Basel III, while very welcome from a financial stability perspective, could also trigger activities within the financial sector to circumvent the strengthened regulatory requirements. Reliable and timely data needed to monitor the relative growth of less-regulated financial sector activities (often called “shadow banking” sector activities) are still scarce, creating practical impediments to the monitoring of such risks. In general, however, it is noteworthy that, viewed in terms of the respective definitions in the euro area financial accounts, the liabilities of monetary financial institutions appear to have been falling in comparison with those of the other financial intermediaries sector.

*... amid signs  
of a renewed  
fall in risk  
aversion and a  
search for yield*

Finally, there is some evidence that risk aversion in financial markets, and among financial intermediaries, is falling again. In the prevailing environment of low interest rates in advanced economies, there is always a risk that investors who are actively searching for yield may neglect the associated risks, particularly those of a systemic nature not internalised in individual actions. In a context of improving conditions for global financial institutions, signs of increased risk-taking warrant close monitoring – in particular any return of aggressive search-for-yield behaviour and the possibility of it again ramping up leverage. Available survey-based evidence suggests that hedge fund leverage has been increasing since 2009, and that euro area banks’ earnings targets have been ratcheted up for some key players against the background of a general decline in risk-aversion indicators, some compression of high-yield corporate bond spreads and a sharp increase in commodity prices. None of these developments, however, as yet suggest unambiguously that there is a clearly identifiable major risk to financial stability that can be derived directly from potential search-for-yield behaviour. Indeed, some of these developments could be explained by a process of normalisation in the wake of the financial crisis. Nevertheless, a close monitoring of such developments is warranted in view of any prospective renewed build-up of associated vulnerabilities and imbalances.



## II THE MACRO-FINANCIAL ENVIRONMENT

### I RISKS FROM THE INTERNATIONAL ENVIRONMENT

Despite some improvements in the global macroeconomic outlook since the finalisation of the December 2010 Financial Stability Review (FSR), several risks originating outside the euro area remain elevated or have even increased. While many region-specific imbalances can be identified, three main risks emerge from a broad analysis of the international macro-financial environment. First, there is a risk of an increase in US government bond yields, stemming from improvements in the economic outlook, increases in energy and other commodity prices, expectations of the withdrawal of quantitative monetary easing, and large fiscal imbalances. Any market-driven and unexpected increase in key benchmark yields could, in turn, spill over to global bond yields and lead to increases in financial institutions' funding costs and associated vulnerabilities, while also posing risks to their profitability and the quality of credit portfolios, and creating a potential for losses on fixed income securities. Second, in emerging economies, challenges exist related to the management of risks arising from volatile private capital inflows, given their potential role in creating asset price bubbles or sudden stops of capital flows. In addition, emerging economies are facing rising inflationary pressures. Furthermore, in the medium term, the risk of a widening in global financial and current account imbalances remains, which could eventually lead to abrupt global capital and asset price movements with adverse effects on euro area financial stability. Finally, commodity prices have increased significantly, driven by improvements in the economic outlook, as well as by supply and demand factors, and likely also by the search for yield and a low interest rate environment. The risk of boom/bust episodes in certain commodity markets portends potential spillover effects to other financial market segments, as highlighted in the increased correlation between prices of certain commodities and financial assets observed in recent months.

### I.1 A TWO-SPEED RECOVERY CONTINUES TO CREATE FINANCIAL STABILITY CHALLENGES

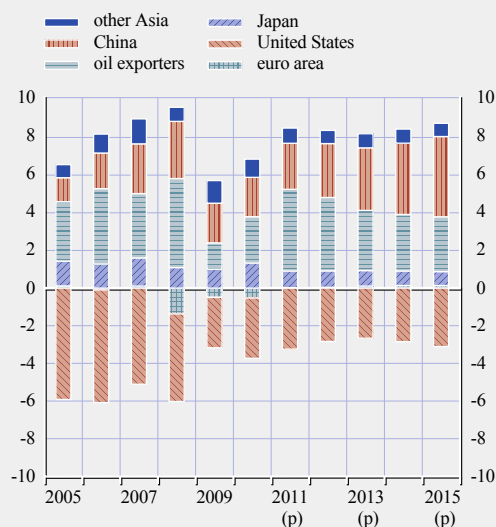
#### GLOBAL FINANCIAL IMBALANCES

The adjustment of global financial and current account imbalances appears to be abating in the main current account deficit and surplus economies. Indeed, evidence suggests that a large part of the adjustment observed since the start of the financial crisis has been driven by cyclical rather than structural factors (see Box 1).

In the United States, the current account deficit narrowed marginally to 3.1% of GDP in the fourth quarter of 2010, from 3.4% of GDP in the second and third quarters of 2010, reflecting an increase in exports. Recent US authorities' announcements on measures aimed at consolidating the US federal budget deficit may, if implemented duly, contribute to a reduction in public sector dissaving and therefore a narrowing of the US current account deficit in the medium term.

Chart I.1 Current account balances for selected economies

(2005 – 2015; percentage of US GDP)



Sources: IMF World Economic Outlook, April 2011, and ECB calculations.  
Note: (p) denotes projections.

In addition, the US household saving rate continued to rise throughout 2010.

has contributed to widening external surpluses in these economies.

Progress made towards rebalancing the sources of growth by strengthening domestic consumption in the current account surplus countries, notably in China, has remained limited. In China, the current account surplus decreased to 4.7% of GDP in 2010 from 6.0% of GDP in 2009 (see Chart 1.1), owing to increased demand for imports. In other emerging economies in Asia, rapid export growth, in conjunction with limited exchange rate flexibility in several cases,

Increases in oil prices and increased demand for oil since the publication of the last FSR will contribute to a rise in oil exporters' current account surpluses. Given the rigidity of the exchange rate regimes of the oil-exporting economies, this may lead to increases in their reserve holdings. In turn, a recycling of these surpluses can be expected – at least in part – to increase capital and liquidity flows into the economies of reserve currency issuers.

#### Box 1

##### IS THE NARROWING OF GLOBAL IMBALANCES SINCE THE FINANCIAL CRISIS CYCLICAL OR PERMANENT?

Global current account and financial imbalances have narrowed markedly during the financial crisis. From a policy perspective, it is important to determine to what extent this narrowing constitutes a structural feature of the global economy, and to what extent it is cyclical, which would imply a renewed widening of imbalances, thereby putting the global recovery at risk. As well as macroeconomic risks associated with global growth, the re-emergence of widening global imbalances may have negative effects on euro area financial stability through increased market and liquidity risks. In particular, should investor concerns focus on the sustainability of public debt, countries with large deficits may experience funding pressures owing to heightened risk aversion and a concomitant rise in bond yields. This may also have an impact on the term structure of international interest rates and lead to volatility in foreign exchange markets, which could spill over to other market segments. Moreover, if global imbalances were to widen and concerns relating to the condition of countries with large external deficits or surpluses were to arise, the risk of disorderly exchange rate adjustments may emerge. Aside from financial stability considerations, this question is also central to international policy discussions, particularly in the context of the G20 Framework for Strong, Sustainable and Balanced Growth, which aims to ensure a durable reduction in global imbalances, together with a sustained global recovery.

The analysis presented in this box aims to quantify how much of the ongoing evolution in the external positions of the key deficit and surplus economies is cyclical in nature and how much is permanent. A cyclical adjustment implies that the factors underlying the change in current account positions are transitory and relate to the evolution of the business cycle – such as those related to transitory changes in commodity prices, wealth effects or macroeconomic stimulus policies – and are thus likely to reverse over the medium term. An adjustment is considered structural in nature if it is due to more fundamental changes in the economies, such as those related to private savings/investment patterns, demographics or structural policies. This taxonomy of cyclical versus structural adjustment is constructed on the basis of estimates

### Estimated cyclical, permanent and unexplained components of the change in selected economies' current account position between 2007 and 2010

(percentage of GDP)

	Permanent	Cyclical	Unexplained
United States	-0.1	0.9	0.9
Euro area	0.1	-0.9	0.1
Japan	0.2	-1.2	-0.3
United Kingdom	-0.7	0.3	0.7
China	-0.6	-4.5	0.5
Oil exporters	-0.7	-3.6	0.0
Emerging Asia (ex. China)	0.0	-1.6	-0.5
Latin America	0.1	-0.9	-0.8
Emerging Europe (CEE3)	-0.2	2.6	1.2

Sources: IMF World Economic Outlook and ECB calculations.

Notes: Based on a Bayesian framework and on 16,000 models spanning all possible combinations of macroeconomic fundamentals for each country. Emerging Asia = Indonesia, Korea, Malaysia, Philippines, Singapore and Thailand; Oil exporters = Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Russia and Venezuela; Latin America = Argentina, Brazil, Chile and Mexico; Emerging Europe = Czech Republic, Hungary and Poland.

for equilibrium, or benchmark, current account positions, based on a model developed by ECB staff.<sup>1</sup> In estimating the current account benchmark, all possible combinations of a wide range of macroeconomic and structural fundamentals are taken into account for each country, leading to the estimation of a large number of models. These models are averaged according to their likelihood of being the “true” model of the current account. The (probability-weighted) average of these models provides the estimate of the current account benchmark. Actual current account positions are then compared with the current account benchmarks consistent with underlying macroeconomic and other structural fundamentals in the medium term to obtain estimates of permanent and de-trended temporary/cyclical components. The resulting time-varying trend is thus the unexplained part of the current account, i.e. the part which cannot be explained by fundamentals or by the business cycle.

The results presented in the table focus on the decomposition of the change in the current account positions of selected economies into permanent, cyclical and unexplained components over the period from 2007 to 2010. According to the model, the narrowing of global imbalances during the financial crisis was largely cyclical. The estimates for the main *external deficit economies* suggest that about 50% of the overall adjustment in the US current account between 2007 and 2010 was cyclical (i.e. 0.9 percentage point of GDP out of a total absolute change of 1.9 percentage points of GDP),<sup>2</sup> as was about one-fifth of the United Kingdom's current account narrowing. The results are more striking for the main *external surplus economies*. About 80% of the adjustment in China's surplus between 2007 and 2010 is estimated to have been cyclical, compared with 70% in the case of Japan. For the oil exporters, the cyclical component accounts for close to 85% of the adjustments. As for the euro area, just over 80% of the deterioration of its current account between 2007 and 2010 is estimated to have been cyclical.

Overall, the results of this model suggest that the narrowing of global imbalances during the financial crisis was largely cyclical. Structural factors underpinning financial and current account balances remain, and along with the growing fiscal pressures in the advanced economies, these

1 See M. Ca' Zorzi, A. Chudik and A. Dieppe, “Current account benchmarks for central and eastern Europe: a desperate search?”, *ECB Working Paper Series*, No 995, January 2009, and M. Bussière, M. Ca' Zorzi, A. Chudik and A. Dieppe, “Methodological advances in the assessment of currency misalignments”, *ECB Working Paper Series*, No 1151, January 2010.

2 The contribution of the cyclical component to the current account adjustments is calculated relative to the absolute sum of the estimated current account components, to take into account the fact that some contribute positively and others negatively to the actual change in the current account.

may cause a resurgence of imbalances in the medium term. While a disorderly unwinding of global imbalances would be particularly concerning, appropriate policy measures can play a role in the resolution of structural imbalances, helping to reduce the downside risks to global growth, as well as the possible negative implications for financial stability.

Looking forward, global financial and current account imbalances are expected to widen further as the cyclical adjustment of imbalances recedes. At the same time, the structural factors behind the large global financial and current account imbalances remain in place and could – together with the growing fiscal burden on advanced economies – cause a resurgence of imbalances over the medium term. This is evident from the current account projections of the IMF that show a re-emergence of global current account imbalances in the next few years (see Chart 1.1).

In the case of an abrupt unwinding of the imbalances, foreign exchange market disturbances may emerge, with possible negative implications for global financial stability. Such disorderly exchange rate adjustments may be caused by concerns regarding the

sustainability of the current account positions of countries with large external deficits or surpluses. The prices of options on foreign exchange rates can be used to analyse market expectations regarding future exchange rate changes. According to the analysis presented in Box 2, the market sentiment is that the probability of extreme US dollar movements has slightly decreased since the publication of the last FSR.

While risks of abrupt short-term currency movements may have abated somewhat, the potential for a reaccumulation of global imbalances as cyclical dynamics fade suggests an important medium-term downside risk to the global economic recovery and financial stability. Policy actions, such as the G20 policy commitments made by the main external surplus and deficit economies to address imbalances, may play a helpful role in mitigating such risks.

## Box 2

### WHAT DO OPTION RISK-NEUTRAL DENSITY ESTIMATES TELL US ABOUT THE EURO/DOLLAR EXCHANGE RATE?

Risk-neutral densities (RNDs) provide an estimate of the probability that market participants attach to future price developments. They are derived from the option prices of a given asset, and under certain assumptions can provide a distribution of outcomes on the basis of which a quantitative risk assessment can be made. In the case of exchange rates, they are an important tool in assessing the likelihood of sharp movements – a key risk for financial stability – and the evolution of this likelihood over time. This box introduces RND estimates for the euro/dollar exchange rate, briefly describes how they are constructed, explains how they can be interpreted and discusses the information they provide at the current juncture.

RNDs can be used to build probability distributions on the basis of two assumptions. The first is that investors are risk-neutral. The second is that options are available for all strikes (that is, the values relevant for exercising the options). With these assumptions, the ratio between the difference in two option prices relative to the difference in option strikes provides the information needed for calculating the relative probabilities of the exchange rate reaching these two levels.

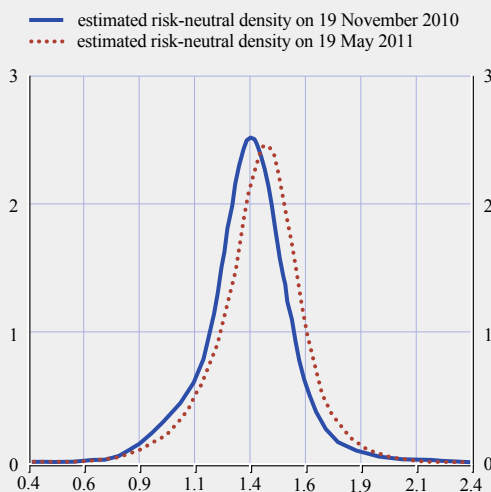
For example, the discrepancy between the prices of two sell options with very close strike prices (e.g. one at USD/EUR 1.2000 and another at USD/EUR 1.2001) would be the probability-weighted difference in option pay-offs. Having a continuum of option prices, one could calculate the whole probability distribution.<sup>1</sup> However, in practice, option prices are available only for a limited number of strikes. Therefore, one needs to estimate – rather than calculate – the overall distribution implied by these prices.

RNDs are not reliable tools for prediction purposes and they are not used for forecasting exchange rates. Rather, their value lies in the information they convey about sentiment on the foreign exchange market: estimated RNDs can be used, for example, as a tool to track changes in market sentiment since the peak of the sovereign debt crisis. By comparing RND estimates based on data up to two different dates, one can assess how foreign exchange market expectations have changed, both in terms of the central estimate and in terms of variance, skewness (larger likelihood of appreciation or of depreciation) and kurtosis (i.e. the probability of large appreciations/depreciations) of the distribution (see the chart).

The chart displays the 12-month-horizon RND for the USD/EUR exchange rate, estimated with data up to 19 November 2010 (the cut-off date of the December 2010 FSR) and up to 19 May 2011. The distribution was skewed to the right on both dates, which means that a euro appreciation was viewed as more probable than a depreciation. On 19 May 2011 the distribution was centred on a higher value of the euro. This is not surprising since the spot exchange rate appreciated between the two dates. To evaluate the likelihood attached by the market to the tail risk of an extreme euro appreciation, we look at the estimated probability of the USD/EUR exchange rate appreciating by more than 26.5%, which is the largest year-on-year appreciation recorded so far for this currency pair. This decreased from 3.1% to 2.2% at a 12-month horizon between 19 November 2010 and 19 May 2011 (see table below). Furthermore, looking at the moments of the 12-month-ahead distribution, the variance, skewness and kurtosis all decreased slightly over the period, indicating that the market attached a lower probability to euro appreciation than before, while the tails of the distribution were thinner. The estimated probability that the USD/EUR exchange rate would appreciate by more than 26.5% is shown in the table for various horizons, from one month to one year. This probability was virtually zero on both dates at the shorter horizons and it decreased at the longer horizons of 6 and 12 months, from 0.5% and 3.1% to 0.3% and 2.2% respectively.

#### Estimated USD/EUR risk-neutral density

(based on 12-month-horizon option prices; USD/EUR exchange rate on the x-axis)



Sources: Bloomberg and ECB calculations.

<sup>1</sup> This has been shown by S. Ross, "Options and efficiency", *Quarterly Journal of Economics*, 90, 1976, pp. 75-89, and subsequently developed by D. Breeden and R. Litzenberger, "Prices of State Contingent Claims Implicit in Option Prices", *Journal of Business*, 51, 1978, pp. 621-652. See also ECB, "The information content of option prices during the financial crisis", *Monthly Bulletin*, February 2011.

Overall, the shape of the estimated RND functions indicates that markets still attach a higher probability to an appreciation of the euro against the US dollar than a depreciation, as shown by the thicker right tail of the distribution. However, the probability of an extreme appreciation has decreased. While exchange rate movements have been affected by many factors since November 2010, in particular by improving macroeconomic developments on average in the euro area, the change in the position and shape of the estimated USD/EUR risk-neutral density also suggests that the policy actions taken at the height of the crisis contributed to stabilising expectations in the exchange rate market. This, in turn, indicates a decreased likelihood of disruption to the balance sheets of those agents that are exposed to currency risk.

#### Probability of the USD/EUR exchange rate appreciating by 26.5% in May 2011 and in November 2010

(based on one, three, six and twelve-month-horizon option prices; percentages)

Horizon	19 November 2010	19 May 2011
1 month	0.00	0.00
3 months	0.00	0.00
6 months	0.50	0.30
12 months	3.10	2.20
<i>Memo item: spot rate</i>	<i>1.37</i>	<i>1.43</i>

Sources: Bloomberg and ECB calculations.

## US SECTOR BALANCES

### Public sector

Since the finalisation of the December 2010 FSR, the US budget outlook has deteriorated, according to the Congressional Budget Office (CBO). This deterioration was primarily a result of the additional fiscal support that was enacted at the end of last year. In December 2010 the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 was implemented, which entails significant fiscal support to economic activity through a combination of tax relief provisions, unemployment insurance extensions and new payroll tax reductions, as well as additional measures.

While the fiscal stimulus will support growth in 2011, it also implies a deterioration of the medium-term budget outlook. The CBO estimated in its April 2011 Budget Outlook that the fiscal deficit for 2011 will widen again from 8.9% in 2010 to 9.3% in 2011. Over the medium term, the CBO estimates that, without a change in current policy, the fiscal deficit will decline further to 6.9% and 4.2% in 2012 and 2013 respectively, while remaining in the range of 2.8% to 3.3% in the period up to 2021. Should the President's budget proposal be enacted, the fiscal outlook would worsen further. The CBO estimates that for 2012 and

2013, the deficit would rise by 0.5 percentage point and 1.3 percentage points, relative to the CBO's baseline estimate, mainly driven by the tax provisions in the budget. Since the finalisation of the December FSR, the CBO has revised upwards its estimate of federal debt held by the public in 2020 – as a share of GDP and assuming no change in current policy – from 70% to 75% (see Chart 1.2). In addition, Standard & Poor's lowered the outlook for its sovereign credit rating on the United States from stable to negative on 18 April, which implies that the credit rating agency believes there is at least a one-in-three chance that its AAA credit rating may be lowered within the next two years. Furthermore, the United States reached the statutory debt limit on 16 May, and put in place temporary measures to avoid breaching this limit. However, the Treasury projects that unless Congress raises the statutory debt limit, the borrowing authority of the US will be exhausted by 2 August, which implies that the US would be unable to meet its debt obligations.

Against this background, the risk of higher US bond yields and the associated rise in interest payments has increased since the December 2010 FSR. If this risk were to materialise, the fiscal outlook would worsen further, as maturing debt would be refinanced at higher rates,

Chart 1.2 US federal debt held by the public

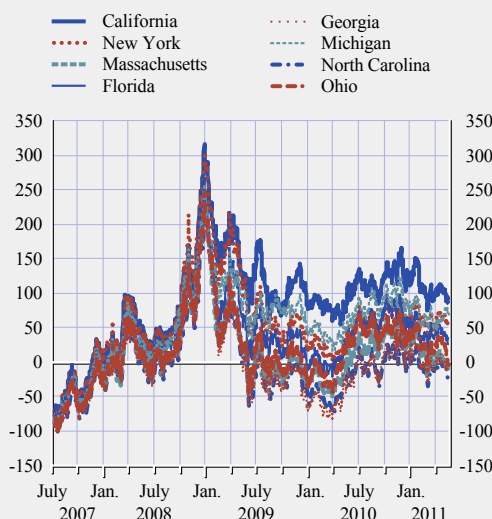
(1939 – 2021; percentage of nominal GDP; fiscal years)



Source: US Congressional Budget Office.

Chart 1.3 Selected US state municipal bond spreads over Treasuries

(July 2007 – May 2011; basis points)



Source: Bloomberg.

which would constrain the scope for further fiscal policy actions. Besides crowding out private investment, large fiscal deficits could also reduce the market value of outstanding US government securities, thus causing losses for their holders. The realisation of such a scenario could cause renewed financial turbulence if there were spillovers to global financial markets.

At the state and local government level, there was an increased issuance of securities in the United States during the second half of 2010, while the yields on state and municipal securities rose noticeably. Credit rating downgrades of state and local governments continued to outnumber upgrades in the second half of 2010 as well, possibly reflecting rising concerns about fiscal solvency at state and municipal level. However, the high levels of issuance and rising yields in the second half of last year were supported by federal subsidies to state and local governments, which expired at the end of 2010. While the rise in municipal yields appears to have levelled off in early 2011, meaning that the rise in issuance volumes observed in the second half of 2010 may overstate the risk within the market for state and local government securities,

such risks nonetheless remain elevated in some cases, as reflected in the increased dispersion of municipal yields (see Chart 1.3).

#### Corporate sector

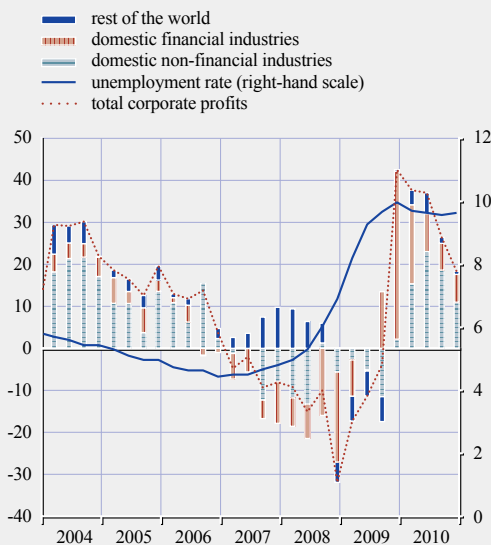
Recent indicators point to an ongoing recovery in the US corporate sector. Growth in corporate profits remains high overall as a result of recent cost-cutting measures and became increasingly broad-based in 2010 across US financial and non-financial entities (see Chart 1.4). However, the outlook for corporate sector profitability is somewhat uncertain owing to the fact that cost-cutting contributed significantly to profit recovery, as well as on account of uncertainties related to the economic outlook.

Despite strong profitability, demand for external financing by non-financial corporations has increased – particularly for large and medium-sized firms – according to the Q2 2011 Federal Reserve Senior Loan Officer Survey. Demand for commercial and industrial loans was exceptionally strong, with a net percentage of about 27% of respondents reporting stronger demand from large and medium-sized firms, which is the highest number since mid-2005.



**Chart 1.4 US corporate sector profits**

(Q1 2004 – Q4 2010; percentage point contribution to year-on-year growth; seasonally adjusted)

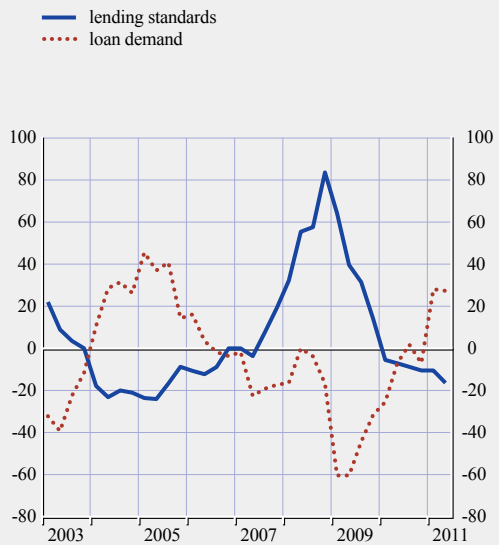


Sources: US Bureau of Economic Analysis and Consensus Economics.

Notes: Corporate profits include inventory valuation and capital consumption adjustments. Profits from the rest of the world (RoW) are receipts from the RoW less payments to the RoW.

**Chart 1.5 Lending standards and demand for corporate loans in the United States**

(Q1 2003 – Q2 2011)



Source: Federal Reserve Senior Loan Officer Survey.

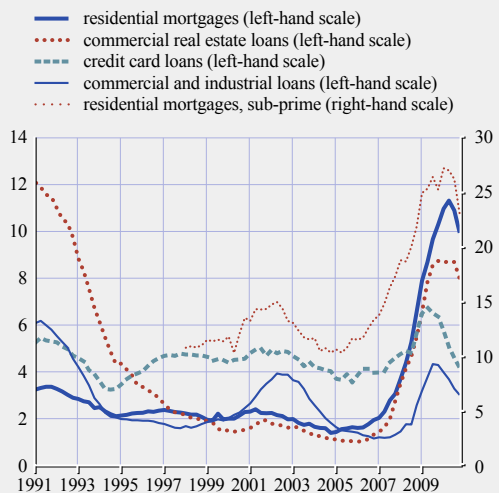
Notes: Lending standards denote the net percentage of domestic respondents reporting a tightening of standards for commercial and industrial (C&I) loans to large and medium-sized firms. Loan demand represents the net percentage of domestic respondents reporting stronger demand for C&I loans by large and medium-sized firms.

In addition, the net percentage of respondents reporting easing lending requirements rose over the second half of 2010, with standards for large and medium-sized firms continuing to ease in early 2011 (see Chart 1.5). The dynamics for small firms in early 2011 also point to rising loan demand and looser loan standards, but are somewhat less pronounced.

Regarding the asset quality on financial sector balance sheets, the quality of loans has also improved, although delinquency rates still remain at very high levels. The decline in delinquencies on commercial and industrial loans continued over the second half of 2010. Delinquencies on commercial real estate loans appear to have reached a turning point in the second half of 2010. This possibly marks an end to the rising delinquencies that have been observed in this loan segment since the beginning of 2006 (see Chart 1.6).

**Chart 1.6 US delinquency rates**

(Q1 1991 – Q4 2010; percentages)



Sources: Federal Reserve Board and Mortgage Bankers Association.

The decline in delinquency rates is consistent with a slight recovery in commercial real estate prices, where a broad-based improvement across all commercial property types was observed in the fourth quarter of 2010. However, given the recent volatility in these data and projected further declines in residential house prices, which tend to affect commercial property prices with a lag, downside risks to the commercial property market remain.

### Household sector

The balance sheets of US households have continued to improve since the December 2010 FSR. Household net worth continued to rise in the fourth quarter of 2010, driven by gains in net financial asset values (see Chart 1.7). At the same time, household liabilities increased for the first time since the third quarter of 2008 (see Chart S5), reflecting an increase in consumer credit, which was only partially offset by a decline in mortgage debt. Overall, the flow-of-funds data suggest that household balance sheets are continuing to strengthen as financial assets recover.

Indicators from the Federal Reserve Senior Loan Officer Survey broadly confirm this picture. The net percentage of respondents that indicate stronger demand for consumer loans turned positive in the first quarter of 2011, for the first time since the third quarter of 2005. Meanwhile, the lending standards on consumer loans continued to ease in early 2011, in particular for credit card debt (see Chart 1.8).

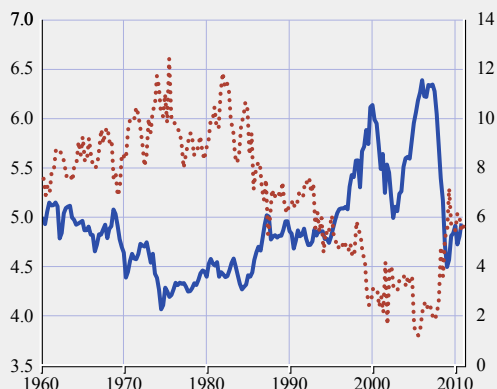
The improvement in households' balance sheets is also reflected in delinquency rates on residential mortgages, which reached a turning point in the second half of 2010. Delinquency rates on credit card loans have fallen below pre-crisis levels (see Chart 1.6).

However, two main risks can be identified for the US household sector. First, cost-cutting measures in the corporate sector have had negative repercussions on employment. While the unemployment rate has decreased from its recession peak of 10.1% last October to 9.0% in April 2011, it clearly remains far above the

Chart 1.7 US household net worth and personal saving rate

(Q1 1960 – Q1 2011)

- household net worth to disposable income (ratio; left-hand scale)
- ..... personal saving rate (percentage of disposable income; right-hand scale)

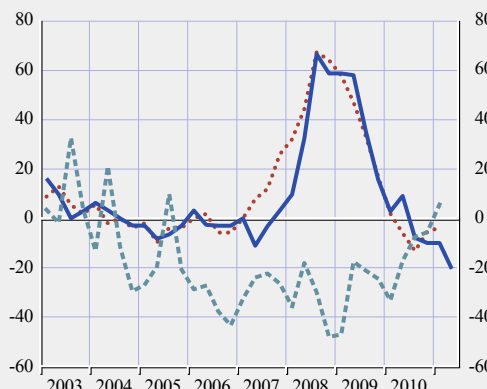


Sources: US Bureau of Economic Analysis and Federal Reserve Board.

Chart 1.8 Lending standards and demand for consumer loans in the United States

(Q1 2003 – Q2 2011; percentages)

- lending standards for credit card loans
- ..... lending standards for consumer loans
- - - - consumer loan demand



Source: Federal Reserve Senior Loan Officer Survey.  
Notes: Lending standards denote the net percentage of domestic respondents reporting a tightening of standards for credit card and other consumer loans. Consumer loan demand represents the net percentage of domestic respondents reporting stronger demand for consumer loans. The data regarding consumer loans end in Q1 2011 due to a change in variable definition.

pre-recession levels. Also, the share of unemployed persons that have been out of work for more than half a year remains elevated at around 43%. In the near term, the outlook for the labour market is weak, with the unemployment rate expected to decline only moderately from its current high level.

Second, the outlook for the US residential housing market remains weak. Since the December 2010 FSR, sales of existing homes have continued to increase, albeit from very low levels, while new home sales remain stagnant. As a result, residential house prices remain soft and S&P/Case-Shiller house price futures indicate further declines in residential house prices in 2011. This contrasts sharply with the indications from house price futures in mid-November 2010, which had pointed towards slight increases in house prices over the same period. Therefore, the downside risk for the housing market outlook has increased slightly since the December 2010 FSR.

## JAPAN

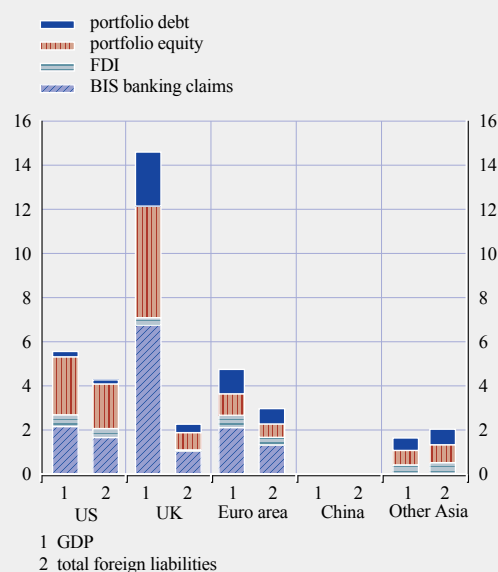
Japan suffered a devastating earthquake and a subsequent tsunami on 11 March 2011. While the events represent first and foremost a human tragedy, the economic costs are also sizeable. A recent estimate by the Japanese government places the total amount of damage at between 3.3% and 5.2% of GDP. In addition, economic growth declined sharply in the first quarter of 2011, to -0.9% on a quarter-on-quarter basis.

While the destruction of infrastructure and energy outages has an adverse impact on economic activity in the short term, reconstruction efforts, financed in part by a supplementary budget by the Japanese government, are expected to partially mitigate the disruption to economic growth in the medium term.

Considering financial linkages with Japan, euro area holdings of Japanese assets are relatively limited, accounting for about 3% of total euro area foreign assets (see Chart 1.9). Japanese holdings of euro area foreign assets amount to about 8% of total euro area liabilities,

**Chart 1.9 Selected countries' holdings of Japanese assets**

(percentage of countries' GDP and percentage of total foreign assets)



Sources: BIS, IMF, OECD and ECB calculations.

Notes: For China, only foreign direct investment (FDI) is available; Other Asia excludes BIS banking claims. Banking sector claims as at end-September 2010. Portfolio investment and FDI as at end-December 2009. Data normalised by total foreign liabilities and nominal GDP as at end-December 2009.

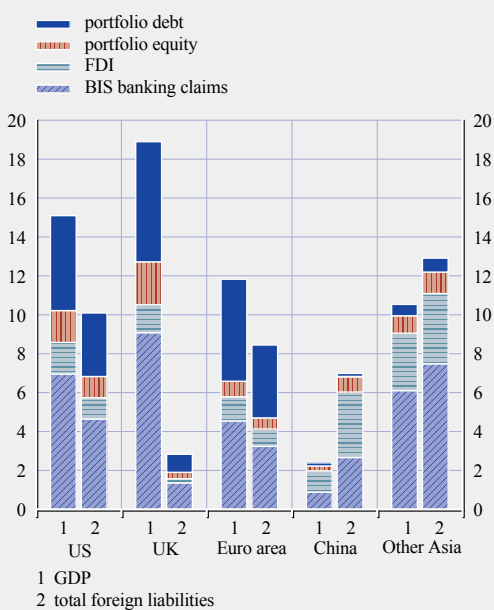
which could potentially be repatriated to finance reconstruction and insurance payments (see Chart 1.10 and Section 5 of this Review). The overall impact on net capital outflows from the euro area is, however, likely to be limited.

As regards the foreign exchange markets, the yen appreciated to a record high of close to JPY 80 to the US dollar following the natural disasters. The strengthening of the yen was driven, in part, by the unwinding of carry trades and repatriation flows. The pressure on the yen subsided somewhat following coordinated official interventions in the foreign exchange market.

The fiscal outlook is expected to deteriorate further as a consequence of the natural disasters. A first supplementary emergency budget of JPY 4 trillion was issued, and several further supplementary budgets may be needed to fund the rebuilding costs, which may reach up

**Chart 1.10 Japan's holdings of selected countries' liabilities**

(percentage of countries' GDP and percentage of total foreign liabilities)



Sources: BIS, IMF, OECD and ECB calculations.  
Notes: Banking sector claims as at end-September 2010. Portfolio investment and FDI as at end-December 2009. Data normalised by total foreign liabilities and nominal GDP as at end-December 2009.

to JPY 25 trillion, according to government estimates. The additional fiscal spending may be partly financed by the issuance of further government debt, which already stands at about twice the size of GDP in gross terms. Against this background, Standard & Poor's and Fitch recently changed the outlook for Japan's sovereign credit rating from stable to negative.

## REGION-SPECIFIC IMBALANCES

### Non-euro area EU countries

In most non-euro area EU countries, the prospects for economic activity have improved further since the December 2010 FSR, although the recovery remains uneven across countries. While external demand has been the main driver of output growth thus far, domestic demand is progressively gaining momentum. Narrowing or stable credit default swap (CDS) spreads as well as interest rate spreads, rising stock prices and

appreciating or broadly stable exchange rates suggest that financial conditions have improved further. Lending activity has remained subdued, however, although there are signs of a pick-up in credit growth, particularly in economies that are recovering relatively strongly.

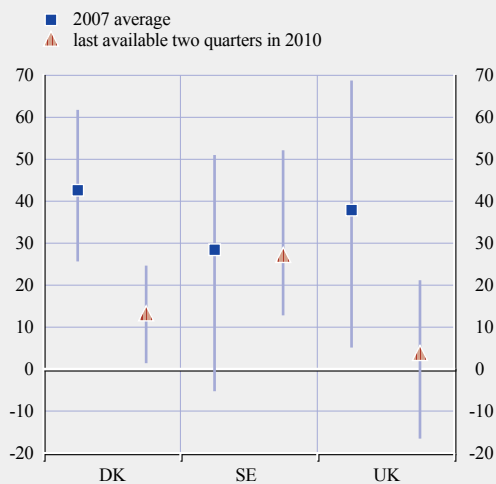
In the United Kingdom, Sweden and Denmark, recent economic growth outturns have been uneven. In the United Kingdom and Denmark, economic activity is likely to recover further in 2011, following some volatility around the turn of the year. In Sweden, economic growth has been remarkably strong as key export sectors have benefited from the recovery in world trade and gains in employment have supported consumption growth. In contrast to many other countries, house prices and household indebtedness in Sweden have continued to increase, fuelled by low interest rates and supported by robust demand. Although Sweden did not experience a construction boom as other countries did in the run-up to the crisis, some signs of house price overvaluation have now emerged (see Chart 1.11). Also in the United Kingdom and Denmark, banks remain vulnerable to further declines in house prices. Finally, banks in all three countries continue to face liquidity and funding risks, partly related to the expiry of public support schemes.

In central and eastern Europe, the economic recovery is likely to continue. The key vulnerabilities remain broadly unchanged from those described in the previous FSR, namely currency mismatches on private sector balance sheets, the deterioration in credit quality in the wake of the severe economic downturn and ongoing high rates of unemployment, as well as higher fiscal imbalances and funding needs. In addition, households are vulnerable to potential increases in interest rates given the high proportion of variable rate mortgages.

The vulnerabilities stemming from currency mismatches are a particular concern in several countries in central and eastern Europe. Although credit growth remains substantially weaker than prior to the crisis, there are signs

**Chart 1.11 Residential property price misalignment indicators for selected non-euro area EU countries**

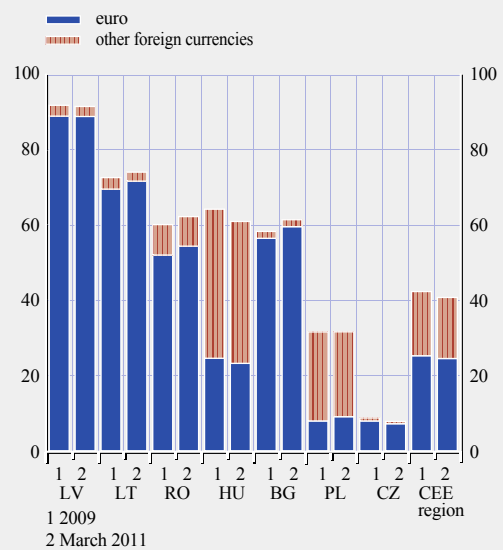
(percentages; deviation of prevailing house prices from indicators; maximum, minimum and mean across four different valuation indicators)



Sources: National statistical offices, national central banks, ECB, OECD and ECB calculations.  
Notes: Data for Sweden and the United Kingdom until the fourth quarter of 2010 and for Denmark until the third quarter of 2010. The estimations start in 1985 for the United Kingdom and 1986 for Denmark and Sweden. Based on four methods to measure over and undervaluation of residential property prices. See Box 3 in Section 2 for details.

**Chart 1.12 Loans in foreign currency to the non-financial private sector in selected non-euro area EU countries**

(percentage of total loans)



Sources: National central banks and ECB calculations.

that the share of foreign currency loans in total loans is picking up again in some countries, as the economic recovery gains strength and broadens to domestic demand (see Chart 1.12). In addition to the usual credit and interest rate risk related to lending, foreign currency loans are associated with currency risk. Potential currency depreciations could significantly increase the debt burdens of unhedged borrowers and decrease the credit quality of loan portfolios. In addition, loan-to-deposit ratios are particularly high in several countries, thus banks continue to depend heavily on foreign funding, mostly in the form of foreign parent bank lending.

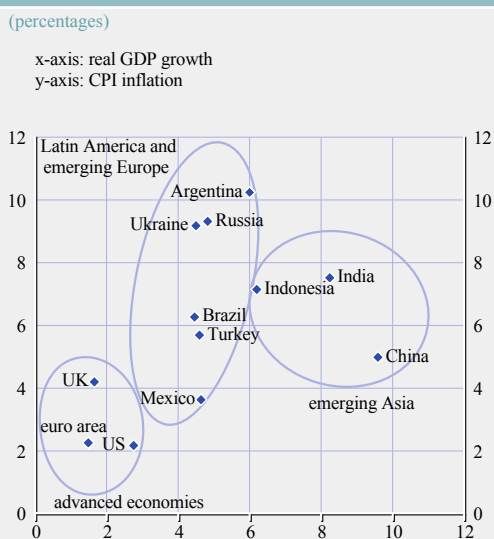
Looking ahead, the economic outlook in the non-euro area EU countries is favourable overall, although large uncertainties remain. In the United Kingdom, Sweden and Denmark, banks remain vulnerable to potential declines in house prices. In central and eastern Europe,

currency mismatches represent a major vulnerability. Financial strains could reappear quickly if risk aversion towards countries in the region were to rise. This might happen as a result of possible spillovers from the sovereign debt crisis in other countries or a reassessment of emerging market risk in general. In addition, risk aversion towards countries in the region could increase as a result of economic policy setbacks, particularly in countries that are going through a protracted macroeconomic adjustment process. Tensions could then lead to disruptions in key funding markets, heightening refinancing challenges facing banks and sovereign issuers.

### Emerging economies

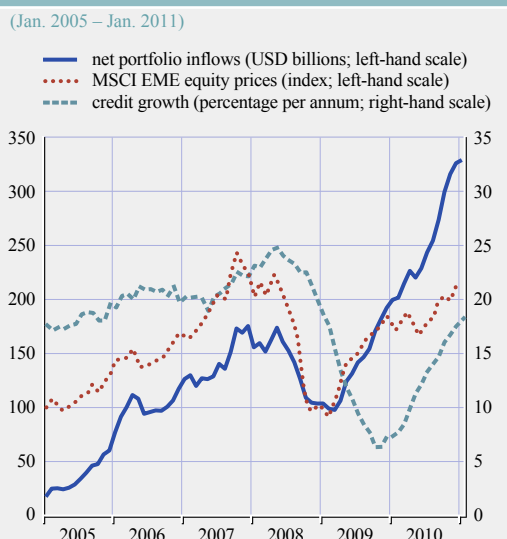
Since the finalisation of the December 2010 FSR, economic activity in emerging economies has continued to recover owing to a strengthening of domestic demand and a further recovery of global trade. Over this period, inflationary

**Chart 1.13 Forecasts of GDP growth and CPI inflation in 2011 for selected emerging and advanced economies**



Source: IMF World Economic Outlook, April 2011.  
Note: The largest three economies of each region are shown.

**Chart 1.14 Capital flows, credit growth and asset prices in key emerging economies**



Sources: EPFR, IMF, MSCI and ECB calculations.  
Notes: Credit growth is the year-on-year growth of credit to the private sector, while net portfolio inflows are the cumulated net inflows into bonds and equities for 19 key emerging economies from emerging Asia, emerging Europe and Latin America. MSCI EME equity prices refer to the MSCI emerging markets index rebased to 100 on 1 January 2005.

pressures have become apparent on account of declining output gaps, rising commodity and food prices, and a relatively accommodative policy stance (see Chart 1.13).

Inflationary concerns, as well as political developments in the Middle East and North Africa (MENA) region, have increased the macroeconomic risks in emerging economies since the December 2010 FSR. This has been further exacerbated by rising capital inflows to emerging economies over the past six months, which are contributing to the risks of overheating and accumulation of macro-financial vulnerabilities (see Chart 1.14).

Since November 2010 the wave of net portfolio flows into emerging economies has moderated somewhat. In the most recent months, portfolio outflows from emerging economies have been observed, owing to market concerns about rising inflationary pressures and political developments in the MENA countries, as well as global interest rate and risk aversion configurations.

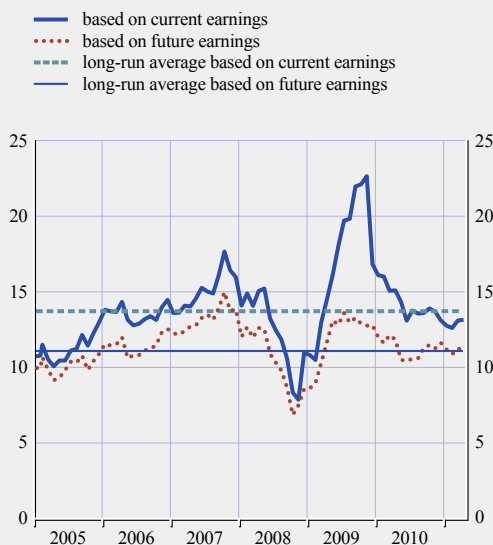
The recent reversal of capital inflows to emerging economies has been associated with a decline in financial asset valuations. Thus, the recent outflows of private capital from emerging economies demonstrate well the risks related to capital flow volatility and the ease with which capital flows reverse.

Since the finalisation of the December 2010 FSR, price/earnings ratios for emerging equity markets have decreased – on account of recent asset price declines – and are currently slightly below the long-term averages (see Chart 1.15). Similarly, emerging market bond prices have also decreased somewhat. Meanwhile, property valuations in the key emerging market economies have risen slightly since the last FSR, owing to improving domestic demand conditions as well as relatively loose domestic monetary and financial conditions.

In the medium term, capital inflows into emerging economies are expected to continue, partly as a consequence of the two-speed

**Chart 1.15 Price/earnings ratios for equity markets in emerging economies**

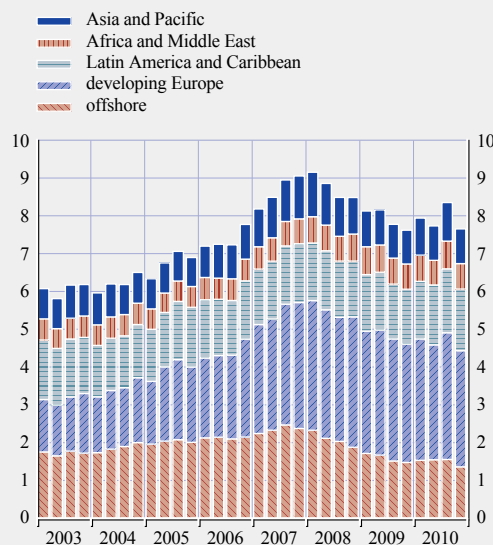
(Jan. 2005 – April 2011; ratio)



Sources: MSCI, Bloomberg and ECB calculations.

**Chart 1.16 Consolidated cross-border claims of euro area financial institutions on emerging economies**

(Q1 2003 – Q4 2010; percentage of total assets)



Sources: BIS and ECB calculations.

recovery of the global economy, with relatively stronger macroeconomic fundamentals and differing monetary policy tightening cycles between key emerging economies and advanced economies, which are “pulling” private investment into emerging economies. Despite some expected monetary policy tightening in the key advanced economies, the low interest rate environment in the advanced economies and the search-for-yield phenomenon are still expected to “push” capital into emerging economies in the medium term.

Thus, the financial stability risks related to volatile capital inflows into emerging economies, either through unsustainable asset price developments or sudden stops of capital flows, continue to pose policy challenges and financial stability risks for the euro area mainly through direct and indirect financial exposures.

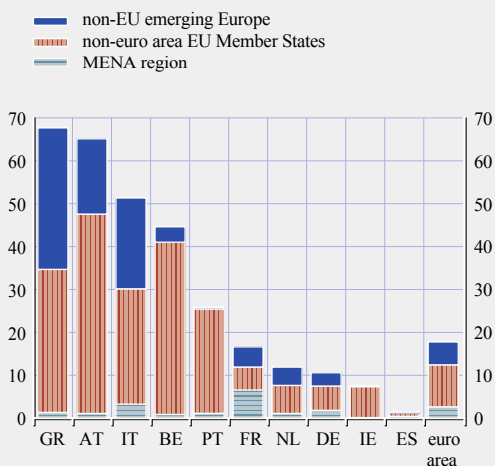
Regarding the risks related to cross-border lending, the lending to emerging economies as a percentage of total assets increased in the third quarter of 2010, following significant portfolio capital flows into emerging economies, but

declined again in the fourth quarter of 2010 (see Chart 1.16).

In EU neighbouring countries, political instability in the MENA region triggered a rise in oil prices and sovereign risk. However, the direct exposure of euro area banks to the MENA region is relatively small (2.5% of total cross-border claims on average) (see Chart 1.17). In south-east Europe, close financial integration with the euro area continues to expose the region to financial fragilities among euro area financial institutions. At the same time, the resumption of credit growth in some non-EU emerging European countries may require local banks to raise additional capital. This could also happen as a result of a deterioration of credit quality, particularly in those countries where output has contracted sharply and leverage is high. The amount of non-performing loans generally tends to remain high for several years following a financial crisis. While the exposure of the euro area is moderate on average, parent banks in some countries with higher cross-border claims on the region could be negatively impacted via a rise in non-performing loans and

**Chart 1.17 Exposure of euro area banks to non-EU and EU emerging Europe to non-EU and EU emerging Europe**

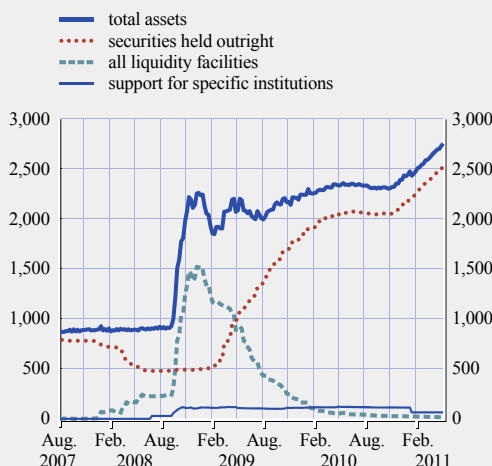
(Q4 2010; percentage of total extra-euro area claims)



Sources: BIS and ECB calculations.

**Chart 1.18 The Federal Reserve's balance sheet**

(Aug. 2007 – May 2011; USD billions)



Source: Federal Reserve.

required to inject capital into local banks in their ownership (see Chart 1.17).

## 1.2 RISKS TO THE FRAGILE FINANCIAL MARKET RECOVERY RESULTING FROM UNCERTAINTIES ABOUT LONG-TERM YIELDS AND COMMODITY PRICES

### US FINANCIAL MARKETS

#### The money market

The Federal Open Market Committee (FOMC) has continued to signal an accommodative monetary policy stance, repeating that current conditions will warrant exceptionally low levels of the federal funds rate for an extended period. The implementation of a plan announced by the FOMC on 3 November 2010 to purchase a further USD 600 billion of longer-term US Treasury securities has led to a continued expansion of the Federal Reserve's balance sheet, which has resulted in an increase in the quantity of reserves in the banking system (see Chart 1.18).

The accommodative monetary policy stance and the ample liquidity conditions have kept

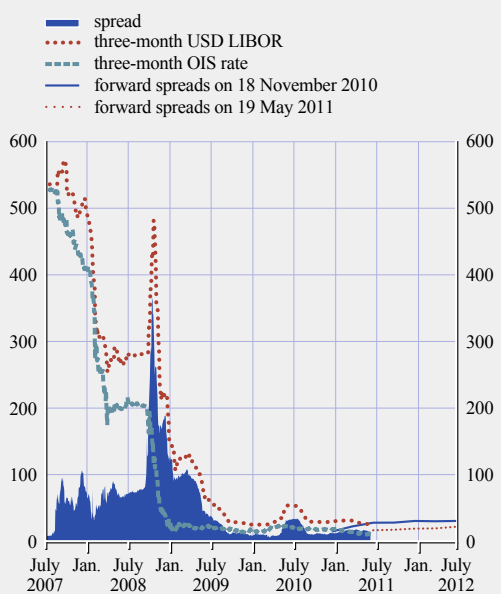
money market rates at low levels. The introduction of a new deposit insurance assessment regime by the Federal Deposit Insurance Corporation (FDIC) in April resulted in a larger than anticipated decline in short-term US dollar money market rates with increased volatility: the effective federal funds rate reached in mid-April a record low of 0.08% and the US dollar overnight repo rate based on general government collateral declined to a record low of 0.01% and reportedly also traded negatively intraday. The new FDIC framework broadened the base for calculating the insurance premium to effectively all liabilities of the banks rather than just domestic deposits. This had the effect of curtailing the demand for short-term funds and the provision of collateral for repo transactions by US banks. Further downward pressure on short-term money market rates came from the temporary unwinding of the Supplementary Financing Program (SFP).<sup>1</sup> The US Treasury allowed most of the outstanding USD 200 billion of T-bills issued under the SFP

<sup>1</sup> The SFP was introduced by the US Treasury, together with the Federal Reserve, in autumn 2008, with the aim of draining reserves from the banking system. Under the SFP, the US Treasury sold T-bills and placed the proceeds into the Federal Reserve's accounts, thereby reducing the level of reserves.



**Chart 1.19 Spreads between the USD LIBOR and the overnight index swap rate**

(July 2007 – June 2012; basis points)



Sources: Bloomberg and ECB calculations.

to mature by the end of March, with the aim of freeing some leeway for the US debt limit. This unwinding has further increased the excess reserves in the banking system, thus contributing to a decline in short-term money market rates.

Overall, the spreads between the three-month US dollar London interbank offered rate (LIBOR) and overnight index swap (OIS) rates have remained fairly stable (see Chart 1.19).

While the US dollar funding situation of European banks appears to have improved somewhat over the last few months, perceived counterparty risk has remained elevated for some European banks in relation to their exposures to euro area countries experiencing sovereign strains. The US dollar swap lines between major central banks, which were reintroduced in May 2010, were prolonged at the end of 2010, up to 1 August 2011. Even though use of the ECB's weekly US dollar liquidity-providing tenders has remained low, the swap line with the Federal Reserve continues to be seen as a reassuring backstop facility for European

banks in case of funding difficulties. In early March 2011 demand in the US dollar liquidity-providing tenders dropped to nil for the first time since August 2010. This was a reassuring sign that Eurosystem banks had sufficient access to the US dollar funding market without having to resort to the ECB facility.

With the US money market fund sector being an important provider of US dollar liquidity to European banks, developments in this sector can have a bearing on the availability of funding to European banks. After the considerable outflows seen in 2009 and in the first half of 2010, the decline in total assets of money market funds halted in the second half of 2010. However, an increase in outflows was again noticeable at the start of 2011. Total assets declined from USD 2.81 trillion at the end of 2010 to USD 2.74 trillion by mid-May, mainly driven by an outflow of institutional money from funds that were following conservative investment strategies by investing in US Treasuries. More specifically, the decline was mainly attributable to the provision of temporary unlimited deposit insurance by the FDIC on all balances held in non-interest-bearing checking accounts.<sup>2</sup> As a result, the US corporate sector appears to have turned to checking accounts as a close substitute for conservative money market funds. Looking ahead, regulatory changes are likely to remain a significant factor in the development of the money market fund sector. In particular, after the end of July 2011 banks will no longer be prohibited from paying interest on demand deposits from corporates, which may lead to further institutional outflows from US money market funds.

The FOMC removed some uncertainty about the immediate future path of the total balance sheet size after it indicated at its April meeting that it will maintain the size of the Federal Reserve's balance sheet once it has completed its purchase of a further USD 600 billion of

<sup>2</sup> The temporary broadening of deposit insurance for the period between January 2011 and December 2012 is part of the Dodd-Frank reforms.

Treasury securities by late June 2011. However, uncertainty still exists as to when the Federal Reserve will eventually begin to reduce the large quantity of reserves in the banking system.

Overall, liquidity conditions are expected to remain ample. However, a faster than expected unwinding of the Federal Reserve's balance sheet together with the start of monetary policy tightening could lead to increased volatility in various money market segments. It might also pose a risk of spillover to other financial markets, in particular the fixed income markets. Such risks would be greater if the FOMC were to apply a tighter monetary policy more quickly than anticipated (see also Box 1 in the June 2010 FSR).

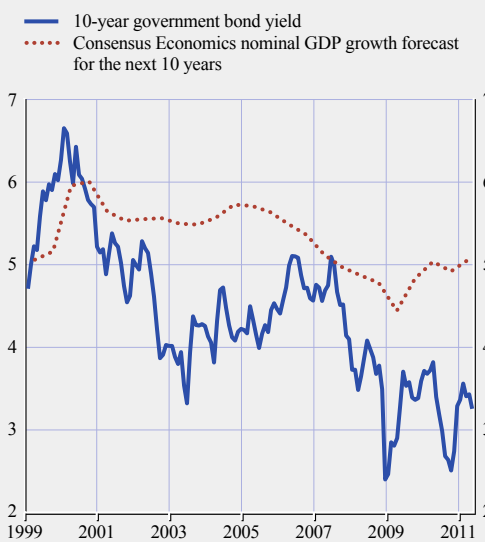
#### Government bond markets

Long-term US government bond yields have increased since the finalisation of the December 2010 FSR, continuing an upward trend that started in the final quarter of 2010. Since then, developments in US government bond yields have been influenced by various factors, driving the yields in opposite directions. On the one hand, positive economic momentum both in the United States and Europe has continued to support the upward trend in yields. This is illustrated in Chart 1.20, which shows the evolution of the ten-year US government bond yield, as well as market expectations for US long-term nominal GDP growth, which have been steadily improving since late 2010.

On the other hand, flight-to-safety flows following the geopolitical tensions in the MENA region brought about downward pressure on government yields. These safe-haven flows intensified after the devastating natural disasters in Japan in early March and put further downward pressure on US government bond yields. The above developments have also influenced volatility in US government bond markets, as measured by the Merrill Option Volatility Estimate (MOVE) index used to track Treasury bond volatility (see Chart 1.21).

**Chart 1.20 US AAA-rated ten-year government bond yield and GDP growth expectations**

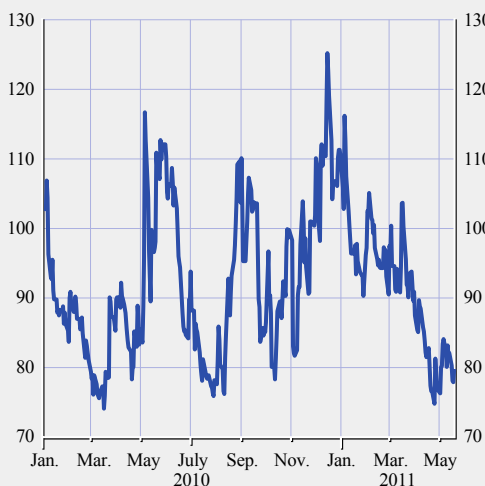
(Jan. 1999 – May 2011; percentages)



Sources: Thomson Reuters, Consensus Economics and ECB calculations.  
 Note: Long-term nominal growth data refer to the average US nominal growth rate expected over the next ten years according to Consensus Economics.

**Chart 1.21 Merrill Option Volatility Estimate index of volatility in the US government bond market**

(Jan. 2010 – May 2011; index)



Sources: Bloomberg and ECB calculations.  
 Note: The MOVE index is a weighted implied volatility index for one-month options on two, five, ten and thirty-year Treasuries.

During the review period, the Federal Reserve started the second phase of its Treasury bond purchase programme. This quantitative easing led to downward pressure on yields stemming from the Federal Reserve's demand for bonds. The purchases under the programme amount to USD 600 billion and are expected to last until the end of the second quarter of 2011.

Uncertainty about the future level of long-term US government bond yields has increased since the December 2010 FSR as a result of several factors. First, ongoing uncertainty about the global economic situation and geopolitical risks is creating flows that will continue to put downward pressure on US government bond yields as long as this uncertainty persists. Second, the long end of the US yield curve is vulnerable to possible increases in inflation expectations and to policy-rate tightening, which are both dependent on the speed of the ongoing economic recovery. Finally, potential fiscal sustainability concerns could exert upward pressure on US government bond yields.

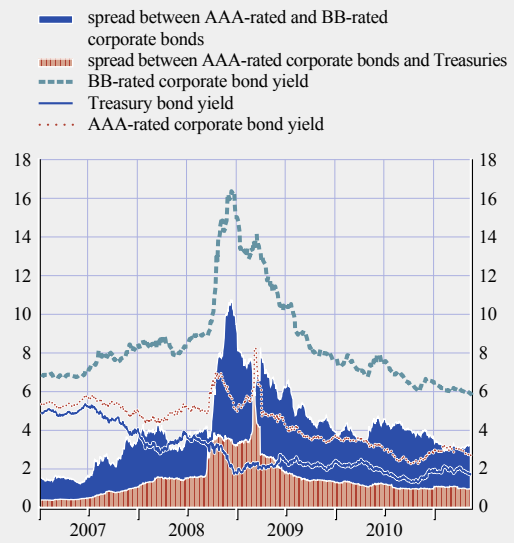
### Credit markets

Despite the increasing levels of US government bond yields, spreads on AAA-rated corporate bonds remained broadly unchanged over the review period. By contrast, the spreads for lower-rated bonds declined, owing to investors' search for yield in the current low interest rate environment. Thus, the spread between AAA-rated and BB-rated US corporate bonds narrowed slightly (see Chart 1.22). This spread was low until mid-February, after which it temporarily widened somewhat as investors fled risky assets in the light of the geopolitical tensions in the MENA region as well as the tragic developments in Japan associated with the March 2011 tsunami.

The issuance volume of US agency bonds was lower in the first part of 2011 than in the first part of 2010. In particular, Freddie Mac and Fannie Mae – the two largest agency debt issuers – saw significant declines in their issuance volumes. The volume of investment-grade and high-yield corporate bonds issued increased

**Chart 1.22 US investment-grade and speculative-grade corporate bond yields, Treasury bond yields and spreads**

(Jan. 2007 – May 2011; percentages)

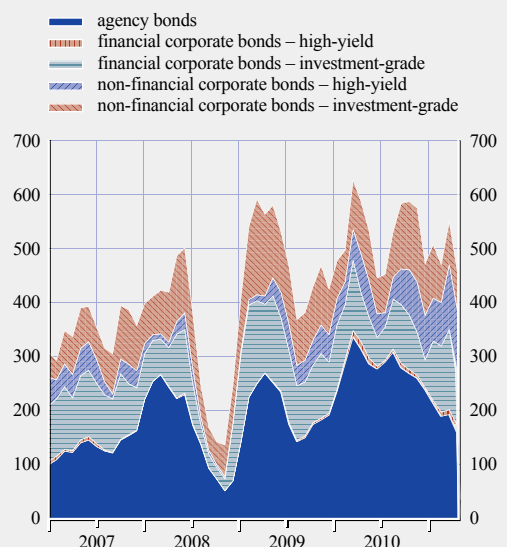


Sources: Bloomberg and ECB calculations.

at the beginning of the period after the finalisation of the last FSR, but this trend later reversed (see Chart 1.23).

**Chart 1.23 Issuance of US corporate and agency bonds**

(Jan. 2007 – Apr. 2011; USD billions; three-month moving sums)



Sources: Dealogic and ECB calculations.

Overall, the outlook for credit markets remains positive, although a potential deterioration in the economic outlook as well as swings in investors' risk appetite could lead to challenges in the market, negatively affecting the outstanding bond values and new issuance volumes. This is especially relevant for lower-rated corporate bonds, which have benefited considerably from the decreased risk aversion and investors' search for yield on account of the low interest rate environment, but which were also supported by the low levels of corporate bond default rates. Further uncertainties relate to the impact on the market that the conclusion of the Federal Reserve's programme of quantitative easing will have at the end of the second quarter of this year.

#### Equity markets

US stock prices have continued to increase since the last FSR, reaching levels last seen prior to the collapse of Lehman Brothers in September 2008. Improvements in the economic outlook as well as stronger than expected earnings announcements have been the main drivers of rising US stock prices since mid-2010. However, the aforementioned increase in investors' risk aversion owing to

geopolitical tensions in the MENA region in mid-February 2011, as well as difficulties related to the March 2011 tsunami in Japan, led to a correction in US stock prices and to an increase in stock market volatility (see Chart 1.24).

Looking ahead, market volatility is expected to remain elevated and movements in stock prices in both directions could appear as long as the geopolitical tensions persist and there are uncertainties related to the global economic recovery.

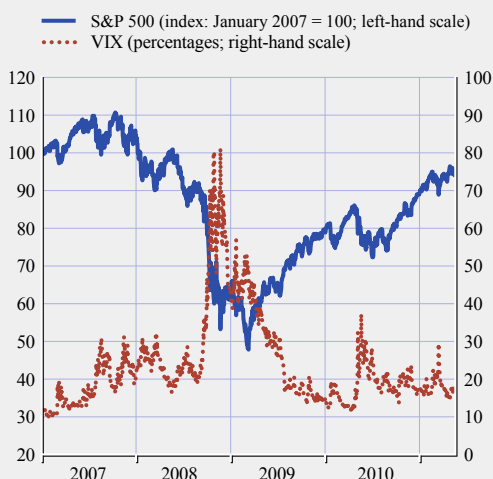
#### Commodity markets

Since the finalisation of the December 2010 FSR, prices across virtually all categories of commodities have increased significantly (see Charts S40 and S42). This increase has come against the background of a significant pick-up in commodity consumption at the global level after the slowdown observed during the crisis, and more recently it has been exacerbated by the geopolitical tensions in the MENA region. A low interest rate environment and associated search-for-yield behaviour have again made the financial products linked to commodities increasingly popular as an alternative asset class: in recent months, commodity-related investment products have seen considerable inflows. Possibly also because of this, the prices of commodities and financial assets have become somewhat more closely related in the last few years (see Chart 1.25). Moreover, the recent general decline of commodity prices illustrates the volatility of that market segment. Given that the risk of asset boom/bust episodes in certain commodity markets has increased, this might cause renewed turmoil in the financial markets.

Starting with energy commodities, Brent crude oil prices have increased significantly over the past few months, and in spite of the recent price correction they still stood at around USD 112 per barrel on 20 May. This latest increasing trend in prices that started in 2009 intensified in the second half of 2010 amid buoyant demand, and was exacerbated by the mounting geopolitical tensions in the MENA region and the resulting threat to the stability of oil supply.

Chart 1.24 S&P 500 index and VIX equity volatility index

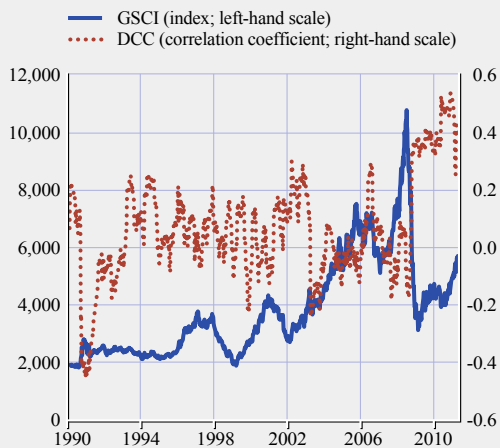
(Jan. 2007 – May 2011)



Source: Thomson Reuters Datastream.

**Chart 1.25 GSCI commodity price index and its dynamic conditional correlation with the S&P 500 index**

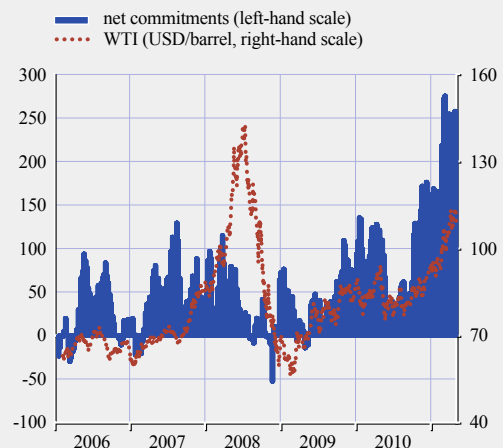
(Jan. 1990 – May 2011)



Sources: Bloomberg and ECB calculations.  
Notes: The calculation of the dynamic conditional correlation (DCC) is based on the methodology presented in R. F. Engle, "Dynamic conditional correlation", *Journal of Business and Economic Statistics*, No 20(3), July 2002.

**Chart 1.26 Speculative positions and WTI crude oil prices**

(Feb. 2006 – May 2011; net future commitments of non-commercials on the New York Mercantile Exchange)



Source: Bloomberg.  
Notes: Net commitments refers to the number of long/short contracts, where each contract represents 1,000 barrels. Non-commercials denotes entities not engaged in crude oil production or refining.

This increase in market tightness and the consequent upward price pressures have also been reflected in the Brent crude oil term structure, which has recently moved from so-called "contango" (where spot prices are lower than futures prices) to "backwardation" (where futures prices are lower than spot prices); the latter situation is associated with supply constraints in the short term.

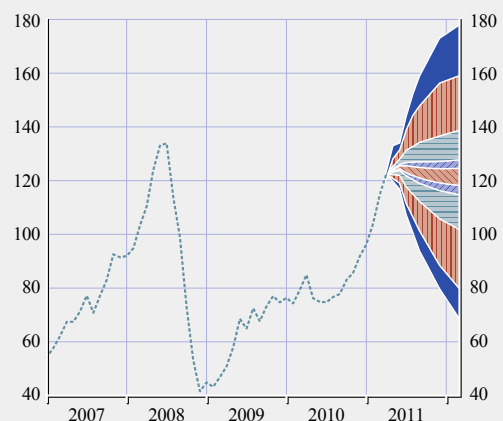
Non-commercial activity in the West Texas Intermediate (WTI) crude oil market has been at very high levels, but this could also be a consequence of the recent disconnect of WTI prices from those of other crude benchmarks (such as Brent or the OPEC basket). Owing to a supply overhang in the US Midwest, where the delivery point of the WTI contract is located, WTI crude is currently trading at a significant discount compared with other benchmarks. Hence, investors may be taking long positions as they anticipate a realignment of prices in the future (see Chart 1.26).

Looking ahead, the current market tightness is likely to persist and market participants expect

oil prices to remain at elevated levels. However, considerable uncertainty regarding future prices remains, as indicated by the implied distributions for future oil prices, extracted from options contracts (see Chart 1.27).

**Chart 1.27 Option-implied risk-neutral densities for the Brent crude oil price**

(Jan. 2007 – Mar. 2012; USD per barrel; 10%, 20%, 50%, 80% and 90% confidence intervals)



Sources: Bloomberg and ECB calculations.  
Note: Based on option prices as at 19 May 2011.

The prices of non-energy commodities have increased moderately since mid-November 2010. The prices of base metals had been increasing until the end of January this year on the back of buoyant demand, particularly from emerging economies, but then stabilised to some extent (see Chart S42). Base metal prices were negatively hit by the news of Japan's natural disasters, mainly as a consequence of the disruptions to industrial production. However, the reconstruction process is likely to be commodity-intensive, which could put upward pressure on commodity prices in the medium term, increasing macro risks to price stability and economic growth.

Regarding precious metals, the price of gold remains very high. In January 2011 the price decreased temporarily, only to resume its long-lasting upward trend in February as a result of the flight-to-safety flows caused by the geopolitical turmoil in the MENA region (see Chart 1.28). Four main factors led to the sharp increase in the gold price, which has been ongoing for several years. First, the low real interest rate environment has caused

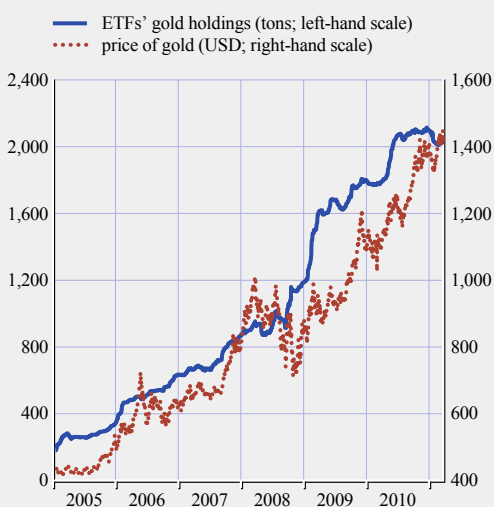
search-for-yield behaviour and pushed investors into alternative asset classes, including gold. Second, the official sector has moved from being a net seller to a net buyer of gold in recent years. Third, because gold is quoted in US dollars, but mined and consumed mainly outside the United States, the USD nominal exchange rate has a large impact on the gold price. Last but not least, the creation of gold exchange-traded funds (ETFs) has improved liquidity, while also making gold more accessible as an asset class to a broader investor base.

Overall, ETFs have become important entities influencing the price dynamics of certain precious commodities, particularly gold. For instance, gold sales by ETFs were reportedly one of the main drivers of the declining gold price back in January. This raises concerns not only that ETFs might contribute to the price increases of precious commodities, but also that a reversal of capital flows out of commodity-based ETFs could cause market distortions and increase price volatility. Another issue related to ETFs in general is increased counterparty risk linked to increasingly popular synthetic replication and securities lending.<sup>3</sup> Similarly, other forms of "financialisation" of commodities, such as increased trading activities in commodity derivatives, could also have negative implications for financial stability.

Finally, regarding soft commodities, food prices also increased up until the end of January this year, driven in particular by gains in wheat and soybean prices resulting from weather-related factors. However, optimistic reports by the US Department of Agriculture concerning the prospects for the 2011 planting season and crops eased some of the upward pressure, and prices stabilised subsequently.

Chart 1.28 Gold price and ETFs' gold holdings

(Jan. 2005 – May 2011)



Sources: Bloomberg and ECB calculations.

3 In synthetic replication, ETF managers swap the returns of a basket of assets (different from the benchmark index constituents) for the actual returns of the underlying index through total return swaps.

### 1.3 IMPROVING FINANCIAL CONDITIONS OF GLOBAL FINANCIAL PLAYERS, WITH SIGNS OF INCREASED RISK-TAKING

#### GLOBAL LARGE AND COMPLEX BANKING GROUPS<sup>4</sup>

The shock-absorption capabilities of global large and complex banking groups (LCBGs) improved further in the fourth quarter of 2010 and the first quarter of 2011, owing to increased regulatory capital, accompanied by a decrease in risk-weighted assets, and buoyant earnings. Earnings were boosted by a decrease in loan loss provisioning and strong net interest income, as well as net fee and commission income. Despite the improved financial condition of global LCBGs, a challenging operating environment persists. The outlook for performance remains uncertain as many banks have yet to fully recover from the recent crisis. Furthermore, they are exposed to changing financial market sentiment, to a rise in long-term yields that could negatively impact trading income, and to any adverse economic and fiscal developments that would pose a risk to the quality of the credit portfolios and to the banks' access to funding markets. In addition, the ongoing regulatory reforms will create further challenges relating to the operating environment for LCBGs.

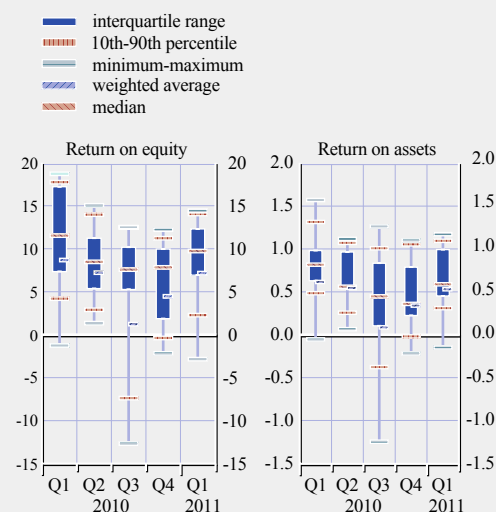
#### Financial performance of global large and complex banking groups

Although global LCBGs' financial results were weaker in the second half of 2010 compared with the first half, the financial results for those LCBGs that reported their quarterly results picked up in the fourth quarter, supported by a further decrease in loan loss provisions and an improvement in net interest income. The pattern of lowering provisions for loan losses continued in the first quarter of 2011 and results improved also on account of higher trading profits. Concerns about the weakest-performing banks have not abated, however, as improvements in financial results were not seen across the board.

The profitability of global LCBGs measured by the return on equity (ROE) improved significantly in the fourth quarter of 2010. The weighted average ROE across global

Chart 1.29 Return on shareholders' equity and return on assets for global large and complex banking groups

(Q1 2010 – Q1 2011; percentages)



Sources: Bloomberg, individual banks' reports and ECB calculations.

Notes: Figures are based on data for the sub-sample of global LCBGs for which results for all quarters are available. Quarterly results have been annualised.

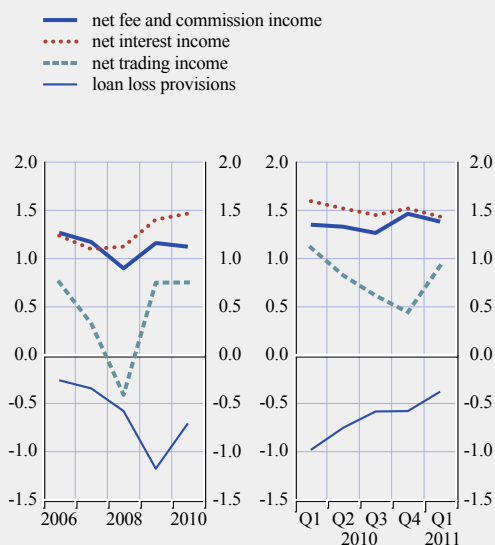
LCBGs increased to 4.5% from 1.2% in the third quarter of 2010, also accompanied by a narrowing in the distribution (see Chart 1.29). In the first quarter of 2011 the weighted average ROE improved further to 7.2%, but with a wider distribution across banks.

The weighted average return on assets (ROA), another measure of banks' performance, advanced to 0.34% in the last quarter of 2010 and further to 0.53% in the first quarter of 2011, from 0.09% in the third quarter of 2010 (see Chart 1.29). At the same time, the leverage of global LCBGs decreased over the quarters either side of the turn of the year, supported by the build-up of shareholders' equity through retained earnings, recapitalisations and a reduction in total assets.

<sup>4</sup> For a discussion on how global LCBGs are identified, see Box 10 in ECB, *Financial Stability Review*, December 2007. The institutions included in the analysis presented here are Bank of America, Bank of New York Mellon, Barclays, Citigroup, Credit Suisse, Goldman Sachs, HSBC, JPMorgan Chase & Co., Lloyds Banking Group, Morgan Stanley, Royal Bank of Scotland, State Street and UBS. However, not all figures were available for all companies.

**Chart 1.30 Decomposition of operating income and loan loss provisions for global large and complex banking groups**

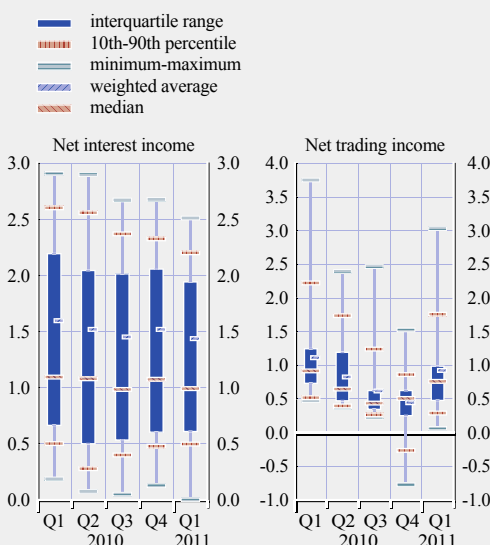
(2006 – Q1 2011; EUR billions, aggregated; percentage of total assets, weighted average)



Sources: Bloomberg, individual banks' reports and ECB calculations.  
Notes: Quarterly figures are based on data for the sub-sample of global LCBGs for which results for all quarters were available. Quarterly results have been annualised.

**Chart 1.31 Net interest income and net trading income of global large and complex banking groups**

(Q1 2010 – Q1 2011; percentage of total assets)



Sources: Bloomberg, individual banks' reports and ECB calculations.  
Notes: Figures are based on data for the sub-sample of global LCBGs for which results for all quarters are available. Quarterly results have been annualised.

Earnings of global LCBGs in the fourth quarter of 2010 were above those in the previous quarter owing to the positive developments in operating incomes with the exception of net trading income and the decrease in loan loss provisions (see Chart 1.30). In the first quarter of 2011 the earnings of global LCBGs improved further, with better trading incomes and a further decrease in loan loss provisions.

After a temporary improvement in the average ratio of net interest income to total assets in the last quarter of 2010, the ratio fell back in the first quarter of 2011 to the level of the third quarter of 2010 (see Chart 1.31). However, in general, net interest income continued to be under pressure, as most banks' net interest margins were compressed, while loan growth remained weak. With a high probability of increased funding costs, the net interest margins of banks will continue to remain under pressure. For the US LCBGs, the growth in

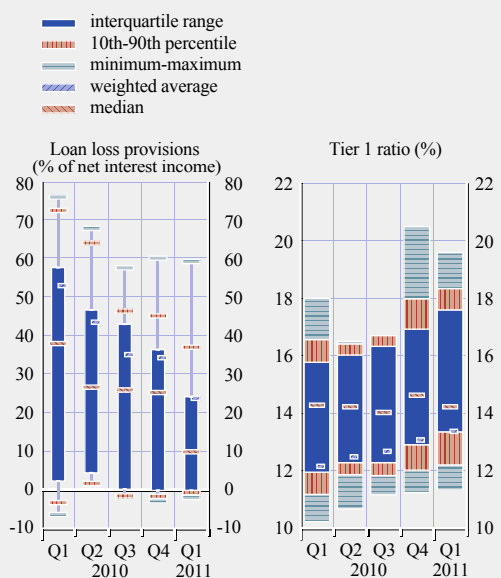
lending was generally weak and primarily driven by commercial loan books.

Trading results contributed positively to the earnings of global LCBGs in 2010 as well as in the first quarter of 2011 as none of the banks reported a full-year or a first-quarter loss on their trading activities (see Table S2 and Chart 1.31). However, increased volatility and decreased trading volumes, combined with a significant rise in the US government and high-quality corporate bond yields, had a negative impact on the fourth-quarter trading results and pushed them into negative territory for some banks. Earnings from fixed income, currency and commodity trading were particularly affected in that period. An increased income stream from fees and commissions, on the other hand, contributed positively to the financial results for the fourth quarter of 2010 and the first quarter of 2011.



**Chart 1.32 Loan loss provisioning and Tier 1 ratios of global large and complex banking groups**

(Q1 2010 – Q1 2011)



Sources: Bloomberg, individual banks' reports and ECB calculations.  
 Note: Figures are based on data for the sub-sample of global LCBGs for which results for all quarters were available.

The main driver of the improved earnings of global LCBGs in 2010 was the reduction of loan loss provisions. Expressed as a percentage of net interest income, average loan loss provisions decreased slightly in the last quarter of 2010 and also in the first quarter of 2011 as credit quality metrics continued to improve (see Chart 1.32), although some global LCBGs that have exposures to countries in distress increased their loan loss provisions. Looking ahead, a further decrease in loan loss provisioning is expected in the context of a continuing credit recovery and the resulting balance sheet repair. However, there is a risk that any potential disruption to the ongoing economic recovery would have a negative impact on expected improvements in credit quality.

#### Solvency positions of global large and complex banking groups

The weighted average Tier 1 capital ratio of global LCBGs increased throughout 2010

to reach 13.4% in the first quarter of 2011, as banks retained a significant portion of their earnings and made an effort to raise capital (see Chart 1.32). Those actions were partially mitigated by the increase in risk-weighted assets for some banks. However, aggregated risk-weighted assets for the sub-sample of LCBGs that reported their quarterly results decreased in the last quarter of 2010 and the first quarter of 2011. In their results commentaries, some banks disclosed their expected Tier 1 ratios under Basel III, with many characterising their compliance with the new rules as manageable. The effects of the increased capital and liquidity requirements resulting from the Dodd-Frank Act, Basel III and some specific national regulatory reforms are still clouded by uncertainty. In addition, in the context of regulatory changes, risks related to regulatory arbitrage are emerging, with those coming from the shadow banking sector growing in importance. Moreover, risks related to unmet capital needs and to the lack of funding diversity among global LCBGs remain.

#### Outlook and risks for global large and complex banking groups

Since the finalisation of the December 2010 FSR, market indicators point to a gradual stabilisation of the outlook for global LCBGs' performance. Despite some variability over recent months, the median share price of the sample of global LCBGs has returned to the level seen at the time of finalisation of the last issue of the FSR. In addition, dispersion across the banks' share prices has decreased compared with the period analysed in the December 2010 FSR. A similar pattern has been observed in the CDS spreads of these banks, although in this case the dispersion of the spreads remained largely unchanged (see Chart 1.33). Nevertheless, in November 2010 fears among market participants about the condition of some banks re-emerged amid concerns about the pressure to meet year-end deadlines for raising capital, about the impact of buybacks of mortgages that failed to meet underwriting standards, and about the situation of banks in selected countries such as Ireland. These concerns abated somewhat in subsequent

months, stabilising the perceived risks. The signs of economic recovery also supported the increase in confidence.

The analysis based on market indicators suggests a gradual abatement of credit risk for LCBGs and an improved earnings outlook. Overall, however, the outlook for global LCBGs remains uncertain, as many banks still have to recover from the crisis. In the short term, any deterioration in financial market sentiment may prolong the recovery, while the expected increase in long-term yields will weigh on trading incomes.

In the medium-to-long term, potential adverse global macroeconomic developments pose a risk to the continuation of the improvement in the credit quality of the assets and in incomes of LCBGs. Furthermore, banks will face increased competition in capital and debt markets among themselves and also from sovereigns, while raising equity and issuing long-term debt to comply

with the new Basel III capital requirements and with potentially higher capital requirements for systemically important financial institutions.

### HEDGE FUNDS

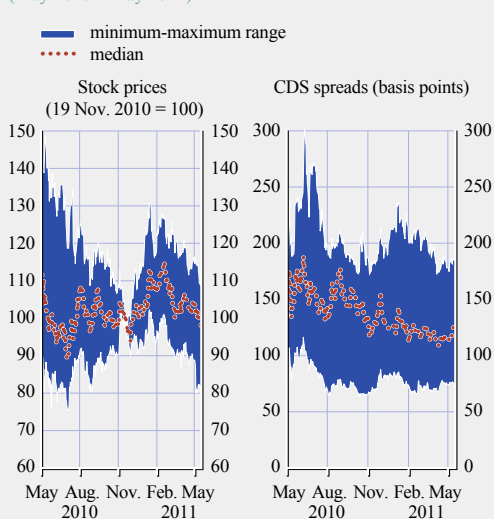
Conditions in the hedge fund sector seemed to have largely normalised. Low nominal interest rates as well as sufficiently attractive investment returns were supportive of recovering investors' inflows, thereby implying lower redemption risk faced by hedge funds. Nonetheless, amid higher counterparty credit risk tolerance and intense competition among banks, the ongoing releveraging of the hedge fund sector needs to be closely monitored, as does the possible crowding of hedge fund trades.

### Investment performance and exposures

After the first four months of 2011 average year-to-date investment results of single-manager hedge funds were slightly worse than after the equivalent period in 2010 (see Chart 1.34).

**Chart 1.33 Stock prices and credit default swap spreads for a sample of global large and complex banking groups**

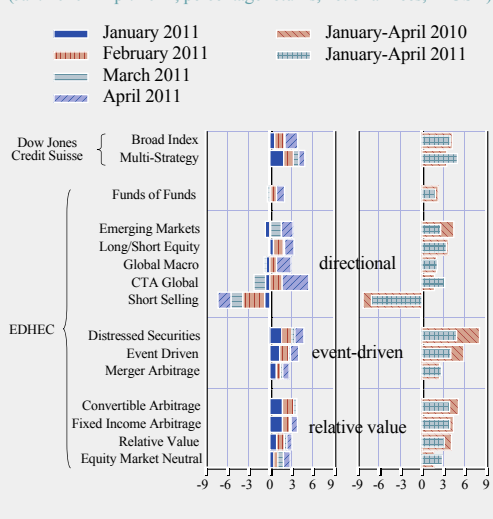
(May 2010 – May 2011)



Sources: Bloomberg and ECB calculations.

**Chart 1.34 Global hedge fund returns**

(Jan. 2010 – Apr. 2011; percentage returns, net of all fees, in USD)



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 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.

With the exception of hedge funds pursuing a dedicated equity short bias investment strategy, all other strategies posted positive year-to-date investment results.

Nevertheless, the similarity of hedge funds' investment positioning within some broadly defined investment strategies and thus the associated risk of simultaneous and disorderly collective exits from crowded trades appeared to be higher than usual. At the end of April 2011 moving median pair-wise correlation coefficients of the investment returns of hedge funds within investment strategies – a measure of the possible crowding of hedge fund trades – reached all-time highs in the case of multi-strategy, long/short equity hedge and global macro strategies (see Chart 1.35). Furthermore, median pair-wise correlations were close to all-time highs for event-driven, equity market-neutral, managed futures, emerging markets and fixed income arbitrage strategies.

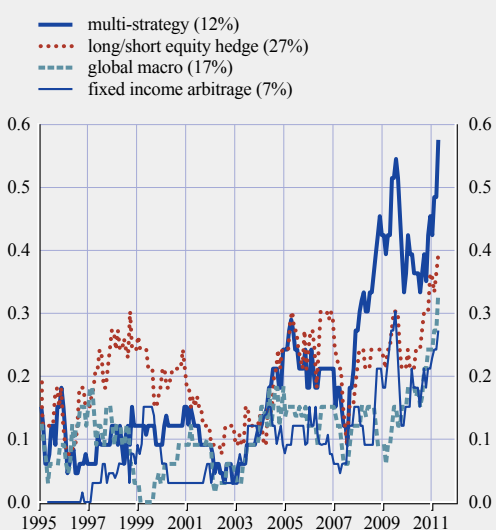
### Funding liquidity risk

In 2010, for the first time since 2007, annual net flows into single-manager hedge funds turned positive again (see Chart S15). At the end of the first quarter of 2011 various estimates of total capital under management were close to or already above previous peaks. Most, if not all, market participants expected that inflows would continue and probably even increase, thereby implying lower redemption risk for hedge funds.

While market observers continued to note concentrated inflows and a stronger preference for larger hedge funds, there has also reportedly been a growing willingness to consider investing in smaller hedge funds, even in the form of seed money. Launch activity has also strengthened, not least because of start-ups by the former trading teams of US banks' proprietary trading desks, which will have to be downsized or closed owing to the new restrictions envisaged in the Dodd-Frank Act.

**Chart 1.35 Medians of pair-wise correlation coefficients of monthly global hedge fund returns within strategies**

(Jan. 2005 – Apr. 2011; Kendall's  $\tau$  correlation coefficient; percentage monthly returns, net of all fees, in USD; moving 12-month window)



Sources: Lipper TASS, Lipper TASS database and ECB calculations.

Note: The percentages in brackets after strategy names indicate the share of total capital under management (excluding funds of hedge funds) at the end of September 2010, as reported by Lipper TASS.

An analysis of longer-term pair-wise correlations between investors' global net flows into individual hedge fund investment strategies suggests that net flows into most investment strategies and groups of strategies tended to be positively correlated (see Table 1.1a), thereby pointing to the risk that redemptions, if they were to materialise, might be broad-based and affect a number of hedge fund investment strategies at the same time. Based on the correlation matrix presented in Table 1.1a, the lowest pair-wise correlation was between net flows into global macro and equity market-neutral strategies, whereas the two highest correlations were between fixed income arbitrage and emerging markets strategies and between multi-strategy and event-driven strategies.

Furthermore, pair-wise tail correlations between the largest redemptions from a particular strategy (the first decile of net flows) and the respective net flows of another strategy (see Table 1.1b) were often substantially higher than the respective pair-wise correlations computed using the full set of each strategy's

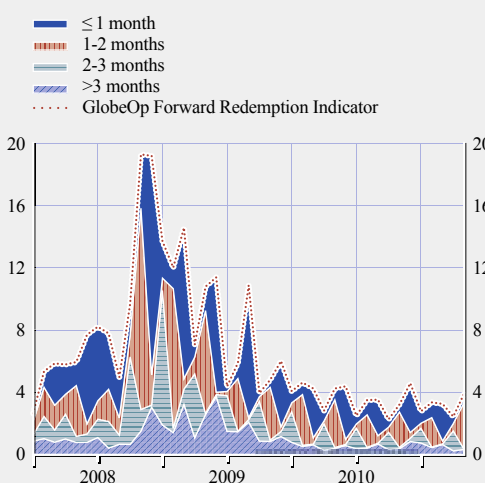
quarterly data, suggesting that in times of stress redemptions from some strategies might be much more correlated than longer-term pair-wise correlation coefficients indicate. This phenomenon of increased correlation in times of stress is particularly notable in the case of large redemptions from global macro and long/short equity hedge strategies, as well as between event-driven and managed futures strategies. In addition, most other strategies tended to experience smaller net flows when either event-driven or long/short equity hedge strategies were suffering large redemptions, whereas large redemptions from fixed income arbitrage and equity market-neutral strategies tended to be associated with larger net flows for other strategies.

According to the data put together by a hedge fund administrator,<sup>5</sup> in mid-May 2011 forward redemption notifications received from investors for administered hedge funds, measured as a percentage of the total capital under management of administered hedge funds, were well below the peak ratios at the end of 2008 and below the historical average since January 2008 (see Chart 1.36). Although this forward redemption indicator is based only on hedge funds that are clients of a particular administrator and which, according to the administrator, accounted for less than one-tenth of total hedge fund capital under management globally, it nevertheless supported the expectations of limited investor redemption pressures in the near term.

In addition to investor redemptions, the possibility of liquidity pressures arising from the short-term financing provided by banks represents another form of funding liquidity risk faced by hedge funds. In this regard, it is noteworthy that, according to market intelligence, amid intense competition, prime broker banks seemed to be increasingly ready to offer term financing commitments. This could imply lower funding liquidity risk for hedge funds, but only if these commitments were not cancellable by banks in stressful conditions.

Chart 1.36 Near-term redemption pressures

(Jan. 2008 – May 2011; percentage of hedge fund assets under administration that investors plan to withdraw, segmented by redemption period)



Source: GlobeOp.

Notes: Assets under administration refer to the sum of the net asset value (capital under management) of all hedge funds administered by GlobeOp. Data are based on actual redemption notices received by the 12th business day of the month. Investors may, and sometimes do, cancel redemption notices. Unlike subscriptions, redemption notices are typically received 30 to 90 days in advance of the redemption date, depending on individual fund redemption notice requirements. In addition, the establishment and enforcement of redemption notice deadlines may vary from fund to fund.

### Leverage

Although timely data on hedge fund leverage are difficult to come by, hedge fund leverage seems to have continued to increase since the finalisation of the previous FSR and thus has been gradually getting closer to pre-crisis levels (see Chart 1.37). The availability of leverage from prime broker banks is reportedly no longer a constraint, as both price and non-price (for example, haircuts, maximum amount and maturity of funding) financing terms continued to improve (see also the sub-section on counterparty risk in Section 4.3).

<sup>5</sup> Administrators provide a variety of services to hedge fund clients, including the processing of investor subscriptions and redemptions, valuations, the calculation of a fund's net asset value, as well as middle and back-office services.

**Table 1.1 Correlations between investors' global net flows into hedge fund investment strategies**

(Q1 1994 – Q3 2010; Kendall's  $\tau_b$  pair-wise correlation coefficients in percentages using investors' global net flows into a hedge fund investment strategy, expressed as percentages of strategy's capital under management at end of previous quarter)

**a) Pair-wise correlations between investors' net flows into hedge fund investment strategies**

Group	Strategy	Directional	Relative value	Multi-strategy	Event-driven
				Multi-strategy	Event-driven
Directional	Dedicated short bias	21	17	23	35
	Emerging markets	49	18	15	32
	Global macro	38	7	17	17
	Long/short equity hedge	46	32	19	30
	Managed futures	31	30	22	12
Relative value	Convertible arbitrage	23	64	35	40
	Equity market-neutral	15	58	29	28
	Fixed income arbitrage	39	60	34	40
Event-driven	Event-driven	40	42	43	
Multi-strategy	Multi-strategy	33	38		43
Relative value		30			
Directional			30		
Column median				23	32

**b) Pair-wise tail correlations between the first decile of investors' global net flows into a hedge fund investment strategy (columns) and the respective net flows of another strategy (rows)**

Columns refer to tail observations (the first decile) of that particular strategy

Directional	Dedicated short bias	62	5	14	43
	Emerging markets	52	24	33	14
	Global macro	33	14	-5	-5
	Long/short equity hedge	33	33	14	62
	Managed futures	52	71	-24	62
Relative value	Convertible arbitrage	24	33	-14	71
	Equity market-neutral	62	43	14	62
	Fixed income arbitrage	24	14	14	14
Event-driven	Event-driven	71	-5	24	
Multi-strategy	Multi-strategy	33	-24		62
Relative value		52			
Directional			43		
Column median				14	62

50 greater than or equal to 50  
0 less than zero

Sources: Lipper TASS and ECB calculations.

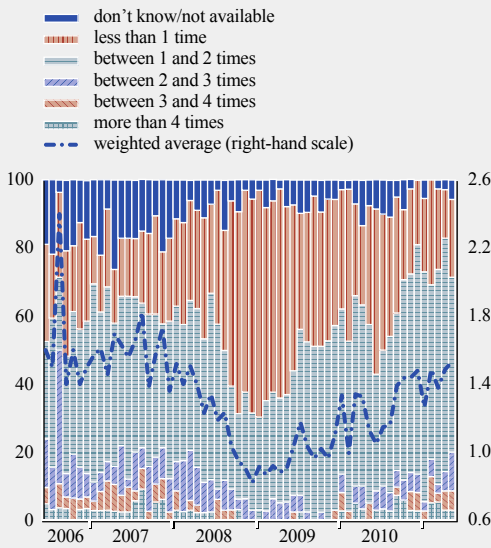
Notes: Correlations would generally be higher if Pearson's rather than Kendall's  $\tau_b$  correlation coefficients were used. The directional group includes dedicated short bias, emerging markets, global macro, long/short equity hedge and managed futures strategies. The relative value group consists of convertible arbitrage, equity market-neutral and fixed income arbitrage strategies.

Relative value		Directional					
Fixed income arbitrage	Equity market-neutral	Convertible arbitrage	Managed futures	Long/short equity hedge	Global macro	Emerging markets	Dedicated short bias
13	26		3	25	0	3	
43	-6	6	26	15	33		3
25	-13	6	33	-9		33	0
23	38	27	11		-9	15	25
37	21	15		11	33	26	3
34	40		15	27	6	6	13
26		40	21	38	-13	-6	26
	26	34	37	23	25	43	13
40	28	40	12	30	17	32	35
34	29	35	22	19	17	15	23
34	26	27	21	23	17	15	13

-24	-14	43	33	52	43	-14	
5	-24	-24	33	43	43		-14
5	-5	-43	24	71		-43	-14
-24	33	33	33		43	33	14
-14	-5	-5		43	24	14	24
-33	52		62	62	33	14	52
-14		33	33	52	5	24	33
	14	24	33	43	33	62	-5
-24	14	24	43	52	33	24	43
-14	-5	14	24	52	-24	33	71
-14	-5	24	33	52	33	24	24

**Chart 1.37 Hedge fund leverage**

(June 2006 – May 2011; percentage of responses and weighted average leverage)



Source: Bank of America Merrill Lynch, “Global Fund Manager Survey”.

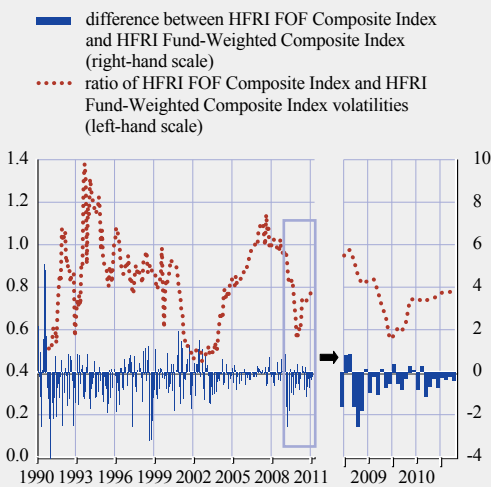
Notes: Leverage is defined as a ratio of gross assets to capital. In 2010 and 2011 the number of responses varied from 30 to 41.

The March 2011 Fed survey on dealer financing terms revealed that over the six months up to February 2011 the use of leverage by hedge fund clients increased across all broadly defined investment strategies.<sup>6</sup>

Furthermore, the ratio of volatilities of returns for funds of hedge funds and single-manager hedge funds has also continued to increase, suggesting that leverage may have started rising at the funds-of-hedge-funds level too (see Chart 1.38).

**Chart 1.38 Comparison of returns of single-manager hedge funds and funds of hedge funds**

(Jan. 1990 – Apr. 2011; ratio of 12-month moving volatilities; percentage difference of monthly net-of-all-fees returns in USD)



Sources: Bloomberg and ECB calculations.  
Notes: Single-manager hedge funds are included and their weighting in the HFRI Fund-Weighted Composite Index may differ from the composition of underlying single-manager hedge fund portfolios of funds of hedge funds included in the HFRI FOF Composite Index.

6 See Special Question No 50 in Federal Reserve Board, “Senior Credit Officer Opinion Survey on Dealer Financing Terms”, March 2011.

## 2 RISKS WITHIN THE EURO AREA NON-FINANCIAL SECTOR

*The euro area macroeconomic environment continued to improve further after the finalisation of the December 2010 Financial Stability Review (FSR), but with continued considerable differences across countries. While this improvement has translated into some easing of strains in the non-financial sector of the euro area, risks still remain.*

*Notwithstanding some amelioration in the euro area fiscal outlook, public finance positions in several euro area countries remain precarious. Indeed, a main risk for the euro area financial system remains the interplay between the vulnerabilities of public finances and the financial sector, with potential adverse contagion effects.*

*For euro area non-financial corporations, the overall macroeconomic improvement contributed to a continued slight improvement of profitability. Nevertheless, conditions in some segments, such as the small and medium-sized enterprises (SMEs) sector, remained fragile. In addition, although most euro area countries have witnessed some improvement in commercial property markets in recent quarters, conditions in some countries remain very challenging.*

*The balance sheet condition of euro area households also strengthened somewhat after the finalisation of the December 2010 FSR, but with the economic recovery remaining uneven across euro area countries and indebtedness still at high levels, significant credit risks in some countries' household sectors remain.*

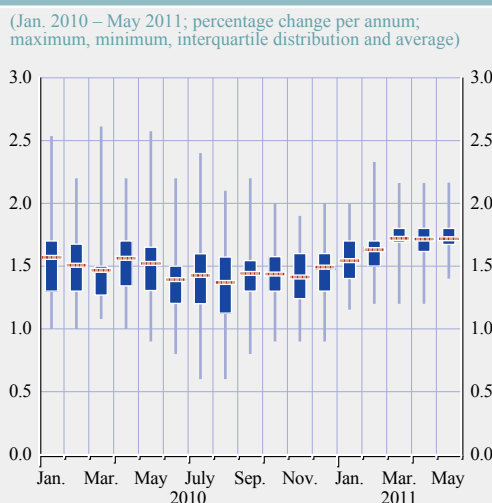
### 2.1 IMPROVING EURO AREA MACROECONOMIC OUTLOOK, THOUGH UNEVEN ACROSS COUNTRIES

The positive economic momentum in the euro area remained in place at the turn of the year, in line with expectations at the time of finalisation of the December 2010 FSR.

Following relatively modest growth in the euro area in the second half of last year, with quarter-on-quarter rates averaging 0.3%, activity registered a strong increase in the first quarter of 2011. Looking ahead, there has been a further improvement in the overall macroeconomic outlook in the euro area. While fiscal stimuli have faded and consolidation efforts are ongoing, the worldwide pick-up in activity, the effects of expansionary monetary policy and the significant efforts to restore the functioning of the financial system are expected to support growth in the euro area, with domestic demand increasingly taking over the lead from net exports. Compared with expectations in the December 2010 Eurosystem staff macroeconomic projections for the euro area, the June projections for real GDP were revised upwards for 2011, with expected annual growth rates between 1.5% and 2.3% in 2011, while the range for 2012 remained broadly unchanged, with growth expected to be between 0.6% and 2.8%.<sup>1</sup> Private sector forecasters also made upward revisions to their forecast of euro area growth during the first months of 2011 (see Chart 2.1).

<sup>1</sup> The June 2011 Eurosystem staff macroeconomic projections were published on 9 June, after the cut-off date for this issue of the FSR.

**Chart 2.1 Distribution across forecasters for euro area real GDP growth in 2011**



Source: Consensus Economics.



However, uncertainty remains high along the current path to sustained recovery, in particular because of the ongoing process of balance sheet adjustment in the financial, non-financial and government sectors inside and outside the euro area. Consequently, the probabilities of adverse growth scenarios, although diminished since the finalisation of the December 2010 FSR, remain strong (see Chart S44). Moreover, there remains considerable heterogeneity in economic developments at the country level. Growth in some countries is likely to remain weak given the accumulation of significant imbalances prior to the onset of financial turmoil, generated in part by cumulative losses in competitiveness (resulting from a combination of high nominal wage growth and lower productivity) and reflected in a widening of current account deficits. The imperative to restore price and cost competitiveness, as well as the need for significant balance sheet repair in various sectors, are likely to impact growth prospects in some countries in the near term.

Overall, the risks to the euro area economic outlook are seen to be broadly balanced. On the one hand, global trade may continue to grow more rapidly than expected, thereby supporting euro area exports. The strong business confidence observed in some euro area countries could also provide more support to domestic economic activity in the euro area than is currently expected.

On the other hand, despite the improvement in the macroeconomic environment, there are still a number of downside risks for growth that have the potential to affect financial stability within the euro area. A key risk relates to the ongoing tensions in some segments of the financial markets and their potential spillover to the euro area real economy. In particular, there remains the risk of adverse macro-financial feedback loops operating between potential further credit losses for banks and future government finance consolidation. Downside risks also relate to the current socio-political turmoil in North Africa and beyond where events are difficult to anticipate. The turmoil has heightened the

risk that elevated commodity prices prompt a retrenchment in demand in the euro area that would have an adverse impact on the creditworthiness of the euro area household and corporate sectors. Finally, further downside risks remain, such as the possibility of protectionist pressures and the possibility of a disorderly correction of global imbalances.

## **2.2 IMPROVING CORPORATE SECTOR CONDITIONS, THOUGH THOSE OF SMEs REMAIN FRAGILE**

### **OVERALL ASSESSMENT OF RISKS IN THE CORPORATE SECTOR**

The profitability of euro area non-financial corporations has continued to improve, in line with the expectations outlined in the December 2010 FSR, although there were signs of increasing costs, and some vulnerabilities within the SME segment highlighted in earlier FSRs have remained. Corporate sector indebtedness declined slightly, but remained at historically high levels. Nevertheless, firms' ability to service their debt benefited from the decline in the interest rate burden and increasing retained earnings, amid broadly improving economic conditions.

Looking ahead, improving profits supported by the projected economic recovery, together with a relatively low cost of financing, should support companies' ability to service their debt and thus also their creditworthiness. However, historically high leverage ratios, tight bank lending standards and slightly increasing debt servicing costs indicate that some vulnerabilities remain within the euro area corporate sector. Specific conditions in some euro area countries, weaker financial positions of some segments of the SME sector and the fragile situation of the construction, wholesale and retail sectors across the euro area may constitute the most pressing sources of concern for the corporate sector's financial outlook.

It should however be noted that the outlook for non-financial corporations is strongly dependent on general economic developments.

If the economic recovery proves to be weaker than expected, the adverse implications for the corporate sector's sales growth and profitability could significantly reinforce balance sheet vulnerabilities.

### EARNINGS DEVELOPMENTS

According to euro area accounts data, the gross operating surplus of all euro area non-financial corporations continued to increase in the second half of 2010. Likewise, the latest data for large and medium-sized listed corporations also point to improving profitability. These developments suggest that firms' profitability cycle has returned to a growth phase.

The annual growth of listed non-financial companies' net sales continued to be strong owing to robust external trade and the pick-up in domestic demand in the euro area (see Chart 2.2). Improving sales and profits were reflected in rising retained earnings. Despite a favourable operating expenses-to-sales ratio, operating expenses of firms appear to be on the rise, as is often the case at this point of the business cycle.

In spite of the general improvement, the profitability of listed medium-sized companies, gauged by the net income-to-net sales ratio, was lower than that of large firms in the fourth quarter of 2010. Profitability remained weakest in the construction, wholesale and retail sectors.

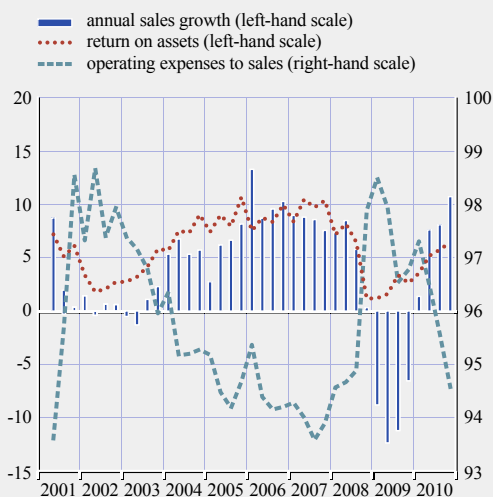
In contrast to large firms, the conditions for small firms on average remained weak. However, some signs of a slightly improving situation emerged. According to the most recent ECB survey on the access to finance of SMEs in the euro area, turnover of SMEs improved slightly in net percentage terms when compared with the previous survey.<sup>2</sup> However, the number of SMEs reporting an increase in production costs (both labour and other costs) grew. Overall, the survey indicated a deterioration in profits, although in this respect the position of SMEs remained unchanged.

The mild improvement of SMEs' turnover appears to be broadly based across sectors, although the industrial sector is leading the revival, while construction shows few signs of recovery. The situation remained negative for SMEs in all countries, but was less negative in Austria and Germany than in other euro area countries.

Overall, the latest available information for euro area corporations shows that profitability is gradually improving, albeit with considerable heterogeneity across sectors and countries. Also, the recovery of large companies is somewhat more advanced than that of SMEs.

**Chart 2.2 Sales growth, return on assets and operating expenses-to-sales ratio of listed non-financial firms in the euro area**

(Q1 2001 – Q4 2010; percentages; medians)



Sources: Thomson Reuters Datastream and ECB calculations.

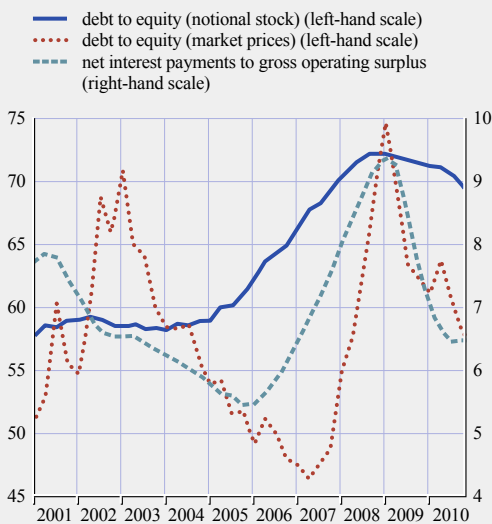
### LEVERAGE AND FUNDING

Several corporate sector debt ratios indicate a slight decrease in firms' leverage levels in the course of 2010 (see Charts 2.3 and S51). In spite of declining indebtedness ratios, leverage continues to be at historically high levels. Looking at the different sectors,

<sup>2</sup> The latest survey covered the period from September 2010 to February 2011. For more information on this survey, see Special Feature B in this issue of the FSR.

**Chart 2.3 Total debt and interest burden of non-financial corporations in the euro area**

(Q1 2001 – Q4 2010; percentages)



Sources: ECB and ECB calculations.

debt levels were highest in the construction, utilities as well as transport and communication sectors in the fourth quarter of 2010.

The ratio of net interest payments to gross operating surplus – a measure of companies’ debt servicing ability – stood at 6.5% in the fourth quarter of 2010. The declining interest burden indicates that firms are more likely to be able to sustain their debt levels. But this positive development stems primarily from low interest rates and much less from firms’ declining leverage.

In addition to the risks stemming from high leverage, firms face funding risks as they eventually need to roll over some of their outstanding debt. So far, the growth of retained earnings has – to some extent – reduced companies’ need for external financing and thus their refinancing risks. However, the latest SME survey reported an increase in firms’ financing needs, in particular for fixed investment and inventory and working capital. The noticeable increase in corporate loan demand was also confirmed by the April 2011 bank lending survey for the euro area.<sup>3</sup>

Besides bank lending, large firms may resort to alternative market-based funding sources. During the first quarter of 2011 market-based financing conditions of firms remained broadly unchanged, as the real cost of external financing for euro area non-financial corporations continued to be affected by the tensions in euro area sovereign bond markets (see Chart S49). Consequently, the issuance of equity was less attractive and the annual growth rate of debt securities issued decreased.

Annual growth of bank lending to companies turned positive in the last quarter of 2010. While bank lending rates remain at low levels, lending standards on loans to enterprises were tightened somewhat in the first quarter of 2011 according to the April 2011 bank lending survey. Nevertheless, this tightening affected mainly large firms, as credit standards remained unchanged for SMEs. Banks’ restrictive lending policies can be especially problematic for young and micro firms, as demonstrated in Special Feature B in this issue of the FSR.

#### EARNINGS AND RISK OUTLOOK

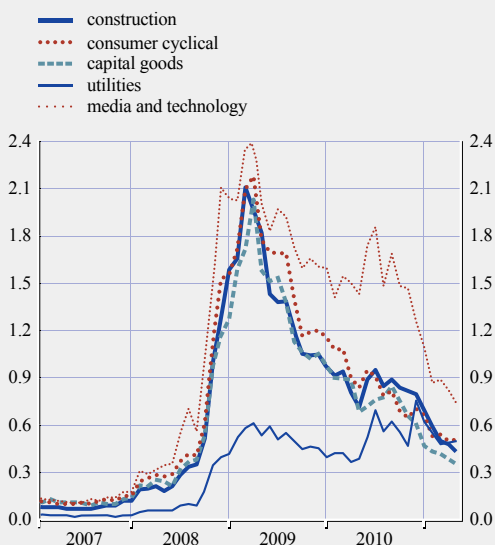
Looking forward, the recovery in firms’ earnings is likely to continue in the course of 2011 as macroeconomic conditions continue to improve. The positive earnings outlook is also reflected in forecasts of financial analysts, who expect growth in earnings per share of non-financial companies included in the Dow Jones EURO STOXX index over a one-year horizon (see Chart S52).

The recovery of earnings is expected to be based on improving sales. The momentum in external trade is likely to be of benefit primarily to large listed companies, but as the economic recovery and domestic demand strengthen, the improvements in earnings are likely to be more broad-based. SMEs’ earnings are also expected to grow, albeit at a slower pace than those of large companies. The general improvement in

<sup>3</sup> See ECB, “Euro area bank lending survey”, April 2011.

**Chart 2.4 Expected default frequencies for selected non-financial sectors in the euro area**

(Jan. 2007 – Apr. 2011; percentage probability)



Sources: Moody's KMV and ECB calculations.

Notes: The EDF provides an estimate of the probability of default over the following year. Owing to measurement considerations, the EDF values are restricted by Moody's KMV to an interval between 0.1% and 35%. The "capital goods" sector covers the production of industrial machinery and equipment.

profitability may nevertheless be slowed down by increasing expenses and dividend payments.<sup>4</sup>

In the April 2011 bank lending survey, euro area banks expected corporate financing needs to increase in the second quarter of 2011. However, a relatively subdued investment outlook and increasing internal funds, together with a need to reduce debt leverage, should limit the firms' demand for external financing. Credit standards on loans to enterprises were also expected to tighten slightly. Banks' restrictive lending policies may have a stronger impact on the overall funding situation of SMEs, as they are more dependent on bank loans than large corporations.

Owing to economic growth, the number of insolvencies is expected to fall in 2011, although remaining at high levels, especially in the countries with a more difficult economic environment.<sup>5</sup>

Moreover, expected default frequencies (EDFs) for euro area corporations point to an improving outlook (see Charts 2.4 and S55). The EDFs declined over the past six months. At the same time, default rates for speculative-grade corporations have decreased and, at the time of writing, default rates were expected to remain low in the following twelve months (see Chart S53).

### 2.3 COMMERCIAL PROPERTY INVESTORS ARE STILL EXPOSED TO HIGH REFINANCING RISK

#### OVERALL ASSESSMENT OF RISKS IN COMMERCIAL PROPERTY MARKETS

Most euro area countries recorded improvements in commercial property markets after the finalisation of the December 2010 FSR. Nevertheless, capital values remain well below the highs seen in previous years and conditions in some countries remain very challenging. This poses significant refinancing risks for many loan-financed property investors, especially since about a third of outstanding commercial property mortgages in the euro area are due to mature between 2011 and 2013. Continued losses for some banks are therefore likely in the period ahead as a result of their exposure to commercial property lending and investment (see Section 4).

#### DEVELOPMENTS IN COMMERCIAL PROPERTY MARKETS

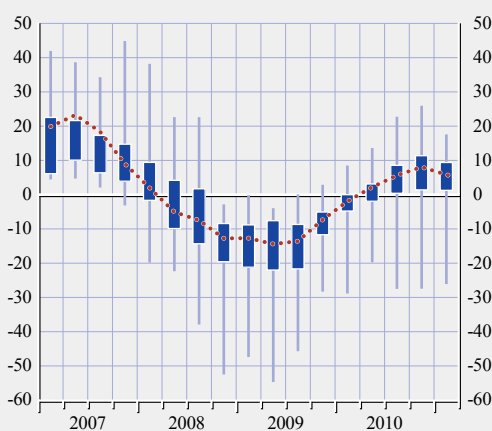
Commercial property market developments during the past six months have been in line with the expectations outlined in the December 2010 FSR. On average, capital values – i.e. commercial property prices adjusted downwards for capital expenditure, maintenance and depreciation – for prime property increased by 8%, year on year, in the fourth quarter of 2010 and 6% in the first quarter of 2011

<sup>4</sup> According to data on listed companies, the average ratio of dividends to common equity was approximately 4.8% between 2002 and 2008. In 2009 the average ratio was 4.2%, reaching a historical low.

<sup>5</sup> See Euler Hermes, "Insolvency Outlook", 8/2010.

**Chart 2.5 Changes in the capital value of prime commercial property in euro area countries**

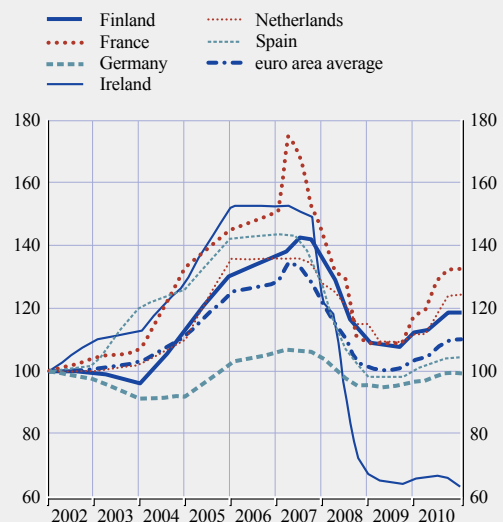
(Q1 2007 – Q1 2011; percentage change per annum; maximum, minimum, interquartile distribution and weighted average)



Source: Jones Lang LaSalle.  
Note: Data for Cyprus, Estonia, Malta, Slovakia and Slovenia are not available.

**Chart 2.6 Capital value-to-rent ratios of prime commercial property in selected euro area countries**

(Q1 2002 – Q1 2011; index: Q1 2002 = 100)



Sources: Jones Lang LaSalle, ECB and ECB calculations.

(see Chart 2.5). However, there was considerable negative skew in the distribution of capital value changes across countries, with some countries still witnessing annual declines – some in the vicinity of 15-30%. In addition, the recovery in capital values has been concentrated in the prime segment, whereas values of non-prime property have continued to decline or only seen modest improvements.<sup>6</sup> Indeed, annual data for both prime and non-prime property showed a more modest recovery of 0.4%, year on year, in 2010 (see Chart S59), compared with 3.5% for prime property.

Investment volumes totalled €10.1 billion in the first quarter of 2011, which was around the levels seen during the first three quarters of 2010 but some €6 billion lower than in the fourth quarter of 2010.<sup>7</sup>

Rent developments of prime commercial property continued to be lacklustre after the finalisation of the December 2010 FSR. On average, rents remained broadly flat in the fourth quarter of 2010 and the first quarter of 2011.

Due to the increases in capital values but stable rents, capital value-to-rent ratios for most euro area countries rose in recent quarters, thereby suggesting an increase in valuation relative to fundamentals (see Chart 2.6).

#### RISKS FACING COMMERCIAL PROPERTY INVESTORS

The income risks for commercial property investors identified in the December 2010 FSR remain broadly unchanged. Capital values remain well below the levels seen in previous years in most countries and rental growth continues to be sluggish. In particular, demand for renting and investing in non-prime property remains low and market participants expect the gap between the sentiment in the prime and non-prime segments to persist or even widen during 2011.<sup>8</sup> In addition, income is likely to be

6 See, for example, DTZ Research, “Property Times – Europe Q4 2010”, January 2011, CB Richard Ellis, “European property in 2011: More of the same or something completely different?”, January 2011, and CB Richard Ellis, “European Capital Markets”, Q4 2010.

7 According to data from DTZ Research.

8 See CB Richard Ellis, “European investor intentions in 2011”, March 2011.

affected by higher interest rates charged on commercial property mortgages in the period ahead.

About a third of outstanding commercial property mortgages in the euro area are due to mature between 2011 and 2013.<sup>9</sup> Many of these mortgages were originated or refinanced when commercial property prices peaked in 2006-07 and were often granted with high loan-to-value ratios (often 75-85%). Since prevailing commercial property prices in many euro area countries stand well below peak levels and because banks have generally tightened lending standards for new loans and applied more prudent lending policies (e.g. by extending loans at lower loan-to-value ratios), property investors are exposed to continued high refinancing risks. Some banks have also reported that they are scaling back their commercial property lending, which could also affect the availability and cost of capital for property investors, although some insurance companies have announced plans to extend commercial property mortgages and might fill the void left by banks (see Box 12 in Section 5). More challenging financing conditions might force property investors to raise capital, for example by selling property, with a view to increasing the equity share in investments.

That said, the strengthening of economic activity in some parts of the euro area should support increases in commercial property prices, which would reduce the associated risks. On average, commercial property values in the euro area are projected to recover only gradually during 2011, but there is considerable heterogeneity in country prospects.

#### 2.4 IMPROVEMENTS HAVE NOT ERODED HIGH HOUSEHOLD DEBT BURDEN OR ATTENUATED ASSOCIATED VULNERABILITIES

##### OVERALL ASSESSMENT OF RISKS IN THE HOUSEHOLD SECTOR

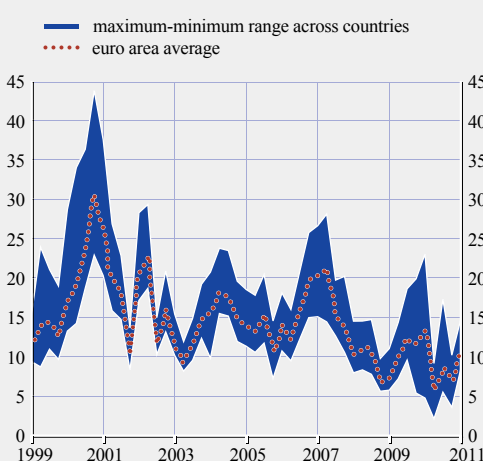
Since the finalisation of the December 2010 FSR, the balance sheet condition of euro area

households has improved somewhat. This improvement has been broadly in line with both the expectations outlined in the December 2010 FSR and measures of distance to distress of euro area households (see Chart 2.7). Nevertheless, with the pace of economic recovery remaining uneven across euro area countries, significant credit risks in some countries' household sectors remain. The main sources of risk to the credit quality of the household sector relate to subdued income prospects and the possibility of higher debt servicing costs in the period ahead. In addition, households' credit standing could be negatively affected by the potential for further residential property price declines in some euro area countries. That said, the impact of house price declines on the credit quality of households depends on country-specific factors, like loan-to-value ratios, the national legal framework surrounding mortgages, the

9 See DTZ Research, "Global Debt Funding Gap", May 2011, and DTZ Research, "The Great Wall of Money", March 2011.

Chart 2.7 Euro area household sector's distance to distress

(Q1 1999 – Q1 2011; number of standard deviations)



Sources: ECB, Bloomberg and ECB calculations.

Notes: A low reading of distance to distress indicates higher credit risk. The distance-to-distress indicator is computed by applying contingent claims analysis to flow-of-funds statistics and is measured as the number of standard deviations and reflects the distance between the asset value and the distress point. Data for the first quarter of 2011 are estimates. For details of this indicator, see Box 7 in ECB, *Financial Stability Review*, December 2009.

extent to which housing collateral is used for consumption credit, future labour market conditions and possible changes in the borrower quality. Overall, given the large share of household lending in total lending by euro area banks, a significant negative impact on banks' balance sheets cannot be ruled out if these risks were to materialise.

### HOUSEHOLD SECTOR LEVERAGE

Euro area households' total debt increased further after the finalisation of the December 2010 FSR (see Chart 2.8). This notwithstanding, a further slight improvement in the macroeconomic environment should, on aggregate, contribute to an ongoing stabilisation of the household sector's balance sheet. However, risks remain due to the high level of household indebtedness in the euro area as a whole and elevated heterogeneity at the country level.

Household loan growth has remained modest. The annual growth in households' total loans, most of which are granted by monetary financial institutions (MFIs), remained broadly unchanged

during the second half of 2010, standing at 2.3% in the last quarter of 2010. This development reflected the stabilisation of annual growth in MFI loans to households just below 3.0% in the fourth quarter of 2010. The latest monthly data indicate, however, that annual growth in loans to households increased slightly in the first months of 2011 (see Chart S61).

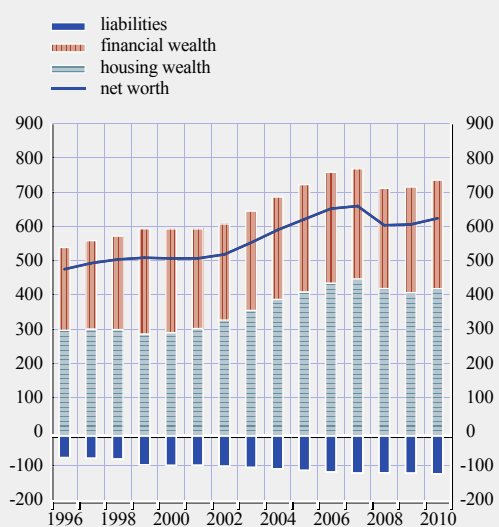
MFI lending to euro area households has been predominantly driven by loans for house purchase, as in previous quarters. Nevertheless, other lending also continued to contribute positively to the annual growth rate in the first quarter of 2011, while the contribution of consumer credit remained negative (see Chart S61).

The maturity structure of MFI loans granted to households appears to have lengthened in recent quarters. Long-term loans (with a maturity of more than five years) contributed positively to the overall annual growth rate for all types of household loans, and lending for house purchase continued to account for the bulk of long-term loans. By contrast, short-term lending (with a maturity of up to one year) and medium-term lending (with a maturity of over one year and up to five years) each exhibited contractions of 4.5% in annual terms in the first quarter of 2011. At the same time, new business in household lending was dominated by loans with long-term initial interest rate fixation, so households seem to have taken advantage of a low interest rate environment combined with expectations that short-term interest rates will increase in the period ahead. In general, this can be seen as a positive development from a credit risk perspective, since it is likely to reduce the vulnerabilities in the household sector to sudden increases in short-term interest rates.

Looking ahead, euro area banks expect households' demand for both loans for house purchase and consumer loans to continue its positive development in the coming months, according to the April 2011 bank lending survey for the euro area.

**Chart 2.8 Household sector net worth in the euro area**

(1996 – 2010; percentage of gross disposable income)



Sources: ECB and ECB calculations.  
Note: Data for housing wealth are based on ECB estimates.

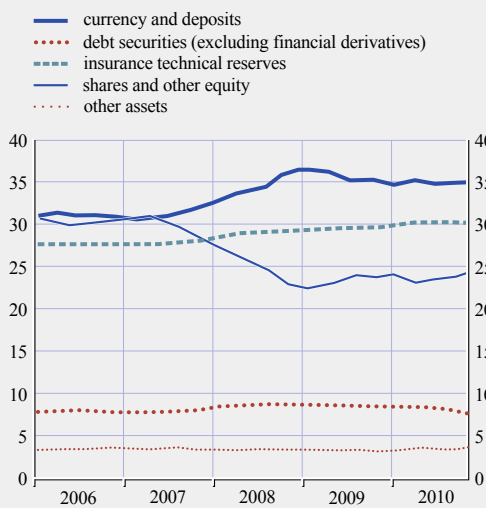
Household borrowing increased slightly more strongly than gross disposable income during the second half of 2010. As a result, the average debt-to-disposable income ratio increased to 98.8%, which was somewhat higher than in mid-2010 (see Chart S62). The household debt-to-GDP ratio stood at 66% at the end of 2010, unchanged from the second quarter of 2010 (see Chart S63), reflecting the fact that overall economic activity has been displaying a stronger cyclical pick-up than household income.

All in all, households' net worth increased thanks to both higher financial as well as housing wealth (see Chart 2.8). On the assets side of the household sector's balance sheet, the value of assets increased in the second half of 2010 for the euro area as a whole mainly due to higher residential property values. However, there was distinct heterogeneity of housing market developments among euro area countries (see sub-section below). Households' financial wealth also increased in the second half of 2010 (see Chart 2.8). Half of this increase was explained by the increase in deposit holdings and increased investment in insurance and pension products as well as shares and other equity, while the other half resulted from rising asset prices and positive valuation effects. This led to improvements in the debt-to-liquid financial assets ratio, which had increased in the first half of 2010, suggesting some improvement in households' ability to meet debt obligations (see Chart S64).

Taking a longer-term perspective on the composition of households' financial wealth, the share of lower-risk components (mainly deposits and insurance technical reserves) on the assets side of their balance sheet increased significantly between mid-2007 and end-2009 at the expense of riskier asset classes (mainly shares) (see Chart 2.9). This development mostly reflected the strong decline observed in stock prices, but also increased investment to the former type of assets over this period. However, there seems to have been some stabilisation in the shares of households' low-risk and riskier financial asset holdings lately.

Chart 2.9 Euro area households' financial assets

(Q1 2006 – Q4 2010; percentage of total financial assets)



Sources: ECB and ECB calculations.

## RISKS FACED BY THE HOUSEHOLD SECTOR

### Interest rate risks of households

The levelling-off of the decline in lending rates charged to households reported in the December 2010 FSR continued after its finalisation and an increasing number of interest rates relevant for household lending began or continued to rise, in particular for short- and medium-term maturities (see Chart S66).

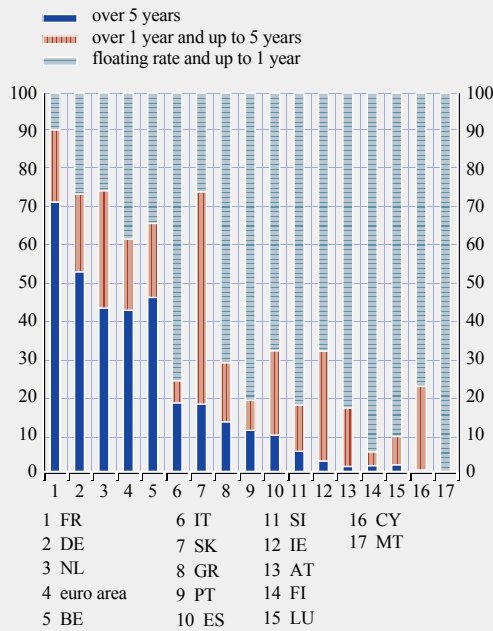
Despite higher interest rates, households' interest burden remained close to historically low levels due to long-term interest rate fixations dominating household lending in the euro area (see Chart S65). However, significant heterogeneity across euro area countries exists regarding the interest rate fixation period of new loans (see Chart 2.10).

Nevertheless, the latest data suggest that for the euro area as a whole, along with the majority of countries, the average interest rate fixation period of household lending increased (see Chart 2.11), which helped households to lock in historically low interest rates and alleviated households' interest rate risks.



**Chart 2.10 Interest rate fixation period of new business purchase volumes of loans to households for house purchase in euro area countries**

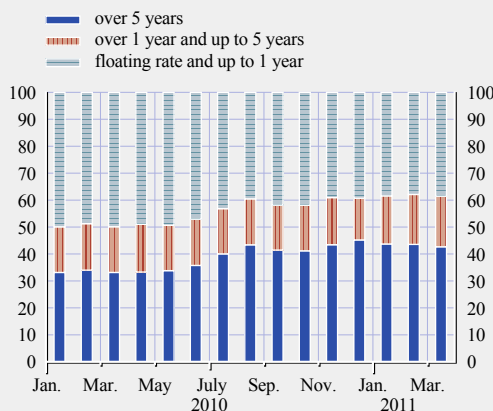
(March 2011; percentage of total)



Sources: ECB and ECB calculations.

**Chart 2.11 Interest rate fixation period of new business volumes of total loans to households in the euro area**

(Jan. 2010 – Mar. 2011; percentage of total)



Sources: ECB and ECB calculations.

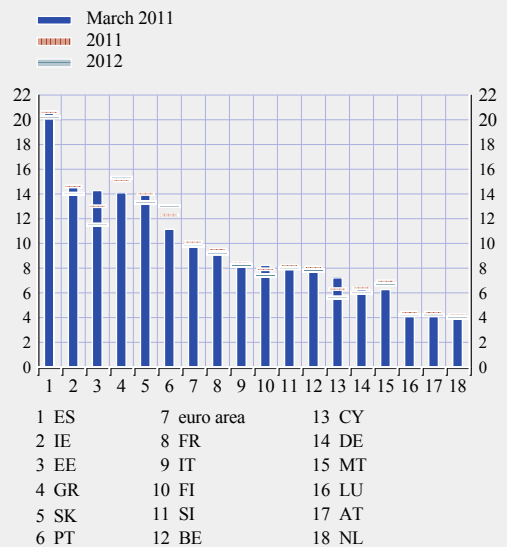
Looking ahead, households' debt servicing costs are likely to increase, although it should be noted that they remain low by historical standards. Nevertheless, the increase of interest rate fixation periods of loans to households will help in alleviating households' interest rate risks.

### Risks to household income

Despite the pick-up in economic activity during the second half of 2010 and the first quarter of 2011 (see Section 2.1), overall growth of households' disposable income remained muted. This was largely due to ongoing increases in some countries' unemployment rates. However, labour market conditions improved somewhat in the euro area as a whole after the finalisation of the December 2010 FSR (see Chart S45). At the same time, job market developments diverge significantly across the euro area, with some countries exhibiting unemployment rates well above 10% and still increasing, while unemployment is below 5% and decreasing further in other countries (see Chart 2.12).

**Chart 2.12 Unemployment rates and forecast in euro area countries**

(percentages)



Sources: ECB and European Commission.  
Note: The most recent data for Greece and for Estonia refer to December 2010.

Looking forward, projections for future labour market conditions were revised slightly upwards in recent months, although large cross-country differences are expected to persist.

### Risks to residential property prices

After the declines observed during 2009, available data suggest that euro area residential property prices reached a trough in many countries last year. On average, prices increased by 2.9% year on year in the fourth quarter of 2010, up from 2.6% in the third quarter (see Chart S67). The gradual recovery in the macroeconomic environment supported the house price increases. However, the aggregate euro area picture masks considerable heterogeneity across countries (see Table S4). Ireland, Greece, Spain, the Netherlands and Slovakia all recorded continued year-on-year declines in house prices up to the end of the fourth quarter of 2010, although the pace of the declines was generally slower compared with earlier in the year. By contrast, Belgium, France, Austria and Finland saw further strong increases in property prices. In some countries, tax and other fiscal measures increased the demand for residential property and are likely to have contributed either to higher house prices or to preventing house

prices from declining. As the effects of these measures will diminish over the coming quarters, the risk of further downward pressure on house prices in some countries persists.

Relative to metrics of underlying fundamentals, house prices in the euro area are still relatively high compared with rents (see Chart S68), while the ratio of nominal income to house prices remained below that observed in 2009 (see Chart S66). At the country level, a cross-check of various simple metrics for assessing residential property valuations produces a fairly wide range of estimates of possible misalignment (see Box 3). Despite the uncertainty behind these ranges and although developments since 2007 indicate that the degree of overvaluation has diminished, there appeared to remain possible signs of overvaluation in several euro area countries, although national specificities (including fiscal treatment and structural aspects of housing markets such as rent controls) have to be taken into account when assessing the house price levels in different countries. Nevertheless, the potential for further correction in house prices in some countries in the near term remains a possible downside risk for financial stability in the euro area.

### Box 3

#### TOOLS FOR DETECTING A POSSIBLE MISALIGNMENT OF RESIDENTIAL PROPERTY PRICES FROM FUNDAMENTALS

Euro area residential property prices have exhibited pronounced volatility over the last decade, not dissimilar to the dynamic in other advanced economies. A legacy of the substantial appreciation in house prices in most euro area countries over the decade leading up to 2005, as well as the strong expansion of economic activity related to housing, has been an accumulation of imbalances in this sector that continue to affect the economic and financial outlook.<sup>1</sup> This box reviews the recent evolution of some measures for detecting residential property price misalignments from fundamentals in selected euro area countries for which relatively long time series for house prices and the ancillary fundamental variables are available from national and international sources.

<sup>1</sup> For an overview of measures to track and quantify house price misalignments from fundamentals, see C. Himmelberg, C. Mayer and T. Sinai, "Assessing High House Prices: Bubbles, Fundamentals, and Misperceptions", *Journal of Economic Perspectives*, No 4, Vol. 19, 2005.

Two sets of valuation metrics are commonly used to assess housing values relative to fundamentals. First, house prices are often related to demand and supply determinants, most frequently captured by some notion of housing affordability, given the inelasticity of housing supply in the short run. In this vein, “affordability” indices and regression-based approaches have been applied in recent cross-country housing market assessments by, for example, the IMF and the OECD.<sup>2</sup> Second, house prices are often assessed using an asset pricing framework relating their evolution to that of the rental yield. Indeed, imputed rents can reflect the cost of owning a house for a period which in equilibrium should be equal to the returns from renting the house for the same period.<sup>3</sup> At the same time, observed rents can be a proxy for the flow of fundamental returns in a dividend discount framework.<sup>4</sup>

Following the approaches described above, four specific methods – two relating to housing demand forces and two relating to an asset pricing framework – were computed for a selected group of euro area countries for which long time series are available. These indicators are computed as follows:<sup>5</sup>

- Crude affordability in the euro area – measured in this case by the ratio of per capita GDP to the house price index – is computed relative to long-term trends (an implied equilibrium given the absence of reliable data on house price levels). While real disposable income may be a more appropriate variable in calculating affordability, real GDP is used instead given the longer time series for this variable.
- A measure of imbalances in housing valuation inferred from the residual of a simple error-correction framework with real house prices regressed on real GDP per capita, population and the real interest rate (with all variables in logs, apart from the interest rate).
- The evolution of the house price-to-rent ratio<sup>6</sup> is computed relative to its long-run average – a simplified static dividend discount model or asset pricing approach.<sup>7</sup>

2 See, for instance, D. Andrews, A. Caldera Sánchez and A. Johansson, “Housing Markets and Structural Policies in OECD Countries”, *OECD Economics Department Working Paper*, No 836, 2011; OECD, *Economic Outlook*, No 86, November 2009; and IMF, *World Economic Outlook*, April 2008. Country house price “gaps” are obtained on the basis of regression analysis on “fundamentals”, such as disposable income, population, interest rates, credit and equity prices.

3 See J.M. Poterba, “Tax Subsidies to Owner-Occupied Housing: an Asset-Market Approach”, *Quarterly Journal of Economics*, No 4, Vol. 99, 1984.

4 See J.Y. Campbell and R.J. Shiller, “The Dividend-price Ratio and Expectations of Future Dividends and Discount Factors”, *Review of Financial Studies*, Vol. 1, 1988.

5 While illustrative, these valuation measures – along with other measures of overvaluation in housing – are subject to several caveats, which can be grouped into three categories. First, data uncertainty is particularly high in measuring house prices given problems in coverage, quality control and representativeness. Second, the problem of structural breaks is particularly acute in housing, as the possibility of changing economic, financial or institutional factors (e.g. non-market distortions in the rental market, the role of tax policies, owner-occupancy rates, etc.) can also induce strong changes in historical or equilibrium relationships. Third, these methods do not control completely for the influence of other factors, such as housing supply elasticity or non-market forces, in driving housing market developments.

6 It should be stressed that the ratio can be distorted in some countries since the rent index may also include a share of controlled rents and old generation contracts. As a result, the valuation measure may overestimate the misalignment in some countries.

7 A dynamic variant of the dividend discount model applied to a panel of euro area countries indicates that, in addition to the evolution of the rental yield, stable low-frequency variation in expected returns may also have contributed to large and persistent swings in euro area house prices – see P. Hiebert and M. Sydow, “What drives returns to euro area housing? Evidence from a dynamic dividend discount model”, *Journal of Urban Economics*, forthcoming.

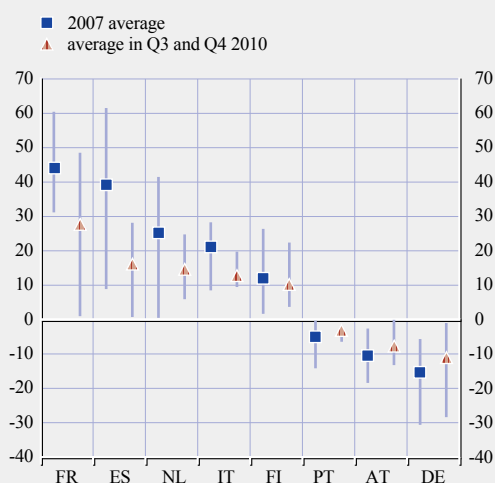
- The evolution of the house price-to-rent ratio computed relative to the real long-term interest rate, based on a model where the return on a housing investment (approximated by the rent-to-house price ratio) should be equal to the returns on alternative investment opportunities bearing the same risk.

Overall, there seems to be a significant reduction over time of the misalignment for the majority of the selected countries when assessing 2010 ranges against 2007 ranges (see chart). Nevertheless, a cross-check of the four above methods suggests some misalignment in housing valuation in 2010, albeit with significant heterogeneity across countries and approaches (see chart). In this vein, it would appear that fundamentals cannot fully explain house price levels in some cases. The reported ranges for 2010 refer to estimates based on the latest available two quarters. Some countries show an average overvaluation between around 10% and 30% (i.e. France, Spain, the Netherlands, Italy and Finland). It should however be noted that the minimum value for some countries (i.e. France and Spain) is around zero. Residential property prices seem to be undervalued in three countries (i.e. Austria, Germany and Portugal). The wide ranges between minimum and maximum values for some countries can be related to the high level of uncertainty surrounding current housing market developments.

All in all, these valuation measures suggest that the off-peak adjustment process has substantially reduced the average residential property price overvaluation in several countries. Nevertheless, overvaluation still seems to persist in some euro area countries, while others are showing signs of undervaluation. That said, it should be noted that – as the wide dispersion across the different valuation measures presented in this box illustrates – it is very difficult to assess property price misalignments and national specificities (including fiscal treatment and structural aspects of housing markets) have to be taken into account when assessing the house price levels in different countries.

### Residential property price valuation indicators for selected euro area countries

(percentages; deviation of prevailing house prices from indicators; maximum, minimum and mean across four different valuation indicators)



Sources: National statistical offices, NCBs, ECB, OECD and ECB calculations.  
Notes: Estimates are based on data until the fourth quarter of 2010. All estimation starts in 1985 except for Austria (1987) and Portugal (1988).

## 2.5 CONTINUED ADVERSE FEEDBACK BETWEEN FISCAL IMBALANCES, THE FINANCIAL SECTOR AND MACROECONOMIC GROWTH

### OVERALL ASSESSMENT OF RISKS IN THE GOVERNMENT SECTOR

The fiscal situation remains challenging in the euro area. After the finalisation of the December 2010 FSR, the medium-term fiscal outlook for

the euro area as a whole improved slightly on account of better macroeconomic prospects and a tightening of the fiscal stance. However, fiscal positions continue to differ substantially across countries and market concerns regarding the ability of some governments to restore sustainable public finances over the medium term remain. This uncertainty could in turn affect the resilience of the euro area banks that

are most reliant on government support. At the same time, the high refinancing needs currently facing euro area governments are feeding into the adverse feedback loop between the sovereign and financial sectors, as the public finance needs might crowd out bank issuance.

A timely execution of the fiscal consolidation strategies adopted by euro area countries is a crucial factor in lowering borrowing requirements and fiscal risks. This would enhance market confidence in the sustainability of euro area public finances, especially in the most vulnerable economies. Any delay in meeting country-specific adjustment targets agreed at the European level, in particular as regards the correction of excessive deficits, could trigger further adverse financial market reactions and undermine macroeconomic and financial stability in the euro area – with costs that could greatly outweigh the short-run economic output implications of fiscal austerity.

#### LATEST FISCAL DEVELOPMENTS

Following the sharp deterioration in 2009, the government budget deficit in the euro area as a whole improved slightly in 2010 to 6% of GDP (see Table 2.1). Several countries, such as

Belgium, Finland, France, Germany, Italy, the Netherlands and Spain, among others, achieved or over-performed their 2010 fiscal targets,<sup>10</sup> mainly due to stronger than expected revenues and enhanced expenditure restraint. As a result of an improved macroeconomic outlook and further consolidation plans spelled out in governments' stability programmes, the euro area deficit is expected to decline to 3.5% of GDP by 2012.

The government debt-to-GDP ratio is nevertheless projected to continue to increase in the euro area as a whole, to 88.5% by 2012, due to still large primary deficits and rising interest payments relative to nominal GDP in many euro area countries.

The fiscal outlook in some euro area countries continues to be confronted with several challenges. Concerns about some governments' ability to restore sustainable public finances over the medium term and heightened fears of sovereign debt restructuring or default have again fed tensions in government bond markets

<sup>10</sup> As notified to Eurostat in autumn 2010.

**Table 2.1 General government budget balance and gross debt in the euro area**

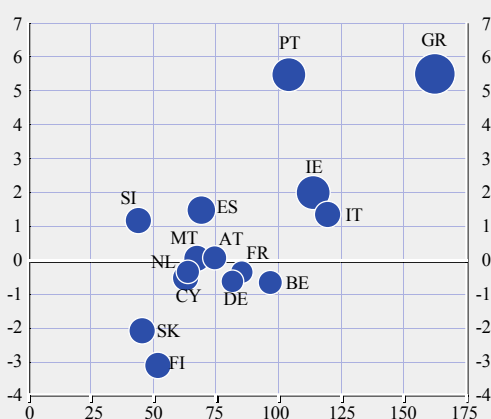
(2007 – 2012; percentage of GDP)

	General government budget balance						General government gross debt					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Belgium	-0.3	-1.3	-5.9	-4.1	-3.7	-4.2	84.2	89.6	96.2	96.8	97.0	97.5
Germany	0.3	0.1	-3.0	-3.3	-2.0	-1.2	64.9	66.3	73.5	83.2	82.4	81.1
Estonia	2.5	-2.8	-1.7	0.1	-0.6	-2.4	3.7	4.6	7.2	6.6	6.1	6.9
Ireland	0.1	-7.3	-14.3	-32.4	-10.5	-8.8	25.0	44.4	65.6	96.2	112.0	117.9
Greece	-6.4	-9.8	-15.4	-10.5	-9.5	-9.3	105.4	110.7	127.1	142.8	157.7	166.1
Spain	1.9	-4.2	-11.1	-9.2	-6.3	-5.3	36.1	39.8	53.3	60.1	68.1	71.0
France	-2.7	-3.3	-7.5	-7.0	-5.8	-5.3	63.9	67.7	78.3	81.7	84.7	86.8
Italy	-1.5	-2.7	-5.4	-4.6	-4.0	-3.2	103.6	106.3	116.1	119.0	120.3	119.8
Cyprus	3.4	0.9	-6.0	-5.3	-5.1	-4.9	58.3	48.3	58.0	60.8	62.3	64.3
Luxembourg	3.7	3.0	-0.9	-1.7	-1.0	-1.1	6.7	13.6	14.6	18.4	17.2	19.0
Malta	-2.4	-4.5	-3.7	-3.6	-3.0	-3.0	62.0	61.5	67.6	68.0	68.0	67.9
Netherlands	0.2	0.6	-5.5	-5.4	-3.7	-2.3	45.3	58.2	60.8	62.7	63.9	64.0
Austria	-0.9	-0.9	-4.1	-4.6	-3.7	-3.3	60.7	63.8	69.6	72.3	73.8	75.4
Portugal	-3.1	-3.5	-10.1	-9.1	-5.9	-4.5	68.3	71.6	83.0	93.0	101.7	107.4
Slovenia	-0.1	-1.8	-6.0	-5.6	-5.8	-5.0	23.1	21.9	35.2	38.0	42.8	46.0
Slovakia	-1.8	-2.1	-8.0	-7.9	-5.1	-4.6	29.6	27.8	35.4	41.0	44.8	46.8
Finland	5.2	4.2	-2.6	-2.5	-1.0	-0.7	35.2	34.1	43.8	48.4	50.6	52.2
<b>Euro area</b>	<b>-0.7</b>	<b>-2.0</b>	<b>-6.3</b>	<b>-6.0</b>	<b>-4.3</b>	<b>-3.5</b>	<b>66.2</b>	<b>69.9</b>	<b>79.3</b>	<b>85.4</b>	<b>87.7</b>	<b>88.5</b>

Source: European Commission, "European Economic Forecast – Spring 2011".

**Chart 2.13 The fiscal and macro-financial outlook in euro area countries, and long-term government bond yields**

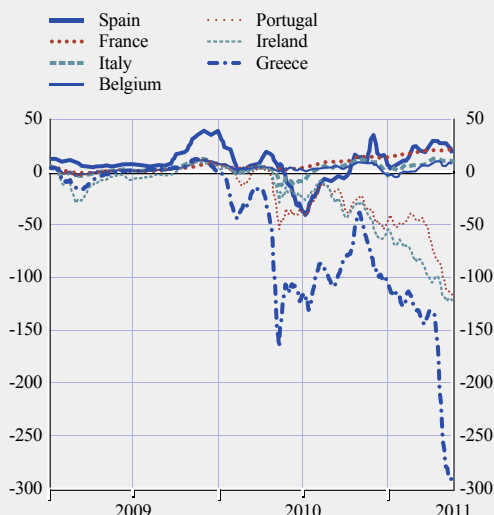
x-axis: expected debt-to-GDP ratio (2011-2012); percentages  
y-axis: expected interest rate/growth differential (2011-2012); percentage points



Sources: European Commission spring 2011 forecasts, Reuters and ECB calculations.  
Notes: The bubble size is proportional to the ten-year government bond yield (average for the period November 2010 – April 2011). The chart does not include Luxembourg and Estonia due to the lack of data on ten-year government bond yields. The implicit interest rate is calculated as the ratio of total annual interest payments in the reference year to the stock of general government gross debt in the previous year.

**Chart 2.14 Sovereign CDS curves for selected euro area countries**

(Jan. 2009 – May 2011; basis points; ten-day moving average of differences between ten-year and five-year CDS spreads)



Sources: Thomson Reuters Datastream and ECB calculations.

in the past months (see Section 3). This led to a continued tightening of refinancing conditions and an extremely hampered access to the primary capital markets for some countries in particular. After Greece in May 2010 and Ireland in November 2010, Portugal had to seek international financial assistance in April this year. High budget deficits, as well as high and rising government debt ratios in several euro area countries, remain sizeable risks to financial stability. The cost of long-term market financing for these countries appears to reflect expectations about their debt sustainability (Chart 2.13 depicts correlations between euro area countries' debt levels, macroeconomic conditions, and long-term sovereign borrowing costs as recently required by the capital markets).

Market participants' heightened fears of sovereign debt restructuring or default were also reflected in the term structure of sovereign CDSs, which exhibited a strong inversion

for the three countries currently in EU/IMF programmes (see Chart 2.14). In this way, the paths of the three countries' sovereign CDS curves have diverged from those of other euro area countries.

Some temporary market relief, albeit not for all countries with financing problems, seems to have been provided by the 11 March decision of the euro area Heads of State or Government to: (i) ensure an effective lending capacity of €500 billion for the future permanent European financial support mechanism, called the European Stability Mechanism (ESM); (ii) make the agreed lending capacity of €440 billion of the European Financial Stability Facility (EFSF) fully effective until the entry into force of the ESM; (iii) lower EFSF lending rates to better take into account debt sustainability of the recipient countries; and (iv) enable the EFSF and the ESM to buy government bonds on the primary market, under exceptional

circumstances and in the context of an adjustment programme with strict conditionality. In addition, governments of the euro area and six further EU Member States agreed the Euro Plus Pact, showing their willingness to go further in strengthening economic and fiscal governance. In this respect, several proposals are intended to improve fiscal sustainability in the future, inter alia: (i) the introduction of a new surveillance framework for the prevention and correction of macroeconomic imbalances; (ii) a stronger focus on fiscal sustainability and the operationalisation of the government debt criterion; (iii) a new enforcement mechanism as part of the macroeconomic and budgetary surveillance; and (iv) new (minimum) requirements for the rules and procedures governing national budgetary frameworks.

Moreover, the ECB actions aimed at maintaining price stability, notably the Securities Markets Programme introduced in May 2010, have also contributed to limiting the adverse feedback loop between the sovereign and financial sectors.<sup>11</sup>

#### MAIN CHALLENGES TO FISCAL SUSTAINABILITY

Fiscal sustainability implies that a government is capable of servicing its debt obligations in the medium-to-long term. Reflecting the tight linkages between fiscal policies, macroeconomic developments and financial sector risks, several challenges to fiscal sustainability stand out. For highly indebted euro area countries in particular, some of these challenges came under closer market scrutiny in the past months.

First, high and still rising debt-to-GDP ratios in most euro area countries imply that sufficiently large primary surpluses need to be created and then maintained by governments over an extended period of time to stabilise the debt dynamics and subsequently put the debt ratio on a declining path. Past evidence suggests that governments in advanced economies take such a debt solvency constraint into account, albeit to varying degrees, when setting their primary balance: holding other relevant factors constant, governments tend to improve primary balances

in response to rising debt-to-GDP ratios. Looking ahead, given higher government debt ratios and lower potential growth after the crisis, the primary surpluses necessary to stabilise and reduce debt ratios would need to be higher than in the past. That said, creating and sustaining high primary surpluses is by no means historically unprecedented,<sup>12</sup> while strong conditionality would guarantee such outcomes for countries subject to EU/IMF programmes.

Second, significant contingent liabilities as a consequence of interventions to support the financial sector continue to pose fiscal risks and may increase further in the event of additional bank restructuring. It is important to mention that in some countries public finance problems stem from the need to support an ailing banking system, while in others the condition of the banking sector did not have an impact. During the period 2008-2010 euro area government debt increased by more than five percentage points of GDP as a direct consequence of government interventions to support the financial sector. Correspondingly, the committed contingent liabilities in the euro area represent around 6.5% of GDP. Thus, the guarantees effectively granted by euro area governments during 2008-10 stood at half of the implicit ceilings set by these governments (at about 13% of GDP). Ireland is the most extreme case, in which contingent liabilities provided to the Irish banking sector still amount to a ceiling of 125% of GDP as of end-2010. The associated fiscal risks in this country have materialised over the past years, notably in 2010, when the capital support given to the banking sector, together with other measures, amounted to 20% of GDP, with an explicit impact on the government deficit and debt. Additional contingent liabilities stem from bilateral and

<sup>11</sup> Under the programme, Eurosystem interventions can be carried out in the euro area public and private debt securities markets to ensure depth and liquidity in dysfunctional market segments and to restore the proper functioning of the monetary policy transmission mechanism.

<sup>12</sup> See Box 10 in ECB, *Monthly Bulletin*, September 2009, and Box 10 in ECB, *Monthly Bulletin*, March 2011.

multilateral financial support arrangements for euro area countries in distress (subject to strong policy conditionality).<sup>13</sup>

Third, risks related to macroeconomic and financial conditions for fiscal sustainability also remain. They include the prospect of a lower trend growth rate following the crisis and of rising short-term interest rates. However, in the short run, the impact of rising short-term interest rates on budget balances is likely to be limited. Given a share of short-term debt and debt at variable interest rates of about 32% for the euro area as at end-2010, an increase in the short-term interest rate by one percentage point would broadly translate into higher annual interest payments by about 0.27 percentage point of GDP for the euro area as a whole. The moderate size of the effect reflects the fact that interest rate changes affect only marginal lending (the deficit plus rollover of existing debt) and not the stock of existing debt. Still, the persistence of high government bond yields, reflecting large risk premia particularly for long-term borrowing, puts additional pressure on fiscal deficits and creates challenges for fiscal sustainability in the most vulnerable countries.

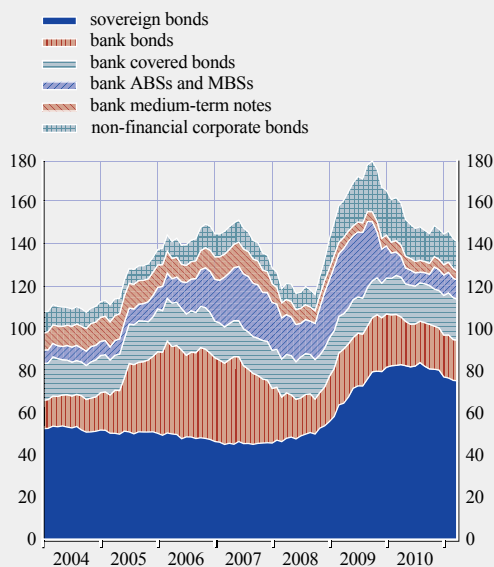
#### SOVEREIGN FINANCING NEEDS

Government borrowing needs in the financial markets represent the most immediate direct interaction between fiscal policies and the financial system. Sovereign bond issuance in the euro area increased significantly after late 2008 and remained at high levels throughout most of 2010 (see Chart 2.15). A slight decline, accompanied by a pick-up in total euro area bank debt issuance (albeit with a marked divergence across countries), became apparent in early 2011.

In 2010 euro area governments' borrowing needs (related to maturing debt and deficits) amounted to approximately 27% of euro area GDP, a sharp increase with respect to a requirement of around 15% of GDP in 2007. In 2011 euro area governments' financing needs are expected to remain broadly unchanged (at about 26.5% of GDP), as declining deficits

Chart 2.15 Euro area bank, sovereign and corporate debt issuance

(Jan. 2004 – Apr. 2011; EUR billions; 12-month moving average)



Sources: Dealogic and ECB calculations.

will be offset by rising debt rollovers from higher debt and maturity shortening.

While these borrowing needs represent some refinancing risk, government liquidity needs could be attenuated to a certain extent via recourse to selected existing government financial assets. Government financial assets, with varying degrees of liquidity, mainly include currency and deposits, loans granted by government, securities other than shares, shares and other equity, and other accounts receivable (see Box 4). At the end of 2010 the average amount of consolidated financial assets held by euro area governments stood at 34.9% of GDP. The market value of consolidated government liabilities at that time was 91.4% of GDP. Accordingly, the euro area government net debt (financial assets held by the government subtracted from its liabilities, both recorded at market value) reached 56.6% of GDP in 2010,

13 For more details, see ECB, "Ensuring fiscal sustainability in the euro area", *Monthly Bulletin*, April 2011.



after having hovered between 40% and 50% of GDP over the previous ten years.

The exposure of indebted governments to changing market sentiment may be higher, the larger the share of public debt held by foreign investors. In 2010 the share of euro area total government debt held by non-residents (including those of other euro area countries) stood at about 52% (compared with 32% in 1999). The share of public debt held by non-residents varies greatly across countries, roughly from 6% to 75%.

The maturity structure of public debt is an important factor affecting the marginal rate

which applies to government refinancing. A sizeable share of debt with a short residual maturity can imply higher liquidity risk. In the euro area, the share of securities with a residual maturity of up to one year in total outstanding government securities increased from a monthly average of 20.7% in 2008 to 23% in 2009. A partial reversal of this trend was noted in 2010, with a decline to 21.4%, while in the first three months of 2011 the average share of such short-term securities slightly increased again to 21.8%. Potentially of greater relevance to governments' refinancing risk, as at the end of March 2011, about 34% of outstanding euro area government debt securities would cumulatively mature within two years.

#### Box 4

##### GOVERNMENT FINANCIAL ASSETS AND NET GOVERNMENT DEBT IN THE EURO AREA

In assessing sovereign debt sustainability, government holdings of financial assets, and not only gross government liabilities, should also be taken into account. An indicator of net government debt provides useful complementary information to gross government debt levels, in particular when an increase in government liabilities is accompanied by a simultaneous increase in government financial assets.<sup>1</sup>

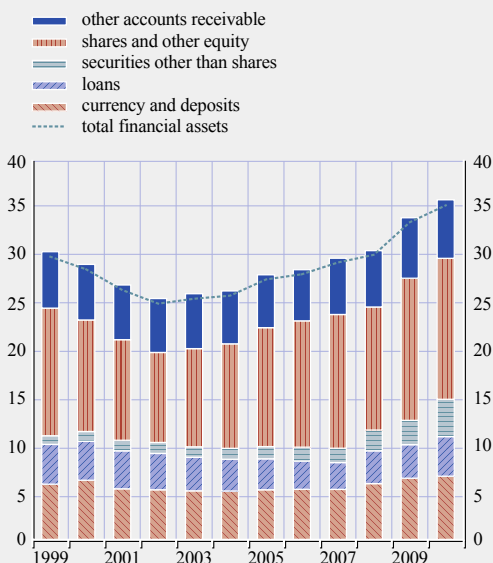
As shown in Chart A, the average amount of euro area governments' financial assets stood close to 35% of GDP in 2010. Out of this, 4.8% of GDP are estimated to be directly related to the financial crisis, mainly involving the net acquisition of financial assets such as currency and deposits (via lending by the government), as well as loans and equity, especially in the cases of the Netherlands and Ireland. Average euro area net government debt stood at 56.6% of GDP in 2010 – that is, the total value of government liabilities was more than twice the market value of government financial assets.

The ratio of financial assets to GDP differs from country to country (see Chart B). The resulting net government debt-to-GDP ratios vary accordingly. Some countries with high gross government liabilities also show high net government debt ratios, even above 100%

<sup>1</sup> In practice, net debt can be derived as the arithmetic difference between the stock of government liabilities and the stock of government financial assets in a given year, measured in market value following the European System of Accounts 1995. The stock of government liabilities includes the financial instruments that constitute the definition of the EDP debt (currency and deposits, loans and securities other than shares excluding financial derivatives), plus financial derivatives and other accounts payable. See R. Mink and M. Rodríguez-Vives, "The Measurement of Government Debt in the Economic and Monetary Union", Sixth Banca d'Italia Workshop on Public Finance, 2004. Japan represents a relevant example as the Japanese government held financial assets worth above 75% of GDP as at end-2009. Since government gross liabilities were around 185% of GDP, the resulting net government debt-to-GDP ratio in Japan was around 110% in 2009.

**Chart A Composition of euro area government financial assets**

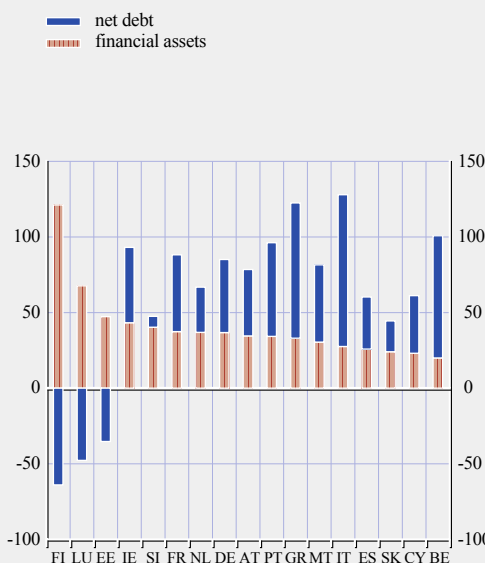
(1999 – 2010; percentage of GDP)



Sources: Eurostat, national data and ECB calculations.

**Chart B Government financial assets and net government debt in euro area countries**

(2010; percentage of GDP)



Sources: Eurostat, national data and ECB calculations.  
Note: Euro area countries are sorted according to the ratio of their financial assets to GDP.

of GDP, as in the case of Italy. By contrast, some countries with a combination of low gross government debt and a high proportion of financial assets display net debt values of only one digit (Slovenia) or negative (Estonia, Luxembourg and Finland).

The feasibility of using government financial assets as a means of temporally smoothing governments' financing needs – and the associated role that such assets can play in reducing funding risks relevant for financial stability – depend on their liquidity and marketability. Short-term financial assets (such as currency and deposits, short-term debt securities, short-term loans and other accounts receivable), which account for around 40% of total financial assets in the euro area on average, are considered more liquid. By contrast, the market value of the financial assets acquired by governments, particularly in the context of the recent financial crisis, is uncertain, in particular if the pressure to sell such assets in depressed market conditions is high. All in all, while government financial assets provide some buffer for liquidity and refinancing needs, the liquidity and marketability of the underlying assets are of high relevance in assessing their role in attenuating sovereign risk.





## III THE EURO AREA FINANCIAL SYSTEM

### 3 RISKS WITHIN EURO AREA FINANCIAL MARKETS

*After the finalisation of the December 2010 Financial Stability Review (FSR), the normalisation process continued in large parts of the euro money market, while excess liquidity declined. Nevertheless, in the context of remaining tensions the ECB decided to continue its fixed rate full-allotment refinancing operations, at least until 12 July 2011.*

*The heterogeneity of developments in capital markets across euro area countries remained significant, especially in euro area government bond markets. While nominal yields on AAA-rated long-term euro area government bonds increased, long-term government bond yields were substantially higher and liquidity conditions continued to be impaired in the government bond markets of a few euro area countries under stress.*

*Issuance activity was particularly strong in both high-yield and covered bond market segments. Higher supply, however, was more than compensated by investor demand and thus did not weigh on average spreads. In the euro area market for asset-backed securities (ABSs), primary and secondary market activity remained subdued, thereby limiting banks' ability to fund themselves via these securities.*

*Following a long period of low nominal interest rates, a sudden or larger than currently expected market-driven increase in long-term interest rates, particularly if accompanied by unexpected twists of the yield curve, might adversely affect some vulnerable market participants.*

#### 3.1 REDISTRIBUTION OF INTERBANK LIQUIDITY REMAINS IMPAIRED, MAINLY DUE TO COUNTERPARTY CREDIT RISK CONCERNS

Since late November 2010 the euro money market has been characterised by contrasting developments. On the one hand, the money market component of the ECB's financial market liquidity indicator has suggested that

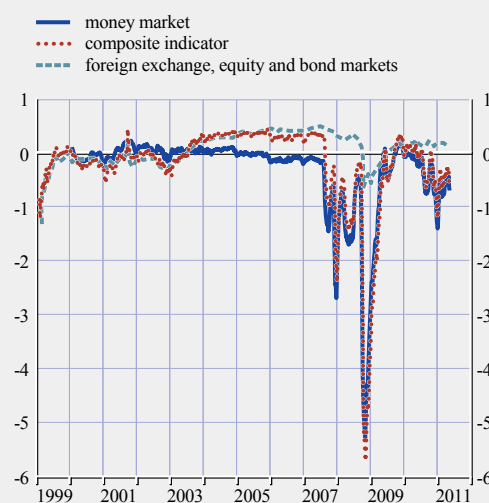
liquidity conditions have remained roughly the same, despite some usual deterioration around the year-end of 2010 (see Chart 3.1). On the other hand, the money market is polarised, as evidenced by some banks from euro area countries under stress being dependent on the Eurosystem's liquidity support.

Looking forward, a further phasing-out of non-standard measures may continue to spur more interbank activity, but it may also represent a challenge for some banks in euro area countries under stress – banks which continue to rely heavily on the liquidity provided by the Eurosystem given limited access to market funding in light of their own specific situation or given the challenges related to the respective sovereign funding situation.

Several positive developments have suggested some normalisation in the euro money market. First, the maturity profile of ECB liquidity-providing operations reverted to the

Chart 3.1 Financial market liquidity indicator for the euro area and its components

(Jan. 1999 – May 2011)



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 over the period 1999-2006 for non-money-market components and 2000-2006 for money market components. The data shown have been exponentially smoothed. For more details, see Box 9 in ECB, *Financial Stability Review*, June 2007.

situation prevailing before the introduction of the enhanced credit support measures on 8 October 2008, and the maximum length of longer-term refinancing operations (LTROs) was limited to three months. The last one-year LTRO matured in December 2010 without causing any disruption to the functioning of the money market. However, LTROs covering an entire maintenance period, which were introduced later as part of the enhanced credit support measures, have remained in use.

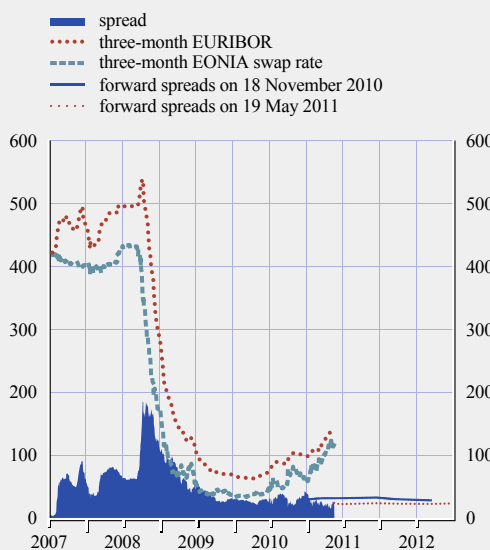
A second positive development in the euro money market relates to the three-month EURIBOR/EONIA overnight index swap (OIS) spread, which – after increasing somewhat in the last two months of 2010 and again in early May 2011 on account of renewed concerns about the creditworthiness of some euro area sovereigns – in late May 2011 was lower than at the time of the finalisation of the previous FSR (see Chart 3.2). In the period ahead, the spread is expected to remain broadly unchanged and above pre-crisis levels.

A third positive development in the euro money market relates to declining demand in the Eurosystem’s refinancing operations since the previous FSR, which has led to a marked reduction in excess liquidity and, consequently, to a substantially lower use of the ECB’s deposit facility (see Chart 3.3). This could be interpreted as a sign that counterparties on aggregate see less of a need to hold a liquidity buffer to insure against liquidity risk, despite still non-negligible counterparty credit risk concerns (see Chart S70).

With excess liquidity being reduced, interest rates in particular for the shortest maturities were more sensitive to changes and unexpected developments in the liquidity situation, including the size of recourse by market participants to the Eurosystem’s open market operations and standing facilities, as well as the unexpected developments in autonomous factors. Taken together, all these factors have tended to cause changes in liquidity demand and supply conditions and thereby also to amplify

**Chart 3.2 Contemporaneous and forward spreads between the EURIBOR and the EONIA swap rate**

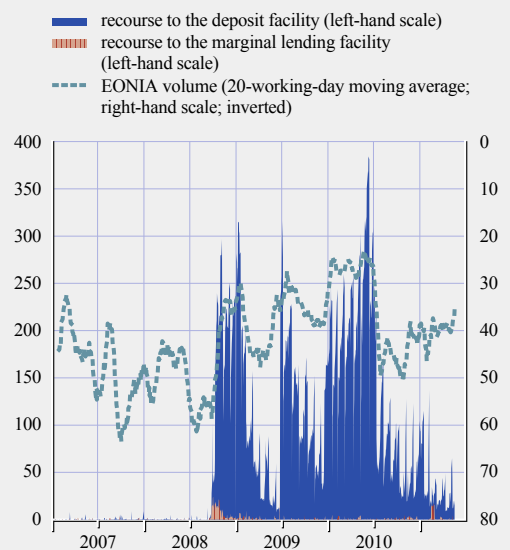
(July 2007 – Dec. 2012; basis points)



Source: Bloomberg.

**Chart 3.3 EONIA volumes and recourse to the ECB’s deposit and marginal lending facilities**

(Jan. 2007 – May 2011; EUR billions)



Source: ECB.

significantly changes in the EONIA rate. This volatility, however, did not spill over to longer maturities, as the implied volatility of three-month EURIBOR futures declined (see Chart S71). In late January 2011, for the first time since June 2009, and later in the second part of April 2011, the EONIA rate was set at levels above the minimum bid rate of the weekly main refinancing operations (MROs) prevailing at that time.

Against the backdrop of substantially lower excess liquidity, the EONIA volume has, nevertheless, remained steady at around €30-40 billion (see Chart 3.3), while at the same time banks have been reporting higher unsecured lending activity at the very short end of the euro money market yield curve.

The volume of repo transactions has also been increasing. Due to the unwinding of the exceptional transactions reported in the June 2010 European repo market survey, a more appropriate comparison of the results of the December 2009 and December 2010 surveys<sup>1</sup> indicated that repo volume has resumed a modest path to recovery. According to the latest survey, there has been further growth in electronic trading, a shift towards greater use of central clearing counterparties (CCPs), and a recovery in tri-party repos. The growing use of CCPs and tri-party repos reflected the continued greater sensitivity to counterparty credit risk.

Despite these positive developments, several signs of tension have continued to persist in the euro money market. Activity in the unsecured and secured term money market segments remained reportedly rather limited, not least because of a decline in the duration of debt investments of euro area-based euro money market funds (MMFs) driven by continuing fragile sentiment towards some euro area sovereign issuers and high market volatility.

After registering net monthly outflows since November 2010, prime euro MMFs<sup>2</sup> domiciled in the euro area saw a modest increase in capital under management in February 2011 and

remained broadly stable in March and April 2011, mainly due to the concomitant increase in short-term yields.

Despite the moderate increase in capital under management of prime euro MMFs, the outstanding volume of euro commercial paper continued to decline, led by commercial paper issued by financial institutions.

In addition to still high recourse to the ECB's deposit facility, an increased dependence on the liquidity provided by the Eurosystem, as well as on emergency liquidity assistance (ELA) provided by national central banks, were other clear symptoms of the ongoing challenges faced by some banks in accessing market funding and pointed to the persistence of a significant market polarisation.

Against the background of remaining tensions, on 3 March 2011 the ECB decided to continue conducting its refinancing operations as fixed rate tenders with full allotment – three-month LTROs up to 29 June 2011 and the MROs for as long as necessary, but at least until the end of the sixth maintenance period of 2011 ending on 12 July 2011.

### 3.2 HETEROGENOUS DEVELOPMENTS IN CAPITAL MARKETS, WITH CONTINUING STRAINS IN SOME GOVERNMENT BOND MARKETS

#### GOVERNMENT BOND MARKETS

The heterogeneity of developments in government bond markets across euro area countries has remained significant. While stable conditions in government bond markets prevailed in the majority of euro area countries, yields were high and liquidity conditions continued to be impaired in the government bond markets of a few euro area countries under stress. Several

1 International Capital Market Association, "European repo market survey", No 20, December 2010.

2 A prime MMF may invest in high-quality, short-term money market instruments, including government debt obligations, certificates of deposit, repurchase agreements, commercial paper, and other money market securities.

factors have contributed to the latter strains, first and foremost market participants' perceptions of fiscal vulnerabilities, notably tied to uncertainty about the magnitude of large, but necessary, additional capital injections into certain domestic banking systems. Government bond yields, especially those of euro area governments facing a particularly malign combination of fiscal, macroeconomic and financial challenges, remained very volatile and heavily dependent on market participants' sentiment. Furthermore, following a long period of low nominal interest rates, a sudden or larger than currently expected market-driven increase in long-term interest rates, particularly if accompanied by unexpected twists of the yield curve, might adversely affect some vulnerable market participants.

After the finalisation of the previous FSR, nominal yields on AAA-rated long-term euro area government bonds increased (see Chart S73), not least because of stronger macroeconomic activity and higher inflation projections, which together have strengthened expectations of monetary policy tightening. On aggregate, the euro area government bond yield curve slightly steepened by late May 2011, with the term spread remaining not too distant from historical highs since the launch of the euro in 1999 (see Chart S73).

The apparent upward trend of nominal yields on AAA-rated long-term euro area government bonds was, however, not without some transitory fluctuations. In particular, socio-political tensions in the Middle East and North Africa (MENA) region in mid-February 2011 and later the devastating earthquake in Japan in early March 2011 both prompted flight-to-safety flows, with concomitant short-term fluctuations around the upward trend.

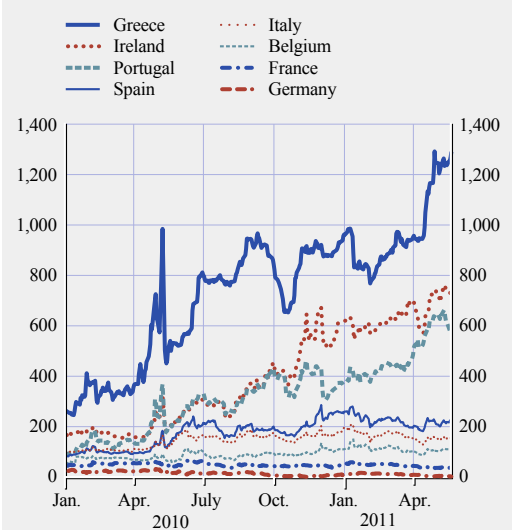
Since late November 2010 spreads of euro area government bond yields over the OIS rate have been characterised by pronounced swings. The positive sentiment that prevailed at the beginning of 2011, strong demand in

debt auctions as well as expectations by market participants of an expansion of the size and flexibility of the European Financial Stability Facility (EFSF) contributed to a compression of euro area government bond yield spreads over the OIS rate in January 2011 (see Chart 3.4).

This narrowing of spreads was, however, short-lived, as later there was no shortage of various triggers that adversely affected government bond yields of countries under stress. In late February 2011 concerns re-emerged that the measures adopted by authorities might not be sufficient to alleviate market participants' concerns and, amid already increased risk aversion due to socio-political tensions in the MENA region and elevated oil prices, triggered another round of euro area government bond spread volatility, especially for bonds issued by sovereigns under stress. In March 2011 concerns about the situation in Portugal continued to intensify and culminated in the request for EU/IMF financial assistance by the Portuguese government on 7 April 2011.

**Chart 3.4 Difference between long-term euro area sovereign bond yields and the overnight index swap rate**

(Jan. 2010 – May 2011; ten-year bond yields and ten-year overnight index swap rate; basis points)



Sources: Bloomberg and ECB calculations.  
Note: The euro overnight index swap rate rather than German government bond yields was used in order to account for the impact of flight-to-safety flows into German government bonds.

From late April 2011, amid speculation about the possibility of Greek sovereign debt restructuring, the Greek government bond yield curve inverted (see also Chart 2.14 in Section 2) and bonds tended to trade on a price rather than a yield basis, reflecting expectations of the recovery rate.

Adverse government bond price dynamics have been further exacerbated by credit rating changes for sovereign and bank bonds. In 2011 the credit ratings of euro area sovereigns under stress have been downgraded, which has triggered quasi-automatic bond sales by rating-constrained investors.

At the same time, a sequence of increases in haircuts applied by the international CCP for repo transactions collateralised with bonds issued by the Irish and Portuguese governments, while fully justified from a prudent risk management point of view after the bond spreads exceeded certain thresholds, have reduced the attractiveness of holding such bonds by prompting banks that extensively used such bonds to obtain private repo funding to resort to the ECB refinancing operations with relatively lower haircuts. Furthermore, it is also noteworthy that the same CCP imposes an additional initial margin call on members that reach the next-to-speculative-grade credit rating, meaning that some banks from the euro area countries under stress might be particularly affected if their credit ratings were to be downgraded as a result of the downgrading of the domestic government.

In addition, the new details with respect to the functioning of the European Stability Mechanism (ESM) that were unveiled in late March 2011 received mixed feedback from market participants and even contributed to some downgrades by credit rating agencies. While the announced measures were seen as helpful in that they might prevent a future crisis, they were also judged by some market participants as falling short of resolving the current crisis by raising the probability that sovereign debt restructuring might eventually occur for some countries under stress which were considered as likely candidates to request ESM support after its start in 2013. This partly stemmed from announcements suggesting that sovereign debt restructuring may accompany borrowing from the ESM. Moreover, the fact that senior unsecured government debt will be subordinate to ESM loans was also perceived as another negative factor for the prices of lower-rated euro area government bonds.

However, it is noteworthy that market participants increasingly viewed Spain as capable of withstanding macro-financial pressures and this higher confidence had a very positive impact on activity in the Spanish government bond market. The impact on euro area government bond spreads of speculation about the possibility of Greek sovereign debt restructuring that intensified in late April 2011 has been largely confined to government bond spreads of euro area countries with EU/IMF programmes (see also Chart 2.14, Chart 3.4 and Box 5).

#### Box 5

#### COMMON TRENDS IN EURO AREA SOVEREIGN CREDIT DEFAULT SWAP PREMIA

The tensions in euro area sovereign debt markets are currently considered one of the major risk factors for financial stability. Looking back at the developments in euro area sovereign credit spreads since 2008, one may distinguish two different types of driving forces. First, there are “common factors”, such as investors’ risk aversion that tends to lift all credit spreads for a given perceived “amount” of credit risk. In a similar fashion, a worsening global macroeconomic outlook would tend to increase all spreads – albeit likely to a varying extent – via the expected adverse impact on a country’s public expenditures and tax base. Second, there are country-specific



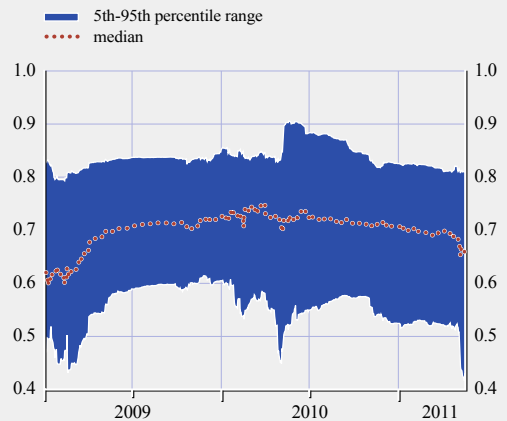
influences such as political developments or the sudden requirement to support certain financial institutions. Such country-specific developments have the potential to change investors' outlook concerning the success of fiscal consolidation and thereby affect the respective country's sovereign credit spreads. If country-specific influences are more (less) important than common factors, the correlation between different countries' sovereign credit spreads would tend to be low (high). This box attempts to quantify these aspects: it measures the tightness of co-movement across euro area sovereign credit spreads and sets out to gauge the relevance of common driving forces versus idiosyncratic influences.

As shown in Chart A, there has been a tight connection among sovereign credit spreads (measured as five-year credit default swap (CDS) premia) of the eleven euro area countries considered.<sup>1</sup> For a moving window of 260 business days, all (i.e. 55) pair-wise correlations of daily changes in CDS premia were computed. The chart shows the median of those correlations, together with their 5th and 95th percentiles. Average correlations turn out to be as high as 0.7. Moreover, even the 5th percentile of country pairs is still showing a correlation above 0.5 most of the time, and the highest pair-wise correlations (95th percentile) are ranging around 0.8. In addition, since mid-2009, correlations have been remarkably stable over time. One notable exception is observed around May 2010, when the sovereign debt crisis reached a peak in intensity: during the week of 7 May 2010 some spreads rose to exceptionally high levels, which was followed by the introduction of the European Financial Stabilisation Mechanism, the European Financial Stability Facility and the ECB's Securities Markets Programme, sending spreads down considerably in the following days.<sup>2</sup> Another slight drop in the median and a discernible decrease in the 5th percentile figure are observed in Chart A at the end of the sample, which is due to the disproportionately large increase in Greek CDS premia in April 2011.<sup>3</sup> Overall, however, the results suggest that there has been a bundle of common driving forces that induced even daily changes in sovereign CDS premia to move fairly synchronously.

In order to shed some more light on the relative importance of common versus idiosyncratic influences on sovereign credit spreads, a principal component analysis – examining the potential for common driving forces – was conducted. The first two principal components were extracted from standardised daily changes in sovereign CDS premia. With the aim of quantifying the proportion of variance explained by common factors, the individual CDS premia were regressed on the first principal component, and alternatively on the first two principal components. This

**Chart A Time-varying correlation between pairs of euro area sovereign CDS premia**

(Jan. 2009 – May 2011; senior debt; five-year maturity)



Sources: Thomson Reuters and ECB calculations.

Notes: For eleven euro area countries, all 55 pair-wise correlations between daily changes of sovereign CDS premia are computed over moving windows of 260 business days.

1 The countries included in the analysis are those with a long time series for CDS premia available, namely Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain.

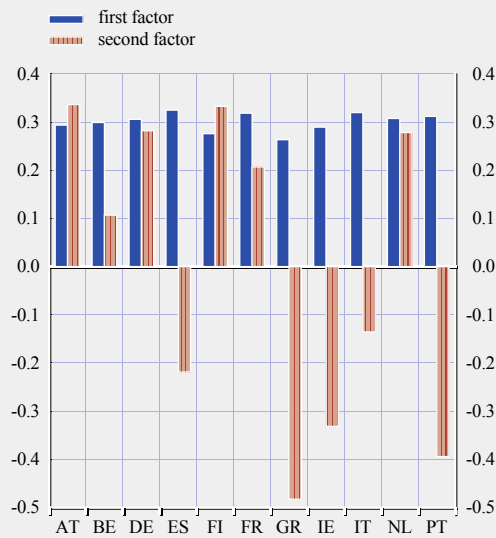
2 This period of extreme turbulence implied that there were country pairs with negatively correlated spread movements and others that showed strong simultaneous jumps. These effects are "averaged out" through the moving-window analysis, but still leave their traces in the trajectory of extreme correlation pairs (5th and 95th percentiles in Chart A).

3 In fact, looking at the individual pair-wise correlations, it turns out that it is primarily the low correlations of Greek CDS premia changes with those of other countries that are behind the described decrease in summary measures of correlation.

exercise was performed over three different sub-samples: from January to September 2008 (first bouts of moderate increases in sovereign spreads), from October 2008 to March 2010 (perceived risk transfer from the financial to the public sector, followed by strong volatility), and from April 2010 to late May 2011 (most recent period). For the last two sub-periods, it turns out that the first principal component alone already accounts for between 55% and 84% (depending on the country) of the variance of daily changes in CDS premia. The average variance proportion captured across countries amounts to 70%. Adding a second factor raises the proportion of variance explained to magnitudes between 69% and 91% depending on the country and to almost 80% on average across countries. Only for the first three quarters of 2008, during which variation in CDS premia was much more subdued, was the importance of common factors relative to idiosyncratic (i.e. country-specific) influences smaller (36% on average with one factor, and 60% on average with two factors).

**Chart B Coefficients in regressions of euro area sovereign CDSs on first two principal components**

(Apr. 2010 – May 2011)



Sources: Thomson Reuters and ECB calculations.

Notes: For eleven euro area countries, the first two principal components are drawn from the time series of standardised daily changes in sovereign CDS premia. The bars depict the loadings (regression coefficients) of the standardised CDS premia on the two principal components.

These two factors could probably be thought of as representing a bundle of influences that jointly drive the whole set of country credit spreads or at least the spreads of certain groups of countries. By design, the principal component analysis cannot be used to single out specific economic driving forces. At the same time, it comes with the advantage of being robust against the choice of specific variables to explain spread variation. Moreover, one can still give some interpretation to the role of the factors by looking at their “loadings”, i.e. the coefficients in regressions of individual CDS premia on the factors. Chart B displays these loadings for the first and second factor as estimated for the most recent sub-period. The coefficients are all positive for the first factor; hence it could be labelled an “overall crisis factor” as its increase tends to lift CDS premia of all countries. The second factor is a discriminatory factor that loads with different signs on CDS premia of euro area countries perceived by market participants as exhibiting higher sovereign risk.<sup>4</sup> That is, whenever this factor moves down, CDS premia of countries with high perceived sovereign risk would rise, while those of the remaining countries would tend to decrease.

Summing up, this statistical analysis of sovereign CDS premia has shown that the relevance of common driving forces has been high since end-2008: the daily ups and downs of sovereign credit spreads in major euro area countries tend to point in the same direction. A single common factor explains the bulk of spread movements, but a second factor that discriminates between countries viewed as having higher sovereign risk and other euro area countries has been found to be likewise important.

<sup>4</sup> Recall that the analysis is conducted based on standardised CDS premia, so one would need to scale back with the respective standard deviations to obtain the absolute effect of a change in the factors on the CDS premia in their original measurement units.

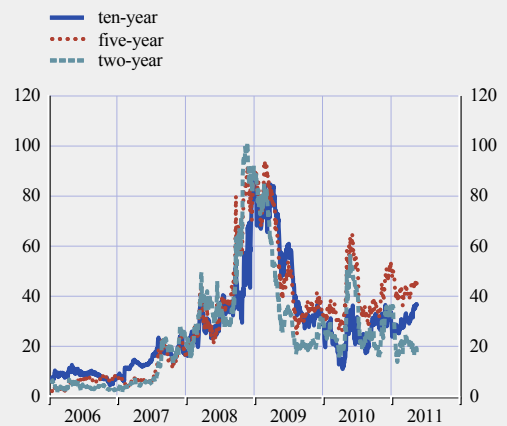
According to market intelligence, banks have been holding very small inventories of euro area government bonds due to higher volatility of their prices. Trading activity in the Greek, Irish and Portuguese government bond markets was reportedly very limited. This thin market liquidity has a vicious cycle property insofar as even a relatively small trade might move the market and cause higher volatility than in the past.

The ECB's Securities Markets Programme (SMP) was important in easing the malfunctioning of the most adversely affected euro area sovereign debt markets. The purchases under the SMP were larger in November 2010, December 2010 and January 2011 than in September and October 2010, yet still relatively small compared with the purchases in May and June 2010 (see Chart 3.5).

In late May 2011 the liquidity premia – as measured by the difference between zero-coupon yields on German government bonds and less liquid, but German government-guaranteed and thus credit-equivalent, Kreditanstalt für

**Chart 3.6 German government bond liquidity premia**

(Jan. 2007 – May 2011; basis points)

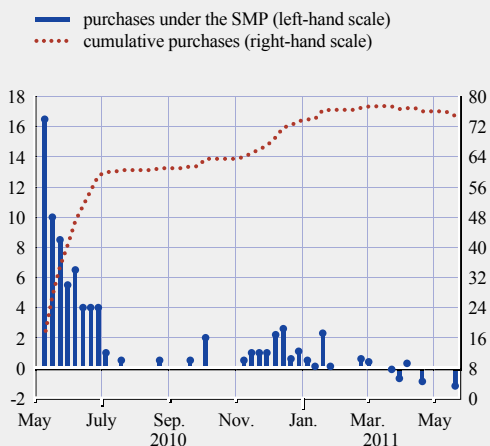


Sources: Bloomberg and ECB calculations.  
Note: Difference between zero-coupon yields on German government bonds and German government-guaranteed KfW agency bonds.

Wiederaufbau (KfW) agency bonds – were approximately the same as at the time of the finalisation of the December 2010 FSR, but nevertheless substantially lower than in early May 2010 (see Chart 3.6).

**Chart 3.5 ECB purchases and maturities of euro area government bonds under the Securities Markets Programme**

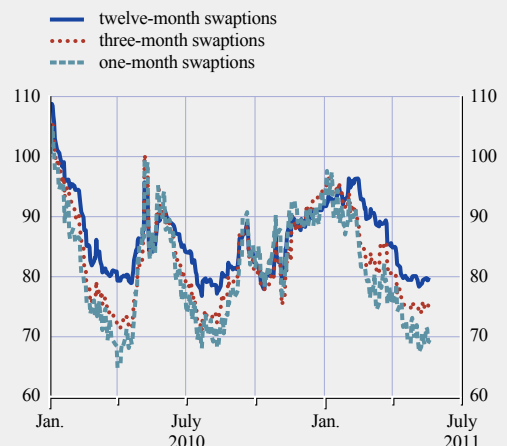
(May 2010 – May 2011; EUR billions)



Source: ECB.  
Note: Negative values of purchases refer to maturing bonds during weeks with no purchases.

**Chart 3.7 Implied euro bond market volatility at different horizons**

(Jan. 2010 – May 2011; MOVE composite indices in percentages)



Source: Bank of America Merrill Lynch.  
Note: The Merrill Option Volatility Estimate (MOVE) composite index is a weighted implied volatility index for swaptions on two, five, ten and thirty-year euro swap rates.

Ongoing tensions in some of the euro area government bond markets were also reflected in the composite implied bond market volatility indices, which in late May 2011 fluctuated at levels that were slightly lower than in late November 2010 (see Charts 3.7 and S74). Similarly, the uncertainty about ten-year German government bond prices has also declined (see Box 6).

Box 6

TRACKING BOND AND STOCK MARKET UNCERTAINTY USING OPTION PRICES

Financial option prices – through the estimation of risk-neutral densities (RNDs)<sup>1</sup> – offer the possibility to gauge the uncertainty attached by market participants to future asset prices and to track its changes over time. This box discusses the uncertainty surrounding the short-term (three-month) outlook for the ten-year German government bond (“Bund”) price – gauged using the prices of options on Bund futures – and relates it to that for the Dow Jones EURO STOXX 50 index during the financial turbulence of the last few years.

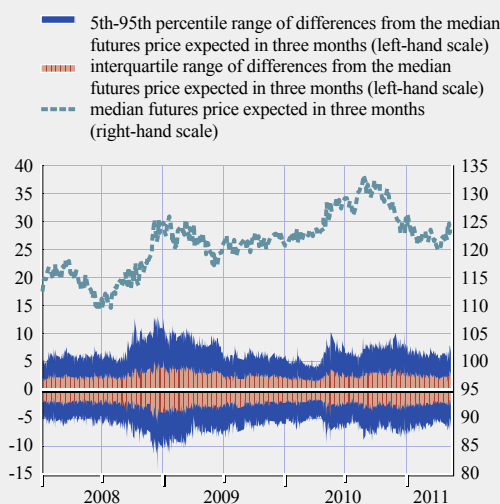
Chart A shows the median Bund futures price expected in the next three months, as derived from option-based RNDs that reflect the probabilities attached by market participants to the distribution of future Bund prices. Bond prices and yields are inversely related and thus lower bond (and Bund futures) prices imply higher yields. Chart A also shows the dispersion of expected Bund futures prices around the median expected price.

The larger the range of expected Bund futures prices, the higher the uncertainty about future Bond prices. Measured this way, uncertainty as well as the magnitude of potential “tail” (i.e. extreme) outcomes clearly peaked in late 2008 after the bankruptcy of Lehman Brothers. It was also high during the euro area sovereign debt crisis episodes in May and November 2010 and remained elevated throughout the first half of 2011.

In order to compare the impact of distress across different markets throughout the financial crisis, Chart B depicts changes in the uncertainty about future asset prices in both German government bond and euro area equity markets and uses the standard deviation of RNDs extracted from three-month option prices to measure the uncertainty with respect to future asset prices.<sup>2</sup> Although uncertainty in both markets co-moved strongly, reflecting the severity and pervasiveness

Chart A Dispersion of ten-year German government bond futures prices expected in three months

(Jan. 2008 – May 2011)



Sources: Bloomberg and ECB calculations.  
Note: The distribution of expected Bund futures prices was estimated using RNDs extracted from the prices of three-month options on Bund futures traded on Eurex.

1 For a description of the RND estimation methodology employed in this box, see R. de Vincent-Humphreys and J. M. Puigvert Gutiérrez, “A quantitative mirror on the EURIBOR market using implied probability density functions”, *ECB Working Paper Series*, No 1281, December 2010.

2 For a detailed description of changes in euro area stock market uncertainty during the financial crisis and some of its specific episodes, see ECB, “The information content of option prices during the financial crisis”, *Monthly Bulletin*, February 2011.

of the financial crisis, the intensity of that co-movement varied over time, as indicated by the moving correlation coefficient presented in the bottom part of Chart B. For example, in late 2008 and in the first half of 2009 uncertainty in euro area equity markets appeared to lead that in the Bund market, possibly on account of the safe-haven status of German government bonds. In addition, the increase in Bund market uncertainty in the spring of 2010 proved to be much longer-lasting, as changes in uncertainty in the two markets started to diverge in September 2010, although the co-movement strengthened again in 2011.

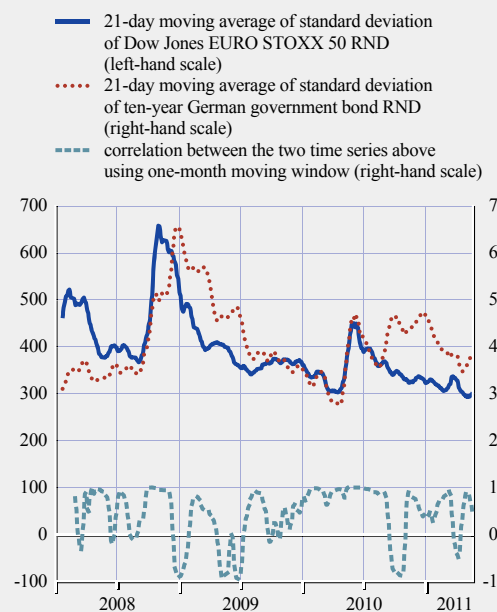
To sum up, the distribution of expected asset prices estimated using option-based RNDs can be useful in gauging uncertainty about future asset prices, as well as the likelihood and magnitude of expected extreme outcomes. Furthermore, various measures of uncertainty may help to interpret better specific episodes of market distress both within and across various financial markets.

Although nominal yields on AAA-rated long-term euro area government bonds have increased, and even more so the yields on lower-rated long-term government bonds of some euro area countries under stress, the possibility of further market-driven increases has remained non-negligible, but also seemed to be widely expected by market participants (see Chart 3.8 and Chart A in Box 6). Nonetheless, such increases would follow a long period of low nominal interest rates and, if sudden, significantly larger than expected or accompanied by unexpected twists of the yield curve (for example, a steepening rather than the expected flattening of the yield curve), might adversely affect some vulnerable market participants.

Moreover, the euro area government bond yield curve remained very steep and thus supportive of interest rate carry trades, which involve funding long-term investments with short-term financing or simply a purchase of an interest rate swap paying floating and receiving fixed

**Chart B Standard deviations of ten-year German government bond and euro area stock prices expected in three months and correlation between them**

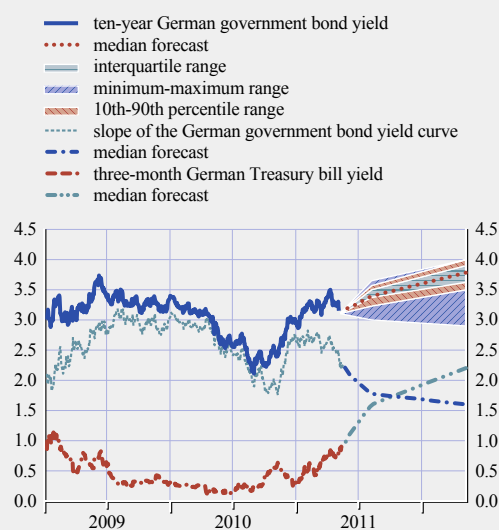
(Jan. 2008 – May 2011)



Sources: Bloomberg and ECB calculations.  
Note: RNDs were extracted from three-month option prices.

**Chart 3.8 Three-month and ten-year German government bond yields, the slope of the yield curve and Consensus Economics forecasts**

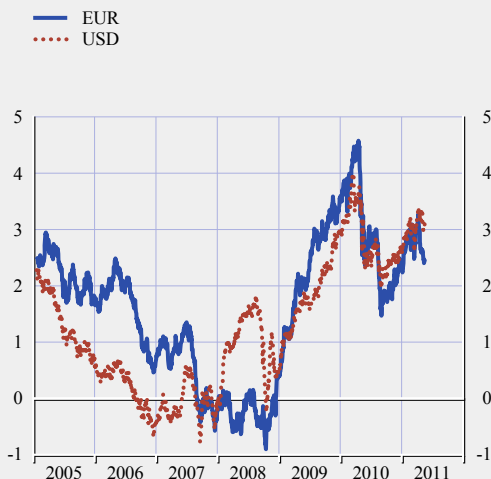
(Jan. 2009 – May 2011; percentages)



Sources: Reuters, Bloomberg, Consensus Economics and ECB calculations.  
Note: Consensus Economics forecasts refer to yields that were expected in three and twelve months on 9 May 2011.

**Chart 3.9 Interest rate carry-to-risk ratios for the United States and the euro area**

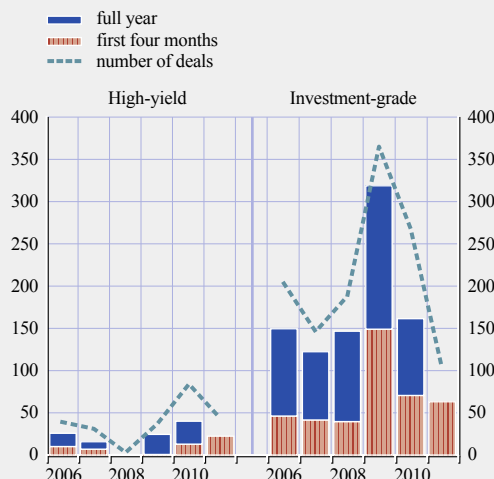
(Jan. 2005 – May 2011)



Sources: Bloomberg and ECB calculations.  
Note: The carry-to-risk ratio equals the differential between the ten-year swap rate and the three-month LIBOR, divided by the implied volatility extracted from three-month swaptions on ten-year swaps.

**Chart 3.10 High-yield and investment-grade bond issuance in the euro area**

(Jan. 2006 – Apr. 2011; issuance in EUR billions and the number of deals)



Sources: Dealogic and ECB calculations.

rates. On a risk-adjusted basis, the attractiveness of such carry trades – as measured by the ratio between the interest rate differential, or carry, and its implied volatility – remained high in late May 2011 (see Chart 3.9), as did the concomitant risk of their abrupt unwinding.

### CREDIT MARKETS

In euro area credit markets, after the finalisation of the December 2010 FSR the issuance activity was particularly strong in both high-yield and covered bond market segments. Higher supply, however, was more than compensated by investor demand and thus did not weigh on average spreads. In the euro area ABS market, primary and secondary market activity remained subdued and banks' ability to fund themselves via ABSs was limited.

### Debt securities issuance

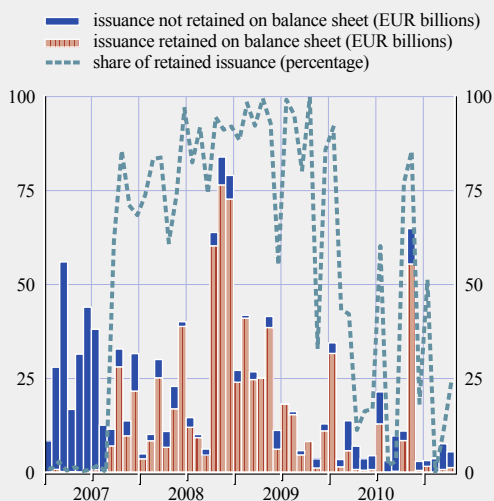
After the lull in issuance in the euro area corporate bond markets in December 2010 due to the end of the year, there was a significant

pick-up in gross issuance of both high-yield and investment-grade bonds during the first four months of 2011 (see Chart 3.10). The increase was particularly pronounced for high-yield bonds, as the gross volume issued up to end-April 2011 exceeded issuance levels over the same period of every year since 2006. By contrast, the gross issuance of investment-grade bonds by euro area corporations was lower than during the same four-month periods in both 2009 and 2010.

This disparity in gross issuance could be explained, at least partly, by differences in the investment performances of and the resulting investor net flows into the respective bond investment funds. In 2010 investor inflows into bond investment funds were quite strong overall, but as investment returns started declining in late 2010, inflows abated. In 2011 they decreased for high-yield bond funds and turned negative for investment-grade bond funds. In the period ahead, a further decrease in investor net flows

**Chart 3.11 Issuance of asset-backed securities by euro area banks**

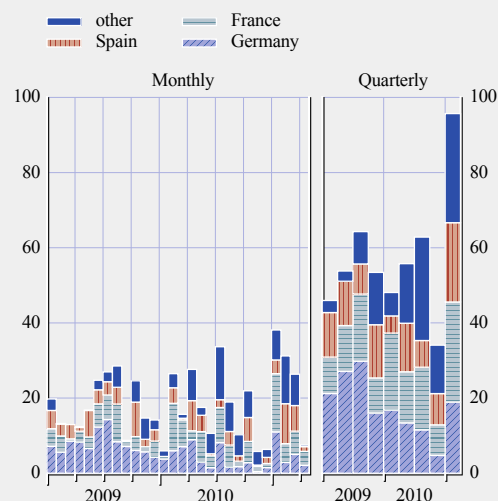
(Jan. 2007 – Apr. 2011)



Sources: Dealogic and ECB calculations.

**Chart 3.12 Issuance of covered bonds in selected euro area countries**

(Jan. 2009 – Apr. 2011; EUR billions)



Sources: Dealogic and ECB calculations.  
Note: "Other" includes Austria, Finland, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Slovakia.

into bond investment funds may weigh on the pace of issuance, although investors' search-for-yield activity remains strong and may continue to support the issuance of high-yield bonds.

After the finalisation of the December 2010 FSR, the gross issuance of euro area ABSs remained at very low levels. The issuance by euro area banks of retained ABSs, most of which were issued with the aim of using them as collateral for refinancing operations with the Eurosystem, decreased, partly on account of tightening of Eurosystem collateral eligibility criteria for ABSs (see Chart 3.11). In 2011 most new ABSs issued by euro area banks were backed either by residential mortgages or by auto loan receivables.

In the euro area covered bond market, issuance activity was very robust in the first quarter of 2011, but declined in April 2011. Moreover, market sentiment deteriorated significantly towards covered bonds issued by banks from euro area countries under stress. Overall, gross issuance in the first quarter of 2011 increased by almost 90%, compared with the quarterly

average throughout 2010, and was led by French and Spanish banks (see Chart 3.12). In addition, banks have increased their reliance on covered bonds to alleviate funding pressures, prompted by the higher cost of unsecured senior debt due to heightened investor concerns about potential burden-sharing.

### Credit spreads

In comparison with late November 2010, corporate bond and CDS spreads had declined by late May 2011, especially those of financial and lower-rated companies (see Charts S81, S82, S83, S84 and S85). Spreads benefited from search-for-yield activity and firm demand for corporate credit, especially in the cash bond market, as fixed income investors continued to switch from government bonds into spread products. Moreover, positive macroeconomic news, as well as better than expected realised corporate earnings, further reinforced positive sentiment among credit market participants. Nonetheless, the tightening of spreads eventually came to a halt due to concerns about the fiscal situation in euro area countries under

stress, socio-political tensions in the MENA region and then the earthquake in Japan.

On 10 January 2011, following the European Commission's proposal to include holders of senior unsecured bank debt in bank restructuring schemes, the iTraxx Financials sub-index for senior five-year debt reached a new high of 210 basis points, but retreated to around 140 basis points by late May 2011. While the iTraxx Financials sub-indices for both senior and subordinated five-year debt started increasing already in late November 2010, the increase as well as the subsequent decline was much more pronounced for the subordinated debt index, thereby leaving the difference between the two sub-indices largely unchanged in late May 2011 compared with levels that prevailed at the time of the finalisation of the previous FSR (see Chart 3.13).

Turning to the euro area ABS market, while spreads on euro area commercial mortgage-backed securities (CMBSs) continued narrowing after the finalisation of the December 2010

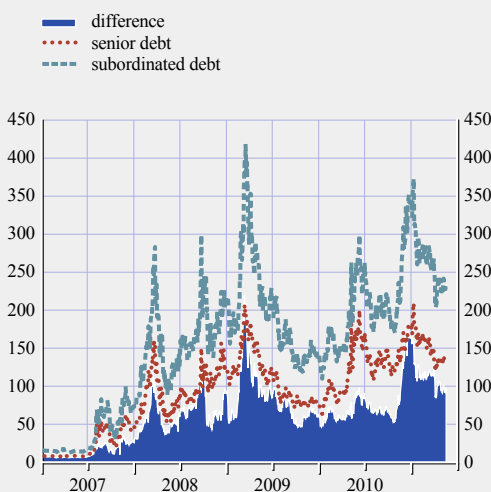
FSR and by late May 2011 dropped to around 325 basis points, spreads on other types of ABSs remained stable (see Chart 3.14). Spreads on euro area residential mortgage-backed securities (RMBSs) continued to be characterised by high differentiation across euro area countries. While spreads on RMBSs collateralised by residential mortgages in euro area countries either hit by severe economic recession or with strained property markets have continued to remain at elevated levels, spreads on other RMBSs have tended to gradually narrow.

In the period ahead, a further narrowing of ABS spreads is a precondition for a recovery of the ABS market as a funding source. It is noteworthy that the largest amounts of new issuance were observed in the markets with the lowest spreads, i.e. ABSs collateralised by auto loan receivables and RMBSs issued by highly rated banks.

After increasing in the final two months of 2010, the average spread between the average covered bond yield (as measured by the iBoxx Euro Covered Index) and euro interest rate

Chart 3.13 iTraxx Financials senior and subordinated five-year credit default swap indices

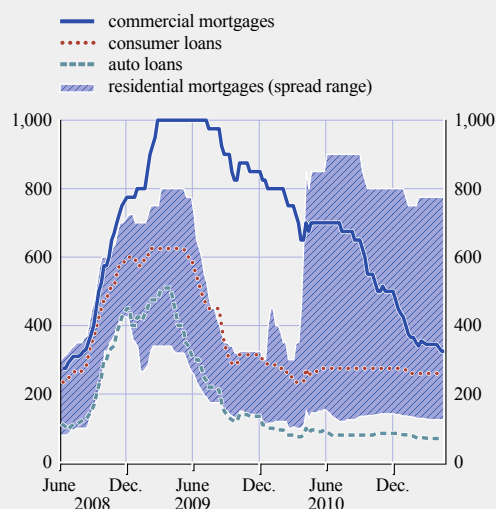
(Jan. 2007 – May 2011; basis points)



Sources: Bloomberg and ECB calculations.

Chart 3.14 Spreads over LIBOR of euro area AAA-rated asset-backed securities

(June 2008 – May 2011)



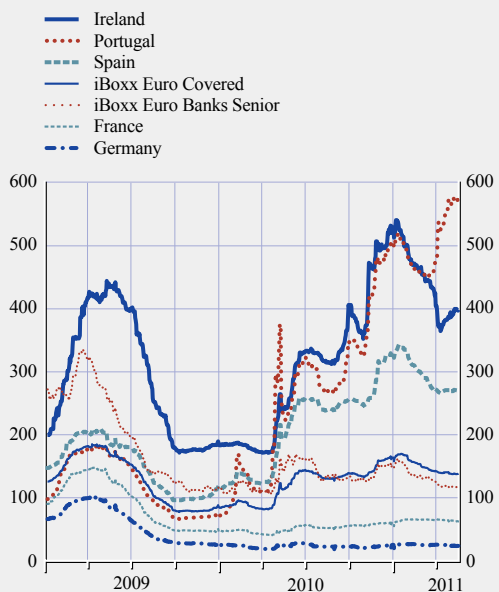
Source: JPMorgan Chase & Co.

Note: In the case of residential mortgage-backed securities, the spread range is the range of available individual country spreads in Greece, Ireland, Italy, the Netherlands, Portugal and Spain.



**Chart 3.15 Spreads between covered bond yields and euro interest rate swap rates**

(Jan. 2009 – May 2011; basis points)



Source: iBoxx.

swap rates started declining in late January 2011 and by late May 2011 had narrowed to levels broadly similar to those at the time of the finalisation of the previous FSR (see Chart 3.15). Nevertheless, concerns about sovereign credit risk have continued to dampen investor appetite for covered bonds of banks from euro area countries under stress, leaving the respective country spreads at substantially elevated levels.

It is also noteworthy that covered bond spreads have remained above those of unsecured senior bank debt, as measured by the iBoxx Euro Banks Senior Index, not least because of strong supply of covered bonds, although this is only a rough comparison due to the differences in the composition of the two bond indices.

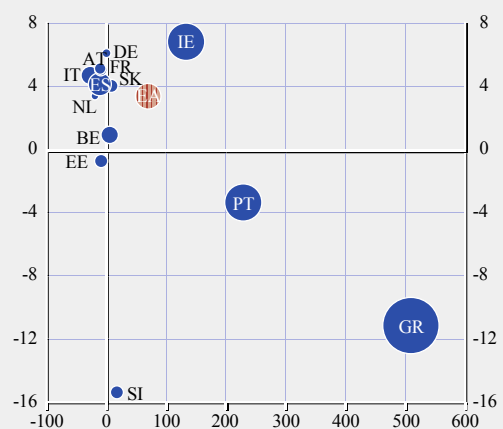
### EQUITY MARKETS

By late May 2011 euro area equity prices, as measured by the Dow Jones EURO

**Chart 3.16 Sovereign credit risk and the performance of national stock indices**

(18 Nov. 2010 – 19 May 2011)

x-axis: sovereign CDS spread (change in basis points)  
y-axis: stock market index (percentage change)



Sources: Thomson Reuters Datastream and ECB calculations.

Notes: Bubble size refers to the level of the sovereign CDS spread on 19 May 2011. "EA" stands for "euro area" and refers to the average sovereign CDS spreads and stock indices of the included euro area countries.

STOXX index, were 2.4% higher than at the time of the finalisation of the previous FSR (see also Chart S75). Both a stronger macroeconomic growth outlook and better than expected realised earnings have been supportive of euro area stock prices. By contrast, fluctuations in market sentiment regarding fiscal sustainability risk and the soundness of the banking sectors in euro area countries under stress tended to cause deviations from the overall upward trend. Cyclically adjusted price/earnings ratios slightly increased, but nevertheless remained well below historical averages and thus did not point to an overvaluation of euro area equity prices (see Chart S78).

In February 2011 euro area equity prices recorded the highest levels in more than 30 months, reaching levels not seen since before the collapse of Lehman Brothers in September 2008. These increases reflected the

overall positive macroeconomic momentum and better than expected earnings, both for financial as well as non-financial companies. In April 2011 the annual growth of annual earnings per share of companies listed in the Dow Jones EURO STOXX index was 28% and was expected to remain relatively strong in the year ahead.

The performance of some national stock market indices appeared to be influenced by changes in the perceived sovereign credit risk, as declines in sovereign CDS spreads tended to be associated with better stock market performance (see Chart 3.16). Furthermore, throughout 2011 the relative performance of prices of bank stocks against those of non-financial companies was also very closely linked to changes in tensions in certain euro area sovereign debt markets.

The upward trend in euro area equity prices was countered by socio-political tensions in the MENA region in February 2011 and later again by the devastating earthquake in Japan in March 2011. Consequently, the implied stock market volatility derived from euro area stock option prices increased temporarily (see Chart S76), but this increase was fully reversed by late May 2011.

One market segment with relatively strong growth over the last years and frequently involving equities as an underlying asset class – along with other underlying assets such as commodities – has been exchange-traded funds (ETFs). Possible financial stability concerns associated with this market development are outlined in Box 7.

#### Box 7

##### EXCHANGE-TRADED FUNDS

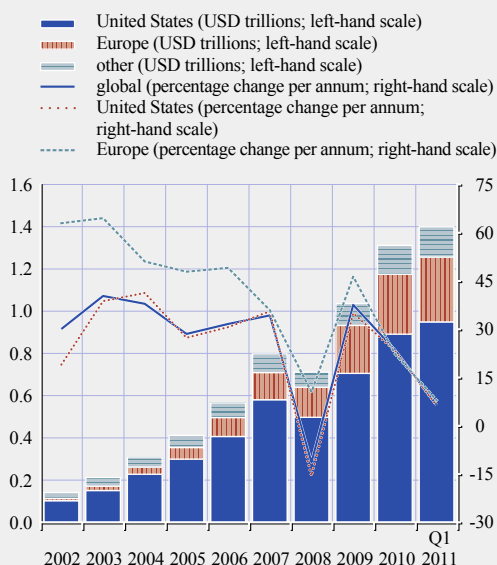
Exchange-traded funds (ETFs) are (mostly) passive index-tracking investment products granting investors cost-effective and liquid exposure to a wide range of asset classes and geographical areas. These products have experienced impressive growth since 2000, and they weathered the crisis relatively unscathed (see Chart A). The growth of these products, the pace of the related financial innovation and (linked to the latter) their increasing degree of complexity have attracted supervisory bodies' attention at the international level. This box summarises the key characteristics of ETFs, describes the evolution of ETFs in terms of the number of funds and assets under management (AuM) (also providing where possible relevant euro area or EU data) and finally sketches in broad terms the issues that may require closer scrutiny in the near future by the international financial stability, supervisory and regulatory communities.

ETFs come broadly in two forms: physical (or plain vanilla) and synthetic (or swap-based) ETFs. Physical instruments track an underlying index by physically holding an approximation of this index's portfolio composition. It is the prevalent ETF form worldwide in general and in the United States, the largest market for ETFs in terms of AuM, in particular. Synthetic ETFs replicate the underlying index by using derivatives rather than holding an approximation of the underlying portfolio. This form is predominant and common in the European and, more specifically, the EU segment of the ETF market. The development of the EU segment is closely linked to the implementation of the UCITS III Directive in the EU in 2002 (see Chart B).

Whereas physical ETFs hold underlying securities in a ring-fenced separate account exposing the investor to no counterparty risk of the issuer, synthetic ETFs hold in addition to a basket of securities (which may be different from the underlying index securities) an index swap, thereby

**Chart A ETF assets under management and assets under management growth rates by geographical area**

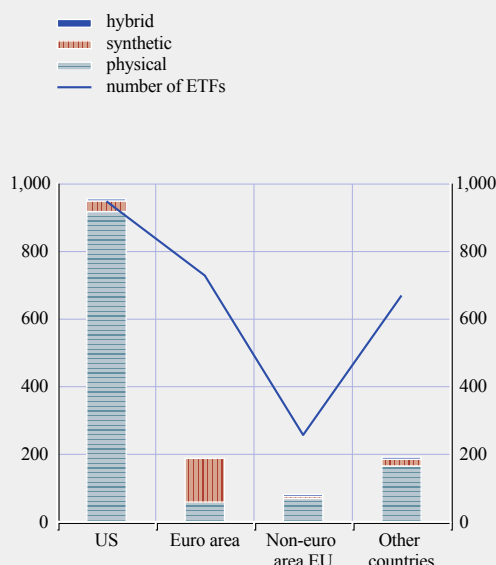
(2002 – Q1 2011)



Source: BlackRock.  
Note: Europe encompasses the EU, Switzerland, Norway, Russia and Turkey.

**Chart B ETF assets under management by type and total number for different geographical regions**

(Q1 2011; USD billions and number of funds)



Source: BlackRock.

exposing investors to swap counterparty risk. In the EU, this risk is limited to a maximum of 10% of the value of the fund under the UCITS III Directive. This difference in structure grants physical ETFs benefits in terms of transparency as investors in physical ETFs in case of failure of the ETF issuer know which actual collateral is backing their investment.

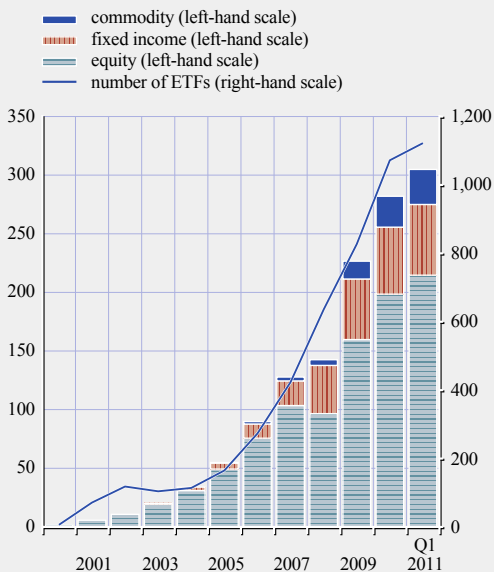
Asset management companies and big banks are the main providers of ETFs, with a high concentration of market shares among a few main providers. While the EU has broadly drawn level with the United States in terms of the number of ETFs and has outpaced the United States and other countries in terms of AuM growth rates since 2002, the US ETFs have considerably more AuM than those in other geographical areas. The share of European commodity ETFs in global commodity ETFs reached 59% of AuM and constituted the fastest-growing segment of European ETFs (see Chart C).

With USD 1.3 trillion of AuM at the end of 2010<sup>1</sup> the global ETF industry is smaller than the global hedge fund (USD 2-2.5 trillion)<sup>2</sup> and the global mutual fund (USD 18.2 trillion)<sup>3</sup> industries. There are, however, ETF-related developments that have drawn the attention of financial authorities. They relate to two different types of factors, each potentially leading to financial stability vulnerabilities.<sup>4</sup>

1 Source: BlackRock.  
2 Based on end-December 2010 estimates by Hedge Fund Research and HedgeFund.net.  
3 The estimate includes equity, bond and balanced/mixed funds, but excludes money market, other (including funds of funds) and unclassified funds. See European Fund and Asset Management Association, "International Statistical Release", Q4 2010.  
4 See Annex 1.7. entitled "Exchange-Traded Funds: Mechanics and Risks" in IMF, *Global Financial Stability Report*, April 2011; Financial Stability Board, "Potential financial stability issues arising from recent trends in Exchange-Traded Funds (ETFs)", 12 April 2011; as well as S. Ramaswamy, "Market structures and systemic risks of exchange-traded funds", *BIS Working Paper Series*, No 343, April 2011.

Chart C European ETFs by underlying asset class

(2000 – Q1 2011; USD millions and number of funds)



Source: BlackRock.

Note: European ETFs include those in the EU countries, Switzerland, Norway, Russia and Turkey.

On the one hand, structural elements linked to specific types or segments of the ETF investment class are currently under closer analysis by financial authorities. In particular, the following aspects of ETFs are generally mentioned as potentially leading to financial stability concerns in this context:<sup>5</sup>

- (i) An increase in complexity and opacity of synthetic ETFs in particular, potentially undermining risk monitoring.
- (ii) Risks linked to the composition and quality of the collateral pool underlying ETF structures.
- (iii) Risks linked to the replication of the underlying indices.
- (iv) Market liquidity risks linked to the available redemption options for ETF shares in both physical and synthetic structures.

On the other hand, the growth in ETF assets under management has added to already considerable investment flows into emerging market economies and commodities. These developments are being monitored closely as they might further fuel asset price bubbles or volatility, increasing the risk of a disorderly unwinding of these investment flows.

<sup>5</sup> It is worthwhile mentioning that the risks and transparency issues raised are not ETF-specific and might also be relevant for certain types of mutual funds or the underlying building blocks (i.e. swaps, securities lending) more generally.

## 4 DEVELOPMENTS IN THE EURO AREA BANKING SECTOR

### 4.1 BANKING SECTOR BENEFITS FROM IMPROVED ENVIRONMENT, BUT CHALLENGES REMAIN

The financial condition of euro area large and complex banking groups (LCBGs) generally improved in late 2010 and in the first quarter of 2011, although differences in financial performance across institutions remained significant. Looking forward, the outlook for euro area banks' earnings remains uncertain, as further improvements in the main drivers of the recent increase in LCBGs' profitability – higher net interest income, as well as a significant reduction of their operating costs – may prove challenging in the period ahead. In this context, it is noteworthy that several euro area LCBGs have announced return-on-equity (ROE) targets for the next few years which are higher than ROE estimates derived from analysts' earnings forecasts. This could imply that some LCBGs may be inclined to take higher risks in the period ahead so as to meet ambitious profitability targets.

Notwithstanding the improvement of funding conditions for most LCBGs in the first few months of 2011, banks' funding risks remain among the key vulnerabilities confronting the euro area banking sector, especially in the context of banks' sizeable refinancing needs in the next few years and the volatility of their wholesale funding costs. Funding pressures for several medium-sized or smaller banks have manifested themselves in the form of elevated costs of wholesale and/or deposit funding. While sovereign risk concerns are one of the important factors contributing to the wide dispersion of the costs of market funding, institution-specific factors, such as banks' capitalisation or asset quality, also contribute to the variations in funding costs, especially in the case of banks located in countries with fiscal vulnerabilities. Moreover, the recent shift in debt issuance towards covered bonds is leading to a higher share of banks' assets being held as guarantees for bond investors, which could potentially reduce the share of assets available to repay unsecured

creditors in the event of issuer default. In some jurisdictions, potential risks from higher asset encumbrance are mitigated by prudential limits on the amount of covered bonds that banks are permitted to issue. At the same time, covered bonds play a positive role as they remain an important and relatively stable source of funding for a number of euro area banks.

Although credit risk in the banking sector appears to be less severe than at the time of the publication of the December 2010 Financial Stability Review (FSR), the environment in which banks operate remains difficult and risks are still at elevated levels. In particular, the risk of potential losses stemming from persistently subdued levels of, or a further decline in, commercial and residential property prices, and the associated deterioration in related assets' quality, remains significant in some euro area countries. Pockets of vulnerability also remain within the euro area corporate sector. In particular, the relatively weaker financial position of small and medium-sized enterprises (SMEs), coupled with their stronger dependence on bank financing, continues to be a source of concern, especially in countries with still weak growth prospects.

Where market-related risks are concerned, there remains a risk of further market-driven increases in long-term interest rates in the euro area. In such a scenario, some euro area banks' profits would be negatively impacted by increasing mark-to-market losses on the still sizeable government bond holdings although this could be offset, at least partly, by increased revenues from maturity transformation activities. On the other hand, however, a possible flattening of the yield curve, as is expected by financial market participants, is likely to affect banks' net interest income from retail customer activities unevenly. Broadly speaking, LCBGs headquartered in euro area countries where a significant proportion of the loans is granted at fixed rates, or at longer maturities, could see their net interest income decline somewhat if short-term rates rise in the future. By contrast, LCBGs resident in countries where most loans carry a rate of interest that is

either floating or has a short period of fixation may benefit from higher short-term market rates to the extent that in these countries lending rates tend to respond more markedly and quickly to rising money market rates than deposit rates.

The most significant risks that euro area LCBGs currently face include:

- ↑ the interplay between the vulnerability of public finances and the financial sector with potential adverse contagion effects, on the one hand, and possible adverse implications for banks' credit and market risk, on the other;
  - ➔ bank funding vulnerabilities and risks related to the volatility of funding costs;
  - ➔ the risk of losses for banks stemming from persistently subdued levels of, or a further decline in, commercial and residential property prices in some euro area countries; and
  - ↑ the risk of market-driven and unexpected increases in long-term interest rates, with possible adverse implications for the profitability of some banks.
- ↑ *Increased since the December 2010 FSR*  
 ➔ *Unchanged since the December 2010 FSR*  
 ↓ *Decreased since the December 2010 FSR*

#### 4.2 IMPROVEMENT OF LCBGs' PROFITABILITY REMAINS DEMANDING<sup>1</sup>

The financial condition of LCBGs in the euro area generally improved in late 2010 and in early 2011, but differences in financial performance across institutions remained significant. Profitability indicators improved considerably against the backdrop of a gradual economic recovery in some euro area countries. Diversification of activities across geographical regions helped some LCBGs to reinforce their profitability, despite the difficulties they faced in their local markets. At the same time, some

LCBGs were negatively affected by higher funding costs. The increase in profits, coupled with banks' efforts to raise capital, contributed to improvements in their solvency indicators.

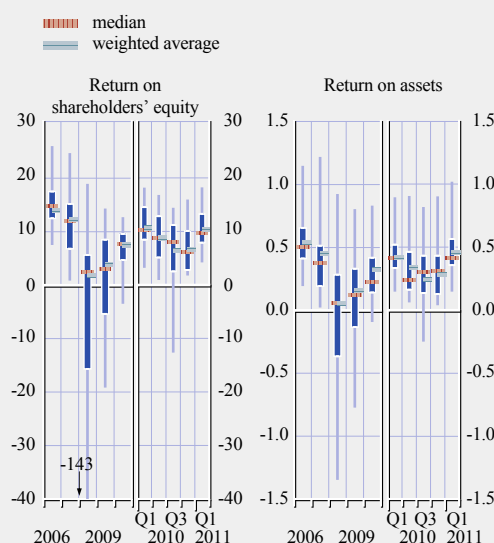
#### PROFITABILITY

The profitability of LCBGs, as measured by the return on equity (ROE), continued to improve in early 2011, building on the recovery in 2010 from the low levels of 2009 (see Chart 4.1 and Table S5). This is illustrated by an upward shift of the ROE distribution for a sub-sample of those LCBGs that had reported their financial results for the first quarter of 2011 at the time of writing. Moreover, the entire distribution of ROE values shifted into positive territory and

<sup>1</sup> The sample used for the majority of the analysis carried out in this section includes 20 euro area banks. 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. However, at the time of writing, results for the first quarter of 2011 were available only for a smaller sub-sample of LCBGs.

Chart 4.1 Euro area LCBGs' return on equity and return on assets

(2006 – Q1 2011; maximum, minimum and interquartile distribution; percentages)



Sources: Individual institutions' financial reports and ECB calculations.

Note: The quarterly figures are annualised and based on data for a sub-sample of LCBGs for which results for all quarters of 2010 and the first quarter of 2011 were available.

the interquartile range narrowed considerably in comparison with the previous quarter. However, the positive developments in profitability in early 2011 need to be interpreted with caution as historical patterns show that first quarter results are typically the strongest. Furthermore, year-on-year comparisons show a slight decrease in the median and the interquartile range of ROE values compared with levels in the first quarter of 2010. The alternative indicator of profitability, the return on assets (ROA), showed a broadly similar pattern as the ROE, with its median level increasing in early 2011. Similarly, the interquartile distribution of the ROA across LCBGs narrowed and shifted into positive territory (see Chart 4.1).

The improvement in the financial performance of LCBGs in the first quarter of this year was due to considerably lower levels of provisioning and, to a lesser extent, improvements in fee and commission income and trading revenues (see Chart 4.2). The operating income of most euro area LCBGs was also supported by the

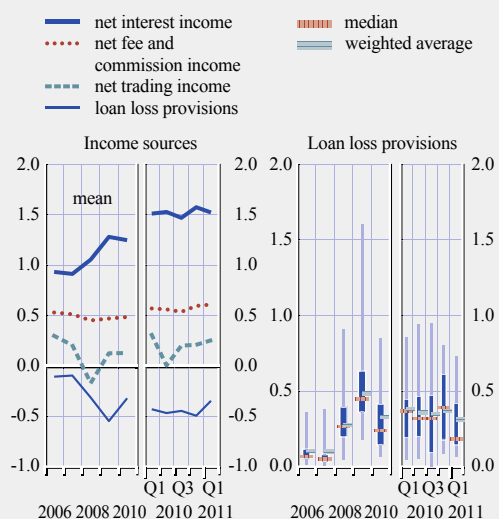
continued strength of net interest income, although for some LCBGs this source of income could have been negatively affected by higher funding costs. After a marked decrease in trading income as a consequence of increased financial market volatility and reduced trading activity in the second quarter of 2010, trading results recovered somewhat in the second half of last year and in the first quarter of 2011, in part due to higher trading flows usually taking place in the first three months of a year.

Further cost control contributed somewhat to the improvement in the profitability of euro area LCBGs. The distribution of the cost-to-income ratios of euro area LCBGs became more concentrated around the 60-65% range (see Chart S90).

Loan loss provisions, which weighed significantly on banks' profitability in 2009, decreased against the background of an improving economic situation in most euro area countries in 2010 and in early 2011, but nevertheless remained higher than the pre-crisis levels. Moreover, the dispersion of the ratio of loan loss provisions to total assets across LCBGs narrowed significantly in the first three months of 2011 in comparison with the previous quarter.

**Chart 4.2 Breakdown of euro area LCBGs' income sources and loan loss provisions**

(2006 – Q1 2011; percentage of total assets)



Sources: Individual institutions' financial reports and ECB calculations.  
Note: The quarterly figures are annualised and based on data for a sub-sample of LCBGs for which results for all quarters of 2010 and the first quarter of 2011 were available.

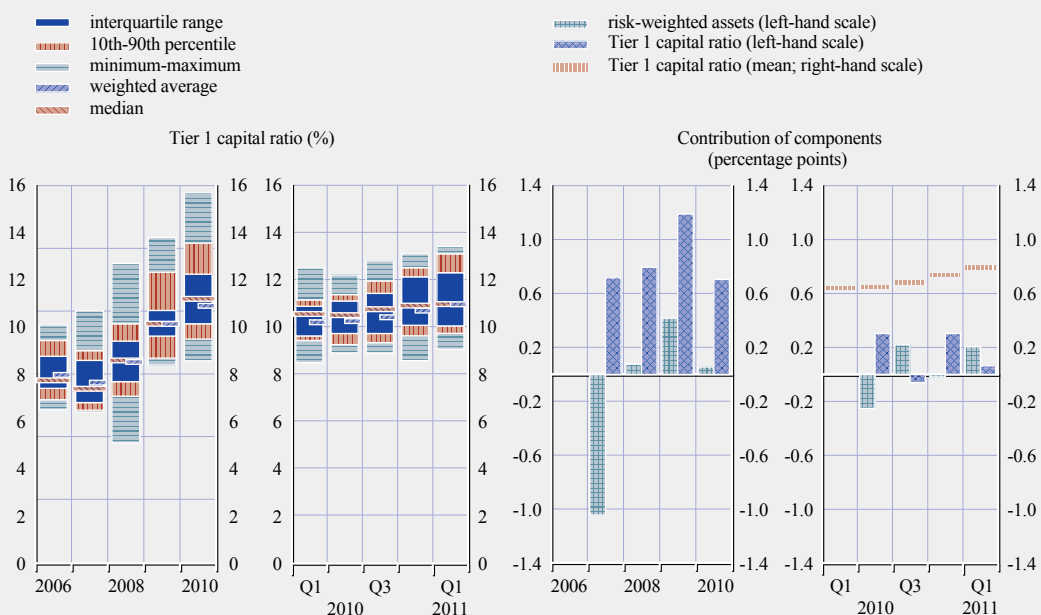
## SOLVENCY

Regulatory capital ratios of euro area LCBGs continued to improve across the board in late 2010 and in early 2011 (see Chart 4.3). The increase in capital ratios was supported by retained earnings, banks' efforts to raise capital and also a decrease in risk-weighted assets in the first quarter of 2011. The median overall solvency ratio for a sub-sample of those euro area LCBGs that had reported their financial results for the first quarter of the year at the time of writing was 14.1% at the end of 2010, but decreased somewhat to 13.7% at the end of the first quarter of this year.

In preparation for the changes in capital regulations prescribing significantly higher

**Chart 4.3 Euro area LCBGs' Tier I capital ratios and the contribution of components to changes in the aggregate Tier I capital ratio**

(2006 – Q1 2011)



Sources: Individual institutions' financial reports and ECB calculations.

Notes: The quarterly figures are based on data for a sub-sample of LCBGs for which results for all quarters of 2010 and the first quarter of 2011 were available. In the right-hand panel, the contribution of components to changes in the aggregate Tier I capital ratio is shown with a sign to indicate whether they resulted in a positive or negative change (e.g. the increase in risk-weighted assets is shown with a negative sign).

core Tier 1 (common equity Tier 1) and Tier 1 capital ratios, banks have been making efforts to improve the quality of their regulatory capital. Euro area LCBGs' core Tier 1 capital ratios, according to current definitions, improved significantly in 2010 and continued improving, on average, early this year, in particular in the upper half of the distribution (see Chart 4.4). This was partly achieved through a further deleveraging and derisking of balance sheets by some institutions, as evidenced by a decline in the ratio of risk-weighted assets to total assets.

Regarding more recent developments, the second quarter of 2011 also saw several euro area banks strengthen their capital base or announce plans to raise capital. Nevertheless, for some banks, further progress in reducing their leverage levels and in increasing their levels of high-quality capital needs to be achieved in order

to ensure sufficient capital buffers for future losses and to strengthen investor confidence.

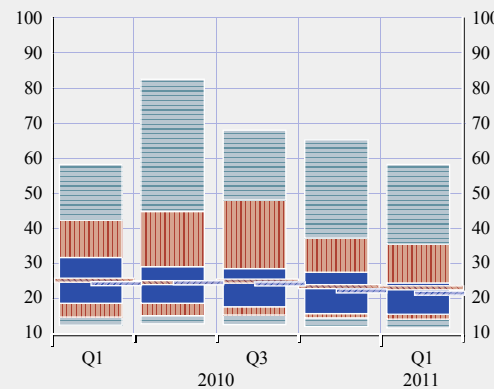
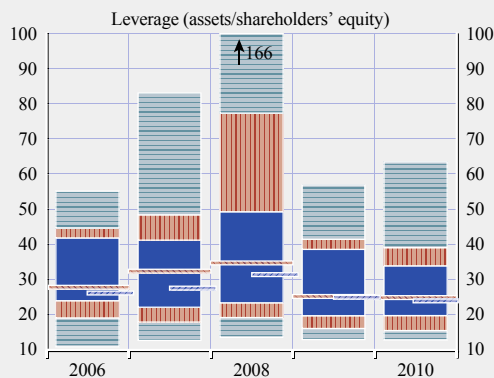
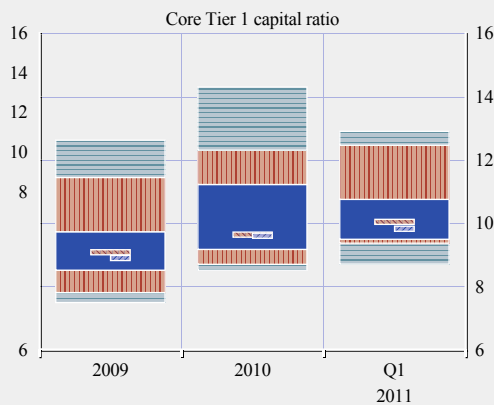
An additional risk related to banking sector regulation is linked to some traditional banking sector activity migrating to less regulated entities (regulatory arbitrage). While data directly capturing such phenomena are limited, the euro area accounts illustrate the potential for flows out of the MFI sector to the other financial intermediary (OFI) sector. Chart 4.5 shows that while the stock of MFI liabilities has remained relatively stable since the start of the crisis, OFI liabilities have continued along the growth trend recorded since 2009. The OFI sector consists of entities that are rather heterogeneous not only in terms of regulation and oversight, but also with regard to the extent to which they are engaged in maturity transformation. In fact, OFIs belong to banking groups in many cases, and are thus subject to consolidated supervision.



**Chart 4.4 Euro area LCBGs' core Tier 1 capital ratios and leverage multiples**

(percentages; maximum, minimum and interquartile distribution)

interquartile range    weighted average  
 10th-90th percentile    median  
 minimum-maximum

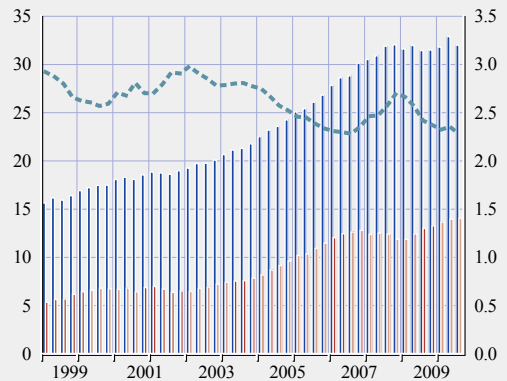


Sources: Individual institutions' financial reports and ECB calculations.  
 Notes: Core Tier 1 capital ratios are based on available data for a sub-sample of LCBGs that disclose such figures. The quarterly figures are based on data for a sub-sample of LCBGs for which results for all quarters of 2010 and the first quarter of 2011 were available. Core Tier 1 capital definitions differ across the banks in the sample.

**Chart 4.5 MFI and OFI liabilities in the euro area**

(Q1 1999 – Q3 2010)

MFI total liabilities (EUR trillions, left-hand scale)  
 OFI total liabilities (EUR trillions, left-hand scale)  
 size of OFI liabilities relative to size of MFI liabilities (multiple, right-hand scale)



Source: ECB.  
 Notes: The OFI sector comprises investment funds (including hedge funds), financial vehicle corporations, financial corporations engaged in lending, financial holding corporations, and securities and derivatives dealers. Insurance companies and pension funds are not included.

Nevertheless, this development would deserve closer monitoring in the future, to the extent that some entities in the OFI sector are less regulated and belong to what is often referred to as the “shadow banking system”. However, the assessment of risks stemming from the less regulated entities or “shadow banking system” would need more detailed data than those that can be derived from the financial accounts for OFIs.

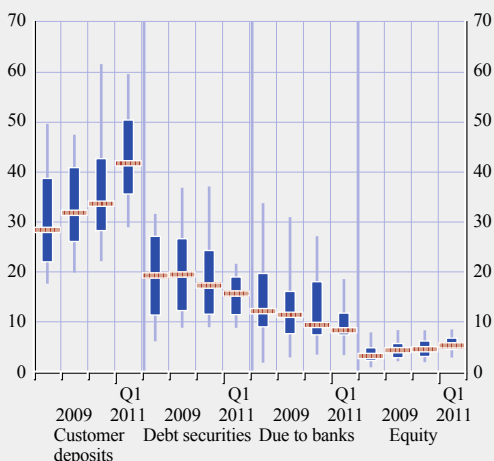
**LIQUIDITY**

Although the liquidity conditions in euro area funding markets, in particular in the shorter-term segment, have improved slightly since the finalisation of the previous FSR, there are signs of significant market segmentation, with banks in some countries facing difficulties in terms of both the availability and the cost of funds (see Section 3.1).

Higher uncertainty in the wholesale funding markets resulted in further changes in banks' funding strategies and liability structures in 2010, leading to a further shift towards more stable funding sources such as retail deposits

**Chart 4.6 The share of main liability items in euro area LCBGs' total liabilities**

(2008 – Q1 2011; percentage of total assets; maximum, minimum and interquartile range, median)



Sources: Individual institutions' financial reports and ECB calculations.

Note: The quarterly figures are based on data for a smaller sub-sample of LCBGs for which results for the first quarter of 2011 were available.

and equity. The share of customer deposits in total liabilities increased significantly across euro area LCBGs in 2010 (see Chart 4.6). As a result, banks' reliance on market funding, as proxied by the loan-to-deposit ratio, decreased considerably, although it still remained high for some LCBGs (see Chart 4.7).

Euro area LCBGs continued to reduce their dependence on wholesale funding markets throughout 2010 and in early 2011. Nevertheless, reliance on wholesale funding remained significant, with the share of interbank liabilities varying from 3% to 27% at end-2010 and decreasing further to a range of 3% to 19% for a sub-sample of those institutions that had reported their financial results for the first quarter of this year at the time of writing.

#### 4.3 BANK FUNDING REMAINS VULNERABLE ON ACCOUNT OF THE VOLATILITY OF WHOLESALE FUNDING COSTS

##### EARNINGS OUTLOOK AND RISKS

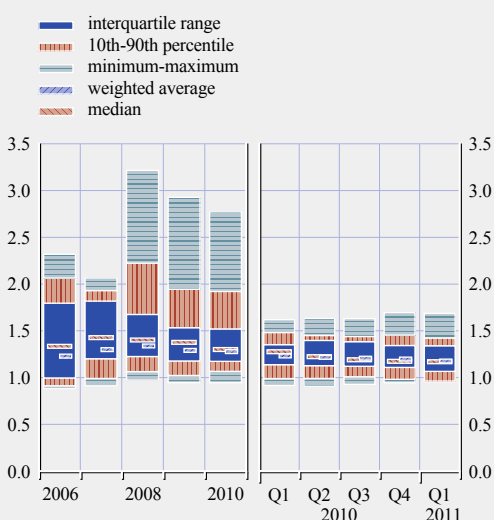
###### Earnings outlook for the banking sector

Looking forward, based both on market and model indicators, the outlook for euro area banks' earnings remains uncertain, as further improvement in the main drivers supporting the recent increase in LCBGs' profitability – higher net interest income as well as a significant reduction of operating costs – may prove challenging in the period ahead. At the same time, LCBGs' loan loss provisions should gradually decrease as improved macroeconomic conditions lead to lower costs of credit risk.

Based on market indicators, since the publication of the December 2010 FSR, for the euro area as a whole, the prospects for net interest income have become less favourable for several reasons. The growth of interest income is likely to be restrained by moderate credit expansion in the period ahead. While lending for house purchase in the euro area recovered in 2010, against the background of historically low lending rates (see Chart S61), a significant rebound in corporate lending is likely to be more

**Chart 4.7 Euro area LCBGs' loan-to-deposit ratios**

(2006 – Q1 2011)



Sources: Individual institutions' financial reports and ECB calculations.

Notes: The quarterly figures are based on data for a sub-sample of LCBGs for which results for all quarters of 2010 and the first quarter of 2011 were available. For some banks, loan-to-deposit ratios may, to some extent, overstate the reliance on wholesale market funding due to the relevance of bank bonds issued to retail customers.

protracted, given the uncertain global investment environment and the significant liquidity buffers built up by non-financial corporations in recent years. In fact, already in the first half of 2010, euro area banks' net interest income was lower, on an annualised basis, than in 2009 (see Chart 4.8). This was outweighed by slightly lower operating costs and a modest increase in other operating income, so that there was a marginal decrease in pre-provisioning profits.

The flattening of the yield curve expected by financial market participants is likely to have a significant impact on net interest income from retail customer activities, which remains one of the key sources of income for euro area banks. On the one hand, banks' net interest income from maturity transformation activities is likely to be adversely affected by a possible flattening of the yield curve, in particular in countries where a significant proportion of loans are

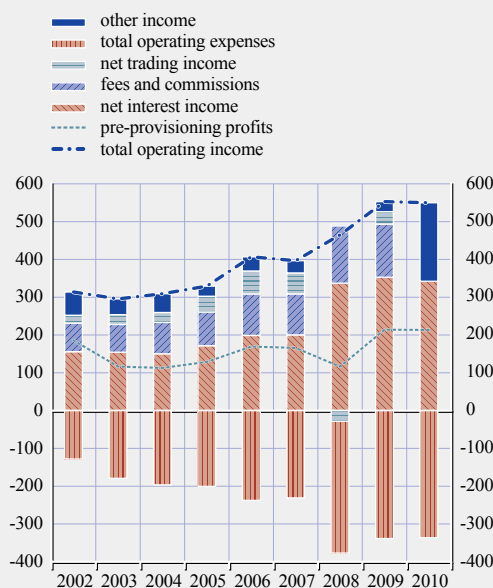
granted at rates that are fixed for a long term. On the other hand, banks' deposit margins, in particular those on current account deposits, are likely, at the same time, to benefit from rising short-term rates.

The earnings outlook is equally uncertain on the basis of model-based indicators. To estimate the overall impact of a change in short-term market rates on banks' net interest income, assumed year-on-year increases in the EURIBOR are combined with country-specific multipliers on banks' loan and deposit rates.<sup>2</sup> The respective changes in loan and deposit rates are then multiplied with the outstanding amounts of loans and deposits for each LCBG at end-2009. In addition, due consideration has to be given to the fact that some banks operate with a substantial funding gap, which implies that part of their loan portfolio would also need to be refinanced in an environment of higher money market rates.<sup>3</sup>

Based on the estimates, the impact of an increase in short-term market rates expected for 2011-2012 is likely to affect LCBGs unevenly (see Chart 4.9). For LCBGs headquartered in euro area countries, where a significant proportion of loans are granted at fixed rates or at longer maturities, net interest income is estimated to decline, relative to the level in 2009, by 0.2% in 2011 and by 1% in 2012. This decrease will be driven by narrowing loan-to-deposit margins, as well as by higher refinancing costs for LCBGs that depend largely on wholesale funding. By contrast, LCBGs resident in countries where the majority of loans carry a rate of interest that

**Chart 4.8 Decomposition of the pre-provisioning profits of the euro area banking sector**

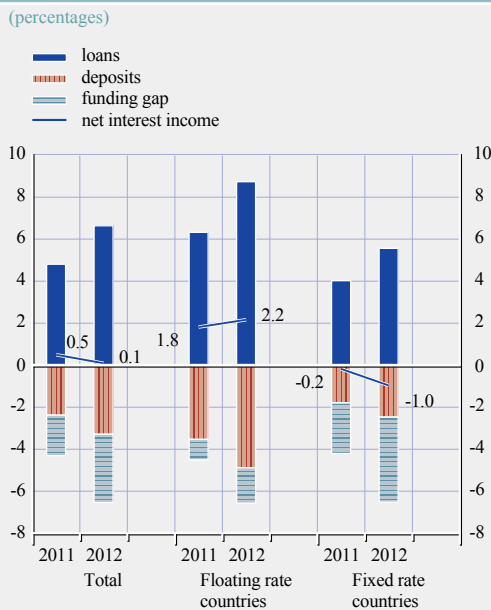
(2002 – H1 2010; EUR billions)



Source: ECB.  
Notes: Data for 2010 have been annualised on the basis of data up to mid-2010. For that year, other income includes fees and commissions, and net trading income.

2 The assumptions with respect to short-term market rates are in line with the European Commission's autumn 2010 forecasts. The methodology applied to estimate the coefficient multipliers was presented in Box 7 of the December 2010 FSR. See also Box 13 of the June 2009 FSR for further details.  
3 For simplicity, it is assumed that the increase in the EURIBOR is passed through, one-to-one, to the costs of refinancing market-based debt, and thus adds to the net interest payments banks will have to honour. The maturity profile of wholesale funding has been approximated with publicly available information from banks' financial reports. It is assumed that banks are able to refinance their maturing funds in the wholesale markets, keeping the relative composition of market-based debt unchanged.

**Chart 4.9 Estimated changes in euro area LCBGs' interest income components relative to net interest income in 2009**



Sources: Individual institutions' financial reports, European Commission's autumn 2010 forecasts, Bloomberg and ECB calculations.

Notes: The effect is calculated using the updated country-specific multipliers reported in Table A of Box 13 in the June 2009 issue of the FSR, estimated via error correction models for country-specific time series of loan and deposit rates on the three-month EURIBOR from February 2003 to October 2010. "Floating rate countries" include Austria, Finland, Greece, Ireland, Italy, Portugal and Spain. In this group of countries, the majority of new business loans are provided with floating rates and an initial rate fixation period of up to one year. "Fixed rate countries" include Belgium, France, Germany and the Netherlands (see also Chart 2.3). In this group of countries, a major proportion of new business loans is granted with an initial rate fixation period of more than five years. See ECB, *Financial Stability Review*, December 2007, for details.

is either floating or has a short period of fixation will benefit from higher short-term market rates to the extent that lending rates in these countries tend to respond more markedly and quickly to rising money market rates than deposit rates. The estimated increase of net interest income relative to the level in 2009 amounts to 1.8% in 2011 and 2.2% in 2012. At the same time, many banks face protracted difficulties in accessing wholesale funding markets, which has amplified competition for retail deposits, thereby limiting banks' scope for a more gradual adjustment of deposit rates (see Box 8).

As for banks' non-interest income, their trading results proved to be rather volatile in 2010, with a strong first-quarter performance followed by significantly weaker results in the last three quarters. Market participants expect a further, albeit markedly slower, decline in fixed income trading revenues for 2011, while prospects for equity trading results are somewhat brighter. With respect to fee and commission income, sizeable debt refinancing and, to a lesser extent, new issuance both by sovereigns and by financial and non-financial firms are still likely to support income streams from underwriting fees throughout 2011.

With regard to loan loss provisions, the decline of which has been a key factor contributing to the recent improvement in banks' profits, a further decline in 2011 – although at a slower pace – can be expected on the basis of market expectations, as gradually improving macroeconomic conditions in the euro area lead to lower costs of credit risk. Looking at the broader euro area banking sector, however, it should be noted that, in line with the differences in the country-specific macroeconomic outlook, future developments in loan loss provisions are likely to be heterogeneous across euro area countries.

Overall, the above model-based forecasts, as well as market expectations, suggest that, compared with the prospects for a moderate recovery indicated in the December 2010 FSR, the growth of euro area LCBGs' revenues is likely, on average, to remain moderate in 2011. At the same time, the contribution of declining loan loss provisions to profits is expected to diminish somewhat. This is also reflected in analysts' earnings forecasts for listed euro area LCBGs, which suggest that, on average, earnings growth will continue into 2011, but is likely to slow down markedly in comparison with 2010 (see Chart S109).

It should be added that several euro area LCBGs have announced ROE targets for the

next few years that are higher than the ROE estimates derived from analysts' earnings forecasts. This could indicate that some

LCBGs may be inclined to take higher risks in the period ahead so as to meet ambitious profitability targets.

## Box 8

### THE IMPACT OF THE FINANCIAL CRISIS ON BANKS' DEPOSIT MARGINS

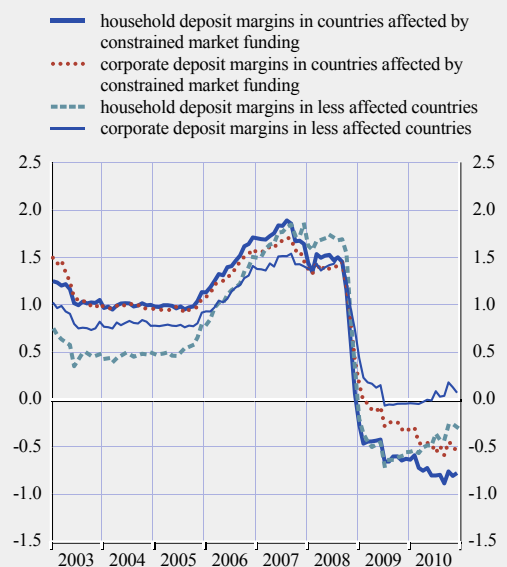
Bank funding risk has been one of the most important sources of banking sector vulnerability throughout the financial crisis. Indeed, one of the notable implications of the ongoing sovereign debt crisis was the intensification of this risk. Especially in some euro area countries where access to market funding has been particularly constrained in recent years, banks have tried to compensate for this by turning to more stable funding sources, such as retail deposits. In order to attract depositors, many banks have increased deposit rates, which has, in turn, resulted in decreasing, and lately even negative, deposit margins having adverse consequences for bank profitability. Using a panel econometric approach and exploiting confidential information from the Eurosystem's bank lending survey (BLS), this box illustrates how impaired access to wholesale funding during the recent financial crisis has influenced the cost of euro area banks' deposit funding.

Euro area bank deposit margins have declined sharply since late-2008, following the onset of the substantial monetary policy easing (see Chart A). As policy rates and, hence, short-term money market rates approached the zero lower bound, bank deposit margins were inevitably compressed (as banks typically set deposit rates somewhat below their reference market rates in order to operate with positive deposit margins). However, this compression of margins was compounded by the concomitant restrained access to market funding, which forced many banks to compete for the more stable deposit funding.

Consequently, since early 2009, retail and corporate deposit margins in many countries have moved into negative territory, and have thus adversely affected banks' overall net interest income and profitability. Notably, these developments have been particularly pronounced in those euro area countries that were affected most by the constraints on access to market-based funding

**Chart A Banks' retail and corporate deposit margins in the euro area**

(Jan. 2003 – Dec. 2010; percentage points)



Sources: ECB, Thomson Reuters and ECB calculations.

Notes: "Countries affected by constrained market funding" include Greece, Ireland and Portugal. Deposit margins have been calculated as the difference between market reference rates and the new business rates on different deposit categories (i.e. overnight deposits, time deposits with agreed maturity and savings deposits redeemable at notice). Market reference rates have been selected to mirror the same maturity band as the deposit rate categories, and thus include the EONIA, the one and three-month EURIBOR and two and five-year euro area government bond yields, respectively. Overall deposit margins have in turn been derived by weighting the margins on the different deposit categories using outstanding amounts as weights. In an intermediate step, new business time deposit rates were aggregated using new business volumes as weights.

(i.e. Greece, Ireland and Portugal). Whereas deposit margins in these countries had, on average, been higher than in the other euro area countries prior to the financial crisis, they were lower and more strongly negative by the end of 2010.

In order to explore the recent developments in bank deposit margins in more detail and, particularly, the impact of malfunctioning funding markets during the financial crisis, a panel regression framework was applied.<sup>1</sup> Using country aggregate figures for MFI deposit rates as well as confidential information from the BLS, a number of panel regressions are run<sup>2</sup> to explore the impact of banks' access to market funding (as reported in the BLS) on bank deposit margins, also taking into account the business cycle (i.e. real GDP growth and proxies for the credit cycle, namely expected corporate sector default frequencies), and of changes in banks' market funding structures<sup>3</sup> and information on banks' terms and conditions for extending loans (also reported in the BLS), to account for potential cross-subsidisation effects between the pricing of banks' (retail-related) assets and liabilities. It is shown that constraints on banks' access to market funding have a negative impact on banks' deposit margins and that this was particularly pronounced when the financial crisis peaked between the fourth quarter of 2007 and the third quarter of 2009 (see Charts B and C). Apart from a potential omitted variable bias and the fact that the regression is estimated in first differences, and not in levels, the rather high residuals observed in the fourth quarter of 2008 and the first quarter of 2009 most likely reflect the only sluggish, but typical adjustment of banks' deposit rates to the sharp drop in policy rates during this period.<sup>4</sup> As regards the unfolding of the sovereign debt crisis that started in the second quarter of 2010, this effect, in turn, has had an impact on especially banks in the countries that had been hit particularly hard by funding stresses, where strong competition for deposits had subsequently emerged among banks, as other sources of debt financing dried up. At the same time, for banks in countries less affected by the sovereign debt crisis, deposit margins increased steadily in the course of 2010, with regression results indicating hardly any negative impact from constraints on access to market funding.<sup>5</sup> Concerning the impact of changes in the structure of market financing, the findings indicate a positive impact on deposit margins from rising new issuance of covered bonds in part alleviating pressures from unsecured market funding. Indeed, this effect was particularly noticeable for some of the countries that encountered severe market funding stress in recent years. Finally, it is found, using information on banks' loan terms and

1 In general, banks' interest rate-setting behaviour, as measured by the spread between retail bank rates and market rates, can be expected to depend on the degree of competition (or bank market power) and on factors related to the cost of intermediation, such as interest rate risk, credit risk, the banks' degree of risk aversion, unit operating costs, bank liquidity and product diversification; for some general explanations, see X. Freixas and J.-C. Rochet, *Microeconomics of Banking*, MIT Press, Cambridge (Massachusetts), 2nd edition, 2008, and T. Ho and A. Saunders, "The determinants of bank interest margins: theory and empirical evidence", *Journal of Financial and Quantitative Analyses*, Vol. 16, 1981.

2 The panel includes eleven euro area countries (the Euro 12 excluding Luxembourg) for the period from the second quarter of 2003 to the fourth quarter of 2010 with a quarterly frequency. The linear cross-sectional time-series models are estimated in first differences with ordinary least squares (OLS) controlling for heteroscedasticity and correlation across panels and, additionally, including country and seasonal dummies. All included variables are significant at least at the 10% and mostly at the 5% or 1% confidence level. R-squared statistics amount to 0.43 for the household deposit regression and to 0.44 for the non-financial corporate deposit regression.

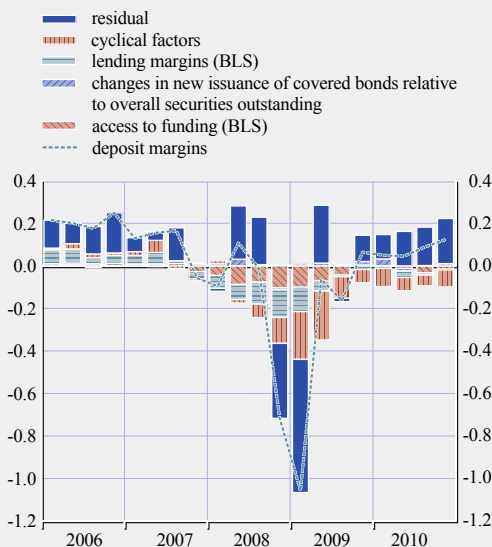
3 Banks' market funding structures are measured here by the ratio of covered bonds to overall bank securities outstanding. The proposition is that the nature of banks' non-deposit funding also matters for the pricing of deposits. In particular, a high reliance on more stable sources of market financing, such as covered bonds, might allow banks to operate with lower deposit rates (i.e. higher margins).

4 See also ECB, "Recent developments in the retail bank interest rate pass-through in the euro area", *Monthly Bulletin*, August 2009.

5 In 2010 – in unweighted average terms – deposit margins in "stressed" euro area countries declined by 0.42 and 0.30 percentage points for corporate and household deposits respectively. The constrained access to market funding contributed -0.07 and -0.22 percentage point respectively to these developments. By contrast, over the same period corporate and retail deposit margins in the "non-stressed" countries increased by 0.12 and 0.28 percentage point respectively, with the variable "access to market funding" contributing positively to margins on corporate deposits and only very slightly negatively to margins on household deposits.

**Chart B Decomposition of factors explaining changes of banks' retail deposit margins in the euro area**

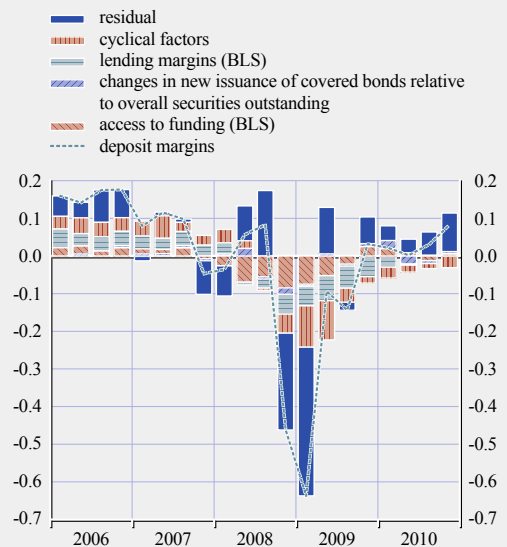
(Q1 2006 – Q4 2010; percentage points)



Sources: ECB, Thomson Reuters and ECB calculations.  
Notes: The decomposition of the factors is based on the estimated coefficients of the panel regressions on the de-meaned variables. Cyclical factors include GDP growth and quarterly averages of expected default frequencies for non-financial corporations (NFCs); lending margins refer to respective sectoral replies to the BLS; access to funding reflects replies to the BLS on constraints on access to market funding as a contributing factor to a tightening of NFC credit standards.

**Chart C Decomposition of factors explaining changes of banks' non-financial corporate deposit margins in the euro area**

(Q1 2006 – Q4 2010; percentage points)



Sources: ECB, Thomson Reuters and ECB calculations.  
Notes: The decomposition of the factors is based on the estimated coefficients of the panel regressions on the de-meaned variables. Cyclical factors include GDP growth and quarterly averages of expected default frequencies for non-financial corporations (NFCs); lending margins refer to respective sectoral replies to the BLS; access to funding reflects replies to the BLS on constraints on access to market funding as a contributing factor to a tightening of NFC credit standards.

conditions extracted from the BLS, that cross-subsidisation effects between the pricing of loans and the pricing of deposits are present in the euro area both for deposits by households and by non-financial corporations.<sup>6</sup>

In conclusion, the disruptions to market-based funding markets observed during the financial and sovereign debt crises in recent years are found to have adversely affected euro area banks' deposit margins and, hence, their profitability and ability to rebuild their solvency positions. This highlights the importance of normalising conditions in euro area bank funding markets, which remain impaired at least in some euro area countries.

6 This could for example reflect that banks try to "lock in" customers by offering high deposit rates in return for obtaining more lucrative loan business relations with those customers. See, for example, P. A. Chiappori, D. Perez-Castrillo and T. Verdier, "Spatial competition in the banking system: Localisation, cross-subsidisation and the regulation of deposit insurance", *European Economic Review*, Vol. 39(5), 1995, pp. 889-918. See also M. Berlin and L. J. Mester, "Deposits and relationship lending", *Review of Financial Studies*, Vol. 12, No 3, Fall 1999.

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

Since the finalisation of the December 2010 FSR, market-based indicators have continued to point to high risks to LCBGs. This has mainly been attributed to the interaction between the problems of public finances and bank

vulnerabilities, mainly due to the potential for further adverse feedback between large fiscal imbalances, downside risks to economic growth and bank funding difficulties. This was reflected in LCBGs' credit default swap (CDS) spreads, which increased significantly to reach new record highs in early January 2011 (see Chart S108).

It should be added that the release of the European Commission's proposal on bank resolution – which allows, among other things, future bail-ins of senior unsecured bondholders – may also have had an immediate impact on senior CDS spreads. The widening of CDS spreads was accompanied by a slight recovery in euro area banks' equity prices (see Chart S110). However, the implied volatility derived from the Dow Jones EURO STOXX bank index continued to be high and remained at substantially higher levels than the volatility calculated for the main index, which suggests that market participants are more uncertain about the outlook for the banking sector than about the outlook for other sectors (see Chart S111).

Turning to the assessment of market participants' perceptions of systemic risk, it should be noted that in early January 2011, the systemic risk indicator, which provides a market-based assessment of the probability of simultaneous default of two or more euro area LCBGs over the next two years, reached an all-time high of 16.6% (see Chart 4.10). Since then, the indicator has receded somewhat, as market participants generally welcomed a comprehensive approach to dealing with the sovereign debt problems. Aiming at establishing a more coordinated economic policy within the euro area, the Eurogroup decided on 11 March 2011 to extend the lending capacity of the European Financial Stability Facility (EFSF) to €440 billion and agreed on the "Pact for the euro". Until mid-May, however, this indicator remained close to its record highs, which indicates that market participants' perceptions of systemic risk in the euro area have continued to be high.

Further insight into the recent increase in the systemic risk indicator can be obtained by breaking down the CDS spreads of the euro area LCBGs into an expected loss component and a risk premium component (see Chart 4.11). After having receded in early 2010, the expected loss component, which represents that part of the CDS spread that is driven by pure default risk, had by the end of 2010 returned to the

**Chart 4.10 Systemic risk indicator for euro area LCBGs**

(Jan. 2007 – May 2011; probability, percentages)



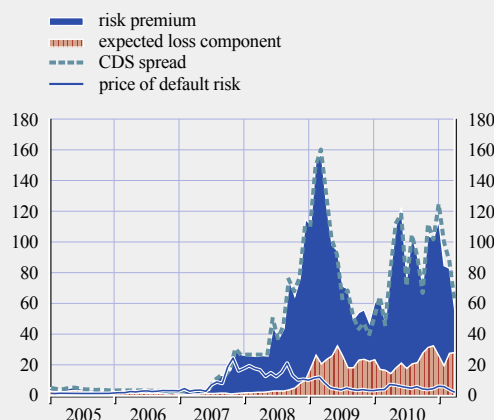
- 1 Turmoil begins
- 2 Bear Stearns rescue takeover
- 3 Rescue plan for US Fannie Mae and Freddie Mac announced
- 4 Lehman Brothers defaults
- 5 US Senate approves Paulson plan
- 6 T. Geithner announces Financial Stability Plan
- 7 Greek fiscal problems gain media attention
- 8 European Financial Stabilisation Mechanism established
- 9 Programme for Ireland signed
- 10 Portuguese government asks for financial support

Sources: Bloomberg and ECB calculations.

Notes: The indicator is based on the information embedded in the spreads of five-year CDS contracts for euro area LCBGs. See the box entitled "A market-based indicator of the probability of adverse systemic events involving large and complex banking groups" in ECB, *Financial Stability Review*, December 2007, for details.

**Chart 4.11 Decomposition of one-year senior CDS spreads of euro area LCBGs and the price of default risk**

(Jan. 2005 – Apr. 2011; basis points)



Sources: Bloomberg, Moody's KMV and ECB calculations.

Notes: The indicator is based on the information embedded in the spreads of five-year CDS contracts for euro area LCBGs. See the box entitled "A market-based indicator of the probability of adverse systemic events involving large and complex banking groups" in ECB, *Financial Stability Review*, December 2007, for details.



record highs observed in mid-2009 and has since remained at elevated levels. The risk premium component, which represents that part of the CDS spread that is driven by factors other than pure default risk, had also increased in relative terms by early 2011, in line with the increase in the expected loss component, but then it receded sharply. Hence, the price of default risk, i.e. the amount paid by protection buyers to recompense sellers for bearing default risk, decreased and by end-April it remained at relatively low levels.

All in all, according to the assessment of market participants, these patterns suggest that the surge in LCBGs' CDS spreads observed in the second half of 2010 was driven mainly by default risk, while the price they demanded for selling protection against default actually changed very little. Notably, the fact that LCBGs' CDS spreads were actually higher in early 2009 than in early 2011 (when the systemic risk indicator reached a record high) may imply that an increased joint default correlation played an important role in the recent increase in systemic risk perceived by market participants.

Overall, similarly to what was indicated in the December 2010 FSR, market indicators continue to suggest that in the view of market participants, the outlook for the euro area LCBGs remains uncertain and is weighed down by persistently high perceptions of systemic risk. In addition, compared with the previous issue of the FSR, a perceived higher interconnectedness of the LCBGs increased the uncertainties surrounding the outlook still further.

#### CREDIT RISK <sup>4</sup>

Where banks' exposure to credit risk is concerned, the balance sheet condition of euro area households has improved somewhat since the finalisation of the December 2010 FSR. Write-offs on housing loans increased slightly in the fourth quarter of 2010, but remained at low levels in the euro area as a whole (see Chart S96). However, the credit risk exposures of euro area banks that arise from mortgage lending vary significantly across countries. In particular, credit risk from

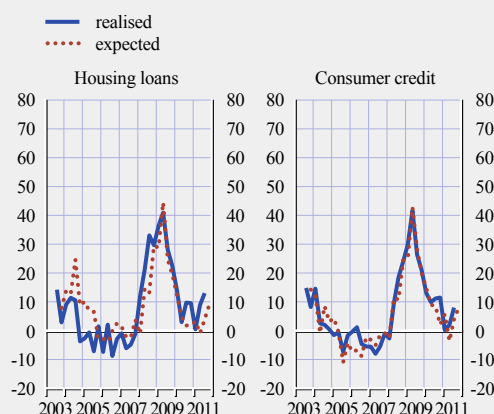
exposures to household lending remains significant for banks in some euro area countries with subdued household income prospects and/or where there is potential for a drop in residential property prices, although the impact of possible house price declines depends on institutional and structural factors specific to individual countries (see Section 2.4).

Bank lending to households continued to expand in the fourth quarter of 2010 and in early 2011, with the annual growth rate standing at 3.4% at end-March 2011. The results of the January and April 2011 bank lending surveys showed a reversal in the process of a progressively lower tightening of credit standards on loans to households since the last quarter of 2010. According to survey results, the further tightening of credit standards could be attributed to the increased cost of market funding and balance sheet constraints and, to a lesser extent, higher risk perceptions regarding economic activity and housing market prospects. Looking forward, euro area banks expected the net tightening of credit standards to continue in the second quarter of 2011 (see Chart 4.12).

4 Pending the publication of the European Banking Authority's stress-test results, no further quantitative assessment of banking sector vulnerabilities has been included in this issue of the FSR.

**Chart 4.12 Changes in credit standards for household loans**

(Q1 2003 – Q2 2011; net percentage of banks reporting tightening standards)



Source: ECB.

Regarding credit risks originating from exposures to the non-financial corporate sector, continued improvements in firms' profitability and still relatively low costs of debt financing contributed to reducing risks in the sector as a whole (see Section 2.2). While write-offs on euro area banks' corporate loans had continued to rise in the fourth quarter of 2010, they started to decrease in early 2011 (see Chart S96). Default rates for non-investment-grade corporations decreased further in late 2010 and are expected to remain at low levels in 2011 (see Chart S53).

However, pockets of vulnerability still remain within the euro area corporate sector. In particular, the relatively weaker financial position of SMEs, coupled with their stronger dependence on bank financing, continues to be a source of concern. Credit risks stemming from exposures to non-financial firms also vary across countries depending on their fiscal and macroeconomic outlooks. Therefore, the outlook for the credit quality of corporate loans remains unfavourable for banks with significant exposures to the SME sector and for (domestically oriented) banks in euro area countries with fiscal vulnerabilities and weak growth prospects.

The results of the April bank lending survey showed a slight reversal in the improvement in credit standards for the corporate sector in the first quarter of 2011, with banks reporting a moderate tightening of credit standards which mainly affected large firms. For the second quarter of 2011 euro area banks expected some further net tightening of credit standards for both large firms and SMEs.

Turning to banks' commercial property exposures, although most euro area countries have witnessed some improvement in recent quarters, values remain subdued in comparison with previous years, and conditions in some

countries and in the non-prime property segment remained very challenging (see Section 2.3). As a result, loan exposures of some banks or banking sectors to commercial property markets continue to be a source of vulnerability, although commercial property exposures vary widely across banks. Some euro area LCBGs have significant commercial property lending exposures, but the greatest vulnerabilities continue to be found among the more specialised commercial property lenders.

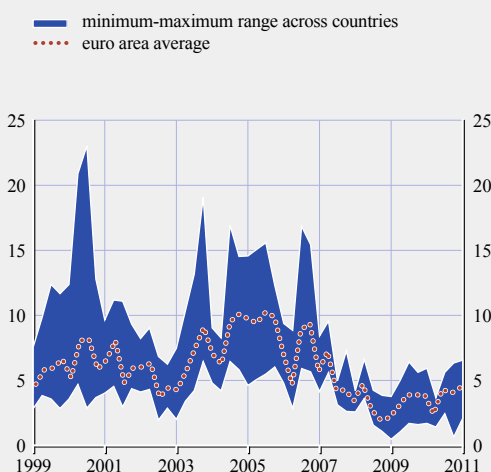
Around a third of commercial property mortgages in the euro area are due to mature between 2011 and 2013. Many of these mortgages were originated or refinanced when commercial property prices peaked in 2006-2007. After 2008, when problems in refinancing loans first appeared, banks were reportedly sometimes rolling over loans for one or a few years.<sup>5</sup> Such practices could reduce ultimate losses for banks, but there is a risk that credit losses would merely be delayed if property values do not recover enough.

Although credit risk in the banking sector appears to be less severe than at the time of publication of the last FSR, the environment in which banks operate remains difficult and risks are still at elevated levels. With respect to the aggregate assessment of the credit risk on banks' balance sheets, a measure of the distance to distress of the euro area banking sector has increased slightly over the past two years and, hence, indicates some easing of conditions facing the banks (see Chart 4.13). At the same time, important cross-country differences exist and in some countries the measure is currently fluctuating around the levels recorded at the time of the bankruptcy of Lehman Brothers.

5 See, DTZ Research, "Global Debt Funding Gap", May 2011, and DTZ Research, "The Great Wall of Money", March 2011.

**Chart 4.13 Euro area MFI sector's distance to distress**

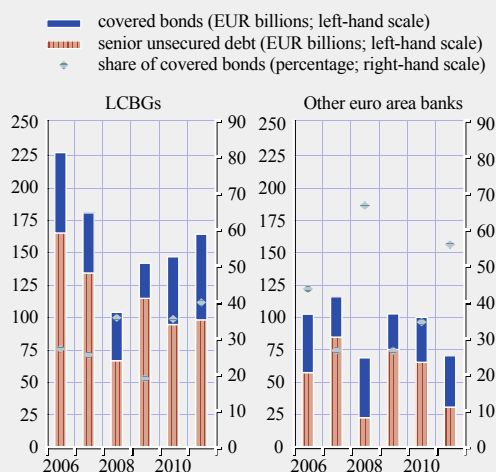
(Q1 1999 – Q1 2011; number of standard deviations)



Sources: ECB, Bloomberg, Thomson Reuters Datastream and ECB calculations.  
Notes: A low reading of the distance to distress indicates higher credit risk. Data for the first quarter of 2011 are estimates. For details about this indicator, see Box 7 in ECB, *Financial Stability Review*, December 2009.

**Chart 4.14 Issuance of senior unsecured debt and covered bonds by euro area banks**

(January – April in the period from 2006 to 2011)



Source: Dealogic DCM Analytics.  
Note: Debt issuance figures are based on the sub-region of operations of the parent banks and are therefore on a consolidated basis.

## FUNDING LIQUIDITY RISK

Notwithstanding the improvement in funding conditions in the first few months of 2011, banks' funding risks remain among the key vulnerabilities confronting the euro area banking sector, especially in the context of banks' sizeable refinancing needs in the next few years and the volatility of banks' wholesale funding costs.

Access to wholesale funding markets has improved for most euro area LCBGs in recent months, as evidenced by a significant pick-up in term debt issuance, in particular in covered bond markets (see Chart 4.14). At the same time, debt issuance by other euro area banks in the first four months of 2011 declined by 30% on a year-on-year basis. Moreover, while the rise in the share of covered bonds was apparent for both groups, it was significantly more pronounced in the case of non-LCBGs, suggesting an increasing reliance of several medium-sized and smaller banks on this funding source. Debt issuance patterns also diverged significantly across countries. In particular, issuance by medium-

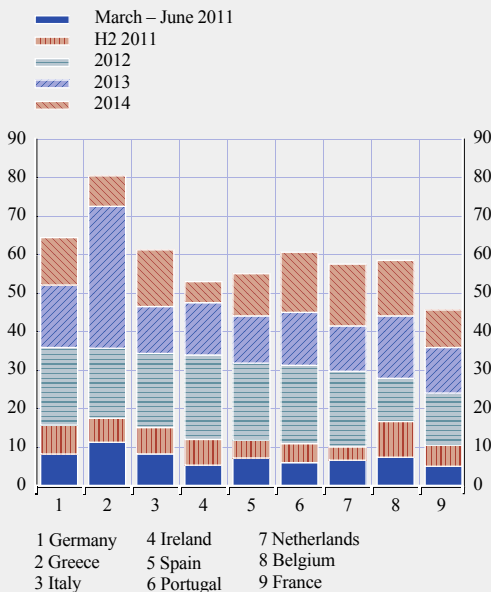
sized or smaller banks from countries with fiscal vulnerabilities dropped in comparison with the same period of last year and, in a few countries, there was no issuance in public markets at all.

With regard to short-term funding, liquidity in the unsecured euro area interbank market has slightly improved since December 2010, although the segmentation of the euro money market remains significant (see Section 3.1 for details). Moreover, some banks in a few euro area countries remained reliant on central bank funding, also because the availability and redistribution of interbank liquidity continues to be impaired on account of elevated counterparty risk concerns, only partly offset by recourse to the repo market.

At the same time, challenges related to euro area banks' sizeable refinancing needs over the next few years remain. For banks in a number of euro area countries, the share of debt to be rolled over by end-2012 is around, or higher than, 30% of the debt outstanding (see Chart 4.15). Banks will continue to compete for funds with the public sector as government debt issuance is expected

**Chart 4.15 Maturity profile of term debt issued by banks in selected euro area countries**

(Feb. 2011; percentage of total debt outstanding)



Source: Dealogic DCM Analytics.

Notes: Term debt includes conventional bonds, covered bonds and medium-term notes. Countries are listed according to the share of debt maturing from March 2011 to end-2012.

to peak in 2011 and 2012 (see Section 2.5). It should be noted, however, that banks in some jurisdictions have frontloaded their securities issues, thereby containing refinancing risks.

This should be seen in the context of volatile and, for some banks, elevated funding costs. Nevertheless, in this situation, it is worth distinguishing between structural and conjunctural issues, i.e. between structural funding problems detected in some institutions that arose as a result of an inadequate funding structure and other funding problems that may appear as a consequence of the interplay between sovereign risk and the financial sector. More specifically, it may be the case that banks with a sound funding structure (for instance, in terms of instrument diversification or maturity structure) are facing funding restrictions, with limited access to certain funding markets because of factors such as sovereign concerns. Sovereign risk concerns are, therefore, perceived as one of the most relevant factors contributing to the wide dispersion of the costs of market funding. Other factors, such as banks' capital positions, can partly account for the variation in funding costs (see Box 9). Furthermore, differences in banks' access to market funding also contributed to divergence in the cost of deposit funding, as discussed in detail in Box 8. Looking forward, some euro area banks could face continued upward pressure on their funding costs as a result of higher deposit rates and/or elevated spreads on their wholesale debt issuance.

### Box 9

#### BANK CAPITAL RATIOS AND THE COST OF MARKET FUNDING

An important policy issue is whether higher bank capital facilitates access to private funding markets. If the risk profile of banks' assets is similar, higher risk-weighted capital ratios should imply that banks are able to fund themselves at lower credit spreads.

In this box, market data on secondary market yields on senior unsecured debt and on covered bonds are used to analyse the relationship between the bank-specific cost of market funding and the Tier 1 capital ratio. Country-specific bank yield curves are analysed to control for the cross-country variation in sovereign bond yields, which are a reference point for pricing bank debt. The sample covers over 300 instruments for which yields are actively quoted, issued by more

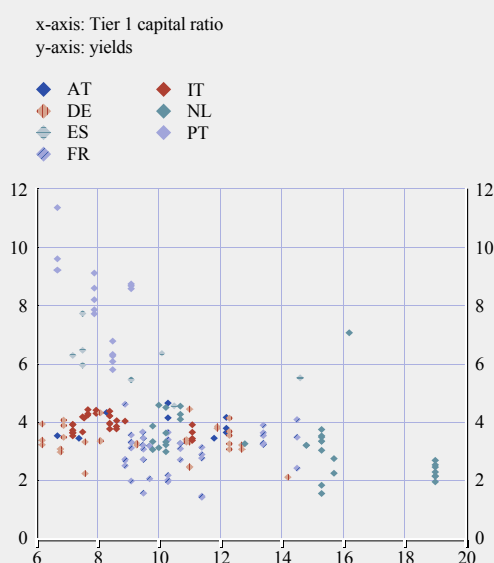
than 80 banking groups in 7 euro area countries. Some euro area countries are not represented in the sample if the total number of going-concern issuers in a country is below three.

While the level of yields may be affected by many factors, including perceived sovereign risk, the results suggest that in some countries higher-capitalised banks face lower yields than their lower-capitalised peers. The relationship between yields and Tier 1 capital ratios is found to be strong when the credit risk on sovereign and bank debt – as measured by credit spreads – is perceived to be high by market participants (see Chart A). On the other hand, this relationship is weak in countries where concerns about sovereign and bank default risk are not significant, although this may also be related to the existence of implicit government guarantees and the use of public support schemes. While formal statistical testing is not meaningful in this context due to the low number of banks in each of the jurisdictions, these results seem to hold true not only for senior unsecured bank bonds, but also for covered bonds, in spite of the latter being collateralised and therefore less exposed to the risk of the issuer’s default (see Chart B).

The relationship between banks’ capital ratios and their funding conditions in the markets can only be illustrated with yields on bank debt in secondary markets. Conditions in the primary markets are observed only at times when debt is issued, and funding quantities are not directly observable for some instruments. Therefore, the potential benefits from increasing banks’ capital may not be as large as suggested by the secondary market yields if the banks are not able to access funding markets for large quantities. On the other hand, adequate capitalisation may help in regaining market access.

**Chart A Yields on senior unsecured debt and the Tier 1 capital ratio of the issuer bank**

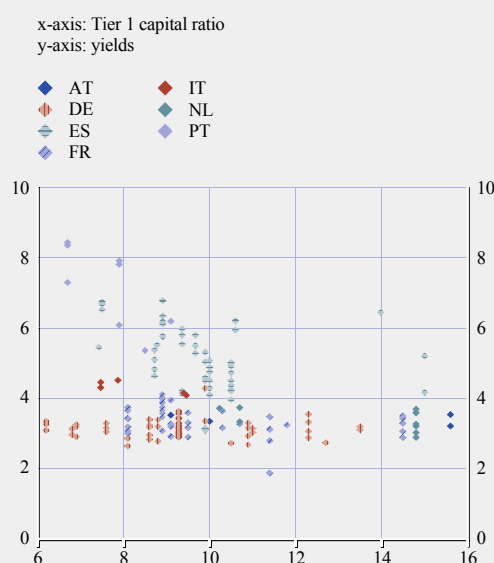
(March 2011; three-to-five-year maturities; percentages)



Sources: ECB, Bloomberg and individual institutions’ financial reports.  
Notes: Yields refer to fixed rate, euro-denominated instruments. If more than one instrument of the given maturity is available for one institution, the largest issues and the instruments of maturity closest to the middle of the bucket are displayed.

**Chart B Covered bond yields and the Tier 1 capital ratio of the issuer bank**

(March 2011; three-to-seven-year maturities; percentages)



Sources: ECB, Bloomberg and individual institutions’ financial reports.  
Notes: Yields refer to fixed rate, euro-denominated instruments. If more than one instrument of the given maturity is available for one institution, the largest issues and the instruments of maturity closest to the middle of the bucket are displayed.

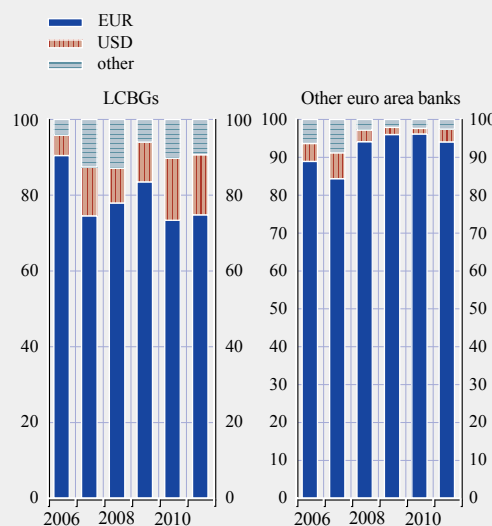
With respect to the recent patterns in term debt issuance, covered bonds play a positive role as they remain an important and relatively stable source of funding for a number of euro area banks. On the other hand, the increase in covered bond funding leads to higher asset encumbrance, also on account of higher over-collateralisation than in the past, and thus reduces the assets available for a repayment of unsecured debt and depositors in the event of an issuer default. In some jurisdictions, this risk is mitigated by the existence of prudential regulation that limits the amount of covered bonds that can be issued. Another possible implication is that the subordination of senior bonds could further increase incentives to issue covered bonds, which entails the risk of making other funding sources more expensive. While the rating agency estimates available thus far suggest that asset encumbrance by covered bonds may not be a significant risk for many euro area banks,<sup>6</sup> this development would deserve closer monitoring in the future.

Regarding the currency composition of debt funding, several euro area banks and, in particular, some LCBGs continued to issue a significant amount of term debt in US dollars (see Chart 4.16), notably in the form of senior unsecured bonds. This can be explained, in part, by these banks' interest in diversifying their funding sources and in exploiting the cost advantage offered by the still negative EUR/USD cross-currency basis swap spread.

At the same time, several euro area banks continue to rely on US money market funds

Chart 4.16 Breakdown by currency of term debt issuance by euro area banks

(2006 – 2011; percentages)



Sources: Dealogic and ECB calculations.

Notes: Includes bonds, medium-term notes, covered bonds and short-term debt securities with a maturity of at least one year (commercial paper and certificates of deposit are not included). For 2011, data are based on issuance up to mid-May.

(MMFs) for their short-term US dollar funding, with MMFs' exposure to euro area banks amounting to over USD 500 billion (see Box 10 for details). This, in turn, entails the risk that money market funds could, either preventively or due to investor redemptions, abruptly scale back funding to certain banks on account of increased headline risk (see Box 10).

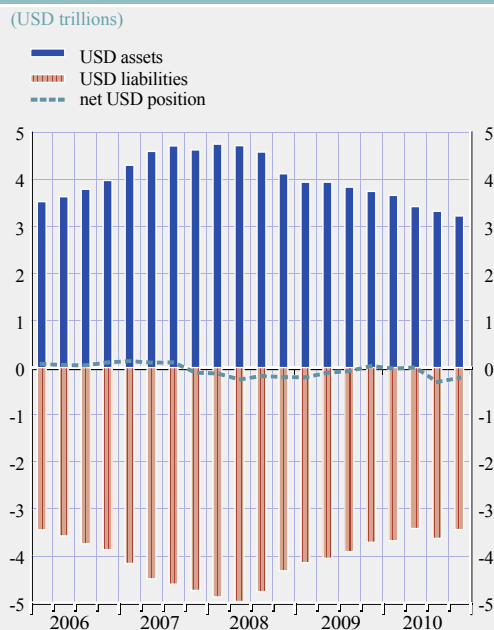
<sup>6</sup> See Fitch Ratings, "Banks' use of covered bond funding on the rise", March 2011.

Box 10

US DOLLAR FUNDING NEEDS OF EURO AREA BANKS AND THE ROLE OF US MONEY MARKET FUNDS

Euro area banks have built up sizeable positions in US dollars over the last ten years. According to data from the Bank for International Settlements (BIS), the US dollar assets of euro area banks at the end of the fourth quarter of 2010 totalled approximately USD 3.2 trillion (see Chart A). These positions were accumulated progressively over the last ten years and reached a temporary high between the third quarter of 2007 and the first quarter of 2008. They are largely the result

**Chart A Gross and net USD-denominated positions of euro area banks**



Source: BIS consolidated banking statistics.  
 Note: Euro area aggregates approximated on the basis of the 12 euro area countries reporting statistics to the BIS.

of search-for-yield types of investment in USD-denominated assets, but also include business expansions into the United States, as well as customer-driven US dollar financing requirements for corporate or project financing. This box looks at the funding consequences linked to these sizeable positions.

Two options are available to any non-US bank for financing its US dollar assets. The first option is to borrow USD currency outright via deposits or debt instruments. Such a financing approach exposes banks to funding (or rollover) risk if the maturity of the assets held differs from that of the liabilities financing them.

The second option is to use foreign exchange (FX) swaps to convert liabilities in domestic or third currencies into funds of the desired denomination. This approach leads to currency risk in cases where there is an unhedged on-balance-sheet mismatch between US dollar assets and domestic currency liabilities.

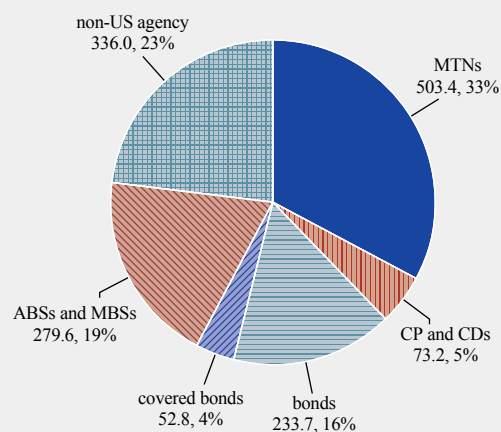
While the first financing option increases liabilities on banks' balance sheets and can therefore be traced by aggregate banking statistics or individual issuance data, the second financing approach relies on off-balance-sheet instruments, the use of which is notoriously difficult to trace in view of the unavailability of statistics with the relevant level of detail. Aggregate statistics illustrate that euro area banks had a structural balance-sheet mismatch before the onset of the crisis, as US dollar assets exceeded US dollar liabilities. This mismatch appears to have been broadly adjusted in 2008, but it re-emerged towards the end of 2009. It signals the existence of financing needs that were probably met in FX swap markets. In the following, this box aims to approximate the size and nature of debt instruments used by euro area banks to finance their USD-denominated assets.

Only a few euro area banks have operations and deposits in the United States. Euro area banks with operations in the United States (and thus with natural US dollar funding needs) and banks that have built up considerable USD-denominated portfolios thus compete for funding with both banks that are trying to diversify their funding sources and banks with a good standing raising US dollar funds at good conditions in markets and serving as counterparties for the basis swaps. These banks attract an investor base that consists mainly of participants in the interbank market, monetary authorities and (US) money market funds.

In the second half of May 2011 approximately USD 1.5 trillion of US dollar-denominated debt instruments issued by euro area banks were outstanding. These figures cover only the Eurobond markets in the case of medium-term notes (MTNs), commercial paper (CP) and certificates of

**Chart B Outstanding USD-denominated debt instruments issued by euro area banks**

(May 2011; USD billions equivalent at issuance)

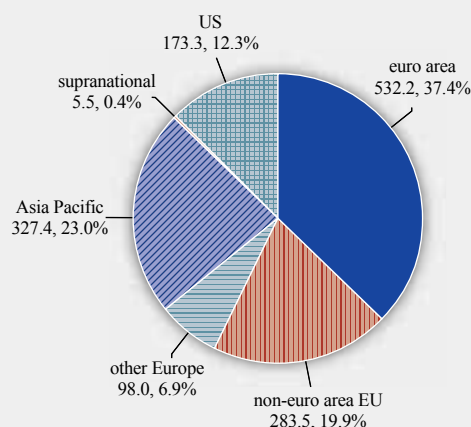


Sources: Dealogic and ECB.

Note: As for the short and medium-term segment, Dealogic figures primarily cover the Eurobond markets and therefore do not include short-term paper issued in US markets.

**Chart C US prime money market funds' geographical exposure**

(Apr. 2011; USD billions and percentages of total assets under management)



Sources: Securities and Exchange Commission and ECB.

Note: SEC figures cover all US prime MMFs.

deposits (CDs), so that the substantial issuance of these instruments in US markets (see Chart B) is not included. 33% of this issuance took the form of short-to-medium-term debt instruments, while 23% and 16% respectively were issued in the form of secured and unsecured debt instruments with longer maturities. The remaining 23% are longer-maturity issues from euro area agencies. Over the period up to the end of 2012, 25% of this outstanding amount of debt is expected to be redeemed, of which half are MTNs, CP or CDs.

Major providers of US dollar funds are prime money market funds (MMFs) in the United States. At the end of April 2011 these funds held USD 1.4 trillion of assets under management, 37.4% (or USD 532 billion) of which were direct or indirect exposures to euro area banks (see Chart C). Broken down by national banking sector, this exposure is accounted for by the following countries: France (18.5% of total US prime MMF exposure), Germany (8.2%), the Netherlands (6.5%), Belgium (1.5%), Italy (1.1%), Spain (1.2%), Austria (0.2%) and Luxembourg (0.1%). The exposures take the form of asset-backed as well as financial company CP, CDs, repurchase agreements against Treasury, government agency or other securities, as well as notes.

US MMFs generally adopt very conservative investment approaches and reduced the average maturity of their portfolios further as a result of recent amendments to SEC rules. They are very sensitive to headline risk (i.e. increased price volatility resulting from negative news coverage) and are prone to swiftly change their investments.

The vulnerability of euro area banks that arises from their substantial US dollar funding needs has only been fully acknowledged since the outbreak of the financial crisis. The vulnerability is linked to the extensive reliance on short-term wholesale financing instruments and the related potential rollover risk. It could materialise under two scenarios. In a first scenario, US MMFs would not renew, or would reduce, their exposures to these euro area institutions



or countries either on account of a run in the wake of one or more MMFs “breaking the buck” (meaning that their net asset value (NAV) drops below USD 1.00) or because investors shun credit or headline risk as a result of bank, country or euro area-specific risks. In another scenario, picking-up economic activity could lead providers of funds to MMFs to reallocate their funds to more attractive investment opportunities outside the MMF sector. The US corporate sector, which currently has significant stocks of cash, provides substantial funds to MMFs and could serve as an investor that is likely to shift its money out of MMFs. Such reversals of flows could put the size of exposures to euro area banks under downward pressure in terms of quantity, or put upward pressure on interest rates paid.

## MARKET-RELATED RISKS

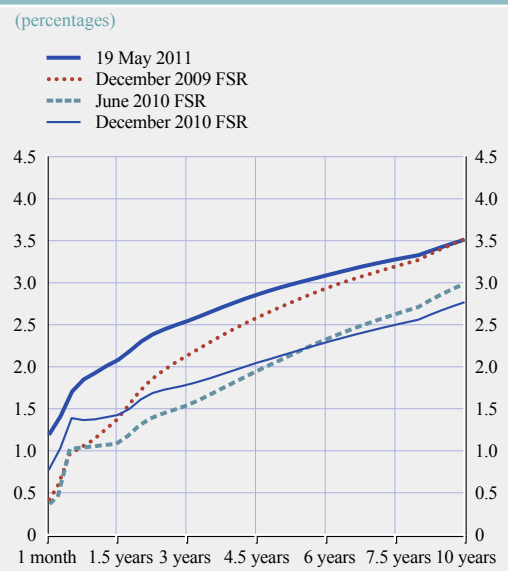
### Interest rate risk

LCBGs’ interest rate risks remained high after the publication of the December 2010 FSR. This was due to persistently high risk perceptions at both the short and the long end of the euro area yield curve. In particular, a certain degree of stress in the euro area interbank market at the beginning of 2011 (see Section 3.1) caused the implied volatility of euro area short-term interest rates to remain relatively high (see Chart S71). Renewed tensions in some euro area countries’ government bond markets pushed the volatility of long-term debt securities to again relatively high levels towards the end of 2010, although it receded thereafter (see Chart S74).

Overall, the minor steepening of the euro area yield curve after the publication of the December 2010 FSR (see Chart 4.17) again supported revenues generated by banks’ maturity transformation activities. It may also have continued to spur interest among market participants in entering into carry trades. As the build-up of such trades creates exposure to the possibility of unexpected changes either in funding costs or in the market value of the long positions, an abrupt unwinding in the event of large unexpected losses could contribute to heightened interest rate volatility.

Given not only that, at the time of writing, options markets were pricing in a greater likelihood of large upward, rather than

Chart 4.17 Euro area yield curve developments (based on euro area swap rates)

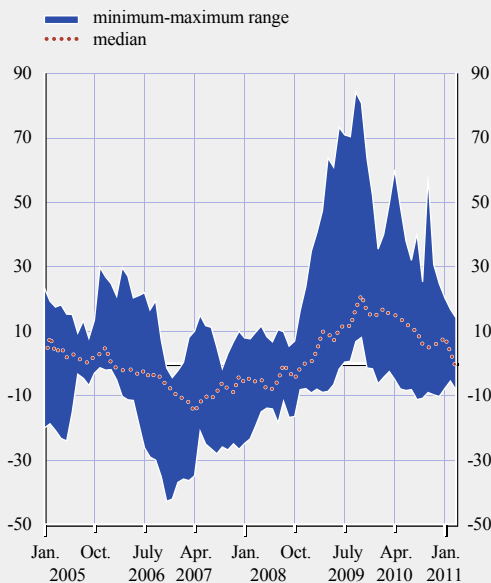


Source: ECB.

downward, changes in short-term interest rates, but also that concerns about sovereign credit risks had not abated, there remains a risk of a market-driven further increase in long-term rates in the euro area. In such a scenario, LCBGs’ profits would be negatively impacted by increasing mark-to-market losses on their government bond holdings, which increased further in some, albeit not all, countries where LCBGs are located (see Chart 4.18). All these factors contributed to LCBGs’ high interest rate risks after the publication of the December 2010 FSR.

**Chart 4.18 Annual growth rates of MFIs' government bond holdings in countries where LCBGs are located**

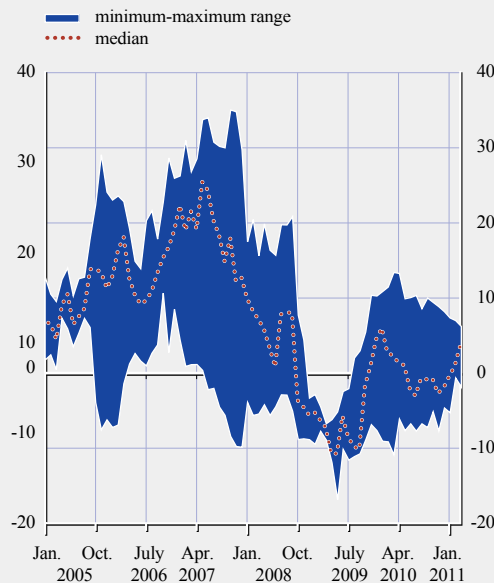
(Jan. 2005 – Mar. 2011; percentage change per annum)



Sources: ECB and ECB calculations.

**Chart 4.19 Annual growth rates of shareholdings by MFIs in countries where LCBGs are located**

(Jan. 2005 – Mar. 2011; percentage change per annum)



Sources: ECB and ECB calculations.

### Exchange rate and equity market risks

Equity market risks for LCBGs remained moderate in the first half of 2011, on account of relatively low volatility. The implied volatility derived from options on the Dow Jones EURO STOXX 50 equity index (see Chart S111) was substantially below the 50% levels seen during the financial crisis. The gradual improvement in equity markets since early 2011 was mirrored by a slight increase in the size of euro area banks' equity portfolios (see Chart 4.19).

Analogous to the developments in equity market volatility measures, implied volatility measures for foreign exchange, which approximate foreign exchange-related risks, stabilised, with some jumps in late 2010, at levels just above 10% in mid-May 2011, which is still lower than the levels recorded in the period after the default of Lehman Brothers (when volatility in the foreign exchange markets temporarily exceeded 20% – see Chart S22).

### Counterparty risk

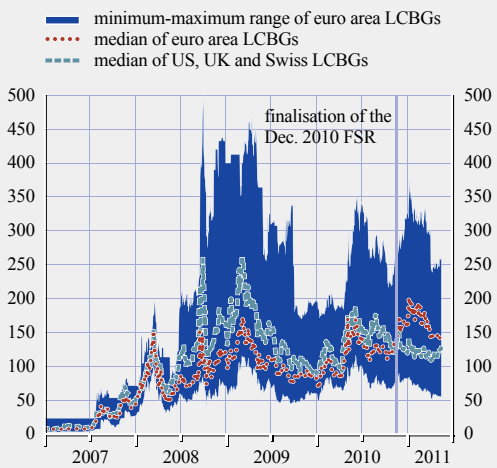
After the finalisation of the December 2010 FSR, the median cost of protection against the default of a euro area LCBG, as reflected by CDS spreads, increased slightly by late May 2011, but was lower than during the pick-up in January 2011 (see Chart 4.20). After early November 2010, market participants viewed euro area LCBGs, and also euro area banks in general, as less creditworthy than their non-euro area counterparts, largely because some euro area banks still faced substantial counterparty credit constraints and continued to rely on Eurosystem liquidity support.

In this context, it is noteworthy that the use of central clearing counterparties (CCPs) for secured lending transactions has been increasing<sup>7</sup> and could prove very useful for euro

<sup>7</sup> See, for example, International Capital Market Association, "European repo market survey", No 20, March 2011.

**Chart 4.20 CDS spreads of euro area and global LCBGs**

(Jan. 2007 – May 2011; basis points; senior debt, five-year maturity)



Sources: Bloomberg and ECB calculations.

area banks with counterparty credit constraints, as evidenced by the very positive experience of Spanish banks after they joined an international

CCP (LCH.Clearnet). In late March 2011, a few Portuguese banks had joined the same CCP, and a number of other Portuguese banks reportedly also had similar intentions.

A large number of counterparty credit risk incidents since the start of the crisis in mid-2007 has provided risk managers with valuable experience and led to substantial changes in counterparty risk management. Nevertheless, even if risk controls have been enhanced, risk appetite, too, seems to be coming back.

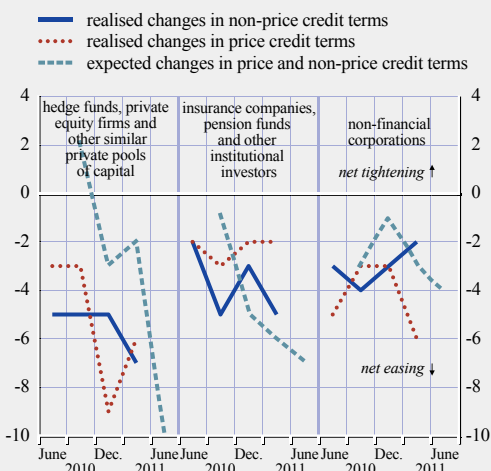
The latest quarterly Fed survey on dealer financing terms revealed a continuing net easing of price and non-price counterparty credit terms for US dollar-denominated securities financing and over-the-counter (OTC) derivatives transactions with non-dealer counterparties (see Chart 4.21).<sup>8</sup> The net easing of credit terms was broad-based, but was especially marked for

<sup>8</sup> Federal Reserve Board, “Senior Credit Officer Opinion Survey on Dealer Financing Terms”, March 2011.

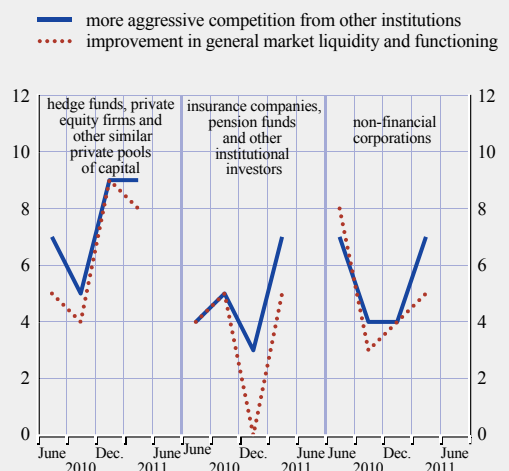
**Chart 4.21 Changes in credit terms by major dealers for US dollar-denominated securities financing and OTC derivatives transactions with non-dealers**

(Q2 2010 – Q2 2011; number of dealers)

**a) net balance of realised and expected changes**



**b) “very important” and “somewhat important” reasons for the easing of credit terms**



Sources: Federal Reserve Board and ECB calculations.

Notes: The net balance is calculated as the difference between the number of respondents reporting “tightened considerably” or “tightened somewhat” and those reporting “eased somewhat” or “eased considerably”. The survey included 20 financial institutions, the majority of which were primary dealers in US government securities and which accounted for almost all of the dealer financing of US dollar-denominated securities to non-dealers and were also the most active intermediaries in OTC derivatives markets.

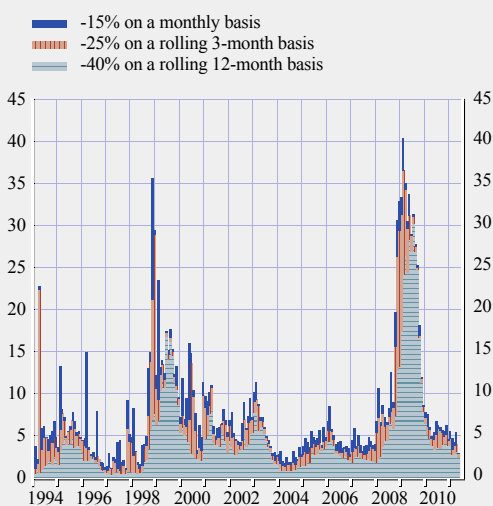
transactions with hedge funds, private equity firms and other similar pools of private capital. In addition, the surveyed dealers, some of which were euro area LCBGs, indicated that the intensity of efforts by hedge funds and other non-dealer counterparties to negotiate more favourable credit terms had been continuing to increase and that more aggressive competition from other institutions was an important reason for the easing of credit terms.

counterparty credit risk associated with banks' exposures to these important and usually very active, leveraged non-bank counterparties.

Nevertheless, conditions in the hedge fund sector seemed largely to have normalised in comparison with the situation reported in the previous FSR (see Section 1.3), as also evidenced by the moderated estimated proportion of hedge funds breaching triggers of cumulative total decline in net asset value (NAV),<sup>9</sup> which was close to longer-term averages (see Chart 4.22). This suggests a lower

**Chart 4.22 Estimated proportion of hedge funds breaching triggers of cumulative total NAV decline**

(Jan. 1994 – Apr. 2011; % 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; it is also referred to as capital under management. For each point in time, estimated proportions are based only on hedge funds that reported respective NAV data, and for which the 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.

9 NAV triggers can be based on a cumulative decline in either total NAV or NAV per share, and 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.

## 5 DEVELOPMENTS IN THE EURO AREA INSURANCE SECTOR

### 5.1 INSURANCE SECTOR RESILIENT IN A DEMANDING ENVIRONMENT

The financial condition of large primary insurers in the euro area remained broadly stable in the fourth quarter of 2010 and the first quarter of 2011 – which was in line with the expectations in the December 2010 FSR. However, the profitability and capital buffers of large euro area reinsurers were significantly affected by large insured catastrophe-related losses in the first quarter of 2011, and in particular the earthquake in Japan.

Some risks and challenges for the sector remain, contributing to some continuing uncertainty about the outlook for euro area insurers. In particular, there is a risk that insured losses caused by the Japanese earthquake and other recent natural catastrophes will be higher than currently estimated, and will leave the insurance sector with a smaller capital buffer in case of further unexpected events. In addition, the stability of insurers' investment income could be challenged if long-term bond yields were to rise rapidly as it would lead to marked-to-market losses on insurers' fixed income investments. At the same time, insurers that have a large stock of guaranteed-return life insurance contracts continue to face challenges as long as yields on AAA-rated government bonds remain low for a prolonged period.

The most significant risks that euro area insurers currently face include:

- ↑ the risk of losses from catastrophic events exceeding projected losses;
- ↑ the risk of a market-driven and unexpected rise in long-term interest rates, causing investment losses;
- ➔ the risk for the profitability of guaranteed life insurance products that yields on AAA-rated government bonds will remain at low levels;

➔ contagion risks from banking activities or via links to banks and other financial institutions;

↓ credit investment risks; and

↓ risks associated with a moderate recovery in economic activity.

↑ *Increased risk since the December 2010 FSR*

➔ *Unchanged since the December 2010 FSR*

↓ *Decreased risk since the December 2010 FSR*

### 5.2 CAPITAL LEVELS SUPPORT SHOCK-ABSORPTION CAPACITY

#### FINANCIAL PERFORMANCE OF LARGE PRIMARY INSURERS<sup>1</sup>

The financial performance of large primary insurers in the euro area remained broadly stable in the fourth quarter of 2010 and the first quarter of 2011 – which was in line with the expectations in the December 2010 FSR. However, the moderate economic activity in some euro area countries continued to weigh on underwriting performance for some insurers and some non-life insurance markets continued to be affected by strong competition (see Chart 5.1).

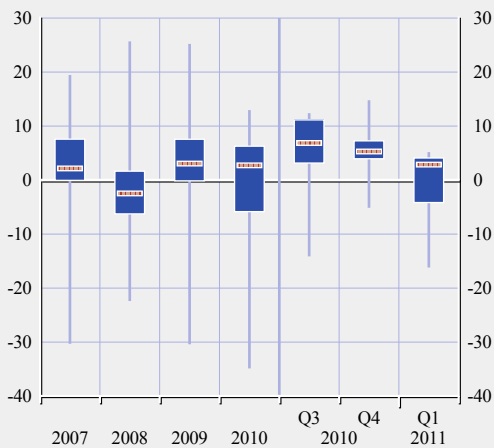
Insurers' financial results were also negatively affected by relatively large insured losses in the fourth quarter of 2010 and the first quarter of 2011, resulting mainly from the flooding in Australia in December 2010 and the earthquakes in Japan in March 2011 and in New Zealand in September 2010 and February 2011. This caused combined ratios of large primary insurers to increase to close to, or in some cases above, 100% (see Chart S119).<sup>2</sup> Nevertheless,

<sup>1</sup> The analysis of the financial performance and condition of large euro area primary insurers is based on a sample of 19 listed insurers with total combined assets of about €4.3 trillion. They represent around 60% of the gross premiums written in the euro area insurance sector. However, quarterly data were only available for a sub-sample of the insurers.

<sup>2</sup> The combined ratio is calculated as the sum of the loss ratio (net claims to premiums earned) and the expense ratio (expenses to premiums earned). A combined ratio of more than 100% indicates an underwriting loss for an insurer.

**Chart 5.1 Distribution of gross premiums written for selected large euro area primary insurers**

(2007 – Q1 2011; percentage change per annum; maximum, minimum, interquartile distribution and median)

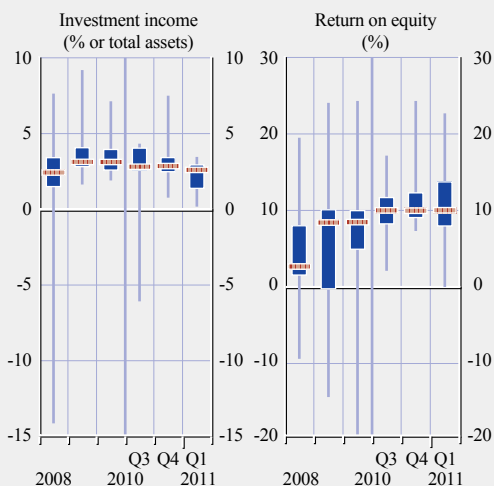


Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

investment income in the fourth quarter of 2010 remained broadly stable and decreased only slightly in the first quarter of 2011 and all included insurers avoided investment losses, which supported their financial performance (see Chart 5.2).

**Chart 5.2 Distribution of investment income and return on equity for selected large euro area primary insurers**

(2008 – Q1 2011; maximum, minimum, interquartile distribution and median)



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

All in all, the profitability of large primary insurers remained stable in the fourth quarter of 2010 and the first quarter of 2011 (see Chart 5.2). The median return on equity remained close to 10%.

### FINANCIAL PERFORMANCE OF MAJOR REINSURERS<sup>3</sup>

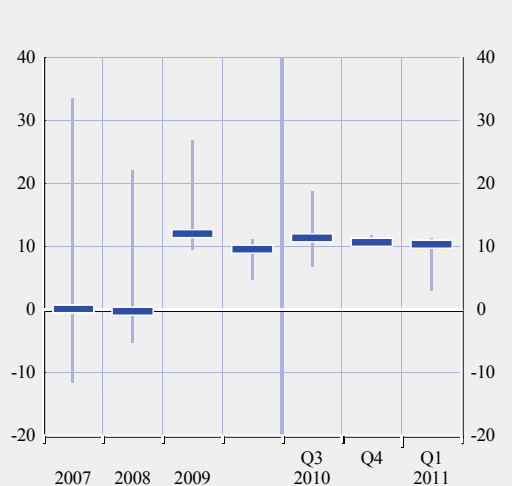
The financial performance of euro area reinsurers remained broadly stable in the fourth quarter of 2010, but deteriorated in the first quarter of 2011 on account of the costly natural catastrophes during this period. Combined ratios of major reinsurers increased to over 140% on average (see Chart S122). Nevertheless, all major reinsurers under consideration recorded annual growth in premiums written (see Chart 5.3), although reinsurance rates declined by around 5-10% on average during the January 2011 renewals.

Reinsurers' investment income remained stable in the final quarter of 2010 and improved in

<sup>3</sup> The analysis of the financial performance and condition of major euro area reinsurers is based on a sample of three reinsurers with total combined assets of about €310 billion, representing about 30% of total global reinsurance premiums.

**Chart 5.3 Distribution of gross-premium-written growth for selected large euro area reinsurers**

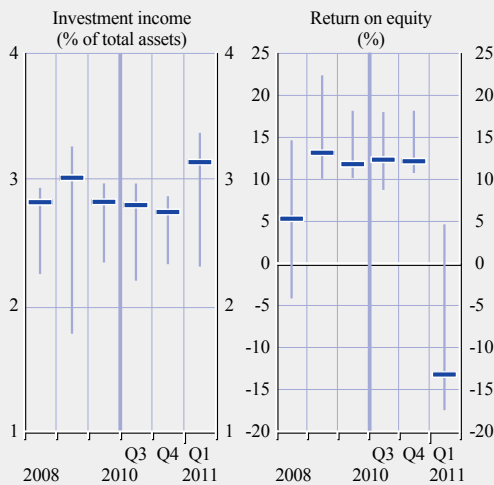
(2007 – Q1 2011; percentage change per annum; maximum-minimum distribution and weighted average)



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

**Chart 5.4 Distribution of investment income and return on equity for selected large euro area reinsurers**

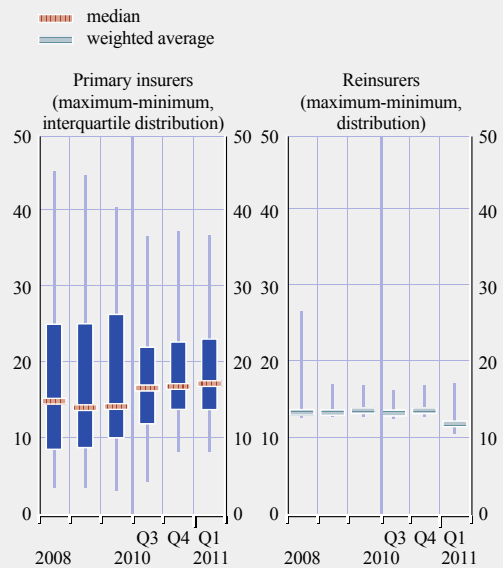
(2008 – Q1 2011; maximum-minimum distribution and weighted average)



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

**Chart 5.5 Distribution of capital positions for selected large euro area insurers**

(2008 – Q1 2011; percentage of total assets)



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.

the first quarter of 2011 (see Chart 5.4). At the same time, profitability was severely affected by insured losses, including, in particular, losses caused by the earthquake in Japan, with the average return on equity standing at around -13% in the first quarter of 2011 (see Chart 5.4).

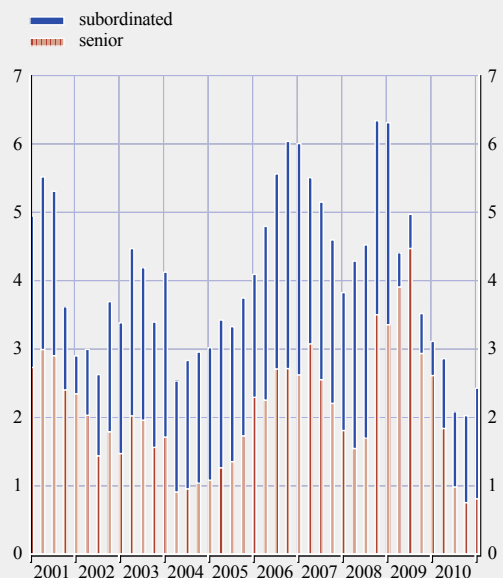
### SOLVENCY POSITIONS OF LARGE PRIMARY INSURERS AND REINSURERS

Primary insurers' capital positions remained stable in the fourth quarter of 2010 and the first quarter of 2011 (see Chart 5.5). The capital buffers of some reinsurers did, however, decrease as a result of the large insured losses in the first quarter of 2011. On average, shareholders' equity decreased by 9% in the first quarter of 2011 compared with end-2010 levels for the three large euro area reinsurers considered.

Euro area insurers issued some €5.5 billion in debt during 2010 (see Chart 5.6). This was significantly below the annual average of around €15 billion during the past ten years. However,

**Chart 5.6 Debt issuance of euro area insurers**

(Q1 2001 – Q1 2011; EUR billions)



Source: Dealogic.

issuance of subordinated debt picked up during the latter part of 2010 and in the first quarter of 2011 (see Chart 5.6). This was spurred by some insurers issuing tier two securities that are expected to be compliant with the new Solvency II requirements.<sup>4</sup>

All in all, capital positions in the first quarter of 2011 appeared, on average, to include a reasonable amount of shock-absorption capacity, although reinsurers' capital buffers were hit, in particular, by the earthquake in Japan.

### 5.3 REBUILDING OF CAPITAL BUFFERS FOR UNFORESEEN FUTURE LOSSES NEEDED IN SOME CASES

#### OUTLOOK

The financial condition of euro area insurers is, on average, likely to remain broadly stable during the next six to twelve months. This is in line with analyst expectations which point towards a continued stabilisation of euro area insurers' earnings during the remainder of 2011 (see Chart 5.7). Earnings are likely to be

supported by improved economic activity in the euro area as a whole. Nevertheless, some euro area insurers' earnings are likely to be affected by large losses caused by natural catastrophes, in particular the Japanese earthquake in March 2011. In addition, some insurers will likely continue to see sluggish demand for both life and non-life insurance products owing to economic activity remaining moderate in some countries. Reinsurers' earnings will also be dampened on account of the fact that reinsurance rates declined by some 5-10% on average during the January 2011 renewals, although rates are expected to increase during the upcoming renewals owing to the large natural catastrophes seen during 2011 pushing demand for reinsurance higher. Insurers will also be confronted with challenges in achieving robust investment income results on account of the fact that yields on highly rated government bonds remain low.

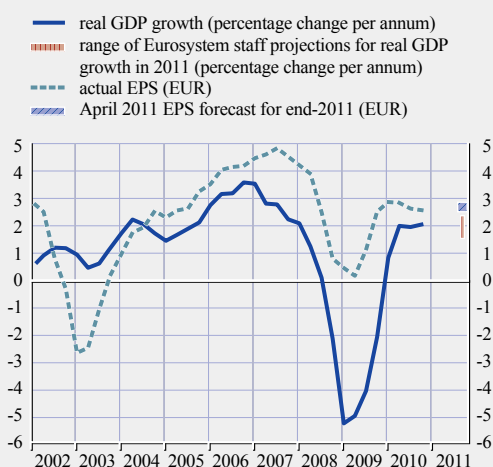
#### Outlook for the insurance sector on the basis of market-based indicators

Euro area insurers' credit default swap (CDS) spreads widened somewhat during the first few months after the finalisation of the December 2010 FSR, but narrowed again from the end of March onwards and the dispersion across institutions also narrowed (see Chart 5.8). Euro area reinsurers remained among the companies with the lowest levels of CDS spreads, but they did witness a widening of spreads during March and early April 2011 as a result of the higher than expected losses caused by the earthquake in Japan in March 2011.

The stock prices of insurance companies broadly followed developments in the overall stock market, albeit with some higher volatility owing to the occurrence of several natural catastrophes. In mid-May 2011 euro area insurers' stock

Chart 5.7 Earnings per share (EPS) for selected large euro area insurers, and euro area real GDP growth

(Q1 2002 – Q4 2011)



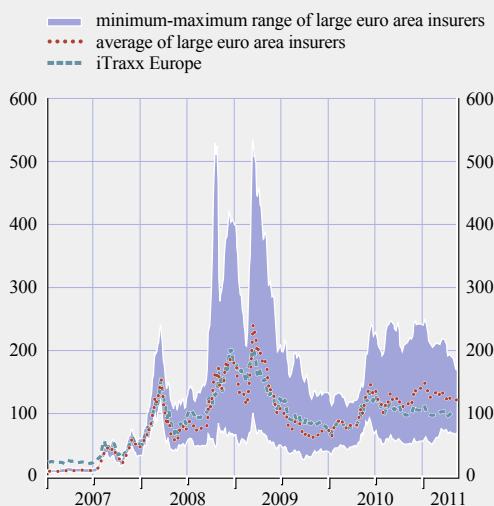
Sources: ECB, Thomson Reuters Datastream and ECB calculations.

<sup>4</sup> See, for example, Barclays Capital, "European insurance outlook 2011 – Another year of volatility and opportunity", January 2011.



**Chart 5.8 Credit default swap spreads for a sample of large euro area insurers and the iTraxx Europe main index**

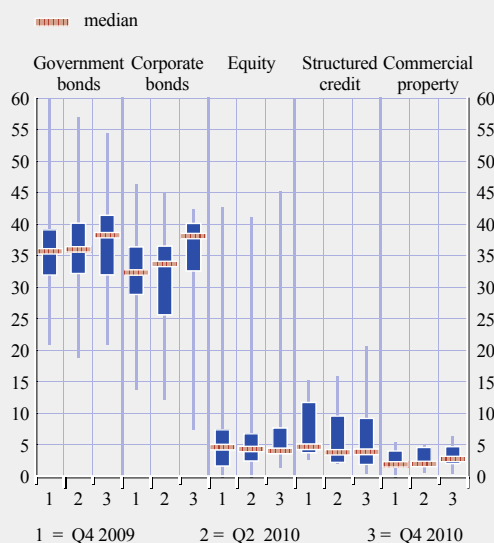
(Jan. 2007 – May 2011; basis points; five-day moving average; five-year maturity; senior debt)



Sources: Bloomberg and JPMorgan Chase & Co.

**Chart 5.9 Distribution of bond, structured credit, equity and commercial property investment for selected large euro area insurers**

(Q4 2009 – Q4 2010; percentage of total investments; maximum, minimum and interquartile distribution)



Sources: Individual institutions' financial reports and ECB calculations.  
Notes: Based on consolidated financial accounts data. The equity exposure data exclude investment in mutual funds.

prices stood some 6% above the levels seen in mid-November 2010 (see Chart S128).

### MAIN RISKS

Euro area insurers continue to be confronted with significant challenges. The most significant are discussed below. It should be noted that they are not necessarily the most likely future scenarios that could affect insurers negatively, but are rather potential and plausible events that could, should they occur, materially impair the solvency of insurers.

#### Financial market/investment risks

Financial market and other investment risks continue to be among the most prominent risks that insurers face.

At the end of 2010 large euro area insurers continued to exhibit high exposure to government and corporate bonds, although there were some differences in investment strategies across institutions (see Chart 5.9). Some

insurers announced plans to increase investment in equities, although exposures on the whole remained relatively low.

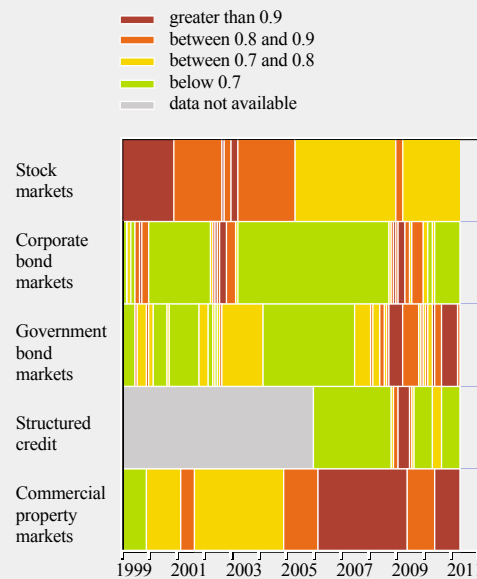
In general, the likelihood of investment losses or muted investment income in the main markets in which insurers invest has remained rather elevated since the December 2010 FSR (see Chart 5.10). In particular, the low yields on highly rated government bonds are making it challenging for insurers to achieve solid investment returns. The uncertainty about future developments in some of the markets in which insurers invest is contributing to continued relatively high investment risks.

#### The risk for the profitability of guaranteed life insurance products that yields on AAA-rated government bonds remain at low levels

While lower levels of AAA-rated government bond yields have bolstered the valuation of insurers' available-for-sale fixed income investments, they continue to pose challenges

**Chart 5.10 Investment uncertainty map for euro area insurers**

(Jan. 1999 – Apr. 2011)



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

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

for the profitability of guaranteed life insurance products and are reducing insurers' reinvestment rates.<sup>5</sup> Nevertheless, yields on AAA-rated government bonds appear to have reached a trough in the autumn of 2010 and the gradual increase thereafter was, in general, beneficial for insurers, even if it reduced the value of their existing fixed income portfolios.

Although the value of existing higher-rated government bond investments decreased in the final months of 2010, data for a sample of large euro area insurers suggest that government bond exposures were somewhat higher at

the end of 2010 than in the second quarter of 2010 (see Chart 5.9).

Provisional estimates based on internal ECB data for all euro area insurance companies and pension funds (a split between the two categories is not available) also indicate continued large investment exposures to government bonds. Insurers and pension funds held about €1.1 trillion of debt securities issued by euro area governments in the fourth quarter of 2010 (see Table 5.1), which was around €26 billion more than in the second quarter of 2010 and €220 billion more than at the beginning of 2008. This represented 44% of insurers' and pension funds' total holdings of debt securities and 16% of their total financial assets.

All in all, although AAA-rated government bond yields increased somewhat after the finalisation of the December 2010 FSR, they remain low by historical standards. This, together with continued large and even increasing exposures, suggests that the associated risk for insurers remains a key challenge.

#### The risk of a market-driven and unexpected rise in long-term interest rates causing investment losses

Euro area insurers, owing to their large government bond exposures mentioned above, are also vulnerable to a sudden rise in long-term government bond yields. For the assets of insurers, an increase in government bond yields will lead to unrealised losses in the short term as the value of the securities held declines. This is because large listed insurers mainly classify their bond holdings as "available for sale" and they are thus entered in the balance sheets at fair value, with any losses or gains that are recorded leading to movements in shareholders' equity. Nevertheless, the short-term impact will be mitigated to some extent in the longer term as higher government bond yields are positive for insurers' investment since they allow them to reinvest in higher-yielding assets.

<sup>5</sup> For a discussion of the impact on insurers of low risk-free interest rates, see Box 16 in ECB, *Financial Stability Review*, June 2010.

**Table 5.1 Financial assets of euro area insurance companies and pension funds**

(Q4 2010; EUR billions)

	Total	MFIs	Non-MFIs						Rest of the world	Not allocated
			General government	Other residents						
				Total	Other financial intermediaries	ICPFs	Non-financial corporations	Households		
Total financial assets	6,895	1,482	1,275	3,155	1,860	470	623	202	919	63
Currency	2	0	0	0	0	0	0	0		
Deposits	803	717	0	0	0	0	0	0	86	0
Securities other than shares excl. financial derivatives	2,546	587	1,133	383	213	20	150	0	444	0
<i>Up to 1 year</i>	48	21	14	4	1	0	3	0	9	0
<i>Over 1 year and up to 2 years</i>	35	13	4	7	3	3	1	0	11	0
<i>Over 2 years</i>	2,463	553	1,115	371	209	16	146	0	424	0
Financial derivatives	60	22	0	11	10	0	0	0	27	0
Loans	509	16	138	331	49	93	42	146	23	0
<i>Up to 1 year</i>	149	1	24	105	36	52	10	8	18	0
<i>Over 1 year</i>	359	15	114	226	13	41	32	138	5	0
Shares and other equity	826	66	0	521	96	22	403	0	238	0
<i>Quoted shares</i>	392	35	0	203	33	13	157	0	154	0
<i>Unquoted shares and other equity</i>	434	32	0	318	63	9	246	0	84	0
Mutual funds shares/units	1,631	64	0	1,492	1,492	0	0	0	76	0
<i>of which: money market fund shares</i>	68	64	0	0	0	0	0	0	5	0
Prepayments of insurance premiums	316		0	294	0	294	0	0	22	0
Other accounts receivable/payable	203	10	4	124	0	40	28	56	3	63

Source: ECB.

Note: Unconsolidated aggregate data for all insurers and occupational pension funds in the euro area.

### Credit investment risks

Although corporate bond exposures remain high and even increased in the course of the second half of 2010 (see Chart 5.9 and Table 5.1), the improvements in the non-financial corporate sector (see Section 2.2) and in corporate bond markets since the finalisation of the December 2010 FSR imply that the associated investment risk for insurers has continued to decline somewhat (see Chart 5.10). Nevertheless, some insurers have reportedly started to invest further down the corporate bond rating scale in attempts to generate higher investment returns, which has increased their investment risk.

Insurers also run the risk of a further deterioration in the credit quality of some sovereign bond issuers. Lower prices of the

government bonds held by insurers would lead to marking-to-market valuation declines on insurers' balance sheets. However, investment exposures of large euro area insurers to lower-rated government bonds appear, in general, to be manageable.

Some insurers have significant exposures to commercial property markets, via direct investment in property and investment in property funds, covered bonds and commercial mortgage-backed securities. In addition, several euro area insurers have lately announced plans to start to extend loans or increase their current lending for commercial property investment (see Box 11). Although the outlook for commercial property markets in the euro area has improved somewhat during the past six months, conditions in some markets remain

fragile (see Section 2.3 and Chart 5.10). This could, in turn, negatively affect insurers' commercial property investments.

### Equity investment risks

Equity exposures remained reasonably stable in the second half of 2010, although some

insurers announced and implemented plans to increase their equity investment to some extent (see Chart 5.9). Overall, although uncertainties in the stock markets remain, the generally low exposure levels suggest that insurers should be able to withstand any adverse developments in stock markets (see Chart 5.9).

## Box 11

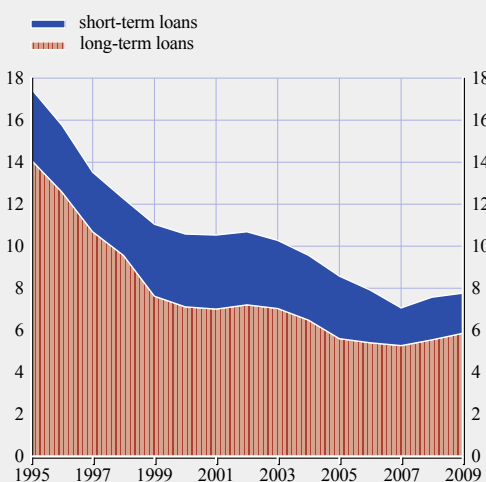
### LENDING BY INSURERS

In recent months several euro area insurers have announced plans to increase their lending activities – in particular for commercial property investment – to fill the void left by banks that, in some cases, have scaled back their commercial property lending. This box presents some data on insurers' lending activities and highlights some financial stability implications.

Insurers scaled back their lending activities during recent decades as competition from banks increased and insurers increased their investment in capital markets instead. In 2009 lending accounted for about 8% of insurers' total financial assets (see Chart A). However, the average figures conceal large differences across countries, mainly owing to differences in regulations across countries, and lending by insurers has remained relatively high in some euro area countries (see Chart B).

**Chart A Evolution of lending by euro area insurers**

(1995 – 2009; percentage of total financial assets)

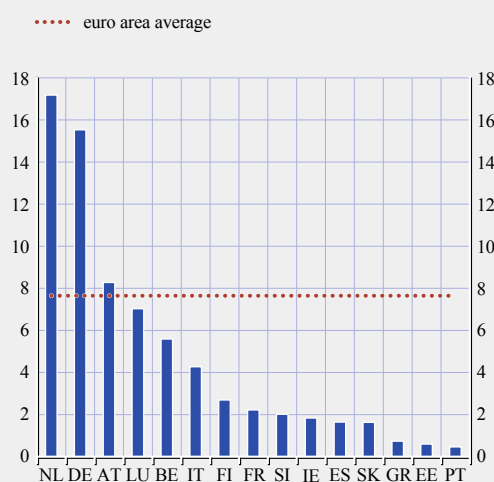


Source: OECD.

Notes: Based on data for 11 euro area countries. In some cases, lending represents transactions within financial groups and not with external counterparties.

**Chart B Lending by euro area insurers by country**

(2009; percentage of total financial assets)



Source: OECD.

Note: Data for Estonia are for 2007 and for Spain for 2008. In some cases, lending represents transactions within financial groups and not with external counterparties.

Insurers' and pension funds' lending has mainly been directed towards households – although such lending is concentrated in a few euro area countries where insurers and pension funds are allowed to lend directly to households – and towards governments, but also to other insurers and pension funds and to non-financial corporations (see Chart C).

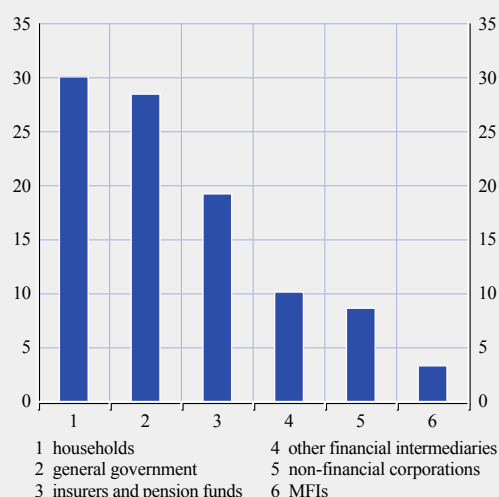
Looking ahead, several euro area insurers have announced plans to increase their direct lending activities or to establish property debt funds. For example, French insurer Axa will commit up to €1.5 billion to the provision of commercial property debt and the German insurer Allianz has announced plans to start to offer senior loans in Germany this year and may expand across the euro area thereafter.

The motivation behind this seems mainly to be due to the decline in competition from banks in some segments, especially commercial property lending, which has pushed commercial property lending rates higher. With highly rated government and corporate bond yields at historically low levels, insurers might see lending as a way to match their long-term liabilities and to capture more attractive returns than fixed income securities currently yield. When compared with the commercial property debt market in the United States, where insurance companies and other institutions account for almost 20% of the total market, there indeed seems to be potential for a greater involvement of insurers in commercial property debt markets also in the euro area. In addition, the Solvency II regulation that is due to come into force in 2013 is expected to lead to some insurers changing their investment strategies somewhat and some market participants have argued that some insurers could instead increase their lending as it could be treated rather favourably as a diversification strategy for some insurers under Solvency II.

Increased lending by euro area insurers can generally be seen as a positive development from a financial stability perspective. From an insurers' perspective, long-term lending can be a good way to match their long-term liabilities and to reduce the risk associated with the currently low levels of highly rated government bond yields. It can also be good for the economy as a whole as insurers could help in providing a stable source of credit to the economy, in particular during periods when banks are scaling back lending. That said, insurers must make sure that their risk management is capable of appropriately assessing the new credit risks they will be taking on.

**Chart C Lending by euro area insurers and pension funds by sector**

(Q4 2010; percentage of total lending)



Source: ECB.

Notes: Lending to other insurers and pension funds includes reinsurance guarantees as reinsurance deposits are classified as loans in the dataset. Lending to households is concentrated in a few euro area countries where insurers and pension funds are allowed to lend directly to households. In some cases, lending represents transactions within financial groups and not with external counterparties.

#### Risks associated with the moderate recovery in economic activity

Euro area insurers continue to be confronted with challenges owing to the moderate recovery in economic activity in several euro area countries.

However, the improvements in the euro area economic outlook since the finalisation of the December 2010 FSR suggest that the associated risks for insurers have decreased somewhat. It should, however, be noted that there remains

considerable heterogeneity in economic developments at the country level, with growth in some countries likely to remain weak given the need for significant balance sheet repair in various sectors (see Section 2.1).

There are several ways in which this could continue to affect insurers negatively. First, insurance underwriting and investment income developments typically follow trends in the overall economy. Underwriting and investment income are thus likely to remain subdued in many segments until the economic recovery has gained more momentum. Second, a moderate economic recovery may lead to vulnerabilities in some segments of the corporate sector. This could result in losses on insurers' investments in corporate bonds, structured credit products and various types of commercial property investment product.

#### Contagion risks from banking activities or via links to banks and other financial institutions

Insurers engaged in banking activities that are part of a financial conglomerate and/or that have significant investment exposures to banks through holdings of equity, debt and debt securities remain vulnerable to possible adverse developments in the banking sector. Some provisional estimates based on internal ECB data show that euro area insurance companies and pension funds held about €587 billion of debt securities issued by euro area monetary financial institutions (MFIs) in the fourth quarter of 2010 (see Table 5.1), slightly up from €585 billion in the second quarter of 2010. This represents 23% of insurers' and pension funds' total holdings of debt securities and 9% of their total financial assets. In addition, euro area insurers' and pension funds' investment in quoted shares issued by euro area MFIs increased by some €3 billion and totalled €35 billion in the fourth quarter of 2010.

Many risks and challenges facing the euro area banking sector remain, as do the links between insurers and banks, and thus the associated risks for insurers remain broadly unchanged.

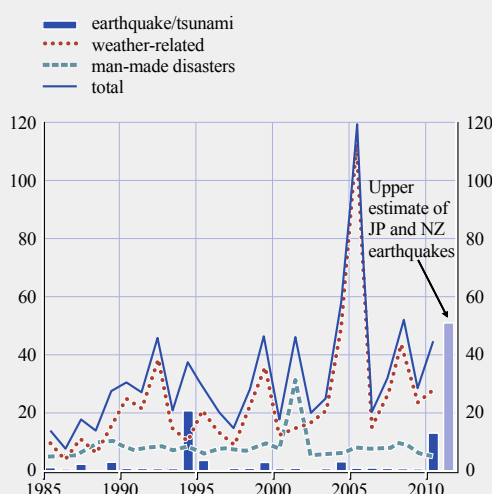
#### The risk of losses from a catastrophic event exceeding projected losses

For reinsurers and non-life insurers, one of the most prominent risks they face remains the risk that losses from catastrophic events turn out to be larger than projected. At the moment, there is, in particular, great uncertainty surrounding the estimates of the ultimate insured losses caused by the Japanese earthquake and other recent natural catastrophes.

Losses related to the Japanese earthquake in March 2011 are complex to estimate as damage was not only caused directly by the earthquake, but also indirectly via fires and nuclear power-related strains. The potential insured losses resulting from the disaster at the Fukushima nuclear facilities are particularly difficult to assess. As a result, the estimates of insured losses provided so far have been wide-ranging and are surrounded by great uncertainty. International catastrophe modelling firms have estimated the insured losses to be around USD 20-39 billion, which would make the Japanese earthquake one of the costliest earthquakes for insurers in history, or even the costliest (see Chart 5.11).

Chart 5.11 Insured catastrophe losses

(1985 – 2011; USD billions)



Sources: Swiss Re, EQECAT, Risk Management Solutions and AIT Worldwide.

It is likely that most of the insured losses will be borne by the Japanese government, Japanese insurers and global reinsurers. Euro area reinsurers have announced preliminary loss estimates based on internal models. Munich Re expects up to €1.5 billion of losses, Hannover Re €250 million and Scor €185 million (after retrocession and before tax).

One of the most difficult aspects to assess is the potential for insurance claims related to business interruption losses. Many electronics factories, car manufacturers and oil refineries had to stop production. This caused business interruption not only in Japan but across the globe.

Further losses for euro area reinsurers from the Japanese earthquake will stem from commercial insurance losses. Such insurance is mainly provided by Japanese private insurers but is often reinsured. Residential insurance cover for earthquakes and tsunamis, on the other hand, is mainly provided by a government-run scheme. However, cover for damage caused by fire after the earthquake is provided by private insurance companies.

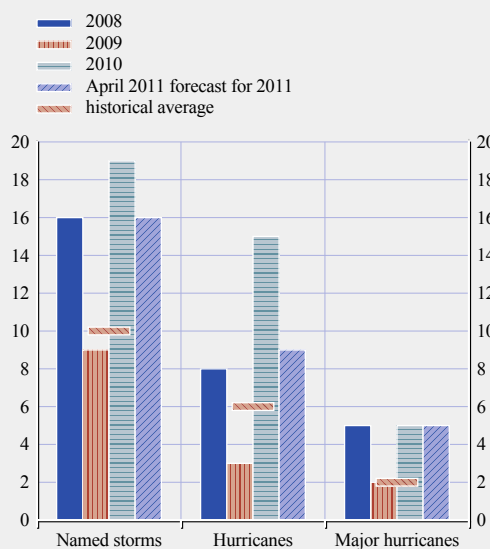
The losses caused by the earthquake in Japan come at a time when euro area reinsurers also have to bear losses from the earthquakes in New Zealand in September 2010 and February 2011. Preliminary estimates put overall insured losses from the Christchurch earthquake of February 2011 at USD 6-12 billion, and for the September 2010 earthquake at USD 3-6 billion.

Some insured losses caused by the Deepwater Horizon oil rig explosion and the flooding in Australia in December 2010 and January 2011 are also still to be borne by euro area reinsurers.

Looking ahead, several rating agencies and other market participants in general have signalled that insured losses caused by the Japanese earthquake and other natural catastrophes during the year can be absorbed by the insurance and reinsurance sectors without widespread solvency problems. Nevertheless, capital reserves for

Chart 5.12 Atlantic hurricanes and storms

(2008 – 2011; number of hurricanes and storms)



Source: Colorado State University (CSU).

some euro area reinsurers have been significantly reduced. In addition, further losses during the year could materially impact the solvency of euro area insurers. In particular, large losses would have to be borne if the level of activity during the 2011 Atlantic hurricane season were to be high. Forecasts made so far indeed foresee above-average activity during 2011, although activity is expected to be somewhat lower than in 2010 (see Chart 5.12).

All in all, catastrophic events during 2010 and so far in 2011 have caused severe losses for euro area reinsurers. Although they are expected to be able to withstand the losses, some might need to bolster their capital positions, in particular if further severe catastrophic events were to occur during the remainder of 2011.

#### 5.4 A SELECTED QUANTIFICATION SUGGESTS THAT DOWNSIDE RISKS ARE MANAGEABLE

The assessment of the resilience of large euro area insurance groups to the risks identified in the previous sections was carried out by

testing the sensitivity of insurers' investment portfolios to market risks.<sup>6</sup> The assessment took into account the following market risk factors: interest rate risk, equity price risk and property price risk.

The exercise was not designed to be related to the EU-wide stress tests in the banking and insurance sectors coordinated by the European Banking Authority (EBA) and the European Insurance and Occupational Pensions Authority (EIOPA). Nonetheless, it does utilise some of the parameters and assumptions provided by the ECB for the 2011 EU-wide stress tests of banks and insurers. These parameters and assumptions mainly relate to developments in long-term interest rates and sovereign credit spreads, as well as changes in equity and property prices.<sup>7</sup>

The analysis was performed following the main assumption that the market values of shares, bonds and property decrease sharply and abruptly with effects occurring instantaneously, before institutions have an opportunity to react and adjust their investments. The likelihood of such extreme shocks happening is very low. Nonetheless, this sensitivity analysis of market risks reveals the extent of the possible losses as a function of the size of the exposures, their composition and the size of the shocks.

Several simplifying assumptions must be made to carry out the assessment. First, owing to the lack of sufficiently granular data on investment exposures, holdings of debt securities of large insurers were analysed by splitting them into four broad categories: sovereign bonds, corporate bonds, mortgage-backed securities and other asset-backed securities (ABSs). Insurers' investments in property covered both commercial and residential property.<sup>8</sup> Second, no hedging or other risk-mitigation measures were taken into account, which means that some exposures might be overestimated. Unit-linked financial investments were also excluded from the scope of the exercise.<sup>9</sup> The results should thus be regarded as the upper boundary for potential market risk-related losses.

It should be noted that insurers' financial investments are largely accounted for as available-for-sale instruments, which means that valuation changes are recorded as changes to shareholders' equity, but there is no impact on the profit and loss account. Furthermore, insurers' exposures to fixed income securities of fiscally distressed countries appear to be fairly limited (see Section 5.3) and most of the debt securities held by insurers bear an investment-grade rating. Considering this, haircuts were derived from implied changes in the value of five-year investment-grade debt instruments for all four predefined categories of debt securities. The haircuts were applied uniformly across the sample of large euro area insurers.

Regarding the size of particular shocks, the government bond portfolio valuation haircut was set equal to the euro area average valuation haircut of 5.7% on benchmark five-year sovereign debt, as in the 2011 EU-wide bank stress test. This translates into an average widening of credit spreads of five-year euro area government bonds by 74 basis points compared with the end-2010 level. On top of this, the revaluation of corporate bond and ABS portfolios was influenced by an additional hypothetical widening of credit spreads by 50 and 100 basis points. Finally, stock prices were assumed to decline by 15% and property prices by 6.3%, in line with the ECB macroeconomic assumptions for the adverse scenario.

Chart 5.13 depicts the distribution across the large euro area insurers of the different market risk sensitivity analysis losses under the

6 The exercise was based on a sample of 17 major insurance groups in the euro area, whose assets accounted for approximately 75% of total assets of the insurance sector in the euro area.

7 For further details, see Annexes 1 and 4 to the "2011 EU-Wide Stress Test: Methodological Note" (available at <http://www.eba.europa.eu/News--Communications/Year/2011/The-EBA-publishes-details-of-its-stress-test-scena.aspx>).

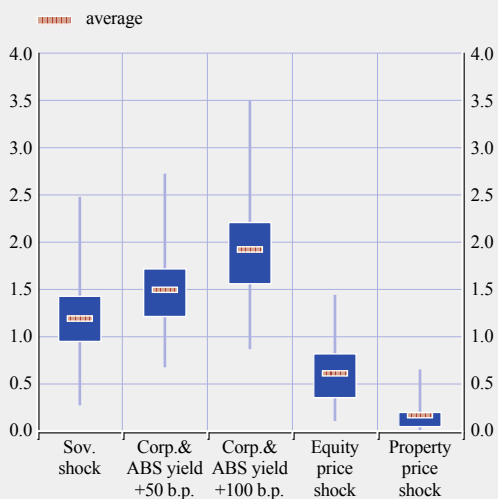
8 Typically, the information on property investment was not sufficiently granular; therefore, in most of the cases, total investment into property was considered.

9 Unit-linked financial investments were excluded because the risk is borne by the policyholders, while this assessment focuses on the effects on insurance companies.



**Chart 5.13 Distribution of sensitivity analysis losses for a sample of large euro area insurers**

(Q4 2010; percentage of total assets; maximum, minimum and interquartile distribution)



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

soundness of the insurance companies. Having said this, it should be noted that the exposure to equity instruments of some insurance companies is rather high and, if not hedged, could become a significant source of risk, should adverse shocks materialise.

different shocks. The share of corporate bonds in insurers' total investment portfolios has increased over the last couple of years and is, for some insurers, larger than that of sovereign bond holdings. As a result, the impact of the two corporate bond yield scenarios is assessed to be higher than the other scenarios. However, results vary across institutions.

Owing to insurers' large government bond exposures, the scenario where the value of government bond portfolios declines by 5.7% also has a significant impact on the value of the insurers' investments (see Chart 5.13).

While conditions in several euro area property markets remain fragile, the related potential losses for insurers would be limited on account of generally contained exposures. Regarding equity price risk, losses from the adverse shock are again largely related to the size of investments. In general, marked-to-market equity holdings seem to be low enough to not have material and adverse implications for the

## 6 STRENGTHENING FINANCIAL MARKET INFRASTRUCTURES

*The operational performance of the key euro payment, clearing and security settlement infrastructures continued to be stable and robust.*

*As a follow-up to the G20 mandate to promote the safety and efficiency of over-the-counter (OTC) derivatives, important regulatory developments have been set in motion. In its opinion on the proposal for a regulation on derivatives, central counterparties (CCPs) and trade repositories, the Eurosystem supported uniform requirements for OTC derivative contracts and for the provision of services by CCPs and trade repositories. Moreover, the opinion recalled the statutory roles of the central banks overseeing these infrastructures. It also underlined the statutory roles of the central banks of issue of the currencies used in transactions processed by these infrastructures.*

*Similarly, in March 2011 the ECB expressed its strong support for the European Commission's initiative for a legislative proposal to strengthen the legal framework for central securities depositories (CSDs) in the European Union. In its response, the ECB also called for any future legislation to take into account existing central bank competences and to provide for adequate recognition of their role.*

Payment, clearing and securities settlement systems play an important role with respect to the stability and efficiency of the financial sector and the euro area economy as a whole. The smooth operation of systemically important payment, clearing and settlement infrastructures also contributes to the implementation of the single monetary policy of the Eurosystem.

The main objective of the Eurosystem's oversight activities is to prevent disturbances in these infrastructures and, should they occur, to prevent their spilling over into the financial system and the economy.

February 2011 saw the launch of a general review of the principles and recommendations of the Committee of Payment and Settlement Systems (CPSS) and the International Organisation of Securities Commissions (IOSCO) for financial market infrastructures (FMIs). This review reflects on the lessons learnt from the financial crisis and on practical experiences in applying the existing standards, as well as on major findings of recent policy and analytical work. There are some important novelties in the adopted approach, namely consideration of all FMIs, as well as the new issues that emerged after the crisis (payment systems, securities settlement systems, CCPs, CSDs and trade repositories), and explicitly addressing interdependencies and links between them. The updated principles will provide a common reference point for authorities around the world to ensure the global consistency of regulatory and oversight requirements for FMIs, with the goal of pre-empting any potential scope for regulatory arbitrage and safeguarding a level playing field. The draft CPSS-IOSCO principles for FMIs, in which central banks and securities regulators from all over the world had an input, has been under public consultation since March 2011. The consultative report is expected to be finalised in early 2012.

### 6.1 PAYMENT, CLEARING AND SECURITY SETTLEMENT INFRASTRUCTURES REMAIN STABLE AND ROBUST

#### TARGET2

TARGET2 maintained its leading position among large-value payment systems in the euro area, with a market share of 91% in terms of value and 61% in terms of volume. During 2010 the number of direct participants increased from 800 to 847, and the number of indirect participants decreased from 3,687 to 3,590.

#### Operational performance

In the second half of 2010 the average daily value of settled transactions amounted to €2.28 trillion, which represents a slight decrease in comparison with the first half

of 2010 (€2.31 trillion). The average daily volume of transactions amounted to 336,535, a decrease compared with that in the first half of 2010 (350,947). The decrease in the value and volume of transactions in the second half of the year was mostly related to seasonal factors (predominantly the significant decrease in August).

In the second half of 2010 the average hourly values settled on the Single Shared Platform (SSP) were highest in the first and in the last but one hour of operations during the day (see Chart S133).

The average daily number of non-settled transactions<sup>1</sup> decreased from 826 in the first half of the year to 638 in the second, whereas the average daily value of these payments increased from €40 billion to almost €43 billion (see Chart S132). In terms of value, 1.9% of the total average daily turnover in the second half of 2010 was not settled.

### Incidents

The TARGET2 oversight function devotes particular attention to the regular monitoring and assessment of incidents, focusing – primarily, but not exclusively – on significant disruptions that are classified as major incidents.<sup>2</sup> The reason for such an approach is that these events may be indications of potential risks and vulnerabilities inherent in the system which, should they materialise, might have implications for its compliance with Core Principle VII on security and operational reliability.<sup>3</sup>

The analysis of incidents in TARGET2 in the second half of 2010 did not identify any significant risks in this respect. The number of minor incidents decreased from ten in the previous six months to nine. Since none of these events resulted in a complete downtime, the calculated availability ratio of TARGET2 over the reporting period remained at 100% (see Chart S134). The operator of the system followed up properly on all failures, and there was no impact on the secure and operationally

reliable functioning of TARGET2 in the reporting period.

### Oversight assessment

#### New releases

The ad hoc activities of the TARGET2 oversight function include the assessment of technical and functional changes in the system. In the reporting period, the assessment of the new software release implemented in November 2010 was continued. Although this assessment focused on the most important change, namely the implementation of internet access, other changes, as well as the whole implementation process, were also evaluated. Internet-based access to TARGET2 is an alternative connection mode to the SSP that offers direct access to the main TARGET2 services without requiring a full-fledged connection to the SWIFT network. It is intended to meet the needs of, in particular, small and medium-sized banks and will not, for example, be available as a means for ancillary systems to connect to TARGET2.

Overall, the TARGET2 oversight function is of the opinion that neither the content of the new release nor the process with which the system operator managed its implementation adversely affect the compliance of TARGET2 with any of the applicable oversight standards, i.e. the Core Principles for Systemically Important Payment Systems. On the contrary, the process was managed in line with the rules for change and release management of TARGET2 and several of the changes eliminate certain weaknesses in the system, result in better services for TARGET2 customers and further contribute to financial stability.

1 The data should be evaluated with due care since the reason for non-settlement cannot be identified.

2 Major incidents are those that last more than two hours, that lead to a delayed closing of the system or that delay the settlement of very critical payments by more than 30 minutes.

3 Core Principle VII states that the system should ensure a high degree of security and operational reliability and should have contingency arrangements for the timely completion of daily processing.

## EURO1

### Main developments

EURO1 is a system for large-value net settlement in euro between EBA Clearing member banks that have a registered office or branch within the EU. The EURO1 system ensures same-day settlement in central bank funds in TARGET2-ECB. In June 2010 EBA Clearing migrated the EURO1 end-of-day settlement process to the Ancillary System Interface (ASI4) module available in TARGET2. Prior to the migration to TARGET2-ASI4, EBA Clearing requested the ECB, in its capacity as the lead overseer of EURO1, to declare that it had no objections thereto. An oversight assessment of this change was conducted by the ECB, in cooperation with the Banca d' Italia. The impact of the EURO1 migration to TARGET2-ASI4 was assessed against the relevant CPSS Core Principles. The ex ante oversight assessment concluded that, a priori, no adverse effects on the legal structure and risk profile of the system are to be expected in live EURO1 operations after migration to TARGET2-ASI4.

No other major developments took place in EURO1 during the reporting period.

### Operational performance

In the second half of 2010 the daily average volume of payments processed in EURO1 was 211,290, an increase of 0.48% in comparison with the first half of 2010 when the system processed, on average, 210,290 EURO1 payments per day. In terms of value, the average daily value of payments processed in the second half of 2010 was €232 billion, while the average daily value settled in the system in the same period was €248 billion (a decrease of 7.18%).

In 2010 the month which saw the highest daily volume of messages processed was April, with 321,631 EURO1 payments in one day. In the same year, the highest total daily value settled in EURO1 was €385 billion, reported in June 2010.

In terms of participation in the system, EURO1 had 67 participants in December 2010 and 10 pre-fund participants.<sup>4</sup>

Concerning the availability of EURO1, there were a few minor incidents that were caused mainly by problems encountered in the infrastructure of EURO1 participants and the service providers.

### CLS

A key feature of Continuous Linked Settlement (CLS), the largest multi-currency cash settlement system, is the settlement of gross-value instructions with multilateral net funding on a payment-versus-payment (PvP) basis. PvP ensures that when a foreign exchange trade in one of the 17 CLS-eligible currencies is settled, each of the two parties to the trade pays out (sells) one currency and receives (buys) a different currency, thus eliminating the foreign exchange settlement risk for its settlement members. Furthermore, CLS offers settlement services related to single-currency transactions (non-PvP transactions), which mainly include non-deliverable forward transactions and credit derivative transactions. The process is managed by CLS Group Holdings AG and its subsidiary companies, including a settlement bank (CLS Bank) that is supervised by the Federal Reserve System. Given the multi-currency nature and systemic relevance of the system, the Group of Ten (G10) central banks, the ECB and the central banks whose currencies are settled in CLS have worked together cooperatively in overseeing the system, with the Federal Reserve System acting as the primary overseer.

In the past few months, the number of CLS participants has risen further. Since September 2010 two new settlement members and another 2,073 third-party users (1,981 of which were investment funds) have joined the CLS system. In March 2011 there were 62 settlement

<sup>4</sup> "Pre-fund participants" are those EBA Clearing members, as well as central banks, admitted to participate in the EURO1 system under certain limitations.

members, as well as 11,684 third-party users in the system (made up of 569 banks, corporates and non-bank financial institutions and 11,115 investment funds).

### Operational performance

In the period starting in August 2010, the average daily volumes settled in CLS initially increased slightly, then dipped towards the end of 2010, but have increased again since the beginning of 2011. In November 2010 a new record volume of 968,000 transactions in a single day was reached. Overall during the reporting period (from September 2010 to March 2011), an average volume of 389,000 trades, with an average daily value equivalent to USD 4.4 trillion, was settled per day. Compared with the same period in 2009-10, both the average volume and the average value increased (from 330,000 trades with an average value equivalent to USD 3.8 trillion). The shares of US dollar and euro trades remained stable during the reporting period, with the former accounting for 45% and the latter for about 20% of the transactions settled.

The share of single-currency transactions (non-PvP transactions) remains small in relative terms (0.67% of all transactions on average in terms of value, irrespective of the currency of denomination). The Eurosystem monitors the turnover of non-PvP settlements in euro with respect to CLS' compliance with the Eurosystem's location policy. During the reporting period, this amounted to a daily average (calculated over a 12-month period) of €0.2 billion.

## 6.2 REGULATORY IMPROVEMENTS IN BOTH OVER-THE-COUNTER MARKETS AND CENTRAL SECURITIES DEPOSITORIES

### OTC DERIVATIVES

In October 2010 the Financial Stability Board published 21 recommendations concerning practical issues that authorities may encounter in strengthening the market and infrastructure for OTC derivatives.<sup>5</sup> In the first half of 2011

a priority measure to improve OTC derivatives markets and market infrastructures in the EU was the development of an adequate EU legislative framework. On 13 January 2011 the ECB presented its opinion on the Commission's proposal of September 2010 for an EU regulation on OTC derivatives, CCPs and trade repositories (referred to as the "EMIR").<sup>6</sup>

In its opinion, the ECB supported the aim to lay down uniform requirements for OTC derivative contracts and the performance of the activities of CCPs and trade repositories, but highlighted concerns with regard to, in particular, the proposed arrangements for involving the ECB and the ESCB in the authorisation and ongoing risk assessment of CCPs, the definition of technical standards for CCPs and trade repositories, and the recognition of third-country CCPs and trade repositories. The ECB also underlined that the access of CCPs to central bank credit is, in principle, a more robust arrangement for mitigating liquidity risk than commercial bank credit. At the same time, the ECB noted that central bank facilities are not per se designed to meet the business needs of market infrastructures and that the Eurosystem is free to decide which facilities it may wish to offer to CCPs and other infrastructures, as well as the terms thereof. Finally, it called for effective cooperation of supervisors and overseers in line with the recommendations of the CPSS and the IOSCO.

The legislative co-decision procedure on the proposal of EMIR with the European Parliament and the Council is still ongoing and expected to be concluded in 2011.

Specific issues concerning financial market infrastructures active in OTC derivatives markets (notably CCPs and trade repositories) are central in the new framework of CPSS-IOSCO principles and recommendations which

<sup>5</sup> Financial Stability Board, "Implementing OTC derivatives market reforms", 25 October 2010.

<sup>6</sup> "Opinion of the ECB (CON/2011/1) of 13 January 2011 on a proposal for a regulation on derivatives, central counterparties and trade repositories", published on the ECB's website.

is currently the subject of public consultation. The updated principles will provide a common reference point for authorities around the world to ensure the global consistency of regulatory and oversight requirements for market infrastructures, with the objective of pre-empting any potential scope for regulatory arbitrage and safeguarding a level playing field. The publication of the draft CPSS-IOSCO “Principles for financial market infrastructures” in March 2011 was an important milestone along the road towards this updated global framework, which is expected to be finalised in early 2012.

#### CENTRAL SECURITIES DEPOSITORIES

In March 2011 the ECB expressed its strong support for the European Commission’s initiative for a legislative proposal to strengthen the legal framework for CSDs in the EU. In its response, the ECB called for any future legislation to take into account the existing central bank competences and provide for adequate recognition of their role in: (i) the setting of harmonised technical standards and requirements for CSDs in line with the framework set by CPSS/IOSCO and ESCB/CESR recommendations; (ii) the authorisation and ongoing supervision/oversight of CSDs; and (iii) recognition of third-country CSDs. Consistency is expected to be ensured between any legislation and regulatory standards for FMIs and legislation relating to major participants in the FMIs.





## IV SPECIAL FEATURES

### A PORTFOLIO FLOWS TO EMERGING MARKET ECONOMIES: DETERMINANTS AND DOMESTIC IMPACT

*This special feature describes the recent wave of private capital flows to emerging market economies (EMEs), analyses the drivers of the flows and discusses the impact of portfolio flows on domestic macro-financial conditions. Currently, private capital flows to emerging markets are characterised by a surge in portfolio inflows which have reached similar levels to those prevailing prior to the onset of the financial crisis in 2007. The prospect of sudden stops and reversals sometimes associated with strong portfolio inflows can complicate the management of domestic macro-financial conditions in EMEs with potential negative financial stability implications. One of the key risks over the medium term linked to such flows is a boom/bust cycle in one or more systemically important emerging economies, along with the unwinding of imbalances and possible contagion. A bust could create severe disruptions in global financial markets and affect the euro area through a rise in global risk aversion, as well as through direct real economy and financial market linkages.*

#### INTRODUCTION

Total private capital inflows to EMEs have rebounded steadily from the financial market turbulence that followed the bankruptcy of Lehman Brothers at the end of 2008. However, the rebound has been uneven across different categories of flows. While the recovery of foreign direct investment (FDI) and banking flows has been sluggish overall and displayed substantial differences across regions, portfolio investment flows into emerging market equity and debt securities have been strong. Recently, the size of portfolio inflows reached unprecedented levels in absolute terms and historically high levels relative to the economies of recipient countries.

While capital flows form an integral and natural ingredient of international macroeconomic

efficiency in normal circumstances, strong and potentially volatile portfolio inflows can complicate the management of domestic macro-financial conditions in EMEs. This could entail negative financial stability implications through the unravelling of imbalances and contagion. Over the short term, portfolio flows driven by volatile factors, such as, for example, herding behaviour among investors, the search for yield and global risk appetite, could lead to a mispricing of financial assets, with the associated risk of a sudden adjustment. Over the medium term, prolonged strong net portfolio inflows could inflate asset prices and fuel credit growth, raising the risk of boom/bust cycles in one or more EMEs. Such a bust could create severe disruptions in global financial markets and affect the euro area through a rise in global risk aversion, as well as through direct real economy and financial linkages.

#### THE CURRENT WAVE OF PRIVATE CAPITAL FLOWS TO EMERGING MARKET ECONOMIES

The recent evolution of total private flows to EMEs has been somewhat volatile, as they decreased sharply in 2008, stagnated in 2009 and recovered in 2010 (see Chart A.1).<sup>1</sup> In conjunction with this volatility, the composition of private flows has also changed. While in 2007 banking flows and FDI were the largest components, this picture changed with the onset of the crisis. FDI and banking flows contracted strongly in 2008 and 2009, while portfolio investment increased sharply after the outflows recorded in 2008. As a consequence, in 2010 portfolio flows accounted for a large fraction of total private capital inflows.

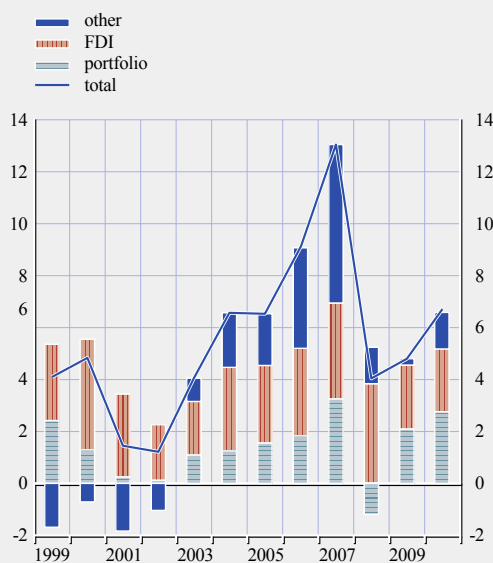
In 2010, from a historical point of view, the size of portfolio flows was unprecedented in absolute terms, while relative to the economies of recipient countries (i.e. in terms of GDP), it reached levels similar to those recorded in 2007, just prior to the financial crisis.

<sup>1</sup> The sample of EMEs analysed in this section includes 19 countries: Argentina, Brazil, Chile, Colombia, Croatia, Hong Kong, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, the Philippines, Russia, South Africa, South Korea, Thailand, Turkey and Venezuela.



**Chart A.1 Total private capital flows into emerging market economies**

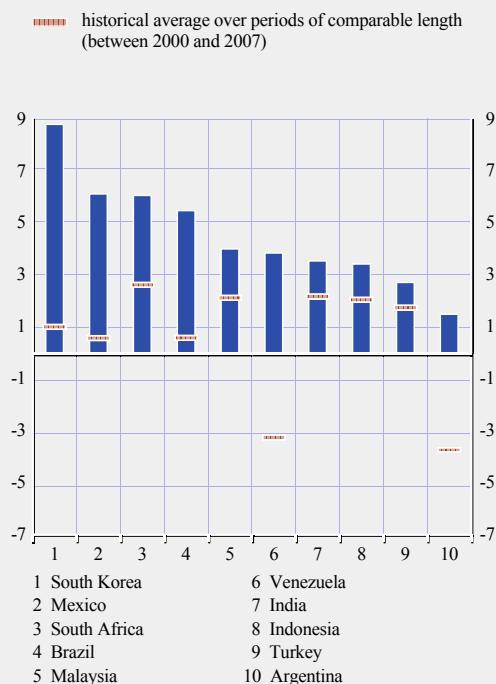
(1999 – 2010; percentage of GDP)



Source: IMF.  
Notes: Other flows include banking flows. Based on 19 emerging market economies (see footnote 1 in this special feature).

**Chart A.2 Top ten recipients of net portfolio inflows to emerging market economies**

(cumulated net inflows between Q2 2009 and Q4 2010; percentage of GDP)



Source: IMF.  
Note: Based on a set of countries including 19 emerging market economies (see footnote 1 in this special feature).

Chart A.2 shows the cumulated net portfolio inflows between the second quarter of 2009 and the last quarter of 2010 in the top ten recipient countries. For the purposes of comparison, the chart also shows the average cumulated flows in time intervals of comparable length (seven quarters) in the pre-crisis period, between 2000 and 2007. Overall, net portfolio inflows exceed historical averages in all of the top ten recipient countries.<sup>2</sup>

Looking forward, sustained and even larger portfolio flows to EMEs cannot be excluded. The attractiveness of EMEs as an asset class has increased in the aftermath of the crisis for a number of structural reasons. These include their strong resilience thus far to the financial crisis, perceived sounder fundamentals in the form of a favourable growth outlook, relatively strong fiscal positions in some

regions and comparatively stable banking sectors. Against this background, institutional investors might be expected to adjust their portfolios by allocating more weight to the EMEs. Large capital flows could materialise, as EMEs overall have low weights in actual fund allocation compared with commonly used benchmarks.<sup>3</sup>

2 High frequency data on portfolio investment show that net inflows into EMEs were weak overall in the first quarter of 2011 owing to geopolitical tensions and the earthquake in Japan. However, recent data show that net portfolio inflows picked up in April 2011.

3 The share that institutional investors allocate to EME equities is small compared with the share of EMEs in world market capitalisation and in the commonly used benchmark indexes. The International Monetary Fund (IMF) estimates that a 1% reallocation of global equity and security holdings by institutional investors in the United States, the euro area, Japan and the United Kingdom would result in around USD 500 billion worth of inflows into EME portfolios. See IMF, *Global Financial Stability Report: Sovereigns, Funding and Systemic Liquidity*, October 2010.

### DETERMINANTS OF NET PORTFOLIO INFLOWS

To quantify the impact of different drivers on net portfolio inflows across EMEs, an econometric model is used to explain net portfolio inflows in one country with push and pull factors having different degrees of volatility. In particular, the determinants of net portfolio inflows in 19 countries across emerging market regions are analysed. The explanatory variables are global risk aversion (as proxied by the VIX index), domestic short-term interest rate differentials versus the United States (at a three-month maturity)<sup>4</sup>, past equity returns and, lastly, fundamentals, as measured by the change in business surveys or growth in industrial production.<sup>5</sup> The dataset includes monthly data from January 2000 to February 2011.<sup>6</sup>

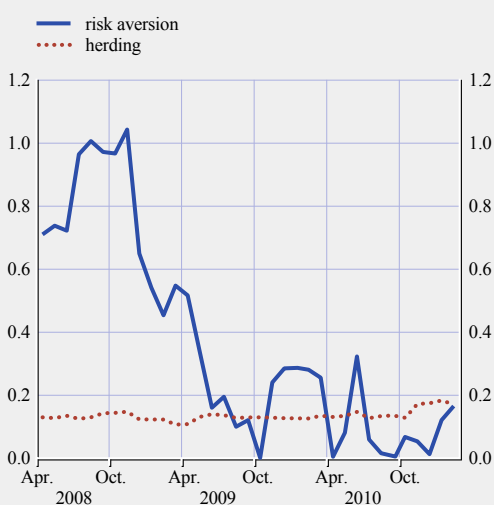
In the econometric model, time-varying regression coefficients aim to capture the fact that the focus of market participants can change over time and thus the determinants of portfolio flows also change across periods. For example, immediately after the bankruptcy of Lehman Brothers, international investors exited from

risky positions in emerging markets in what could be described as a disorderly manner, with scant regard for country or region-specific fundamentals. In that period, the allocation decisions of international investors seem to have been mainly driven by a strong increase in risk aversion. More recently, several analysts have suggested that investors have been searching for yield, and therefore the market focus may be on increasing interest rate differentials between emerging markets and advanced economies. The use of time-varying loading coefficients makes it possible to track the relative importance of such different determinants of portfolio flows over time.

Charts A.3 and A.4 show the average (across countries) measures of dependence of portfolio flows on the explanatory variables included in the model.<sup>7</sup> While these measures only indirectly

**Chart A.3 Dependence of net portfolio inflows to emerging market economies on risk aversion and herding**

(Apr. 2008 – Feb. 2011)



Sources: EPFR, Thomson Reuters Datastream and ECB calculations.

Note: The measures of dependence have been computed as the average of the standardised absolute value of the estimated coefficients ( $\beta$ s) across countries.

4 While interest rate differentials are affected by fundamentals, we list them among the volatile determinants of portfolio flows because they also reflect a number of other factors (including credit and liquidity risk, both at the domestic and global level) which can contribute to making them more volatile than fundamentals. This taxonomy appears to be empirically validated by the model's results, which indicate substantial time variation in the sensitivity of portfolio flows to this factor, i.e. the search for yield is stronger in certain periods

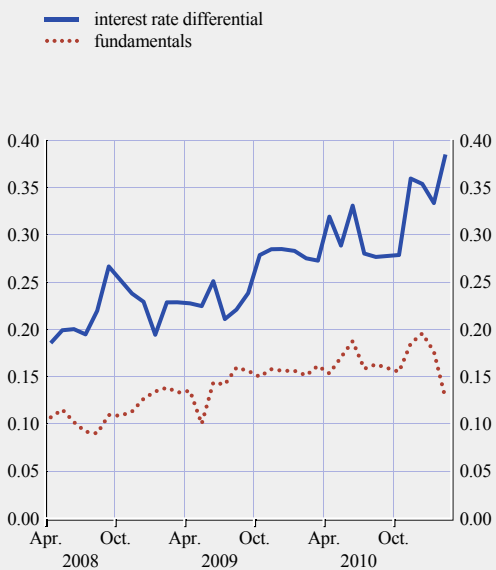
5 The loading coefficient of past local equity returns is often used as an approximation of the importance of herding behaviour among international investors (see IMF, *Global Financial Stability Report: Sovereigns, Funding and Systemic Liquidity*, October 2010). Herding behaviour essentially describes a "backward looking" investment strategy where investors follow market trends in imitation of other investors, i.e. they invest in countries where returns have been higher in the recent past. This strategy, by creating self-reinforcing cycles, could have negative financial stability implications in terms of volatility of net inflows and cause asset prices to deviate strongly from fundamentals, creating boom/bust cycles.

6 The source of net portfolio inflows data is EPFR Global. Other data used in the analysis are provided by Thomson Reuters. See footnote 1 for the countries included in the study.

7 The measures of dependence have been computed as the average of the standardised absolute value of the estimated coefficients ( $\beta$ s) across countries. The estimated  $\beta$ s are statistically significant in almost all of the periods, with some particular exceptions. For example, the estimated  $\beta$  of the interest rate differential is not statistically significant (at the 90% confidence level) between November 2008 and January 2009, after the collapse of Lehman Brothers. This supports the conclusion that investors' decisions in that period were driven by other factors, such as risk aversion, while interest rate differentials were less of a concern. The significance of the estimated  $\beta$ s is assessed by looking at the filter uncertainty that is calculated from the Kalman filtering iteration (see, for example, J. Durbin and S.J. Koopman, *Time Series Analysis by State Space Methods*, Oxford Statistical Science Series, Vol. 24, 2001).

**Chart A.4 Dependence of net portfolio inflows to emerging market economies on interest rate differentials and fundamentals**

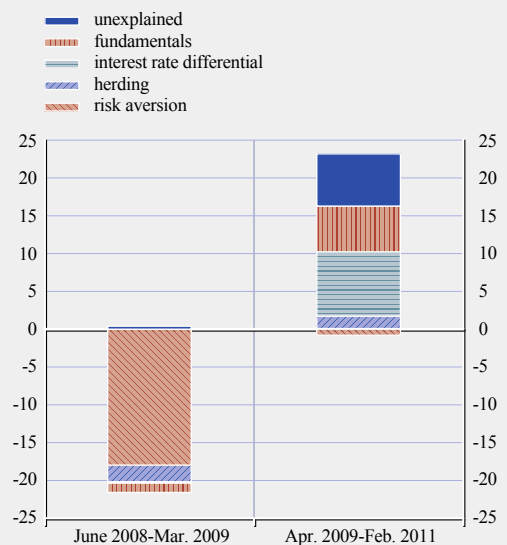
(Apr. 2008 - Feb. 2011)



Sources: EPFR, Thomson Reuters Datastream and ECB calculations. Note: The measures of dependence have been computed as the average of the standardised absolute value of the estimated coefficients ( $\beta$ s) across countries.

**Chart A.5 Contribution of different factors to cumulated portfolio outflows – crisis and recovery period**

(percentage of asset under management)



Sources: EPFR, Thomson Reuters Datastream and ECB calculations.

Notes: The contribution at each time period  $t$  is computed by multiplying the value of the explanatory variable at time  $t$  by the value of the estimated loading coefficient for the variable for that period. Contributions are summed up over the reference periods: June 2008-March 2009 and April 2009-February 2011.

reflect the contributions of each factor to the flows, they show the evolution of the relative importance of each factor across periods, reflecting the change in market participants' focus on different determinants over time.<sup>8</sup>

First, Chart A.3 shows that risk aversion was an important driver of flows during the acute phase of the crisis at the end of 2008. During 2009 and 2010, as market conditions improved, the importance of risk aversion gradually declined. The dependence of flows on risk aversion increased again at the end of 2009 and beginning of 2010 owing to sovereign tensions in Europe, although it remained well below the peak recorded at the end of 2008. Herding behaviour, by contrast, appears to have differed little over the last two years.

Second, the dependence of portfolio flows on interest rate differentials between emerging and advanced economies has increased since

March 2009 (see Chart A.4), supporting the idea that the recent wave of portfolio flows reflects an increase in carry trades and the search for yield.

Third, the dependence of portfolio flows on fundamentals has also increased overall since October 2008, reflecting the increased attention paid by investors to developments in EMEs' fundamentals (see Chart A.4).

Chart A.5 shows the impact of different factors on cumulated net portfolio inflows in the months around the peak of the financial crisis in September 2008, and over the recovery period starting in April 2009. The contribution of each factor has been computed by multiplying the value of the factor by the estimated  $\beta$  coefficient in each month and then cumulating over the reference period.

<sup>8</sup> The contribution of each explanatory variable  $i$  (see below) is computed as the product of the estimated  $\beta_i$  and the explanatory variable  $i$ . The measures of dependence reflect only the  $\beta$ s.

The model suggests that during the peak of the crisis (June 2008 to March 2009) strong outflows from emerging markets were mostly related to an unprecedented increase in risk aversion, whereas the period from April 2009 to February 2011 reflected a combination of different factors (see Chart A.5). While modelled fundamentals played a role in driving the inflows from April 2009, it appears that volatile factors (herding and interest rate differentials) also contributed substantially to the inflows. In particular, the interest rate differential between emerging market and advanced economies became the most important explanatory factor among those included in the model. While, overall, the included factors explain much of the variance in capital flows, it is worth noting that part of these flows over the recovery period remains unexplained. The existence of a persistent and positive component in net inflows that is not explained by the model suggests that some structural factors could be having an impact on capital flows into EMEs. This supports the view of a generalised portfolio reallocation, whereby international investors are structurally increasing asset allocations into EME assets.

#### DOMESTIC IMPACT OF PORTFOLIO FLOWS

While the capital flows form an integral and natural ingredient of international macroeconomic efficiency under normal circumstances, the current size of portfolio flows and the potential for even stronger flows raise financial stability concerns. In the past, strong waves of net portfolio inflows have preceded episodes of financial instability in emerging markets, such as, for example, the Mexican crisis in 1994 and the Asian crisis in 1997.<sup>9</sup>

Portfolio flows have been the most volatile component of private capital flows, and sudden stops or quick reversals of flows can have detrimental effects on the recipient economies. Exchange rate and asset price volatility could increase substantially and domestic financing conditions deteriorate suddenly.

If portfolio flows prove to be persistent, e.g. owing to structural portfolio rebalancing by international investors, strong net inflows could have a destabilising impact on emerging market economies through several channels.

First, strong net inflows can produce undesired real exchange rate appreciation, leading to overshooting and undermining the competitiveness of the economy.

Second, they can cause asset mispricing by placing further upward pressure on assets in countries where valuations are already high. To illustrate this, country-specific VAR models were estimated using monthly data for a sample of 19 EMEs.<sup>10</sup> Next to net portfolio inflows, the world business cycle as well as domestic industrial production, inflation, policy interest rates and stock market prices were included in the model. According to the model estimates, a shock to net portfolio inflows has a strong effect on equity prices across emerging markets and produces a monthly increase in equity prices of around 3.5% (see Chart A.6). In a number of countries, the effect of portfolio flows on equity prices persists for two to three months. The effect is economically relevant across emerging markets as the shock to portfolio flows explains a large part of the variation in equity prices.<sup>11</sup> In the context of stretched asset valuations in EMEs, strong portfolio inflows could add pressure to asset prices and lead to prices deviating substantially from their fundamental values.

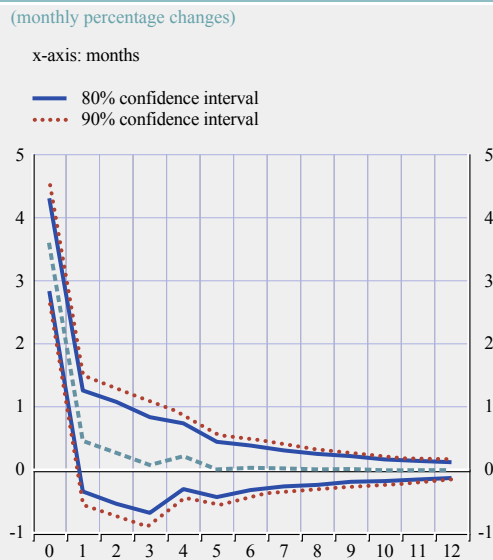
Third, by easing domestic monetary and financing conditions, portfolio inflows can add strong inflationary pressures in those countries

9 See, for example, B. Eichengreen and A. Mody, "Interest Rates in the North and Capital Flows to the South: Is There a Missing Link?", *International Finance*, Vol. 1, Issue 1, October 1998.

10 See footnote 1 in this special feature for the composition of the sample.

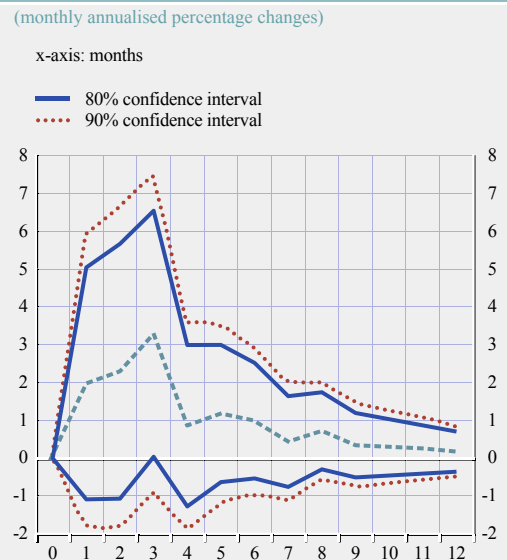
11 The effect varies across countries and displays some negative correlation with the degree of financial development. The larger the stock market capitalisation, the weaker the reaction of equity prices to portfolio flows.

**Chart A.6 Average response of equity prices to a shock to net portfolio inflows to emerging market economies**



Sources: IMF, Thomson Reuters Datastream, Haver Analytics and ECB calculations.  
 Note: Estimated VAR impulse response.

**Chart A.7 Average response of industrial production to a shock to net portfolio inflows to emerging market economies**



Sources: IMF, Thomson Reuters Datastream, Haver Analytics and ECB calculations.  
 Note: Estimated VAR impulse response.

where the economy is close to its potential output.<sup>12</sup> According to the analysis, shocks to net portfolio inflows are found to have a positive impact on industrial production across EMEs (see Chart A.7). The effect reaches a peak around a 3.5% average annualised monthly increase in industrial production three months after the shock. However, the width of the confidence bands shows that there is substantial heterogeneity in the real economy's response to portfolio inflows. Hence, while the economic impact of net portfolio inflows on industrial production may be low for many countries, it is substantial for a number of others, especially in Asia and central and eastern Europe.

Against the background of the potential negative financial stability implications, it is not surprising that the current wave of portfolio flows to EMEs has led to various policy responses and a debate in international fora on their appropriateness. In general, policy responses to manage strong net capital inflows should be tailored to individual countries' circumstances. They should also take into account the nature of the determinants disentangling the role of temporary versus

long-lasting factors. In general, sound domestic macroeconomic policy frameworks and institutions as well as appropriate exchange rate regimes, financial regulation and supervision are the first line of defence against excessive capital volatility. In situations where financial stability risks gain importance, macro-prudential policy measures may be called for to better manage capital flows. From a longer-term perspective, structural policy measures to foster financial deepening will also be necessary.

## CONCLUDING REMARKS

This special feature discussed the recent wave of portfolio inflows into emerging markets. While capital flows are an integral and natural ingredient of international macroeconomic efficiency under normal circumstances, strong portfolio inflows can create pockets of potential instability, particularly in cases where asset price valuations are stretched. In addition, while stable structural factors and fundamentals seem

<sup>12</sup> The effect is even stronger in those countries that are experiencing strong net FDI and banking inflows simultaneously.

to play a role in driving net inflows to EMEs, the evidence presented in this special feature suggests that other volatile factors are at play as well. Strong portfolio inflows could lead to a mispricing of financial assets and volatility and, in the medium term, a boom/bust cycle in one or more systemically important emerging economies. The burst of an asset price bubble in a key EME could create severe disruptions in global financial markets and affect the euro area through a rise in global risk aversion and through direct real and financial linkages. Micro and macro-prudential policies, as well as policies to deepen financial markets and improve the capacity of these economies to absorb persistently large capital inflows, will be crucial to face these challenges.

## B FINANCING OBSTACLES FACED BY EURO AREA SMALL AND MEDIUM-SIZED ENTERPRISES DURING THE FINANCIAL CRISIS

*During the recent financial crisis, euro area firms, and especially small and medium-sized enterprises (SMEs), reported severe problems gaining access to finance. Using new survey data for a sample of more than 5,000 firms in the euro area, this special feature presents the results as a means of tracking the financing obstacles faced by non-financial corporations, as well as a structural analysis of this issue during the recent crisis. After disentangling the impact of various factors, it is shown that firm age and size are key determinants of whether a company experiences problems accessing financing. As SMEs are often unable to switch from bank credit to other sources of finance, experiencing major financing obstacles can be a considerable challenge and can endanger economic growth. Looking forward, expanding access to finance while ensuring financial sector stability through responsible practices and an appropriate evaluation of risks appears essential for a sustained economic recovery.*

### INTRODUCTION

Access to finance is a crucial factor enabling firms – especially SMEs – to maintain their day-to-day business as well as to achieve long-term growth and investment goals. With generally limited direct access to capital markets, many euro area firms rely heavily on the banking sector for credit. A well-functioning banking sector can play an important role in channelling resources to the best firms and investment projects. However, experiencing major financing obstacles can be a considerable challenge for enterprises, which in turn can increase the credit risks stemming from the corporate sector and also negatively affect productivity in the economy. Indeed, the extensive literature on the growth of firms has increasingly focused on the effects of financing constraints. The literature has clearly identified a negative impact on growth – highlighting the macro-financial feedback effects which can result in a crisis.<sup>1</sup>

During the financial crisis, sources of firm financing became scarcer and the availability of financing instruments generally deteriorated. SMEs are generally more prone to experiencing difficulties in accessing bank credit and, more broadly, external finance, with the main reason being linked to at least three specificities.<sup>2</sup> First, firm size may affect the quality and quantity of information available on an investment project and the quality of collateral, as well as the firm's relationship with capital markets and banks. Small firms are often believed to be more opaque and to have a higher risk of failure than large firms. Second, small firms are often young and have not had the time to build up a track record and reputation. Third, SMEs do not normally issue traded securities that are continuously priced in public markets, thus providing the market with information. Hence, from the banks' perspective (i.e. the supply side), the costs involved in assessing and setting appropriate premia for risk and the relatively high monitoring costs may discourage them from providing funds to smaller firms.

This special feature assesses financial constraints based on direct self-reporting by firms and their perception of financing obstacles. The analysis uses data from a new firm-level survey based on a sample of non-financial corporations in the euro area: the ECB and European Commission survey on the access to finance of small and medium-sized enterprises (SAFE).<sup>3</sup> A first investigation of

- 1 See M. Ayyagari, A. Demirgüç-Kunt and V. Maksimovic, "How Important Are Financing Constraints? The Role of Finance in the Business Environment", *World Bank Economic Review*, Vol. 22, No 3, 2008. In the euro area, SMEs contribute to more than 60% of total value added and represent 70% of employment.
- 2 For a review of the literature on surveys, see the paper by the Task Force of the Monetary Policy Committee of the European System of Central Banks entitled "Corporate finance in the euro area", *ECB Occasional Paper Series*, No 63, June 2007.
- 3 More information regarding the survey as well as the results of the individual waves can be found on the ECB's website at <http://www.ecb.europa.eu> in the "Statistics" section under "Monetary and financial statistics"/"Surveys"/"Access to finance of SMEs". In the survey, SMEs are defined as firms with less than 250 employees. For details about the econometric analysis of the survey, see A. Ferrando and N. Griesshaber, "Financing obstacles among euro area firms: who suffers the most?", *ECB Working Paper Series*, No 1293, February 2011 and C. Artola and V. Genre, "Euro area SMEs under financial constraints: belief or reality?", *ECB Working Paper Series*, forthcoming.

this new data focused on confirming whether or not SMEs were indeed more prone to experiencing difficulties in accessing finance. This complements the large body of literature investigating the existence and determinants of financing constraints for firms – including both survey and balance sheet-based analyses.<sup>4</sup>

#### SURVEY ON THE ACCESS TO FINANCE OF SMALL AND MEDIUM-SIZED ENTERPRISES (SAFE)

The SAFE survey has been carried out four times between the summer of 2009 and March 2011. The survey contains firm-level information mainly related to major structural characteristics (size, sector, firm autonomy, turnover, firm age and ownership) as well as to firms' assessments of recent short-term developments regarding their financing needs and access to finance.

Compared with existing cross-country surveys within Europe (for instance the European Commission's Flash Eurobarometer), the SAFE survey displays two novel characteristics. First, the survey is carried out at a higher frequency (every six months). In addition, it contains a small set of large companies so that SMEs' perceptions of financing obstacles can be placed in a wider perspective. Indeed, by construction, the survey includes a large number of SMEs (around 90%) which are mostly independent firms not belonging to larger industrial groups. In terms of age, around half of the firms are more than ten years old.

Some important caveats should be recalled when using information derived from surveys. First, surveys might be affected by self-reporting biases, i.e. firms might claim to be financially constrained even if they are not. Second, one characteristic of the SAFE survey is that all four waves were carried out during exceptional times of deep financial turmoil and in the middle of an economic recession followed by a mild recovery. This increases the risk that firms' responses may prevalently reflect a general deterioration of credit conditions in the economy. For these reasons, two different measures of financing obstacles are considered: one based on the perceptions of firms and the other based on their

actual experiences in seeking external finance and applying for a loan.<sup>5</sup>

Each surveyed firm is asked to identify the most pressing problem it is facing at a time of the SAFE survey.<sup>6</sup> It is therefore possible to identify a firm as being confronted with financing obstacles whenever it chooses "access to finance" as its most pressing problem. Since the beginning of 2009, the most pressing problem reported by euro area firms has been "finding customers", reported by nearly 30% of firms. In the 2009 survey, "access to finance" came second in the implicit ranking of issues, with 19% of firms considering it to be the most pressing problem in the second half of the year. In the last wave, this share decreased slightly to 16%.

One major drawback of focusing on this particular question is that respondents cannot signal more than one problem at a time and hence must implicitly rank the seriousness of the problems they face.<sup>7</sup> In other words, it

4 A major stream of the literature makes use of a priori classifications between financially constrained and unconstrained firms in order to check whether the sensitivity of investment, cash holdings or growth to cash flow is higher for constrained than for unconstrained firms. For instance, it is expected that small and young firms face more binding financing obstacles owing to the more severe information asymmetries in the context of their creditworthiness analysis (see M. Devereux and F. Schiantarelli, "Investment, Financial Factors, and Cash Flow: Evidence from U.K. Panel Data", in R.G. Hubbard (ed.), *Asymmetric Information, Corporate Finance and Investment*, University of Chicago Press, Chicago, 1990; S. Gilchrist and C. Himmelberg, "Evidence on the role of cash flow for investment", *Journal of Monetary Economics*, No 36, Issue 3, December 1995). An investment grade rating for corporate bonds also reduces financing constraints as it signals that the firm has low-cost access to capital markets (see T.M. Whited and G. Wu, "Financial Constraints Risk", *Review of Financial Studies*, Vol. 19, Issue 2, 2006).

5 Furthermore, comparisons with the results obtained using survey data collected well before the onset of the economic crisis in 2007 highlight the more structural elements of the relationship between financing obstacles and their determinants.

6 Each respondent is given a choice of seven alternatives: finding customers, competition, access to finance, costs of production (including labour costs), availability of skilled staff, regulation and other reasons.

7 It is important to note that the wording of this question in SAFE is different from the wording of similar questions in other surveys (such as the World Business Environment Survey, WBES), where firms are typically asked to rank a given problem on a certain scale (e.g. from 4, representing a major obstacle, to 1, no obstacle, see T. Beck, A. Demirgüç-Kunt, L. Laeven and V. Maksimovic, "The determinants of financing obstacles", *Journal of International Money and Finance*, No 25, 2006).



is not possible to observe the actual levels of financing obstacles within a firm where “access to finance” may well be the second or third most pressing problem. The survey results may thus not fully take into account the existence of firms that consider “access to finance” as a pressing (albeit not the most pressing) problem, thus potentially underestimating the overall problems surrounding access to finance. It can, however, be assumed that a firm’s choice will reflect a (very) serious issue considered by the respondent to be the most pressing problem. But the reply may of course only be based on the respondent’s general perception and not a priori its actual experience.

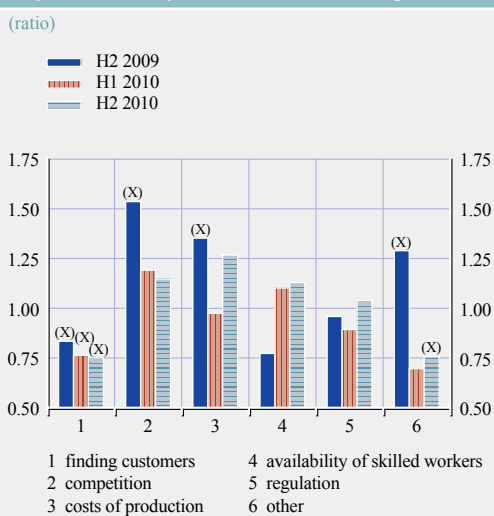
#### PERCEIVED AND ACTUAL FINANCING OBSTACLES

By conducting a multinomial logit regression using the categorical variables on the most pressing problem as independent variables, it is possible to calculate the probability of SMEs choosing “access to finance” as the most pressing problem in the survey versus other issues, all other variables, being constant. For example, in 2009 SMEs had a significantly higher probability

than large firms of choosing “access to finance” over problems of competition (1.5 times higher), cost of production or finding customers (Chart B.1). At the same time, there was little or no difference between the responses of SMEs and large firms with respect to regulation and the availability of skilled workers (the differences in the odd ratios were not statistically significant). In the third survey wave, differences between large and smaller firms no longer appeared significant, except for finding customers. In the last survey wave, SMEs tended to choose “access to finance” more often than “other problems” than large firms.

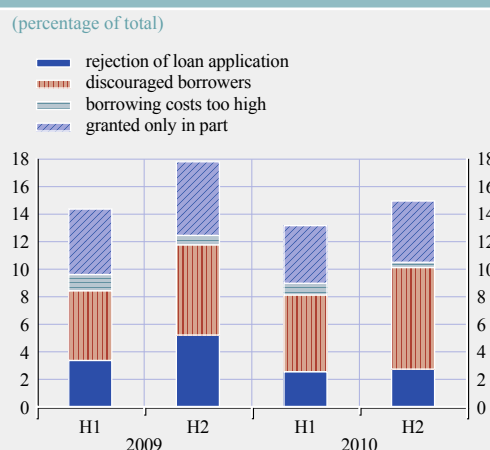
An alternative way to identify firms facing financing constraints is their actual experience in applying for a loan. Indeed, respondents to the SAFE survey are asked whether or not they have applied for a bank loan and whether they were successful in obtaining one. Based on this information, Chart B.2 shows that about 18% of SMEs experienced some kind of constraint on bank loans in the second half of 2009, down to

**Chart B.1 Probability that euro area SMEs report “access to finance” as the most pressing problem with respect to other problems, relative to large firms**



Sources: EU-ECB survey on access to finance and ECB calculations.  
Notes: (X) indicates that the variable is statistically significant at 10%. Odd ratios based on multinomial logit regressions where the dependent variables are the different types of potential obstacles and problems captured in the survey. The odd ratios are calculated with respect to large firms and with other determinants (age, ownership, country and sector) held constant.

**Chart B.2 Actual constraints on bank loans experienced by euro area SMEs**



Source: EU-ECB survey on access to finance.  
Notes: The indicator is defined as the percentage of respondent SMEs who did not apply for a loan for fear of rejection; applied for a loan but saw their application rejected; had to refuse the loan because the cost was too high; or obtained less than the sum applied for.

15% according to the last survey wave. Large firms reported lower but unchanged percentages at around 12%, broadly stable between the second half of 2009 and that of 2010.

### DETERMINANTS OF FINANCING OBSTACLES

Using the information on firm characteristics derived from the SAFE survey (size, age, the sector of economic activity and type of ownership), a set of logistic regressions was run where the dependent variable was the indicator of financial obstacles described above. The results enable two different types of heterogeneity to be distinguished: across firms and across countries.

#### Heterogeneity across firms

Firm size, age and location (by country) appear to be the key determinants of whether a company experiences problems accessing external finance. As there is a high degree of correlation between age, ownership and firm size (i.e. the smaller the firm, the more likely it is to be younger and a one-person or family-owned business), it is important to unravel the various interactions between these variables. To do so, additional regressions were run, including interaction terms, and the marginal

effects of each determinant were computed. The results show that small or, more significantly, young firms are more likely to be confronted with financing obstacles (see Charts B.3 and B.4).

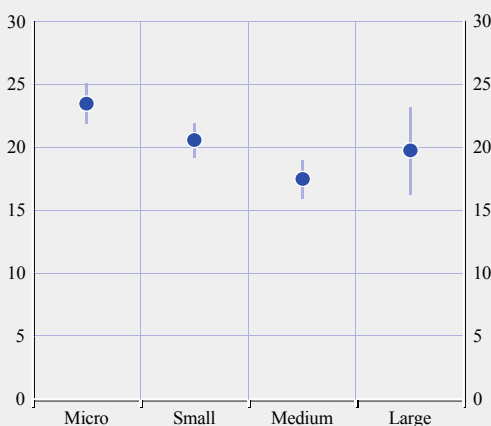
At the same time, the analysis shows that sectoral differences across firms are not particularly relevant in explaining the presence of financing obstacles.<sup>8</sup>

As discussed above, a non-negligible proportion of firms encounter financing constraints, but do not report access to finance as their main, most pressing, problem. In order to enrich the

8 This finding is in line with Canton, Grilo, Monteagudo and van der Zwan, where the sector of activity does not seem to play an important role for the EU10 sample (E. Canton, L. Grilo, J. Monteagudo and P. van der Zwan, "Investigating the perceptions of credit constraints in the European Union", ERS 2010, No 1). However, by exploiting information derived from the WBES for five major euro area countries (Germany, Spain, France, Italy and Portugal), Coluzzi, Ferrando and Martinez-Carrascal found that firms in the manufacturing and construction sectors faced more financing obstacles than those in the service sector. In this case, data referred to the beginning of 2000 (C. Coluzzi, A. Ferrando and C. Martinez-Carrascal, "Financing obstacles and growth: an analysis for euro area non-financial corporations", *ECB Working Paper Series*, No 997, January 2009).

**Chart B.3 Predicted probability of euro area firms experiencing financing obstacles by firm size**

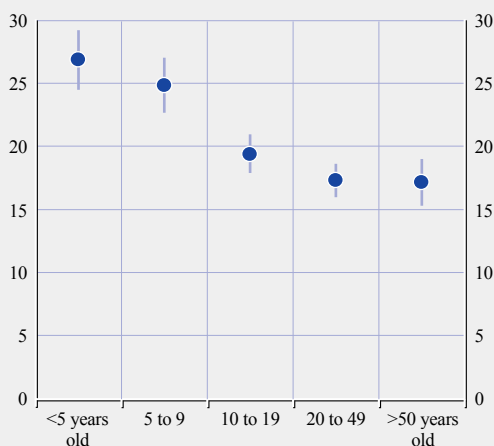
(includes the 95% confidence interval around the point estimate)



Source: EU-ECB survey on access to finance.  
Notes: Results based on pooled data analysis of all four survey rounds. Micro firms are defined as firms with less than ten employees; small firms have between ten and 49 employees; medium firms have between 50 and 249 employees; and large firms more than 250 employees.

**Chart B.4 Marginal effect of firm age on the predicted probability of euro area firms experiencing financing obstacles**

(includes the 95% confidence interval around the point estimate)



Source: EU-ECB survey on access to finance.  
Note: Results based on pooled data analysis of all four available survey rounds.

analysis, an additional indicator was constructed which combines perceived and experienced financing constraints. This categorical variable “financing obstacle” takes the value 0 if the firm neither perceived nor experienced any financing obstacles. The variable takes the value 1 if the responding firm perceived financing obstacles but did not actually experience any, and the value 2 where the firm actually experienced financing constraints, no matter what its perceptions were.

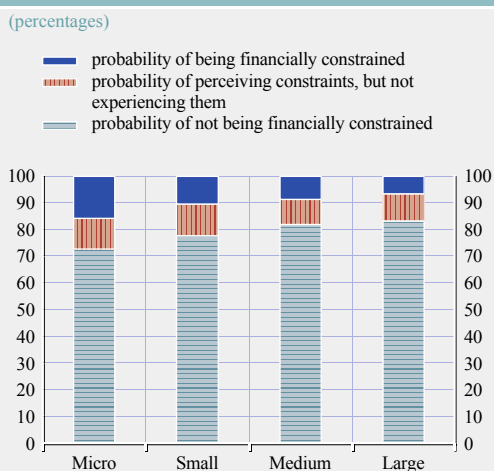
Based on the results of a multinomial probit regression, Chart B.5 depicts, by firm size, the predicted probabilities of: (i) experiencing financing constraints; (ii) only perceiving them; and (iii) not experiencing financing obstacles. The model prediction suggests that firm size has a clear impact on the likelihood of experiencing financing obstacles (which is not so evident for firms who only perceive financing obstacles). In particular, it seems that the smaller the firm, the more likely it is to face difficulties in obtaining external finance. A similar relationship emerges when looking at firm age. The older the firm, the less likely it is to have actually experienced financing problems.

### Heterogeneity across countries

In the analysis of the determinants of obstacles to obtaining finance through bank loans, the country dimension turned out to be particularly important. In 2009 and 2010 the economic and financial environment differed across countries and this might explain different levels of financial constraints faced by firms. In particular, the survey results highlighted very mixed developments in the corporate income situation across countries, with firms in Spain and, to a lesser extent, Italy reporting a deterioration in turnover and profits, while French and German firms recorded clearer improvements. In other words, a higher average probability of experiencing financial constraints in specific countries may not necessarily point to extraordinary supply restrictions, but can simply reflect a different assessment of credit risk by banks in those countries. Although the survey sample contains non-financial corporations from all euro area countries, this analysis only focuses on the four euro area countries for which there is a representative sample: Germany, Spain, France and Italy.

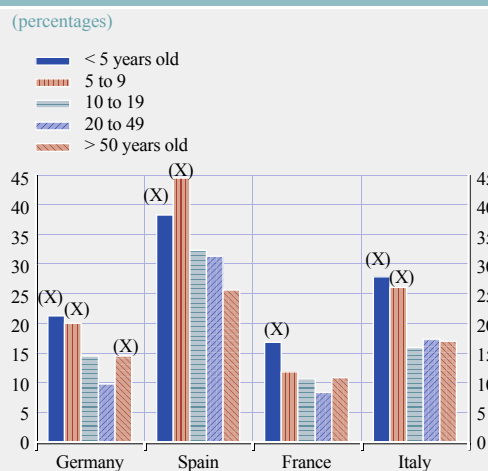
In all four countries, age remains a key determinant of whether a company experiences financing

**Chart B.5 Predictions of euro area firms experiencing or perceiving financing constraints or not experiencing financing constraints, by firm size**



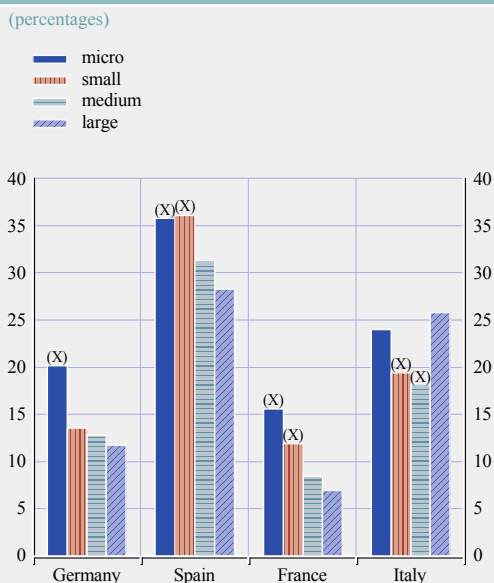
Source: EU-ECB survey on access to finance.  
Notes: Results based on H2 2010 survey round. Results are similar for other available waves.

**Chart B.6 Predicted probability of euro area firms experiencing financing constraints by firm age**



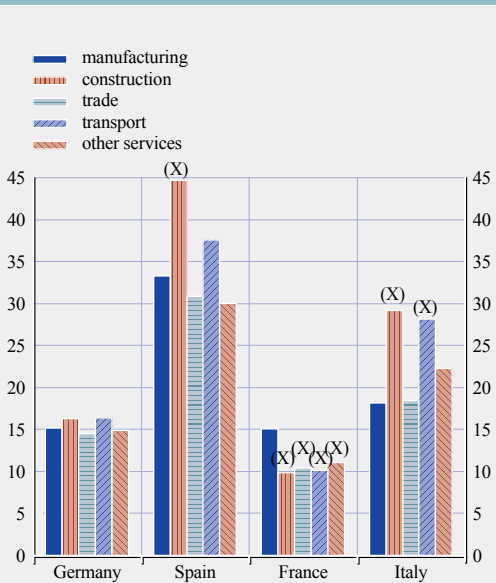
Source: EU-ECB survey on access to finance.  
Notes: Each country estimation is run separately and based on a random-effect probit model run on pooled data of all available survey rounds. (X) indicates that the probability is significantly different from that for firms aged 50 and above (at the 10% level).

**Chart B.7 Predicted probability of euro area firms experiencing financing constraints by firm size**



Source: EU-ECB survey on access to finance.  
 Notes: Each country estimation is run separately and based on a random-effect probit model run on pooled data of all available survey rounds. (X) indicates that the probability is significantly different from that of large firms (at the 10% level).

**Chart B.8 Predicted probability of euro area firms experiencing financing constraints: the role of sectoral activity**



Source: EU-ECB survey on access to finance.  
 Notes: Each country estimation is run separately and based on a random-effect probit model run on pooled data of all available survey rounds. (X) indicates that the probability is significantly different from that of manufacturing (at the 10% level).

constraints. Younger firms (and especially those less than five years old) have a significantly higher likelihood of experiencing difficulties in accessing finance (see Chart B.6). The “reputation” or “track record” effect, often found in previous surveys, is quite widespread across countries.

Turning to ownership, the fact that a business is a one-person or family business appears to significantly hamper access to finance in Spain.

The probability of experiencing financing obstacles is also linked to firm size. However, the significance of the size effect varies across countries (see Chart B.7). In France and Spain, small and micro firms have a substantially higher probability of experiencing financing obstacles than medium-sized and large companies. In Italy, the predicted probability of being financially constrained turns out to be significantly lower for small and medium-sized firms than for large firms (although for the latter the coefficient is not significant).

Finally, differences can be observed regarding the relevance of the sector of economic activity for whether a firm will experience financing constraints. Testing for the overall significance of industrial sectors in the estimations by country, it is found that the business sector does not explain the existence of financing obstacles at all in Germany, and only marginally in France, but is a very relevant factor in both Italy and Spain. In particular, construction and real estate firms in Spain and, to a lesser extent, in Italy faced a much higher probability of experiencing financing obstacles than any other firms (45% in Spain and 29% in Italy; see Chart B.8). Given construction and real estate conjunctural developments, notably in Spain since 2007, this result does not come as a surprise. Also, French manufacturing firms have a relatively higher risk of experiencing financing obstacles compared with firms operating in other sectors of the French economy, which is not observed in any other country.

## CONCLUDING REMARKS

The most recent EU-ECB survey on access to finance confirmed that financial obstacles were one of the most cited factors impeding business dynamics. A first investigation using this data also showed that while the general sentiment of heightened financial obstacles was broadly based across firms during the recent crisis, the firms that actually experienced financial constraints tended to be small and young, confirming the fact that SMEs were indeed hit harder when banks' credit standards tightened.<sup>9</sup>

This analysis is not a test of the lending efficiency of financial institutions in financing SMEs as the quality of potential borrowers is not measured by the survey. However, the findings described in this special feature seem to point to discriminatory behaviour by banks with regard to the granting of loans to smaller companies. Since SMEs are often unable to switch from bank credit to other sources of finance, experiencing major financing obstacles can be a considerable challenge for them compared with larger firms. In view of SMEs' valuable contribution to employment and local development, prolonged credit rationing, which goes beyond justified credit risk considerations, could endanger economic growth.

With the advent of a new regulatory framework for the banking system, expanding access to finance while ensuring financial sector stability through responsible practices and an appropriate evaluation of risks is clearly an essential prerequisite to a sustained economic recovery.

<sup>9</sup> According to latest results of the Bank Lending Survey, the recent tightening of credit standards for SMEs was largely driven by risk-related factors, i.e. factors related to the overall deterioration of the economic outlook rather than by supply-side constraints (see ECB, "Determinants of bank lending standards and the impact of the financial turmoil", *Financial Stability Review*, June 2009). Moreover, looking at the ECB's MFI (monetary financial institution) interest rate statistics, the interest rates charged on small-sized loans to non-financial corporations (as a proxy of loans to SMEs) have increased more than those applied to large-sized loans (see the box entitled "Have euro area banks been more discriminating against smaller firms in recent years?", in ECB, *Financial Stability Review*, December 2010).

## C SYSTEMIC RISK METHODOLOGIES

*The financial crisis has illustrated the importance of timely and effective measures of systemic risk. The ECB and other policy-making institutions are currently devoting much time and effort to developing tools and models which can be used to monitor, identify and assess potential threats to the stability of the financial system. This special feature presents three such models recently developed at the ECB, each focusing on a different aspect of systemic risk. The first model uses a framework of multivariate regression quantiles to assess the contribution of individual financial institutions to systemic risk. The second model aims to capture financial institutions' shared exposure to common observed and unobserved drivers of financial distress using macro and credit risk data, and combines the estimated risk factors into coincident and early warning indicators. The third model relies on standard portfolio theory to aggregate individual financial stress measures into a coincident indicator of systemic stress.*

### INTRODUCTION

An understanding of systemic risk is central to macro-prudential supervisory and regulatory policies. Quantitative measures of systemic risk can be helpful in identifying and assessing threats to financial stability. In the context of the great complexity of systemic risk and the need to formulate well-targeted policy responses, it has proven useful to distinguish three main forms of systemic risk, as described, for example, by the President of the ECB and in previous FSR special features.<sup>1</sup> First, contagion risk refers to an initially idiosyncratic problem that becomes more widespread in the cross section, often in a sequential fashion. Second, financial imbalances such as credit and asset market bubbles that build up gradually over time may unravel suddenly, with detrimental effects on intermediaries and markets more or less simultaneously. Third, shared exposure to financial market shocks or adverse macroeconomic developments may negatively affect a range of financial intermediaries and

markets at the same time. These different forms of systemic risk can also be interrelated. For example, contagion risk may be more pronounced in a business cycle downturn, when financial intermediaries are already weakened. This special feature reviews three recent modelling frameworks developed at the ECB which can be used to assess these different aspects of systemic risk.<sup>2</sup> The first section describes an econometric framework that is used to estimate the extent to which individual financial institutions contribute to overall systemic risk, based on stock price data. This tool therefore takes a cross-sectional perspective on the system which is in line with the first source of systemic risk mentioned above. The second section discusses how coincident and early warning indicators of simultaneous failures of financial institutions can be constructed from cross-sectional data for financial and non-financial firms, combined with macro-financial and credit risk data. The coincident and early warning indicators capture shared exposure to common shocks and imbalances that may build up gradually over time, i.e. the second and third forms of systemic risk. The third and final section derives a coincident indicator of systemic stress in the financial system that aggregates information from different segments of the overall financial system. With its focus on certain financial market segments as a whole, this composite indicator may be well suited to capturing systemic stress emanating from market-to-market contagion as well as from other sources of systemic risk as

1 See J. C. Trichet, "Systemic risk", Clare Distinguished Lecture in Economics and Public Policy, Clare College, University of Cambridge, 10 December 2009; V. Constâncio, "Macro-prudential supervision in Europe", speech at the ECB-CEPR-CFS conference on macro-prudential regulation as an approach to containing systemic risk – economic foundations, diagnostic tools and policy instruments, Frankfurt am Main, 27 September 2010; ECB, "The concept of systemic risk", *Financial Stability Review*, December 2009; and O. de Bandt, P. Hartmann and J. L. Peydró-Alcade, "Systemic risk in banking: An update", in A. Berger, P. Molyneux and J. Wilson (eds.), *Oxford Handbook of Banking*, Oxford University Press, 2009.

2 For a brief review of the latest advances in systemic risk measurement in the general literature, see ECB, "New quantitative measures of systemic risk", *Financial Stability Review*, December 2010.

soon as they have more widespread effects. However, because the composite indicator does not build on firm-level data in contrast to the two previous indicators, it provides no information as to where strains are located at the level of individual financial institutions.

### MEASURING SYSTEMIC RISK CONTRIBUTION USING MULTIVARIATE REGRESSION QUANTILES

In the current debate on systemic risk, great emphasis has been placed on the question of how to measure the systemic importance of an individual financial institution. This is understandable since the failure of a systemically important financial institution could produce severe negative externalities with a bearing on the whole financial system, with the default of Lehman Brothers being a forceful case in point. It has been argued that the supervisory and regulatory treatment of such firms should take their systemic importance into account, thereby creating incentives for institutions to internalise some of these adverse externalities. For this purpose, however, financial authorities have to rely on quantifiable measures of the systemic risk created by individual financial institutions.

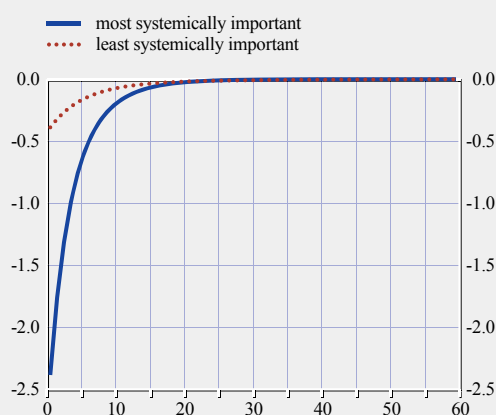
A popular means of assessing the systemic importance of a financial institution is to look at the sensitivity of its value at risk (VaR) to shocks to the whole financial system.<sup>3</sup> White, Kim and Manganelli propose a novel method of estimating such sensitivity.<sup>4</sup> The methodology is based on a vector autoregressive (VAR) model, in which the dependent variables are the VaR of individual financial institutions and of the overall market, which depend on (lagged) VaR and past shocks. The authors demonstrate the way in which the parameters of the model can be estimated using multivariate regression quantiles. Regression quantile estimates are known to be robust to extreme values. This is arguably important for the purpose of measuring systemic importance since situations of severe financial strains are rare events, and the model is intended to estimate linkages between individual financial institutions and the market as a whole under such rare circumstances. A multivariate version allows

researchers to measure directly tail dependence among the random variables of interest. By casting regression quantiles in a VAR framework, it is possible to estimate the spillover and feedback effects among the variables of the system, as well as the long-run VaR equilibria and associated impulse response functions.

Chart C.1 presents an application of this methodology. The model has been estimated on a sample of 22 large EU banks. It displays two average impulse responses. The solid line, labelled “most systemically important”, is the average impulse response of the three banks whose VaR is most affected by a shock to the stock market. The dashed line, labelled “least systemically important”, is the impulse response of the three banks whose VaR is least sensitive to a stock market shock.

- 3 See, for instance, T. Adrian and M. Brunnermeier, “CoVaR”, *Federal Reserve Bank of New York Staff Reports*, No 348, September 2008; V. V. Acharya, L. H. Pedersen, T. Philippon and M. Richardson, “Measuring Systemic Risk”, *New York University Working Paper*, 2010; and C. T. Brownlees and R. F. Engle, “Volatility, Correlation and Tails for Systemic Risk Measurement”, *New York University Working Paper*, 2010.
- 4 H. White, T.-H. Kim and S. Manganelli, “VAR for VaR: measuring systemic risk using multivariate regression”, *ECB Working Paper Series*, forthcoming.

Chart C.1 VAR for VaR impulse responses



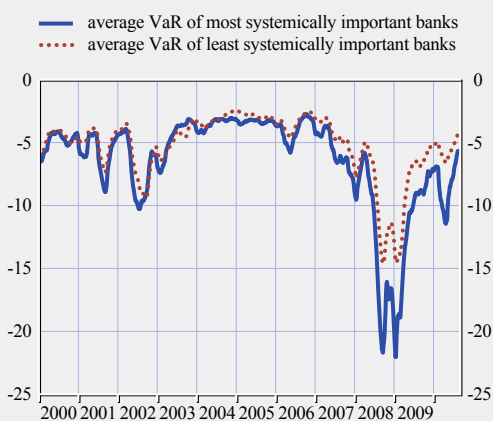
Sources: Thomson Reuters and ECB calculations.  
Notes: Average VaR reaction of the most systemic and least systemic banks to a 1% stock market shock. The horizontal axis measures weeks, while the vertical axis is expressed in percentage stock price weekly returns.

There is a striking difference in behaviour between the two groups. While the least systemically important banks are barely affected by common shocks (their VaR increases by less than 0.5%), the impact on the VaR of the most systemically important banks is more than five times higher. The persistence of the shock, on the other hand, is quite comparable, as in both cases it appears to die out after the twentieth week.

As a possible way to validate and illustrate the usefulness of the model, Chart C.2 plots over time the average VaR associated with the two groups of banks. To facilitate the comparison, the data were smoothed with a 60-day moving average. The chart presents two striking facts. In normal times, i.e. before the onset of the crisis in mid-2007, the VaR of the most and least systemically important groups of banks is roughly equal. The VaR of the least systemically important banks even exceeded the VaR of the most systemically important ones during some periods in 2003. The situation changes abruptly with the beginning of the financial crisis. The VaR of the most systemically important banks increases significantly more than that of the least systemically important banks from 2008 onwards, showing a greater exposure to common shocks.

**Chart C.2 VaR of most and least systemically important banks**

(Jan. 2000 – Nov. 2010)



Sources: Thomson Reuters and ECB calculations.

Notes: Time evolution of the average VaR of the most and least systemically important banks. 60-day moving average.

The application illustrates how the proposed methodology can be used to identify the set of banks which may be most exposed to common shocks, especially in times of crisis. Of course, this should only be considered as a partial, model-based screening device for identifying the most systemically important banks. Further analysis, market intelligence and sound judgement are other necessary elements to produce a reliable risk assessment of large banking groups.

#### COINCIDENT AND EARLY WARNING INDICATORS BASED ON CREDIT RISK CONDITIONS

Credit risk from correlated exposures is a dominant source of risk for financial firms. As a result, changes in credit risk conditions matter for the profitability and solvency of financial intermediaries, and overall financial stability. Schwaab, Koopman and Lucas study how macro-financial fundamentals and credit risk conditions interact to yield clusters of financial and non-financial firm failures.<sup>5</sup> After estimating the model parameters and the risk factors underlying financial distress, these factors are then combined to form coincident indicators and forward-looking indicators of common stress and the likelihood of simultaneous financial firm failures.

Conceptually, coincident measures of financial distress can be compared to thermometers that a policy-maker can plug into the financial system to read its “heat”. A straightforward indicator of such distress is the aggregate likelihood of failure for financial sector firms (banks as well as non-bank financial firms). However, such a time-varying failure rate is hard to obtain. First, financial firms rarely default. Second, risk factors other than readily available macroeconomic and financial indicators are important for quantifying financial distress. Financial firms are “special” along a number of dimensions, and additional data sources and risk factors are required to approximate their risk dynamics.

5 B. Schwaab, A. Lucas and S. J. Koopman, “Systemic risk diagnostics: coincident indicators and early warning signals”, *ECB Working Paper Series*, No 1327, April 2011.



Chart C.3 plots a model-implied failure rate for a large cross section of EU and US financial firms. The failure rate is the share of overall intermediaries that can be expected to fail over the next three months. The failure rate refers to approximately 450 US and 400 EU rated financial firms. It includes banks, insurers and real estate firms (also special-purpose vehicles and thrifts, as long as they have received a rating, but not hedge funds). As a result, the reported failure rate takes into account a significant part of the parallel banking system, i.e. non-bank financial firms that play an important role in the intermediation process.

The chart compares the model-based failure rates for a broad set of financial firms with the mean expected default probability (EDF) for the twenty largest financial firms in the United States and the EU. The distress in each region during the years 1991, 2001 and 2007-10 is visible from the chart. The financial sector failure rate is different from and almost always higher than what is suggested by an analysis of the average EDFs for the largest (and highly rated) financial firms in each region. Essentially, the model

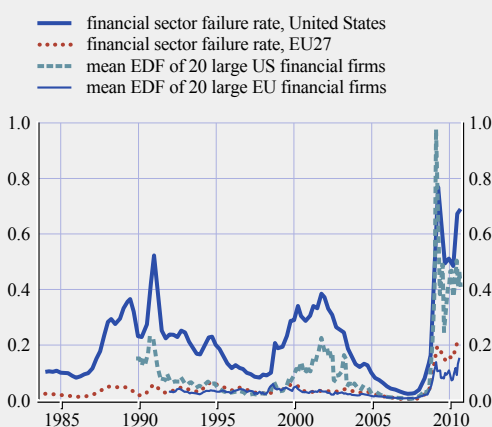
borrowes the risk dynamics as implied by the EDF data to infer the risk dynamics for the larger cross section of all rated financial firms. From the fourth quarter of 2010, both the mean EDF and the model-implied rate suggest high levels of common stress for EU financial firms.

Systemic risk is necessarily a multivariate concept, involving a system of banks and non-bank financial firms. The notion of systemic risk can be made operational as the risk of experiencing a systemic event, such as the simultaneous failure of a large number of financial institutions. Conceptually, simultaneous failures are analogous to disasters such as earthquakes and tsunamis – unlikely events for the most part, but with an asymmetrically large and potentially devastating impact if the risk materialises.

Joint failure probabilities can be inferred from the large-dimensional factor model. The model structure is chosen such that it captures the skewness and fat tails that are typical of joint failure distributions. The three-dimensional graph in Chart C.4 plots the probability of at least  $k\%$  of financial firms failing over a one-

**Chart C.3 Failure rates for financial firms in the EU and the United States**

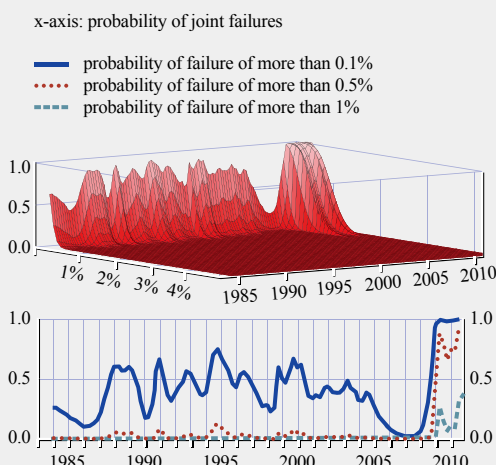
(Q1 1984 – Q4 2010)



Sources: Moody's, Moody's KMV, Thomson Reuters and ECB calculations.  
Note: The horizontal axis measures time, while the vertical axis measures quarterly failure probabilities.

**Chart C.4 Implied probability of simultaneous MFI failures in the EU**

(Q1 1984 – Q4 2010)



Sources: Moody's, Moody's KMV, Thomson Reuters and ECB calculations.  
Note: The horizontal axes measure time, while the vertical axes measure joint failure probabilities over a one-year horizon.

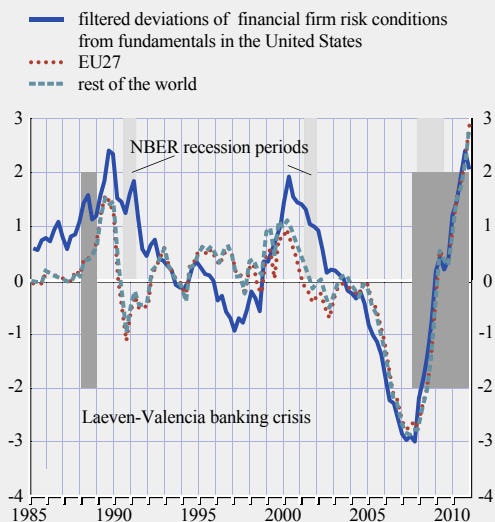
year horizon (z-axis), as a function of  $k$  (y-axis), over time from the first quarter of 1984 to the fourth quarter of 2010 (x-axis). The bottom panel cuts the three-dimensional plot into various slices along the time dimension: at 0.1%, 0.5% and 1% of overall financial sector firms. The estimates reveal that, in the fourth quarter of 2010, the probability of failure of at least 1% of financial sector firms (e.g. at least four firms of average size out of four hundred firms), at coincident levels of stress, is around 30%. As a result, there is a substantial risk of simultaneous failures. A more detailed analysis may reveal the sources of the joint risk.

Coincident risk indicators, such as current marginal and joint failure probabilities, do not provide forward-looking signals of financial distress. Recent research at the Bank for International Settlements (BIS) and the ECB on early warning indicators points towards the importance of credit market activity.<sup>6</sup> In order to obtain a related but different early warning signal for future financial stability, Schwaab, Koopman and Lucas<sup>7</sup> argue that in addition to tracking *credit quantities* over time (such as the private credit-to-GDP ratio), a policy-maker can also benefit from tracking *credit risk conditions* over time. Credit quantities and credit risks are related – it is harder to default if firms have easy and ample access to credit. Conversely, firms come under stress if credit is rationed.<sup>8</sup>

Chart C.5 plots a “credit risk deviations” early warning indicator. The indicator captures the extent to which local stress in a given industry (the financial industry in this case) differs from that suggested by macro-financial fundamentals. The figure compares estimated deviations in the United States, the EU and the rest of the world. The light and dark shaded areas correspond, respectively, to National Bureau of Economic Research (NBER) recession periods for the United States and episodes of banking crises as identified by Laeven and Valencia.<sup>9</sup> Deviations larger than one in all regions may define a global warning signal. The chart demonstrates that a significant and persistent decoupling of risk conditions from fundamentals preceded in

Chart C.5 Deviations of credit risk conditions from macro fundamentals for financial firms

(Q1 1984 – Q4 2010)



Sources: Moody's, Moody's KMV, Thomson Reuters, and ECB calculations.

Note: The horizontal axis measures time, while the vertical axis measures absolute deviations of risk conditions from fundamentals.

particular the financial crisis and recession of 2007-09. In the years leading up to the crisis, risk conditions were significantly below those suggested by macro-financial fundamentals. Currently, financial firms' risk conditions are substantially higher than those suggested by current macroeconomic fundamentals. This may reflect that the fundamentals do not take into account sovereign default risk conditions.

6 C. Borio and M. Drehmann, “Assessing the risk of banking crises – revisited”, *BIS Quarterly Review*, March 2009, and 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*, 2011.

7 See footnote 5.

8 For deviations of credit risk from observed macro-financial conditions, see S. Das, D. Duffie, N. Kapadia, and L. Saita, “Common Failings: How Corporate Defaults are Correlated”, *The Journal of Finance*, Vol. 62, Issue 1, February 2007. See also S. J. Koopman, A. Lucas, and B. Schwaab, “Modeling frailty-correlated defaults using many macroeconomic covariates”, *Journal of Econometrics*, Vol. 162, Issue 2, June 2011, forthcoming.

9 L. Laeven and F. Valencia, “Resolution of Banking Crises: The Good, the Bad, and the Ugly”, *IMF Working Paper*, No 10/146, June 2010. This research suggests two banking crises in the United States (in 1988 and from 2007 onwards) and one in the EU (from 2008 onwards).

## A COINCIDENT INDICATOR OF SYSTEMIC STRESS

This section presents a recent indicator of contemporaneous financial stress called the “composite indicator of systemic stress” or simply CISS (pronounced “kiss”).<sup>10</sup> It aims to measure the current state of instability, i.e. the current level of frictions, stresses and strains (or the absence thereof) in the financial system and to condense that state of instability into a single statistic. The CISS permits not only the real-time monitoring and assessment of the stress level in the whole financial system, but may also help to delineate and characterise historical episodes of “financial crises”. Such episodes might then be better compared and studied empirically in the context of early warning signal models, for instance.<sup>11</sup> Last but not least, composite financial stress indicators can also be used to gauge the impact of policy measures directed towards mitigating systemic stress.

The CISS captures several symptoms of stress in different segments of the financial system, such as increases in agents’ uncertainty (e.g. about asset valuations or the behaviour of other investors), in investor disagreement or in information asymmetries intensifying problems of adverse selection and moral hazard (e.g. between borrowers and lenders). It also captures lower preferences for holding risky or illiquid assets (flight to quality and liquidity, respectively). The CISS measures such stress symptoms mainly by financial market indicators which are quite standard in the literature (such as volatilities, risk spreads and cumulative valuation losses). These indicators are readily available for many countries at a daily frequency in general and with relatively long data histories.

The main methodological innovation of the CISS compared with alternative financial stress indicators is the application of standard portfolio theory to the aggregation of the underlying individual stress measures into the composite indicator. For this purpose, 15 homogenised<sup>12</sup> individual stress measures are

first grouped into five sub-indices representing arguably the most important segments of an economy’s financial system: the bank and non-bank financial intermediaries sector; money markets; equity and bond markets; and foreign exchange markets. Each sub-index is calculated as the simple mean of the transformed values of three individual stress measures for each market segment. The five sub-indices are then aggregated on the basis of their time-varying cross-correlation structure in the same way as the overall risk of an asset portfolio is calculated from the risk characteristics of its individual assets. As a result, the CISS puts relatively more weight on situations in which stress prevails in several market segments at the same time. The second element of the aggregation scheme featuring systemic risk is the fact that the “portfolio weights” attached to each of the five sub-indices reflect to some extent their relative importance for economic activity.<sup>13</sup>

Chart C.6 displays the CISS calculated for the euro area as a whole.<sup>14</sup> It clearly shows how systemic stress emerged in August 2007; how the situation escalated into a full-blown financial crisis after the bankruptcy of Lehman Brothers in September 2008; and how the sovereign debt crisis interrupted the process of relaxation from April 2010.

10 D. Hollo, M. Kremer and M. Lo Duca, “CISS – A ‘Composite Indicator of Systemic Stress’ in the Financial System”, November 2010, available at <http://www.ssrn.com>. The CISS was briefly introduced in ECB, “Analytical models and tools for the identification and assessment of systemic risk”, *Financial Stability Review*, June 2010.

11 See, for example, M. Lo Duca and T. Peltonen, “Macro-financial vulnerabilities and future financial stress: assessing systemic risks and predicting systemic events”, *ECB Working Paper Series*, No 1311, March 2011.

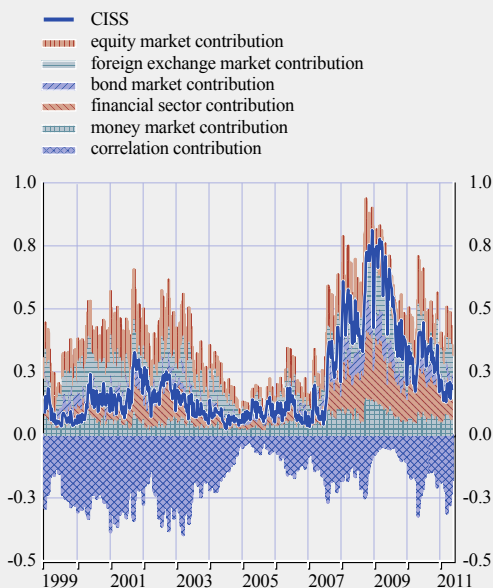
12 Before aggregation, the individual stress measures need to be harmonised on a common scale. For this purpose, each raw indicator is transformed on the basis of order statistics such that each transformed indicator measures financial stress on an ordinal scale ranging from zero to one, a property also inherited by the CISS. For details, see D. Hollo, M. Kremer and M. Lo Duca, *op. cit.*

13 The sub-index weights for the euro area CISS are: money market: 15%; bond market: 15%; equity market: 25%; financial intermediaries: 30%; and foreign exchange market: 15%.

14 The CISS is also available as an EU aggregate, where the euro area CISS is averaged with CISSs for the Czech Republic, Denmark, Hungary, Poland, Sweden and the United Kingdom, based on relative real GDP weights.

Chart C.6 Composite indicator of systemic stress (CISS) for the euro area

(Jan. 1999 – May 2011)



Sources: Thomson Reuters, ECB and ECB calculations.

The chart also plots the stacked plain contributions from each sub-index by ignoring their cross-correlations. The upper border of the upper area is thus equivalent to the weighted average of the five sub-indices. Such averaging implicitly assumes perfect correlation across all of the sub-indices all the time. The difference between this “simple average” CISS and the CISS proper thus reflects the impact of the cross-correlations and is plotted in the chart as the area below the zero line.

One can see that whenever financial stress is extremely high (or extremely low) in all market segments at the same time, all cross-correlations increase strongly and the CISS approaches the simple average of sub-indices. It can therefore be said that the simple average overstates the level of financial stress in normal times when correlations are relatively moderate, and introduces a bias in its information content in such circumstances. For instance, the CISS clearly identifies the current financial crisis from August 2007 as by far the most severe

period of systemic stress over the past quarter of a century.<sup>15</sup> By contrast, the simple average of sub-indices would not be able to differentiate between the peak levels of stress caused by the dot-com bubble and bust cycle around the turn of the century (which was mainly driven by stock market stress), and during the first year of the “sub-prime” crisis (i.e. from its outbreak in August 2007 until the bankruptcy of Lehman Brothers). Since this may appear implausible with the benefit of hindsight, indicators not incorporating the systemic nature of stress could provide misleading information regarding the “true levels” of strains in the financial system as a whole.

In line with contemporaneous definitions of systemic risk, the CISS is designed to capture two crucial characteristics of systemic stress, namely that instability is widespread within the financial system (“horizontal view”) and usually very costly for an economy (“vertical view”).<sup>16</sup> A simple way to think of the second view is that activity in the real economy becomes severely endangered if financial stress reaches a certain threshold level. Chart C.7 shows the graphical results of a parsimonious statistical exercise estimating and testing such a critical benchmark level of systemic stress. The procedure tests the hypothesis that the empirical relationship between annual growth in industrial production and the CISS (four months lagged) switches across two different regimes, where the regimes depend on whether the CISS lies above or below a certain threshold level.<sup>17</sup> The results indeed suggest that the economy behaves very differently when the CISS reaches a level of 0.36 or above. While at lower levels of the CISS the scatter plot appears to be purely

15 The data sample of a backward extended version of the euro area CISS starts in January 1987.

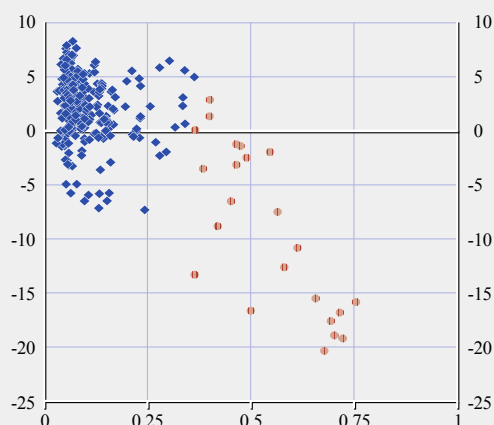
16 See ECB, “The concept of systemic risk”, *Financial Stability Review*, December 2009.

17 The procedure applies a grid search algorithm, and the preferred threshold level is the one which rejects the null hypothesis of no regime difference with the highest likelihood. See B. E. Hansen, “Sample splitting and threshold estimation”, *Econometrica*, Vol. 68, No 3, May 2000.

**Chart C.7 Financial stress and economic activity in the euro area**

(Sep. 1987 – Oct. 2010)

x-axis: CISS  
y-axis: industrial production growth  
(percentage change per annum)



Sources: Eurostat, Thomson Reuters, ECB and ECB calculations.  
Notes: Financial stress is measured by the CISS. The CISS is plotted against annual growth rates in industrial production four months ahead. Red dots represent such data pairs for months in which the CISS exceeds an estimated threshold level of 0.36.

random (blue diamonds), at higher levels of the CISS a clear negative relationship emerges between industrial production and financial stress (red dots), as one can expect if financial stress becomes widespread and thus systemic.

### CONCLUDING REMARKS

The recent financial crisis is an overwhelming example of systemic risk which had gradually built up to a point where the amplification and propagation of a series of relatively small shocks eventually led to widespread financial collapse and a global recession only comparable to the Great Depression. There is general agreement that in order to avoid such disasters happening again, financial authorities need to better identify, assess and control the level of systemic risk prevailing in the financial sector. But this is easier said than done because of the complexity as well as the multifaceted and elusive nature of systemic risk. In addition, the theoretical and empirical research on systemic risk is still in its early developmental stage. This, in turn, implies that financial authorities have to build

up, from scratch, a wide range of measures and tools covering different aspects of systemic risk in different parts of the financial system, with each tool having its specific purposes, advantages and caveats that must always be borne in mind when interpreting its results. This of course also applies to the three new systemic risk measurement tools presented in this special feature.

## D FINANCIAL RESOLUTION ARRANGEMENTS TO STRENGTHEN FINANCIAL STABILITY: BANK LEVIES, RESOLUTION FUNDS AND DEPOSIT GUARANTEE SCHEMES

*Fundamental reforms of regulation and supervision are currently under way – both at international and European level – to address the deficiencies exposed by the financial crisis. In this context, a range of policy approaches have been developed, aimed at mitigating the burden on taxpayers and minimising future reliance on public funds to bail out financial institutions.*

*This special feature examines the recent initiatives undertaken by several EU Member States to implement bank levies and resolution funds, in some cases exploiting synergies with deposit guarantee schemes (DGSs). These financing mechanisms are fully supported by the European Commission in the context of the proposed EU framework for bank recovery and resolution.*

### INTRODUCTION

In order to improve crisis resolution mechanisms, to reduce moral hazard and build up financial buffers against possible future crises, the G20 leaders – at their June 2010 Toronto meeting – undertook to develop a new policy framework. They also agreed that the financial sector should make a fair and substantial contribution towards paying for any burdens associated with possible government interventions, where they occur, to repair the financial system or fund resolution.<sup>1</sup> Countries intending to implement measures to this end should respect a number of principles to ensure a minimum level of coordination.<sup>2</sup>

In the course of 2010 broad support for private sector contributions was also expressed by international financial institutions such as the International Monetary Fund (IMF), the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS).<sup>3</sup>

In the EU, even more precise guidance was provided by the European Council to the

Member States in its conclusions of 17 June 2010: “Member States should introduce systems of levies and taxes on financial institutions to ensure fair burden-sharing and to set incentives to contain systemic risk.<sup>4</sup> Such levies or taxes should be part of a credible resolution framework. Further work is urgently required on their main features, and issues relating to the level playing field and the cumulative impact of various regulatory measures should be carefully assessed.”

In accordance with these European Council conclusions, several Member States have already established or begun to develop a country-specific system whereby national financial sectors will help to bear the net cost of a financial crisis. Other Member States are actively considering the introduction of such measures and are likely to follow this lead.

This special feature provides an update on the ongoing initiatives to implement bank levies and resolution funds in the Member States. These plans are part of a broader range of initiatives to strengthen financial stability in the EU. When assessing whether to introduce ex ante financing arrangements for bank resolution funds, full account should be taken of the effects of the pending major overhaul of the prudential framework, aimed at strengthening the resilience, safety and soundness of the banking system. To that purpose, the European Commission also

- 1 G20 Toronto Summit Declaration of 26-27 June 2010.
- 2 The principles on levies and taxes agreed by the G20 are the following: i) protect taxpayers; ii) reduce risks from the financial system; iii) protect the flow of credit in good times and bad times; iv) take into account individual countries’ circumstances and options; and v) help promote a level playing field.
- 3 The IMF’s support for measures related to levies and taxes was expressed in its final report for the G20 entitled “A Fair and Substantial Contribution by the Financial Sector”, June 2010. In their joint paper on capital and liquidity surcharges and financial levies and taxes, the IMF, FSB and BCBS emphasised that any levy should be accompanied by the creation of an effective resolution regime; that it should ideally be designed as a risk-based charge; and that an ex ante levy would avoid survivor bias and be less pro-cyclical than ex post measures. See also *Draft ECOFIN report – Preparation of the European Council on the state of play on measures in the financial sector in response to the crisis*, 2 June 2010, 10361/10.
- 4 In the same conclusions, the Czech Republic reserved its right not to introduce these measures.

considers private financing arrangements to be an important part of the new crisis management and resolution framework.

### BANK LEVIES AND TAXES

Although the working assumption – as a follow-up to the June 2010 European Council meeting – is that Member States<sup>5</sup> should introduce a system of levies or taxes, no deadline has been set for their implementation. So far, eight Member States have introduced a bank levy *stricto sensu* (Germany, France, Latvia, Hungary, Austria, Portugal, Sweden and the United Kingdom – see Table D.1).<sup>6</sup> Other countries are in the process of introducing systems of levies and taxes (e.g. Cyprus, Lithuania and Slovenia). Some Member States are in favour of, or might consider, introducing systems of levies or taxes at a later stage when there is more clarity in terms

of: i) EU coordination; ii) the interference of a levy or tax with other regulatory measures; and iii) the potential credit supply effects of a levy or tax. Finally, a few Member States would consider introducing them in the context of an EU-wide approach to crisis resolution.

In most of the above-mentioned countries, the approach based on imposing a levy on banks is broadly favoured over a financial transaction tax (also known as a Tobin tax).<sup>7</sup> A financial

<sup>5</sup> Except for the Czech Republic.

<sup>6</sup> Denmark and Belgium have introduced levies in the context of DGSs. In Denmark, these measures include *ex post* funding.

<sup>7</sup> Recently, there has been renewed interest in the introduction of a global tax on financial transactions as a means of reducing the size of the financial sector and deterring excessive risk-taking. The tax would be a sort of generalised Tobin tax, which would be levied on a broader set of financial transactions than foreign currency transactions alone, as originally proposed by Tobin.

Table D.1 List of bank levies in place

(March 2011)

	Destination of proceeds	Duration	Scope	Base
DE	Stability fund	Permanent	All banks	Liabilities excluding capital and deposits + derivatives
FR	General budget	Permanent	All banks with risk-weighted assets over €500 million	Risk-weighted assets
LV	General budget	Permanent	Credit institutions	Liabilities excluding equity capital, deposits subject to a deposit guarantee scheme, mortgage bonds and subordinated liabilities
HU	General budget	Temporary	Credit institutions, insurers, other financial organisations	Unconsolidated (modified) balance sheet total
AT	General budget	Permanent	All banks with liabilities above €1 billion	Unconsolidated (modified) balance sheet total + “add on” for financial derivatives on trading book
PT	General budget	Permanent	Credit institutions	Liabilities excluding tier one and tier two capital and insured deposits + notional amount of derivatives
SE	Stability fund	Permanent	All banks, other credit institutions	Liabilities excluding capital
UK	General budget	Permanent	Banks with aggregate liabilities above GBP 20 billion	Liabilities excluding tier one capital, insured deposits, policyholder liabilities and assets qualifying for the Financial Services Authority liquidity buffer

Sources: ECB opinions and publicly available sources.

transaction tax would entail great uncertainty with respect to its effectiveness, the risks surrounding its possible impact on financial market conditions, and its potential for revenue generation.

Apart from the Tobin tax, the European Commission in its 2010 Communication on the Taxation of the Financial Sector also proposed a Financial Activities Tax (FAT), to be levied on profits and wages, which might be less attuned to behavioural changes, but a more efficient way to raise money to consolidate the public balance sheet, which has been stretched by the financial crisis.

The country-specific systems envisage a levy on all banks, with France, Austria and the United Kingdom introducing a (minimum) size threshold for determining which banks are subject to the tax. Many Member States have also widened the net to include credit institutions, with Hungary extending the scope of application of the levy to other financial sector institutions, such as insurers.

In the EU initiatives, the bank levy/tax is directly linked to the objective of recouping the costs of past bail-outs (ex post levies), or financing a rescue fund (ex ante levies).

Ex ante funding may be an appropriate choice, as it diverts the cost of the crisis from the taxpayer to the financial sector. The impact on moral hazard is uncertain. On the one hand, the costs of taking on excessive risk will be immediately borne by the financial sector. This is especially true if the funding is, at least partially, contingent on the risk profile of the contributing financial institutions and targets identified sources of systemic risk such as excess leverage, risk-taking and maturity mismatches. Examples of the different approaches include higher rates for larger institutions and a fee for derivatives (Germany), different rates for different kinds of institutions, such as insurance companies and broker dealers (Hungary),

and lower rates for longer-term funding (United Kingdom).<sup>8</sup> On the other hand, the existence of a rescue fund can induce moral hazard as it makes the existence of a safety net for the financial sector more explicit. Moreover, even under a system of ex ante funding, negative externalities may remain. Financial institutions would still be able to privatise the gains of excessive risk, while transferring losses to a rescue fund.

Ex post funding is already being practised by some Member States to obtain reimbursement for their earlier efforts to keep the financial system functioning. An example is the temporary tax on bonuses paid in the financial sector in the United Kingdom and France in 2010.<sup>9</sup> However, ex post recovery charges have significant drawbacks, as emphasised by the IMF in its final report for the G20.<sup>10</sup> First, they impose a burden only on industry survivors; failed institutions pay nothing. Second, ex post financing may be pro-cyclical, requiring the industry to meet costs precisely when it is least able to do so. Thus, while they may complement a system of ex ante charges, sole reliance on ex post charges may be unwise, as ex ante funding is a crucial element of a credible resolution framework.

As a tax base, the choice of liabilities, net of equity and other insured sources of funding, appears a sensible choice in many Member States. While in principle it would be desirable to target a levy specifically on the most volatile

8 The importance of the levy being proportional to the contribution of individual banks to systemic risk is broadly acknowledged. However, this raises considerable challenges about how to define and measure systemic risk and its application into a tax. Furthermore, a levy might trigger unintended consequences, for instance by encouraging regulatory arbitrage and disintermediation.

9 The United Kingdom implemented a temporary bank payroll tax in late 2009. It taxes bank employees' bonuses above GBP 25,000 at 50%. The tax raised a net amount of GBP 2.3 billion. France followed the United Kingdom's lead and taxed bonuses above €27,500 granted to a sub-group of financial sector workers in 2009 at 50%. See "Financial Sector Taxation: The IMF's Report to the G-20 and Background Material", IMF, September 2010.

10 See footnote 3 above.



liabilities as well as on measures of maturity mismatch (hence accounting to some extent for the assets' risk profile), a pragmatic approach would be to focus on a broad definition of liability. This would also have the advantage of requiring a lower rate than in the case of a narrower base, and thus be potentially less distorting.<sup>11</sup>

#### The double-charging issue

In general, the tax parameters (base, rate and scope) of the country-specific systems differ considerably and, in some cases, are unrelated to the medium-term objective of setting up a credible resolution framework.

This has raised concerns of competitive distortions arising in the short term within the Single Market. On this issue, the European Council agreed in October 2010 that "in line with the Council's report, there should be further coordination between the different levy schemes in place in order to avoid double-charging". In December 2010 the Council underscored the need to "minimise risks of double charging and of distortions of the level playing field within the Single Market".

Across the Member States which have introduced bank levies, there are various approaches with regard to the institutions falling within the scope of the tax base. All countries include resident banks in the scope of their tax base. Some, however, also include foreign branches of resident banks and/or home branches of foreign banks. This variety of approaches leads to a large matrix of possible tax overlaps and gaps, which Member States should try to avoid. In this sense, it is relevant to keep in mind the EU's ongoing efforts to improve tax harmonisation (see "European agenda" below).

Double-charging issues involving cross-border financial institutions can arise if a country that introduces the levy also taxes:

- subsidiaries of its own financial institutions in other EU countries (which is the case for both the French and British levies);
- foreign branches of EU banks resident in that country (which is the case for Latvia, Hungary, Austria and the United Kingdom).

At this point in time, the magnitude of the double-charging tax problem, based on the limited number of levies already in place or being set up, appears to be moderate.<sup>12</sup>

However, this problem could take on larger proportions if more Member States introduce levies. Indeed, the incentives to do so tend to increase in tandem with the number of Member States imposing a levy. Overall, 21 Member States host EU subsidiaries with a total share of more than 5% of the banking sector's total assets, while nine Member States host EU branches of an equivalent significance. The potential magnitude of double-charging is therefore high, in particular if Member States introduce levies covering subsidiaries in other EU countries or branches of foreign EU banks. In this regard, EU banks with subsidiaries or branches in the central and eastern European countries appear to be most exposed to double taxation, owing to the presence of significant foreign EU subsidiaries and branches in their domestic banking sectors.

#### RESOLUTION FUNDS

For some Member States, a possible destination for the proceeds of taxes/levies would be a

<sup>11</sup> In the light of the experience during the crisis, off-balance-sheet exposures should also be included in the base of the levy, at least insofar as they have systemic implications (for instance, implicit support to asset-backed commercial paper conduits, structured investment vehicles, etc.). However, this may not be easy to implement in the near future.

<sup>12</sup> This assessment is based on a first analysis carried out on the basis of a mapping exercise of large European banking groups with significant cross-border banking activities, conducted by the Banking Supervision Committee (BSC) of the European System of Central Banks (ESCB) in 2008.

resolution fund fed by ex ante levies and based on harmonised criteria.<sup>13</sup>

The primary purpose of a resolution fund should be to mitigate the effects of a failure on different stakeholders by trying to maximise the value of a failing bank's remaining assets and to facilitate, if possible, a quick return of assets to their productive use, e.g. when selling the bank to another bank or when financing a good bank/bad bank solution. Resolution funds may also help with the transfer of assets in the case of bankruptcy. Furthermore, a resolution fund can help to lower the overall costs of resolution – since the alternative is full-blown bankruptcy – by avoiding fire sales of assets and ensuring a smoother path to a takeover or a good bank/bad bank solution.

The establishment of resolution funds in the EU should be considered as part of a broader range of initiatives aimed at strengthening financial stability. In this context, enhanced prevention measures should minimise the likelihood and severity of a bank failure. Moreover, efficient procedures leading to earlier intervention and more effective resolution mechanisms should reduce the cost of a crisis. To reduce the risk of moral hazard, it is crucial that resolution funds are not used as insurance against failure or to bail out failing banks. In addition, clear, stringent and properly communicated conditions for their use need to be defined, such as the lack of an automatic link between the fees paid in and the funds paid out to any one bank.

At the current juncture, the preference for establishing national resolution funds with EU level harmonisation with respect to their main features is a pragmatic and realistic option. It should not exclude, however, the possibility of establishing, at a later stage, a European “fund of funds” to address the issues arising in respect of cross-border banks.

A network of national resolution funds may raise coordination issues during a crisis, similar to those raised in the context of burden-sharing by public funds. It may also create serious concerns regarding the maintenance of a level playing field

across Member States. In order to address these concerns and to minimise market distortions, a high degree of cross-country harmonisation of the criteria and their application is essential.

Some Member States have already taken action to set up national resolution funds (see Table D.2). There are two bank resolution funds currently in place in the EU financed by ex ante levies imposed on banks or other types of financial institutions (Germany and Sweden), while another is planned in Cyprus. The Swedish fund is expected to be coordinated with the deposit guarantee scheme (DGS), showing that Member States aim to exploit the synergies between resolution funds and DGSs. The Banque Centrale du Luxembourg has proposed a Financial Stability Fund combining DGS and resolution fund functions.

Moreover, in the light of the European Commission's consultation on technical details of a possible European crisis management framework,<sup>14</sup> certain aspects of the implementation of resolution funding mechanisms must be examined further, such as: i) the exact purposes for which the funds might be used; ii) the trigger and timing of the intervention (with privately financed money); iii) the interaction with DGSs; iv) governance and related State aid issues; v) the basis for raising the levy from the private sector; vi) the potential pro-cyclical effects, taking into account the regulatory measures being adopted at EU level; and vii) the relation between the resolution funding mechanism and the resolution authority.

13 While some Member States could find it convenient to use these contributions to reduce their public deficit, in the long run, failure to establish dedicated resolution funds may result in the financial sector becoming more dependent on public funds should new crises occur, and further reinforce the moral hazard problem associated with “too big to fail” institutions. Furthermore, there would always be a risk that levies that are accrued to the general budget without earmarking and ring-fencing could be diverted for other uses. In principle, it would be preferable that a dedicated resolution fund is created under the control of an independent resolution authority/agency which should decide on how the available resources are to be used.

14 “Technical details of a possible EU framework for bank recovery and resolution”, Commission working document released for public consultation on 6 January 2011, available at [http://ec.europa.eu/internal\\_market/consultations/2011/crisis\\_management\\_en.htm](http://ec.europa.eu/internal_market/consultations/2011/crisis_management_en.htm)

**Table D.2 Overview of national initiatives on resolution funds**

(March 2011)

	Duration	Scope	Base	Measures to be financed	Target size
DE	Permanent	All banks	Liabilities excluding capital and deposits + derivatives	Creating bridge banks or acquiring participations in banks acquiring assets from failing banks; issuing guarantees for bonds issued by acquiring banks; recapitalising acquiring banks.	Respective regulation not yet decided
SE	Permanent	All banks, other credit institutions	Liabilities excluding capital	Government measures such as capital injection, loans and guarantees to support financial system.	2.5% of GDP after 15 years
CY <sup>1)</sup>	Permanent	Credit institutions	Liabilities excluding capital	Supporting and restructuring banks with capital injections and other means.	Initial target: 3% of GDP
LU <sup>2)</sup>	Permanent	Credit institutions, insurers	Not known yet	Paying out deposits and financing deposit transfers	Not known yet

Sources: ECB opinions; websites and national information notes; S. Schich and B. Kim, "Systemic Financial Crisis: How to Fund Resolution", OECD Journal: Financial Market Trends 2010/2.

1) CY resolution fund has been established by law, but its organisation and operational framework are expected to be completed during 2011.  
2) A proposal for a Financial Stability Fund combining DGS and resolution fund functions has been prepared by the Banque Centrale du Luxembourg.

### SYNERGIES WITH DEPOSIT GUARANTEE SCHEMES

As also underlined by the European Commission in its communications,<sup>15</sup> the establishment of resolution funds requires that potential synergies with DGSs are fully explored.

Indeed, the core functions and objectives served by DGSs and resolution funds can be complementary. Resolution funds, for example, can offer another way of preserving the wealth of depositors and their access to their money. Some Member States' DGSs are already active in bank resolution, such as those in Spain<sup>16</sup> and Italy.

Some Member States have voiced concerns about the difficulty of determining the right of funding for a combined resolution fund and DGS, the impact of collecting the funds, and the considerable differences in managing DGSs across Member States.

There are various approaches in the EU to the management of DGSs and resolution funds.

No prescriptive provisions should limit these arrangements as long as the objectives of the respective schemes are fully respected. Nonetheless, for a country whose DGS already performs resolution functions, the objectives of the DGS may be combined with those of the resolution fund. This simplification would benefit the whole system.

The possible sources of synergies are at least threefold. First, one operational synergy is economies of scale: a joint fund could be smaller than two separate ones and management costs could decrease, as well as the cost of collecting contributions. Making only one payment would be simpler both for administration and for the financial industry.

15 European Commission Communication on bank resolution funds of 26 May 2010, COM(2010) 254 final; and Communication on an EU framework for crisis management in the financial sector of 20 October 2010, COM(2010) 579 final.

16 Apart from its own competences on resolution, the Spanish DGS also partly finances the Spanish Fund for an Orderly Restructuring of the Banking System (FROB), which is a resolution fund that combines both public and private contributions

Second, prompt action financed by a resolution fund may be cheaper than waiting for formal bankruptcy proceedings to begin. For example, depositors could be reimbursed and asset fire sales avoided. Also, transferring assets to another bank in the context of a facilitated sale would be beneficial to depositors, who would otherwise only be protected up to a certain limit, as well as ensuring service continuity. Depositor reimbursement, transferral of assets and service continuity are aspects that DGSs already deal with, hence a resolution fund could benefit from their expertise.

Third, strong funding provisions including ex ante components increase the range of options available in resolution cases. Some DGSs are already ex ante funded, with the European Commission proposing to make this a mandatory feature,<sup>17</sup> which may be taken into account when considering resolution funding mechanisms.

Risks arise when the differences in function and scope between resolution funds and DGSs are not carefully thought through. For example, the group of member institutions are not necessarily the same. The conditions for the use of deposit guarantee funds for means of resolution have to be strongly bounded to avoid a deterioration of confidence in the DGSs.

The financial resources available for pay-out should be ring-fenced within the balance of the fund and used to cover the part of the resolution cost that indirectly ensures the depositors' protection.

Finally, ex ante funding is a crucial element of a credible resolution framework and must therefore be maintained.

#### EUROPEAN AGENDA

The harmonisation of bank levies and resolution funding at EU level is particularly important. This is because the introduction of different bank levies and resolution funds could undermine the process of financial integration by introducing

elements of fiscal, regulatory and supervisory fragmentation.

The different initiatives must be coordinated, for example through bilateral agreements. At the national level, the design and implementation of domestic schemes should ensure the necessary flexibility to facilitate a move towards greater harmonisation of both bank levies and resolution funds, e.g. by including rendez-vous clauses<sup>18</sup> or by bilateral double taxation agreements. In this respect, the European Commission supports, as a general goal, a pan-European DGS, which may also tie into resolution funding and the longer-term “fund of funds” solution. Agreement on the scope of financial levies is crucial to solve the issues relating to double-charging and maintaining a level playing field. However, it is acknowledged that the achievement of such a consensus is not realistic in the short term.

#### CONCLUDING REMARKS

The financial sector has imposed significant costs on the public by privatising profits prior to the crisis and then relying on public support to continue operations. For this reason, mechanisms have been examined both to recoup the losses of the crisis and to create provisions against future events. Ex ante funding is a crucial element since it may reduce moral hazard and improves the authorities' ability to react to crises earlier, thus strengthening the credibility of such actions. Taxes and levies are valuable revenue-raising mechanisms to finance crisis measures. Uncertainty remains on how they would affect the particular problem of moral hazard in the financial sector. In the design of taxes and levies, accumulation of different, counterproductive measures need to be avoided. However, maintaining a level playing field and coordination between Member States is paramount in order to avoid distortion of taxes, levies, fund contributions and resolution tools.

<sup>17</sup> European Commission Proposal for a Directive on Deposit Guarantee Schemes of 12 July 2010.

<sup>18</sup> These document the Member States' intention to come back to an issue for which no agreement could be reached yet.



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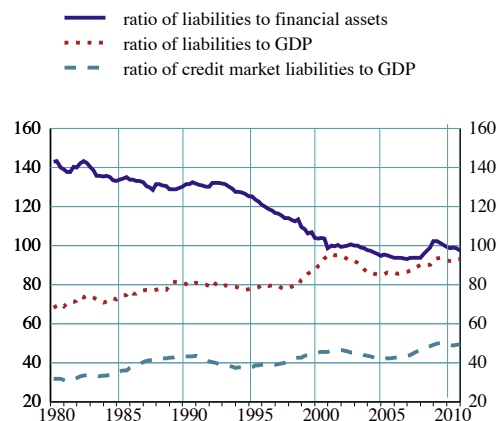


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# I EXTERNAL ENVIRONMENT

**Chart S1 US non-farm, non-financial corporate sector business liabilities**

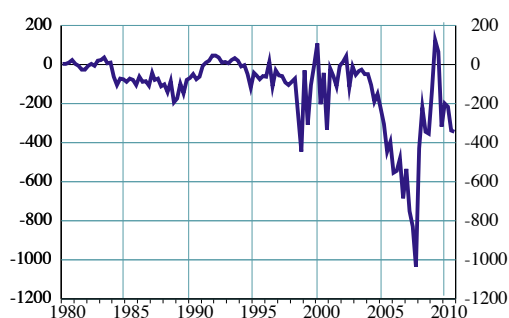
(Q1 1980 - Q4 2010; percentages)



Sources: Thomson Reuters, Bank for International Settlements (BIS), Eurostat and ECB calculations.

**Chart S2 US non-farm, non-financial corporate sector business net equity issuance**

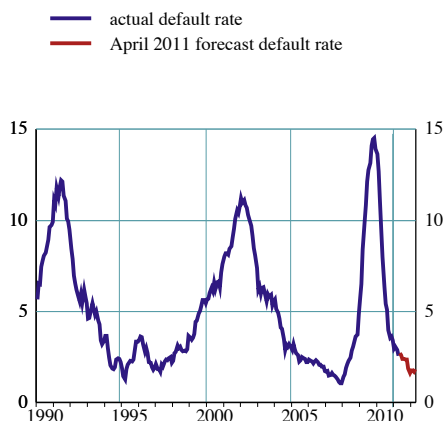
(Q1 1980 - Q4 2010; USD billions; seasonally adjusted and annualised quarterly data)



Source: BIS.

**Chart S3 US speculative-grade corporations' actual and forecast default rates**

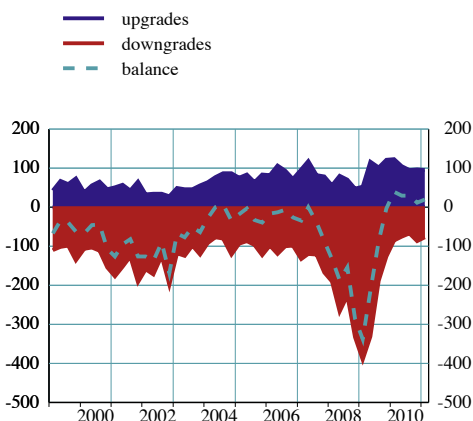
(Jan. 1990 - Apr. 2012; percentages; 12-month trailing sum)



Source: Moody's.

**Chart S4 US corporate sector rating changes**

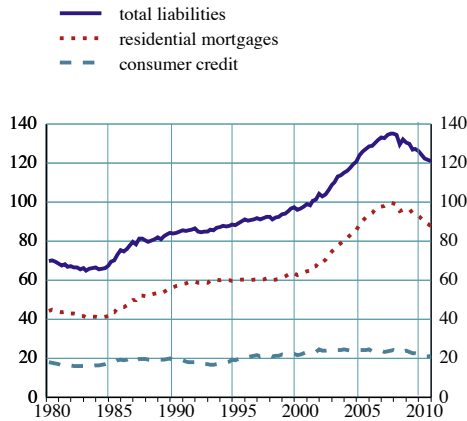
(Q1 1999 - Q1 2011; number)



Sources: Moody's and ECB calculations.

### Chart S5 US household sector debt

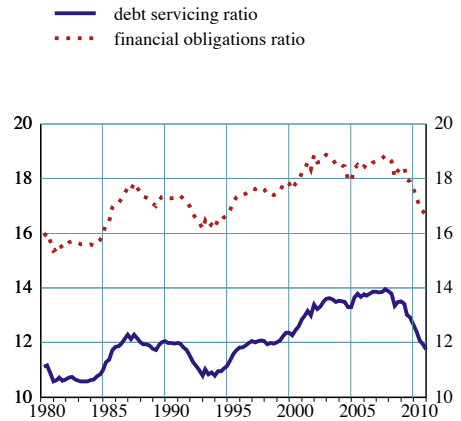
(Q1 1980 - Q4 2010; percentage of disposable income)



Sources: Thomson Reuters, BIS and ECB

### Chart S6 US household sector debt burden

(Q1 1980 - Q4 2010; percentage of disposable income)

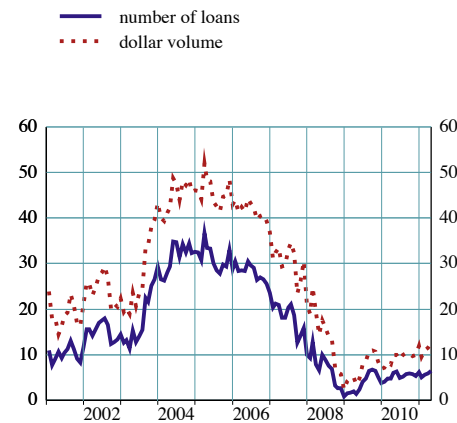


Source: Thomson Reuters.

Notes: The debt servicing ratio represents the amount of debt payments as a percentage of disposable income. The financial obligations ratio also includes automobile lease payments, rental payments on tenant-occupied property, homeowners' insurance and property tax payments.

### Chart S7 Share of adjustable rate mortgages in the United States

(Jan. 2001 - Apr. 2011; percentage of total new mortgages)



Source: Thomson Reuters.

### Chart S8 US general government and federal debt

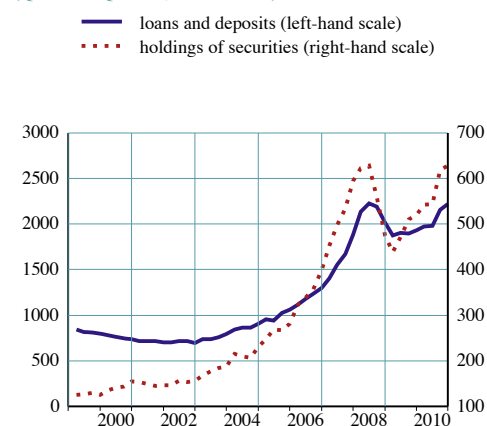
(Q1 1980 - Q1 2011; percentage of GDP)



Sources: Board of Governors of the Federal Reserve System, Eurostat, Thomson Reuters and ECB calculations.  
Note: General government gross debt comprises federal, state and local government gross debt.

**Chart S9 International positions of all BIS reporting banks vis-à-vis emerging markets**

(Q1 1999 - Q4 2010; USD billions)



Sources: BIS and ECB calculations.

**Table S1 Financial vulnerability indicators for selected emerging market economies**

	Real GDP growth (% change per annum)			Inflation (% change per annum)			Current account balance (% of GDP)		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
<b>Asia</b>									
China	10.3	9.6	9.5	4.7	4.2	2.0	5.2	5.7	6.3
Hong Kong	6.8	5.4	4.2	3.1	4.0	4.4	6.6	5.2	5.5
India	10.4	8.2	7.8	8.6	7.7	5.9	-3.2	-3.7	-3.8
Indonesia	6.1	6.2	6.5	7.0	7.3	5.5	0.9	0.9	0.4
Korea	6.1	4.5	4.2	3.5	4.1	3.0	2.8	1.1	1.0
Malaysia	7.2	5.5	5.2	2.4	2.8	2.5	11.8	11.4	10.8
Singapore	14.5	5.2	4.4	4.0	2.8	3.1	22.2	20.4	19.0
Taiwan	10.8	5.4	5.2	7.4	2.3	2.0	9.4	11.6	10.9
Thailand	7.8	4.0	4.5	3.0	5.1	2.4	4.6	2.7	1.9
<b>Emerging Europe</b>									
Russia	4.0	4.8	4.5	8.8	8.5	7.5	4.9	5.6	3.9
Turkey	8.2	4.6	4.5	6.4	7.0	5.4	-6.5	-8.0	-8.2
Ukraine	4.2	4.5	4.9	9.1	10.2	7.7	-1.9	-3.6	-3.8
<b>Latin America</b>									
Argentina	9.2	6.0	4.6	10.9	11.0	11.0	0.9	0.1	-0.5
Brazil	7.5	4.5	4.1	5.9	5.9	4.5	-2.3	-2.6	-3.0
Chile	5.3	5.9	4.9	3.0	4.5	3.2	1.9	0.5	-1.3
Colombia	4.3	4.6	4.5	3.2	3.2	3.1	-3.1	-2.1	-2.2
Mexico	5.5	4.6	4.0	4.4	3.5	3.0	-0.5	-0.9	-1.1
Venezuela	-1.9	1.8	1.6	27.2	32.4	30.1	4.9	7.0	6.3

Sources: International Monetary Fund (IMF).

Notes: Data for 2011 and 2012 are estimates. In the case of real GDP for Korea, Thailand, Russia, Turkey, Ukraine, Brazil and Colombia, inflation for Brazil and Thailand, and current account balance for Korea, Thailand, Russia, Turkey, Ukraine, Argentina, Brazil, Colombia and Mexico, the data for 2010 are estimates.

**Table S2 Financial condition of global large and complex banking groups**

(2005 - 2010)

	Minimum	First quartile	Median	Average	Weighted average <sup>b)</sup>	Third quartile	Maximum
<b>Return on shareholders' equity (%)</b>							
2005	7.91	15.22	16.32	17.27	16.62	19.78	27.17
2006	12.47	15.42	19.23	19.25	17.29	23.09	25.14
2007	-11.97	10.21	12.47	11.78	11.52	14.93	27.08
2008	-52.53	-17.40	3.36	-5.57	-6.68	6.12	14.18
2009	-12.98	-3.74	2.71	3.68	4.26	7.09	19.87
2010	-1.50	6.39	7.59	6.84	5.60	9.86	13.82
<b>Return on risk-weighted assets (%)</b>							
2005	1.00	1.58	1.82	2.06	1.90	2.25	4.52
2006	1.53	1.62	2.00	2.38	1.96	2.96	4.47
2007	-1.40	1.22	1.46	1.25	1.15	1.83	2.40
2008	-7.04	-2.78	0.45	-0.67	-0.80	0.61	2.60
2009	-2.78	-0.82	0.44	0.42	0.61	0.98	3.10
2010	-0.24	0.85	1.43	1.42	0.88	2.33	3.60
<b>Total operating income (% of total assets)</b>							
2005	1.94	3.08	4.11	4.13	3.66	5.57	7.34
2006	2.14	3.06	4.49	4.16	3.65	4.95	6.63
2007	1.61	2.68	3.72	3.63	2.98	4.57	5.85
2008	0.37	1.08	2.66	2.79	2.09	3.76	6.16
2009	1.74	3.04	3.62	3.84	3.61	4.94	6.20
2010	2.16	3.04	4.30	3.98	3.66	4.85	5.98
<b>Net income (% of total assets)</b>							
2005	0.37	0.68	0.80	0.87	0.83	1.00	1.65
2006	0.46	0.71	0.90	1.04	0.88	1.14	2.76
2007	-0.23	0.36	0.81	0.62	0.51	0.93	1.04
2008	-1.43	-0.70	0.22	-0.07	-0.30	0.26	1.04
2009	-1.19	-0.20	0.25	0.17	0.27	0.58	1.58
2010	-0.10	0.24	0.54	0.50	0.37	0.82	1.02
<b>Net loan impairment charges (% of total assets)</b>							
2005	-0.02	0.00	0.19	0.21	0.25	0.37	0.53
2006	-0.02	0.00	0.22	0.21	0.26	0.35	0.57
2007	-0.01	0.01	0.19	0.29	0.34	0.49	0.77
2008	0.00	0.11	0.30	0.60	0.65	0.96	1.74
2009	0.05	0.15	0.82	0.93	1.18	1.57	2.18
2010	-0.01	0.02	0.55	0.55	0.71	0.95	1.32
<b>Cost-to-income ratio (%)</b>							
2005	24.12	48.73	65.71	58.85	55.07	69.95	75.39
2006	26.94	47.89	59.41	56.65	54.30	66.79	71.60
2007	30.55	54.12	59.28	63.45	59.75	70.96	111.32
2008	54.88	62.83	87.03	156.66	101.40	133.20	745.61
2009	35.29	49.72	58.85	65.74	55.55	72.91	119.14
2010	30.53	53.64	62.01	61.32	56.92	73.30	79.46
<b>Tier 1 ratio (%)</b>							
2005	7.00	8.08	8.50	9.20	8.62	10.15	12.80
2006	7.50	8.20	8.64	9.67	8.87	10.65	13.90
2007	6.87	7.45	8.40	8.67	7.98	9.31	11.20
2008	8.00	9.15	11.00	12.17	10.57	13.30	20.30
2009	9.60	11.10	13.00	13.29	11.92	15.30	17.70
2010	11.24	12.10	13.40	14.40	12.91	16.10	20.50
<b>Overall solvency ratio (%)</b>							
2005	10.90	11.50	12.02	12.37	12.00	13.25	14.10
2006	10.70	11.70	12.30	13.17	12.44	14.10	18.40
2007	10.70	11.11	12.20	12.18	11.83	12.98	14.50
2008	11.20	13.60	15.00	16.24	14.58	17.90	26.80
2009	12.40	14.80	16.30	16.45	15.26	18.20	20.60
2010	14.00	15.50	16.50	17.34	16.18	19.10	22.00

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

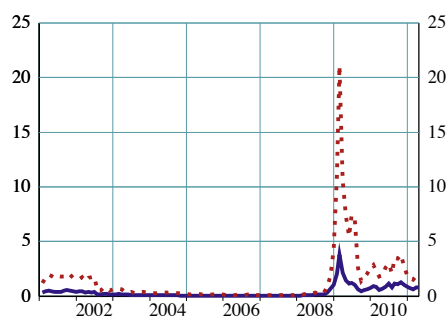
Notes: Based on available figures for 13 global large and complex banking groups.

1) The respective denominators are used as weights, i.e. the total operating income is used in the case of the "Cost-to-income ratio", while the risk-weighted assets are used for the "Tier 1 ratio" and the "Overall solvency ratio".

**Chart S10 Expected default frequency (EDF) for global large and complex banking groups**

(Jan. 2001 - Apr. 2011; percentage probability)

— weighted average  
- - - maximum

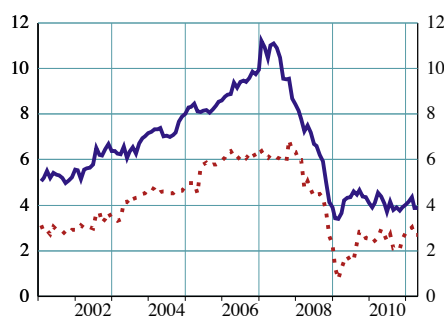


Sources: Moody's KMV and ECB calculations.  
Notes: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%. The weighted average is based on the amounts of non-equity liabilities outstanding.

**Chart S11 Distance to default for global large and complex banking groups**

(Jan. 2001 - Apr. 2011)

— weighted average  
- - - minimum

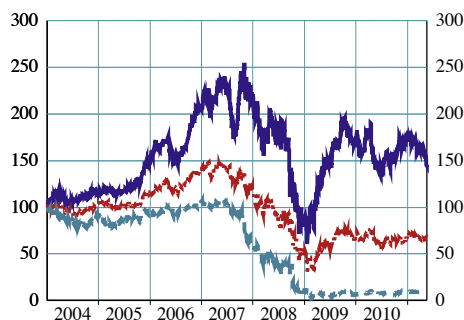


Sources: Moody's KMV and ECB calculations.  
Notes: An increase in the distance to default reflects an improving assessment. The weighted average is based on the amounts of non-equity liabilities outstanding.

**Chart S12 Equity prices for global large and complex banking groups**

(Jan. 2004 - May 2011; index: Jan. 2004 = 100)

— maximum  
- - - median  
- - - minimum

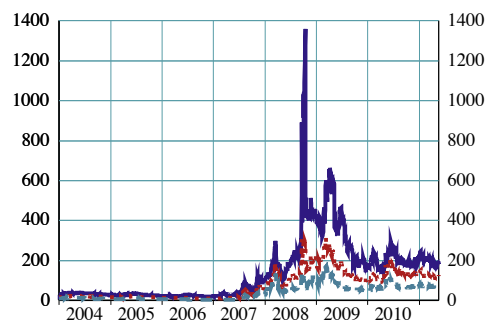


Sources: Bloomberg and ECB calculations.

**Chart S13 Credit default swap spreads for global large and complex banking groups**

(Jan. 2004 - May 2011; basis points; senior debt; five-year maturity)

— maximum  
- - - median  
- - - minimum

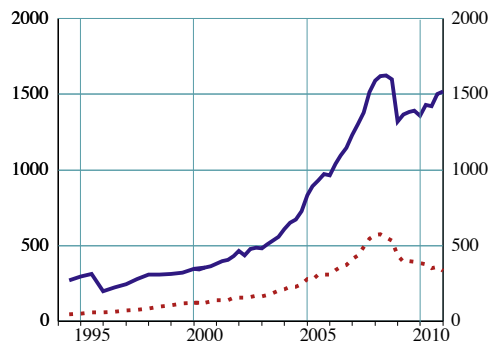


Sources: Bloomberg and ECB calculations.

**Chart S14 Global consolidated claims on non-banks in offshore financial centres**

(Q1 1994 - Q4 2010; USD billions; quarterly data)

— all reporting banks  
 ..... euro area banks

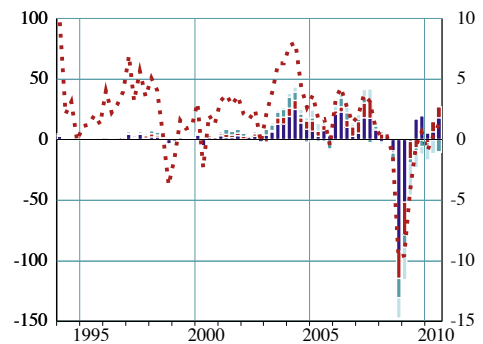


Sources: BIS and ECB calculations.  
 Note: Aggregate for euro area banks derived as the sum of claims on non-banks in offshore financial centres of euro area 12 countries (i.e. euro area excluding Cyprus, Malta, Slovakia, Slovenia and Estonia).

**Chart S15 Global hedge fund net flows**

(Q1 1994 - Q3 2010)

■ directional (USD billions; left-hand scale)  
 ■ event-driven (USD billions; left-hand scale)  
 ■ relative value (USD billions; left-hand scale)  
 ■ multi-strategy (USD billions; left-hand scale)  
 ..... total flows as a percentage of capital under management (right-hand scale)

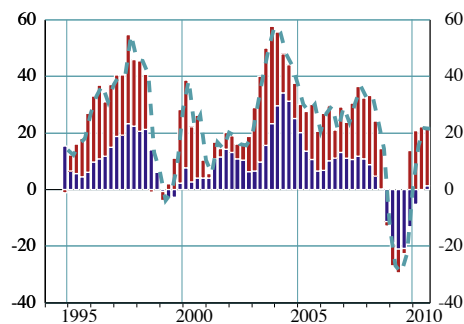


Sources: Lipper TASS and ECB calculations.  
 Notes: Excluding funds of hedge funds. The directional group includes long/short equity hedge, global macro, emerging markets, dedicated short-bias and managed futures strategies. The relative-value group consists of convertible arbitrage, fixed income arbitrage and equity market-neutral strategies.

**Chart S16 Decomposition of the annual rate of growth of global hedge fund capital under management**

(Q4 1994 - Q3 2010; percentages)

■ contribution of net flows  
 ■ contribution of returns  
 - - 12-month changes of capital under management

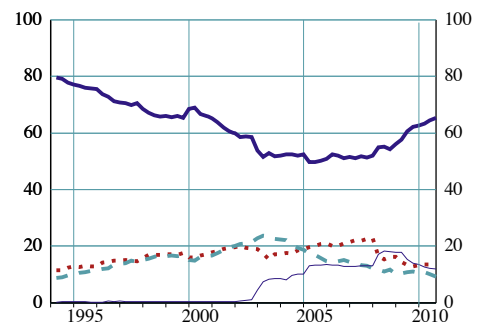


Sources: Lipper TASS and ECB calculations.  
 Notes: Excluding funds of hedge funds. The estimated quarterly return to investors equals the difference between the change in capital under management and net flows. In this dataset, capital under management totalled USD 1.2 trillion at the end of December 2009.

**Chart S17 Structure of global hedge fund capital under management**

(Q1 1994 - Q3 2010; percentages)

— directional  
 ..... event-driven  
 - - relative value  
 — multi-strategy

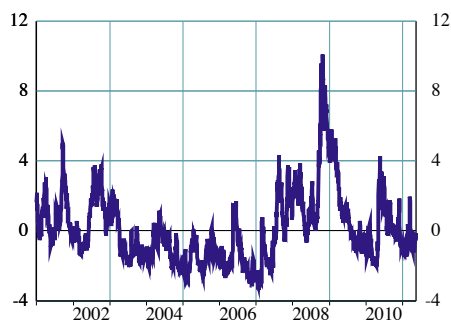


Sources: Lipper TASS and ECB calculations.  
 Notes: Excluding funds of hedge funds. The directional group includes long/short equity hedge, global macro, emerging markets, dedicated short-bias and managed futures strategies. The relative-value group consists of convertible arbitrage and equity market-neutral strategies.

## 2 INTERNATIONAL FINANCIAL MARKETS

**Chart S18 Global risk aversion indicator**

(Jan. 2001 - May 2011)



Sources: Bloomberg, Bank of America Merrill Lynch, UBS, Commerzbank and ECB calculations.  
Notes: The indicator is constructed as the first principal component of five risk aversion indicators currently available. 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.

**Chart S19 Real broad USD effective exchange rate index**

(Jan. 2001 - Apr. 2011; index: Jan. 2001 = 100)

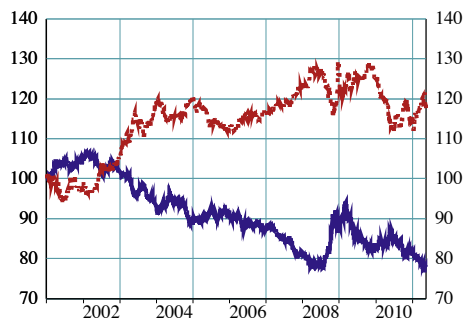


Source: Thomson Reuters.  
Notes: Weighted average of the foreign exchange values of the US dollar against the currencies of a large group of major US trading partners, deflated by the US consumer price index. For further details, see "Indexes of the foreign exchange value of the dollar", *Federal Reserve Bulletin*, Winter 2005.

**Chart S20 Selected nominal effective exchange rate indices**

(Jan. 2001 - May 2011; index: Jan. 2001 = 100)

— USD  
- - - EUR

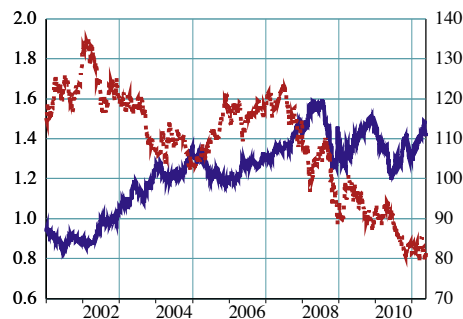


Sources: Bloomberg and ECB.  
Notes: Weighted averages of bilateral exchange rates against major trading partners of the euro area and the United States. For further details in the case of the euro area, see ECB, "The effective exchange rates of the euro", *Occasional Paper Series*, No 2, February 2002. For the United States see the note of Chart S19.

**Chart S21 Selected bilateral exchange rates**

(Jan. 2001 - May 2011)

— USD/EUR (left-hand scale)  
- - - JPY/USD (right-hand scale)



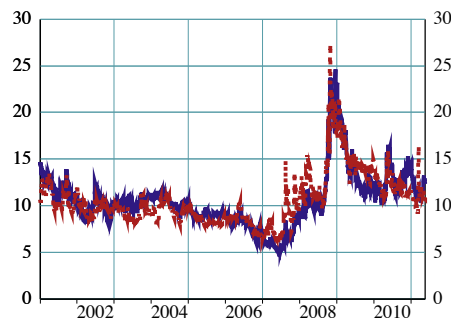
Source: ECB.



### Chart S22 Selected three-month implied foreign exchange market volatility

(Jan. 2001 - May 2011; percentages)

— USD/EUR  
 ..... JPY/USD

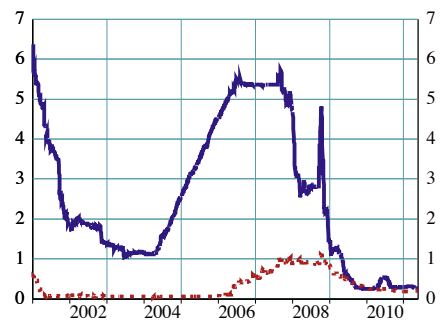


Source: Bloomberg.

### Chart S23 Three-month money market rates in the United States and Japan

(Jan. 2001 - May 2011; percentages)

— United States  
 ..... Japan

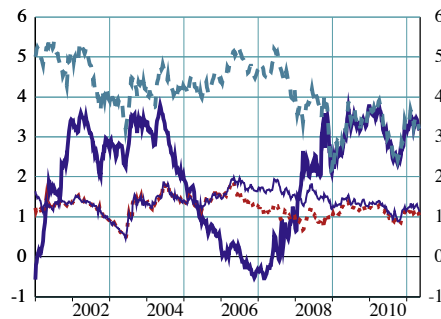


Source: Thomson Reuters.  
 Note: USD and JPY 3-month LIBOR.

### Chart S24 Government bond yields and term spreads in the United States and Japan

(Jan. 2001 - May 2011)

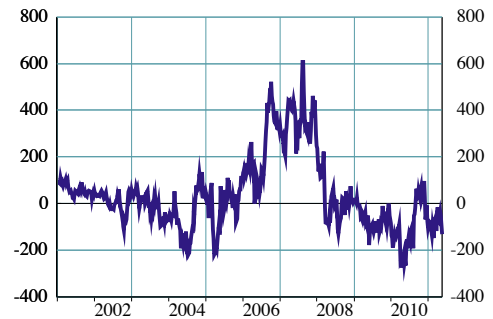
— US term spread (percentage points)  
 ..... Japanese term spread (percentage points)  
 - - - US ten-year yield (percentage)  
 — Japanese ten-year yield (percentage)



Sources: Bloomberg, Thomson Reuters and ECB calculations.  
 Note: The term spread is the difference between the yield on ten-year bonds and that on three-month T-bills.

### Chart S25 Net non-commercial positions in ten-year US Treasury futures

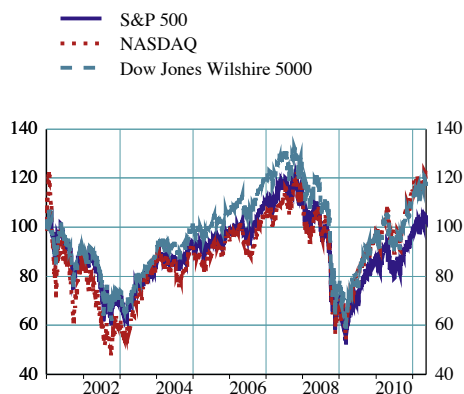
(Jan. 2001 - May 2011; thousands of contracts)



Sources: Bloomberg and ECB calculations.  
 Notes: Futures traded on the Chicago Board of Trade.  
 Non-commercial futures contracts are contracts bought for purposes other than hedging.

**Chart S26 Stock prices in the United States**

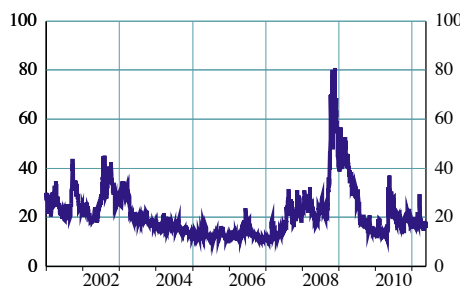
(Jan. 2001 - May 2011; index: Jan. 2001 = 100)



Sources: Bloomberg, Thomson Reuters and ECB calculations.

**Chart S27 Implied volatility for the S&P 500 index**

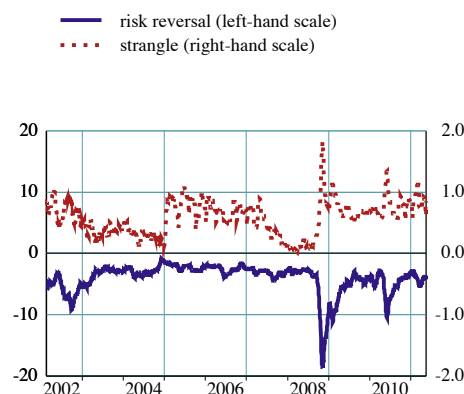
(Jan. 2001 - May 2011; percentages)



Source: Thomson Reuters.  
 Notes: Chicago Board Options Exchange (CBOE) Volatility Index (VIX). Data calculated as a weighted average of the closest options.

**Chart S28 Risk reversal and strangle of the S&P 500 index**

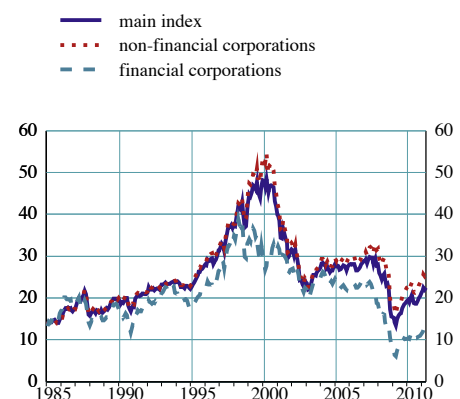
(Feb. 2002 - May 2011; percentages; implied volatility; 20-day moving average)



Sources: Bloomberg and ECB calculations.  
 Notes: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The strangle is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the at-the-money volatility of calls and puts with 50 delta.

**Chart S29 Price/earnings (P/E) ratio for the US stock market**

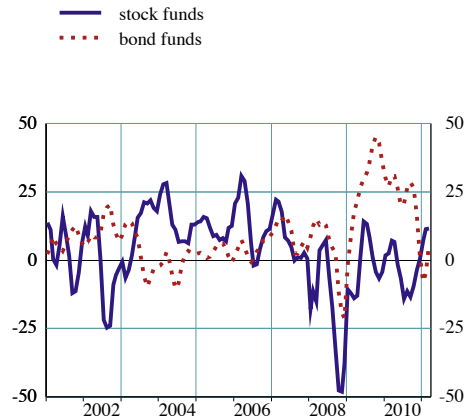
(Jan. 1985 - Apr. 2011; percentages; ten-year trailing earnings)



Sources: Thomson Reuters and ECB calculations.  
 Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

### Chart S30 US mutual fund flows

(Jan. 2001 - Mar. 2011; USD billions; three-month moving average)



Source: Thomson Reuters.

### Chart S31 Debit balances in New York Stock Exchange margin accounts

(Jan. 2001 - Mar. 2011; USD billions)

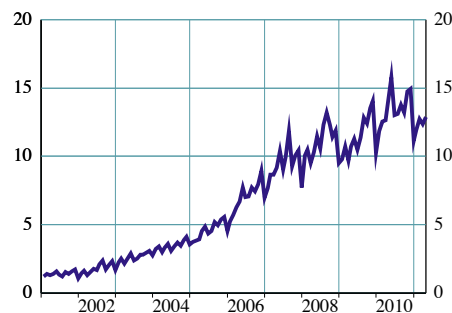


Source: Bloomberg.

Note: Borrowing to buy stocks “on margin” allows investors to use loans to pay for up to 50% of the price of a stock.

### Chart S32 Open interest in options contracts on the S&P 500 index

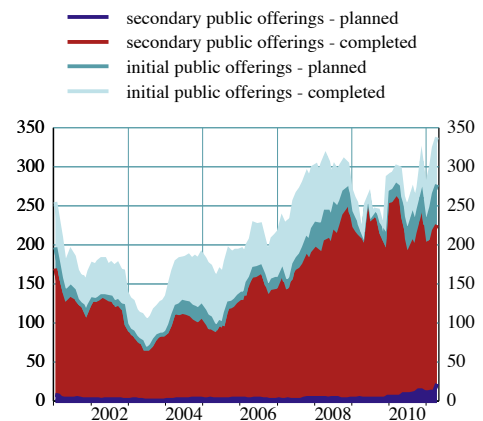
(Jan. 2001 - Apr. 2011; millions of contracts)



Source: Bloomberg.

### Chart S33 Gross equity issuance in the United States

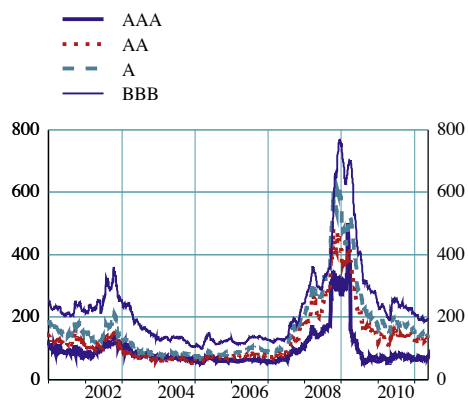
(Jan. 2001 - Apr. 2011; USD billions)



Source: Thomson ONE Banker.

**Chart S34 US investment-grade corporate bond spreads**

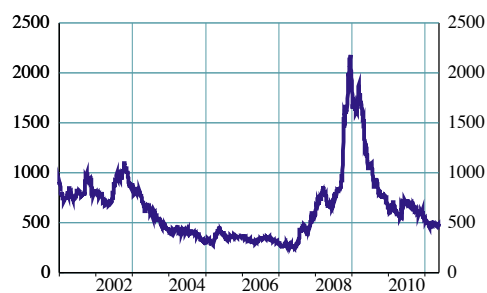
(Jan. 2001 - May 2011; basis points)



Source: Merrill Lynch.  
Note: Options-adjusted spread of the seven to ten-year corporate bond indices.

**Chart S35 US speculative-grade corporate bond spreads**

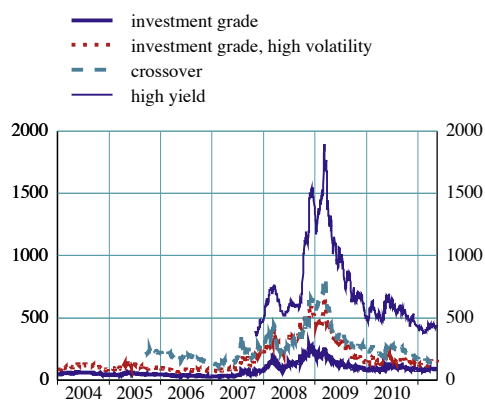
(Jan. 2001 - May 2011; basis points)



Source: Merrill Lynch.  
Note: Options-adjusted spread of the US domestic high-yield index (average rating B1, average maturity of 7½ years).

**Chart S36 US credit default swap indices**

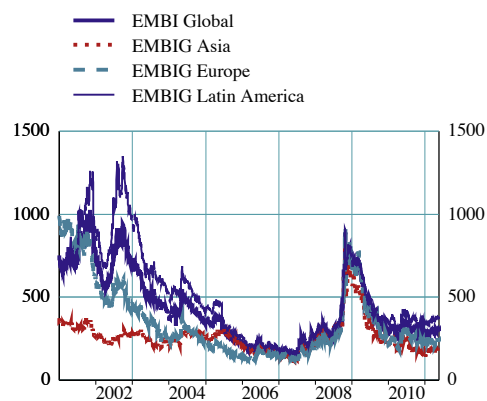
(Jan. 2004 - May 2011; basis points; five-year maturity)



Sources: Bloomberg and ECB calculations.

**Chart S37 Emerging market sovereign bond spreads**

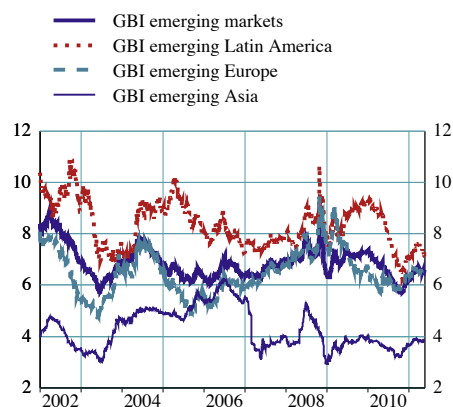
(Jan. 2001 - May 2011; basis points)



Sources: Bloomberg and ECB calculations.

**Chart S38 Emerging market sovereign bond yields, local currency**

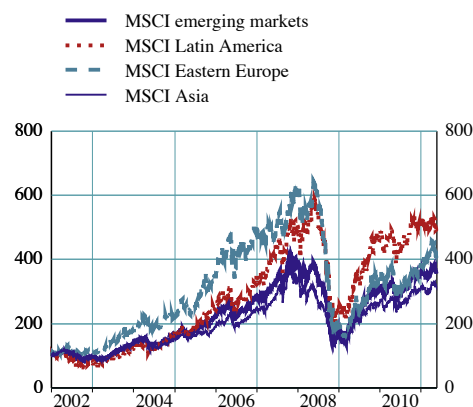
(Jan. 2002 - May 2011; percentages)



Source: Bloomberg.  
Note: GBI stands for "Government Bond Index".

**Chart S39 Emerging market stock price indices**

(Jan. 2002 - May 2011; index: Jan. 2002 = 100)



Sources: Bloomberg and ECB calculations.  
Note: MSCI stands for "Morgan Stanley Capital International".

**Table S3 Total international bond issuance (private and public) in selected emerging markets**

(USD millions)

	2004	2005	2006	2007	2008	2009	2010	2011
<b>Asia</b>	<b>63,256</b>	<b>47,533</b>	<b>46,673</b>	<b>70,591</b>	<b>40,322</b>	<b>38,265</b>	<b>59,310</b>	<b>66,235</b>
<i>of which</i>								
China	4,484	5,830	1,945	2,196	0	4,400	8,320	12,430
Hong Kong	7,680	6,500	800	4,570	1,020	0	4,900	4,300
India	6,529	4,634	7,001	14,882	12,101	7,000	9,000	10,000
Indonesia	1,540	4,456	4,603	4,408	3,790	4,700	5,600	6,000
Malaysia	4,132	2,765	1,620	0	0	3,550	3,350	3,310
Singapore	1,841	1,948	2,293	2,401	1,300	800	2,000	2,000
South Korea	26,000	15,250	20,800	39,111	20,600	15,205	21,810	24,415
Taiwan	4,962	530	1,050	1,210	412	720	1,230	1,430
Thailand	1,400	2,236	935	765	523	370	570	700
<b>Emerging Europe</b>	<b>19,952</b>	<b>25,242</b>	<b>30,014</b>	<b>57,725</b>	<b>32,150</b>	<b>16,747</b>	<b>36,600</b>	<b>42,750</b>
<i>of which</i>								
Russia	10,140	15,620	21,342	46,283	26,520	10,500	26,000	34,000
Turkey	6,439	8,355	7,236	6,163	4,150	4,482	6,850	4,750
Ukraine	1,457	1,197	962	4,525	1,230	200	2,500	2,500
<b>Latin America</b>	<b>35,143</b>	<b>41,085</b>	<b>35,846</b>	<b>39,878</b>	<b>28,566</b>	<b>52,001</b>	<b>58,061</b>	<b>57,728</b>
<i>of which</i>								
Argentina	918	2,734	3,123	5,504	2,025	0	3,000	2,000
Brazil	10,943	14,831	15,446	16,907	16,008	19,000	27,500	28,875
Chile	2,375	1,200	1,463	250	100	1,500	2,300	1,500
Colombia	1,545	2,304	2,866	1,762	1,000	5,000	2,000	3,300
Mexico	12,024	8,804	7,769	9,093	4,431	9,000	9,500	10,000
Venezuela	4,260	6,143	100	1,250	4,650	12,000	10,000	10,000

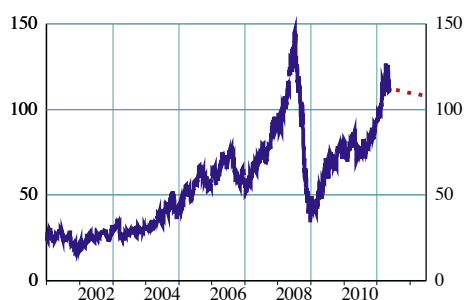
Source: Thomson Reuters Datastream.

Notes: Data for 2010 are mainly estimates and for 2011 are forecasts. Series include gross public and private placements of bonds denominated in foreign currency and held by non-residents. Bonds issued in the context of debt restructuring operations are not included. Regions are defined as follows: Asia: China, Special Administrative Region of Hong Kong, India, Indonesia, Malaysia, South Korea, the Philippines, Singapore, Taiwan, Thailand and Vietnam; Emerging Europe: Croatia, Russia, Turkey and Ukraine; and Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.

### Chart S40 The oil price and oil futures prices

(Jan. 2001 - June 2012; USD per barrel)

- historical price
- futures prices on 19 May 2011

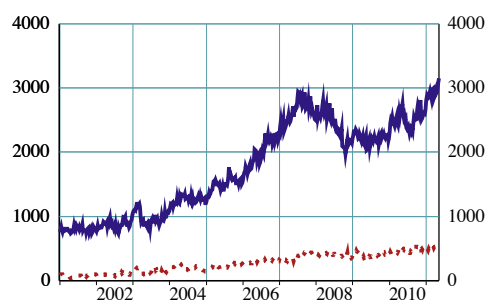


Sources: Thomson Reuters, Bloomberg and ECB calculations.

### Chart S41 Crude oil futures contracts

(Jan. 2001 - May 2011; thousands of contracts)

- total futures contracts
- non-commercial futures contracts

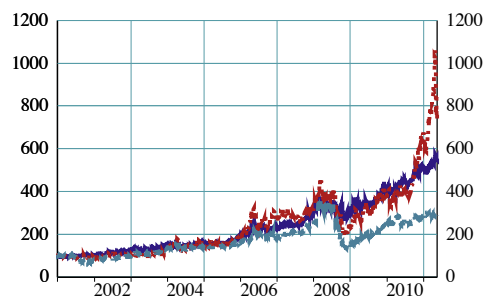


Source: Bloomberg.  
Notes: Futures traded on the New York Mercantile Exchange. Non-commercial futures contracts are contracts bought for purposes other than hedging.

### Chart S42 Precious metal prices

(Jan. 2001 - May 2011; index: Jan. 2001 = 100)

- gold
- silver
- platinum



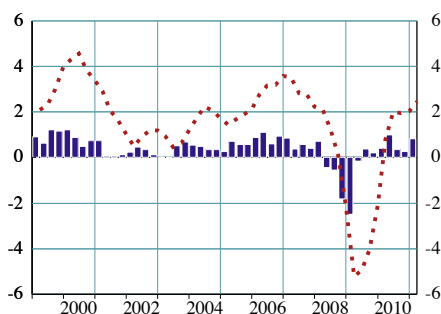
Sources: Bloomberg and ECB calculations.  
Note: The indices are based on USD prices.

### 3 EURO AREA ENVIRONMENT

**Chart S43 Real GDP growth in the euro area**

(Q1 1999 - Q1 2011; percentage change)

■ quarterly growth  
 ..... annual growth

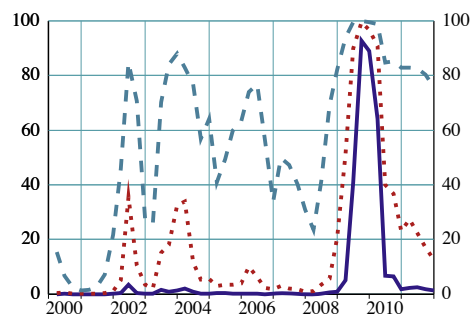


Sources: Eurostat and ECB calculations.

**Chart S44 Survey-based estimates of the four-quarter-ahead downside risk of weak real GDP growth in the euro area**

(Q1 2000 - Q4 2011; percentages)

— probability of GDP growth below 0%  
 ..... probability of GDP growth below 1%  
 - - - probability of GDP growth below 2%



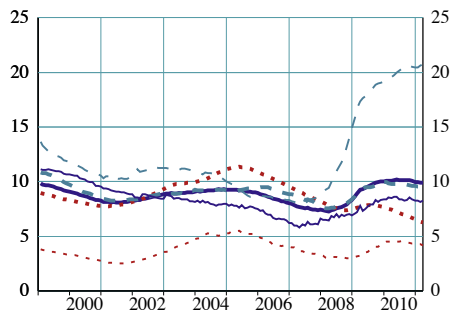
Sources: ECB Survey of Professional Forecasters (SPF) and ECB calculations.

Notes: The indicators measure the probability of real GDP growth expectations being below the indicated threshold in each reference period. Estimates are calculated four quarters ahead after each official release of GDP figures.

**Chart S45 Unemployment rate in the euro area and in selected euro area countries**

(Jan. 1999 - Mar. 2011; percentage of workforce)

— euro area      — Italy  
 ..... Germany      ..... Netherlands  
 - - - France      - - - Spain

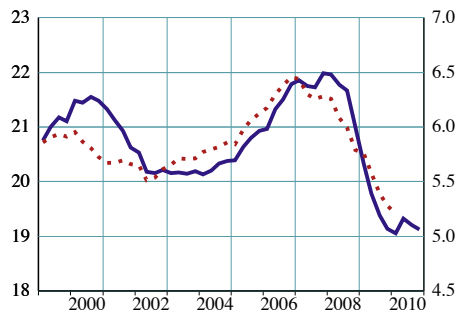


Source: Eurostat.

**Chart S46 Gross fixed capital formation and housing investment in the euro area**

(Q1 1999 - Q4 2010; percentage of GDP)

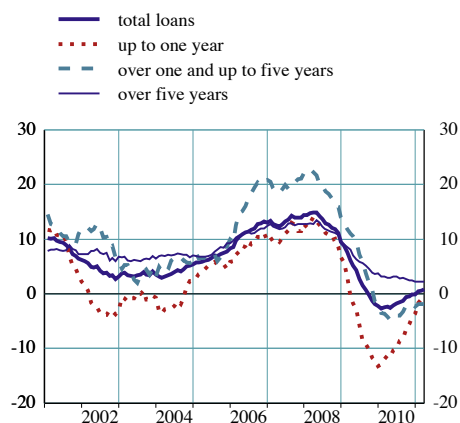
— gross fixed capital formation (left-hand scale)  
 ..... housing investment (right-hand scale)



Sources: Eurostat and ECB calculations.

**Chart S47 Annual growth in MFI loans to non-financial corporations in the euro area**

(Jan. 2001 - Mar. 2011; percentage change per annum)

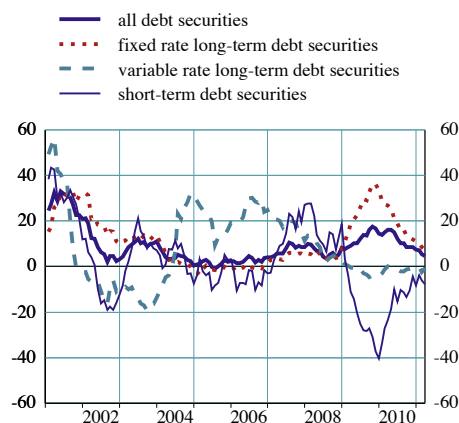


Sources: ECB and ECB calculations.

Notes: Data are based on financial transactions relating to loans provided by monetary financial institutions (MFIs) and are not corrected for the impact of securitisation. For further details, see ECB, "Securitisation in the euro area", *Monthly Bulletin*, February 2008.

**Chart S48 Annual growth in debt securities issued by non-financial corporations in the euro area**

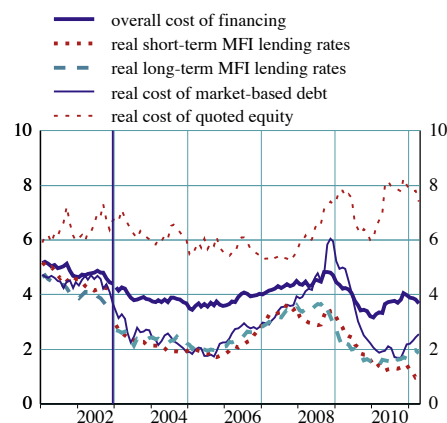
(Jan. 2001 - Mar. 2011; percentage change per annum)



Source: ECB.

**Chart S49 Real cost of the external financing of euro area non-financial corporations**

(Jan. 2001 - Apr. 2011; percentages)

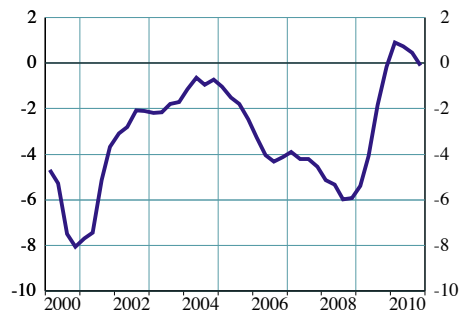


Sources: ECB, Thomson Reuters, Merrill Lynch, Consensus Economics forecasts and ECB calculations.

Notes: The real cost of external financing is calculated as the weighted average of the cost of bank lending, the cost of debt securities and the cost of equity, based on their respective amounts outstanding and deflated by inflation expectations. The introduction of MFI interest rate statistics at the beginning of 2003 led to a statistical break in the series.

**Chart S50 Net lending/borrowing of non-financial corporations in the euro area**

(Q1 2000 - Q4 2010; percentage of gross value added of non-financial corporations; four-quarter moving sum)

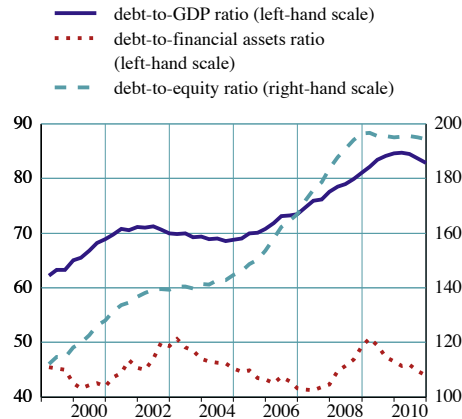


Sources: ECB and ECB calculations.



**Chart S51 Total debt of non-financial corporations in the euro area**

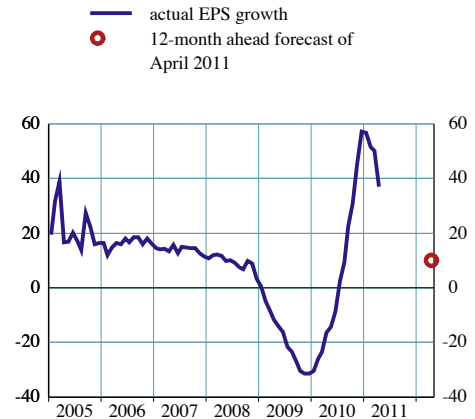
(Q1 1999 - Q4 2010; percentages)



Sources: ECB, Eurostat and ECB calculations.  
Notes: Debt includes loans, debt securities issued and pension fund reserves. The debt-to-equity ratio is calculated as a percentage of outstanding quoted shares issued by non-financial corporations, excluding the effect of valuation changes.

**Chart S52 Growth of earnings per share (EPS) and 12-month-ahead growth forecast for euro area non-financial corporations**

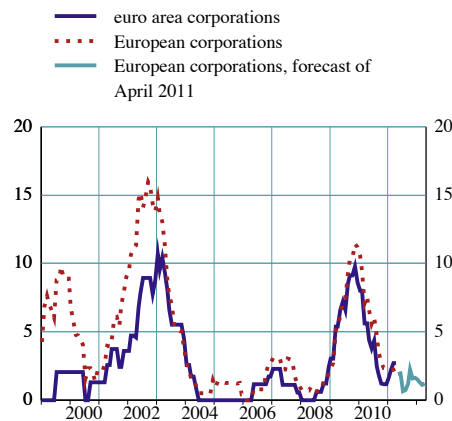
(Jan. 2005 - Apr. 2012; percentage change per annum)



Sources: Thomson Reuters and ECB calculations.  
Note: Growth rates are derived on the basis of aggregated EPS of Dow Jones STOXX indices for euro area non-financial corporation sub-sectors, using 12-month-trailing EPS for actual figures and 12-month-ahead EPS for the forecast.

**Chart S53 Euro area and European speculative-grade corporations' actual and forecast default rates**

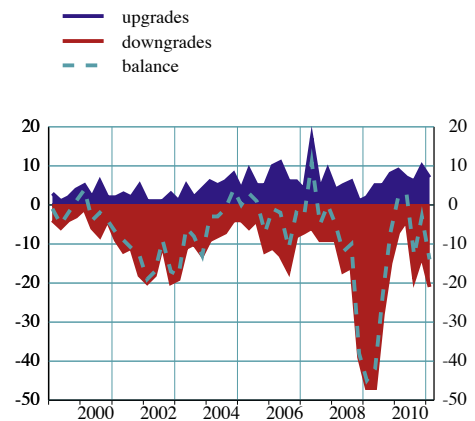
(Jan. 1999 - Apr. 2012; percentages; 12-month trailing sum)



Source: Moody's.

**Chart S54 Euro area non-financial corporations' rating changes**

(Q1 1999 - Q1 2011; number)

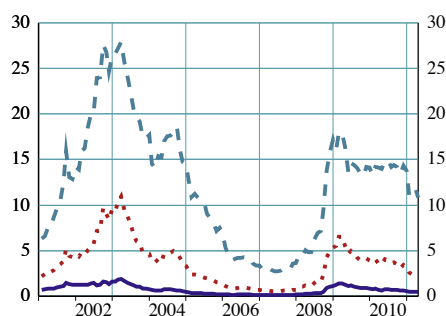


Sources: Moody's and ECB calculations.

**Chart S55 Expected default frequency (EDF) of euro area non-financial corporations**

(Jan. 2001 - Apr. 2011; percentage probability)

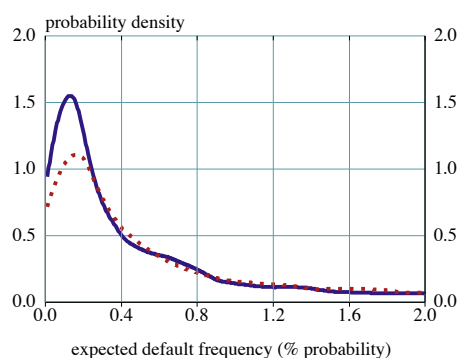
— median  
 - - - 75th percentile  
 - - - 90th percentile



Sources: Moody's KMV and ECB calculations.  
 Notes: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

**Chart S56 Expected default frequency (EDF) distributions for euro area non-financial corporations**

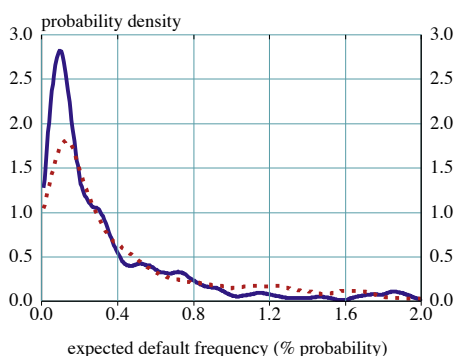
— April 2011  
 - - - October 2010



Sources: Moody's KMV and ECB calculations.

**Chart S57 Expected default frequency (EDF) distributions for large euro area non-financial corporations**

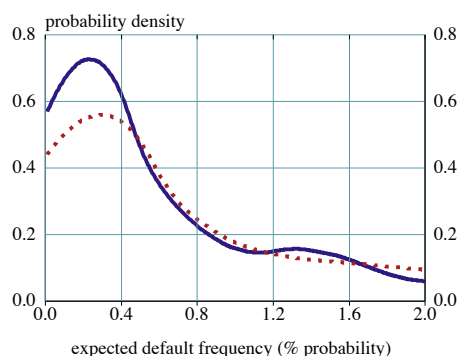
— April 2011  
 - - - October 2010



Sources: Moody's KMV and ECB calculations.  
 Note: The sample covers euro area non-financial corporations with a value of liabilities that is in the upper quartile of the distribution.

**Chart S58 Expected default frequency (EDF) distributions for small euro area non-financial corporations**

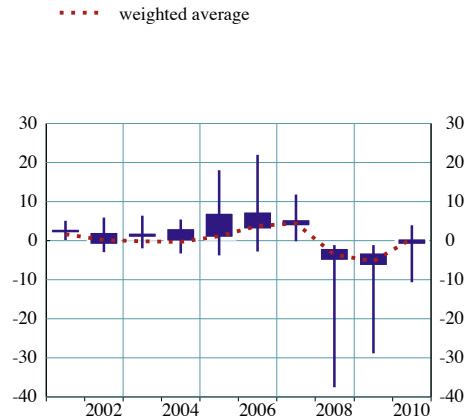
— April 2011  
 - - - October 2010



Sources: Moody's KMV and ECB calculations.  
 Note: The sample covers euro area non-financial corporations with a value of liabilities that is in the lower quartile of the distribution.

### Chart S59 Euro area country distributions of commercial property capital value changes

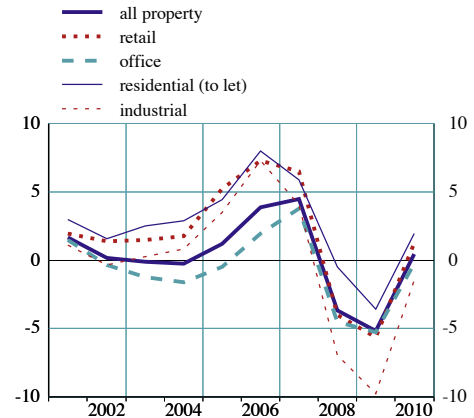
(2001 - 2010; capital values; percentage change per annum; minimum, maximum and interquartile distribution)



Sources: Investment Property databank and ECB calculations.  
Notes: Distribution of country-level data, covering ten euro area countries. The coverage of the total property sector within countries ranges from around 20% to 80%. Capital values are commercial property prices adjusted downwards for capital expenditure, maintenance and depreciation. The values of the national commercial property markets are used as weights for the cross-country weighted averages.

### Chart S60 Euro area commercial property capital value changes in different sectors

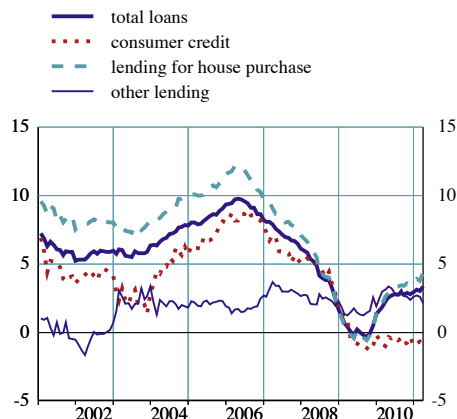
(2001 - 2010; capital values; percentage change per annum; cross-country weighted average)



Sources: Investment Property databank and ECB calculations.  
Notes: The data cover ten euro area countries. The coverage of the total property sector within countries ranges from around 20% to 80%. Capital values are commercial property prices adjusted downwards for capital expenditure, maintenance and depreciation. The values of the national commercial property markets are used as weights for the cross-country weighted averages.

### Chart S61 Annual growth in MFI loans to households in the euro area

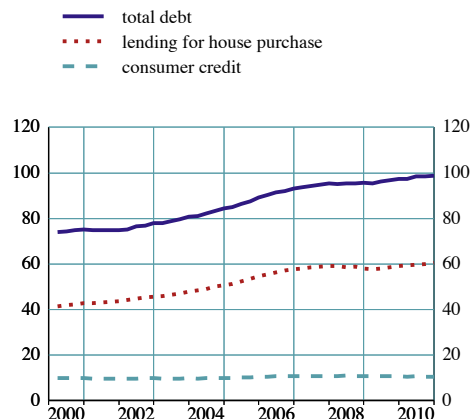
(Jan. 2001 - Mar. 2011; percentage change per annum)



Sources: ECB and ECB calculations.  
Notes: Data are based on financial transactions relating to loans provided by MFIs and are not corrected for the impact of securitisation. For more details, see the note of Chart S47.

### Chart S62 Household debt-to-disposable income ratios in the euro area

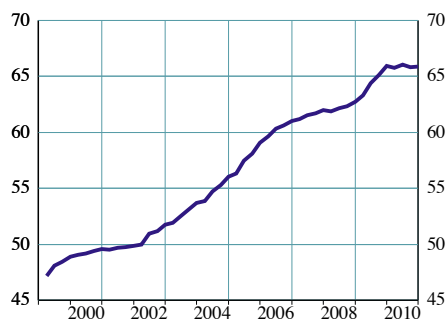
(Q1 2000 - Q4 2010; percentage of disposable income)



Sources: ECB and ECB calculations.  
Note: These series are the fourth-quarter moving sums of their raw series divided by the disposable income for the respective quarter.

**Chart S63 Household debt-to-GDP ratio in the euro area**

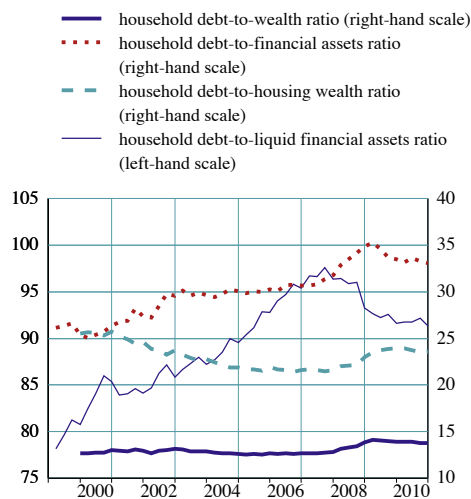
(Q1 1999 - Q4 2010; percentages)



Sources: ECB, Eurostat and ECB calculations.

**Chart S64 Household debt-to-assets ratios in the euro area**

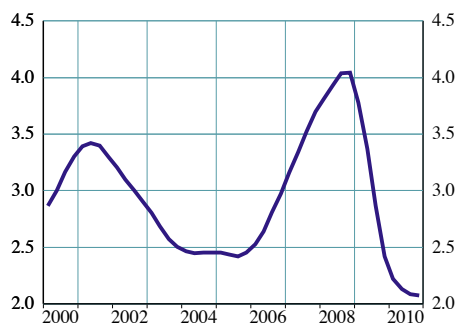
(Q1 1999 - Q4 2010; percentages)



Sources: ECB and ECB calculations.

**Chart S65 Interest payment burden of the euro area household sector**

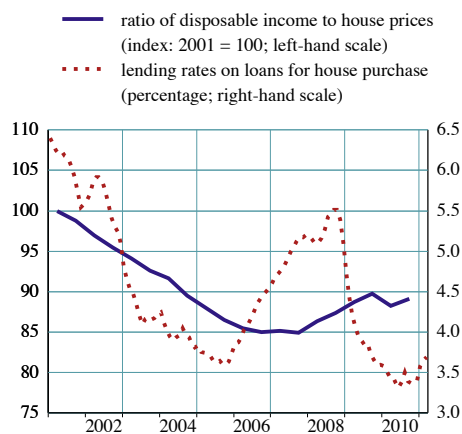
(Q1 2000 - Q4 2010; percentage of disposable income)



Source: ECB.

**Chart S66 Narrow housing affordability and borrowing conditions in the euro area**

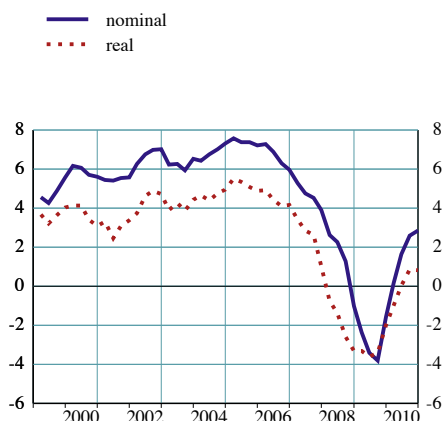
(Jan. 2001 - Mar. 2011)



Sources: ECB and ECB calculations.  
 Note: The narrow measure of housing affordability given above is defined as the ratio of the gross nominal disposable income to the nominal house price index.

**Chart S67 Residential property price changes in the euro area**

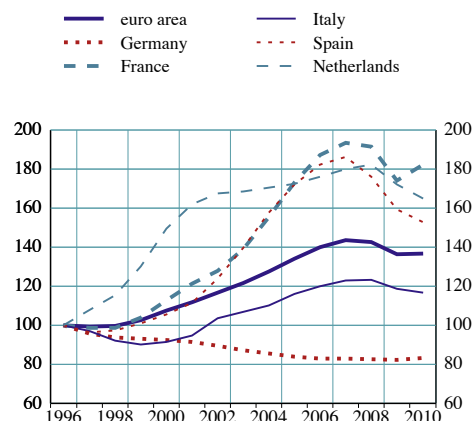
(Q1 1999 - Q4 2010; percentage change per annum)



Sources: Eurostat and ECB calculations based on national sources.  
Note: The real price series has been deflated by the Harmonised Index of Consumer Prices (HICP).

**Chart S68 House price-to-rent ratio for the euro area and selected euro area countries**

(1996 - 2010; index: 1996 = 100)



Sources: Eurostat and ECB calculations based on national sources.  
Note: For information on the sources and coverage of the series displayed, refer to Table S4. For Spain, data prior to 2007 refer to another national source.

**Table S4 Changes in residential property prices in the euro area countries**

(percentage change per annum)

	Weight	1999 2007	2008	2009	2010	2010 H1	2010 H2	2010 Q2	2010 Q3	2010 Q4	2011 Q1
Belgium <sup>1)</sup>	3.8	8.1	4.9	-0.3	5.4	4.8	5.9	5.9	5.8	5.9	-
Germany <sup>2)</sup>	27.2	-0.3	0.6	0.6	2.3	-	-	-	-	-	-
Estonia <sup>4), 6)</sup>	0.2	-	-13.4	-35.9	0.1	-4.5	5.1	-0.6	6.2	4.0	-
Ireland <sup>2), 3)</sup>	1.7	11.7	-9.1	-13.7	-15.5	-17.9	-12.9	-17.0	-14.8	-10.8	-
Greece <sup>4)</sup>	2.5	-	1.7	-3.7	-4.6	-3.2	-6.1	-4.7	-5.2	-6.9	-5.0
Spain <sup>2), 6)</sup>	11.5	-	-1.5	-6.7	-2.0	-1.9	-2.0	-0.9	-2.2	-1.9	-
France <sup>1), 6)</sup>	21.2	10.3	1.2	-7.1	6.3	3.7	8.9	6.1	8.4	9.4	-
Italy <sup>2)</sup>	17.0	5.9	2.6	-0.4	0.1	-0.2	0.4	-	-	-	-
Cyprus <sup>2), 7)</sup>	0.2	-	16.7	-4.1	-2.5	-0.6	-4.3	-1.1	-2.4	-6.2	-
Luxembourg <sup>2)</sup>	0.4	10.4	0.1	-	-	-	-	-	-	-	-
Malta <sup>2)</sup>	0.1	8.0	-2.7	-5.0	1.1	2.4	-0.2	0.5	1.5	-2.0	-
Netherlands <sup>1), 6)</sup>	6.4	7.9	2.9	-3.3	-2.0	-3.2	-0.8	-2.0	-0.6	-1.0	-1.2
Austria <sup>2), 5)</sup>	3.0	1.1	1.2	3.6	5.7	5.5	5.9	5.3	5.0	6.8	3.9
Portugal <sup>2), 3)</sup>	1.9	3.3	3.9	0.4	1.8	1.4	2.2	1.6	2.9	1.6	-
Slovenia <sup>1), 6)</sup>	0.4	-	3.1	-8.2	2.8	2.6	3.1	4.1	4.6	1.5	-
Slovakia <sup>1)</sup>	0.7	-	22.1	-11.1	-3.9	-6.0	-1.7	-3.7	-1.3	-2.1	-2.5
Finland <sup>1), 6)</sup>	1.9	-	0.6	-0.3	8.7	10.9	6.6	10.3	8.0	5.2	4.0
<b>Euro area</b>	<b>100.0</b>	<b>6.1</b>	<b>1.3</b>	<b>-2.8</b>	<b>1.8</b>	<b>0.9</b>	<b>2.7</b>	<b>1.6</b>	<b>2.6</b>	<b>2.8</b>	<b>-</b>

Sources: National sources and ECB calculations.

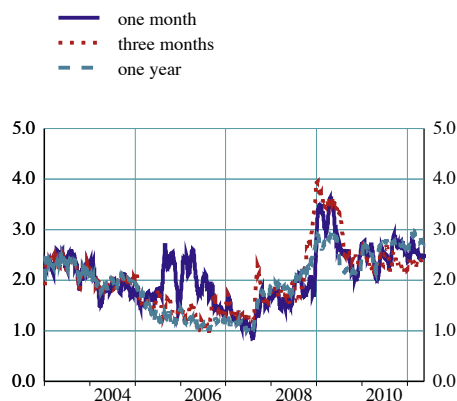
Notes: Weights are based on 2010 nominal GDP and are expressed as a percentage. The estimates of the euro area aggregate include quarterly contributions for Germany and Italy based on interpolation or temporal disaggregation of annual or semi-annual data, respectively. For Germany from 2008 on, quarterly estimates take into account early information from seven cities.

- 1) Existing dwellings (houses and flats); whole country.
- 2) All dwellings (new and existing houses and flats); whole country.
- 3) Series compiled by national private institutions.
- 4) All flats; whole country.
- 5) Series compiled by other national official sources.
- 6) Series compiled by the national statistical institutes.
- 7) The property price index is estimated by the Central Bank of Cyprus, using data on valuations of property received from several MFIs and other indicators relevant to the housing market.
- 8) Up to 2000, data are for Vienna only.

## 4 EURO AREA FINANCIAL MARKETS

**Chart S69 Bid-ask spreads for EONIA swap rates**

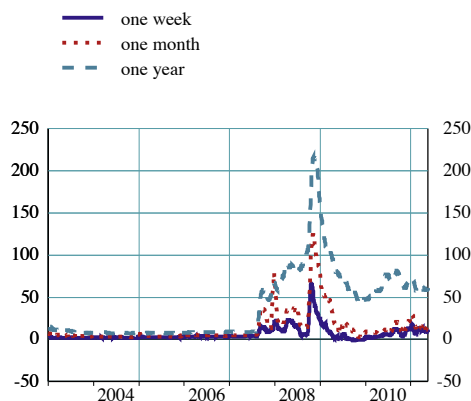
(Jan. 2003 - May 2011; basis points; 20-day moving average; transaction-weighted)



Sources: Thomson Reuters and ECB calculations.

**Chart S70 Spreads between euro area interbank deposit and repo interest rates**

(Jan. 2003 - May 2011; basis points; 20-day moving average)



Sources: Thomson Reuters and ECB calculations.

**Chart S71 Implied volatility of three-month EURIBOR futures**

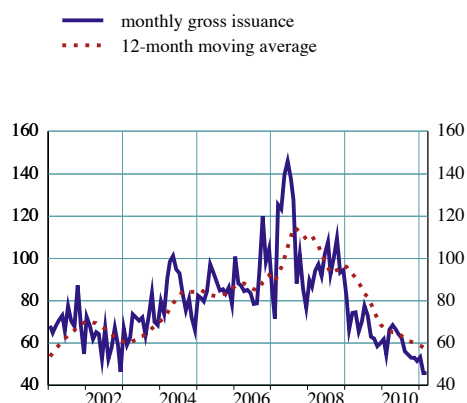
(Jan. 2001 - May 2011; percentages; 60-day moving average)



Sources: Bloomberg and ECB calculations.  
Note: Weighted average of the volatility of the two closest options.

**Chart S72 Monthly gross issuance of short-term securities (other than shares) by euro area non-financial corporations**

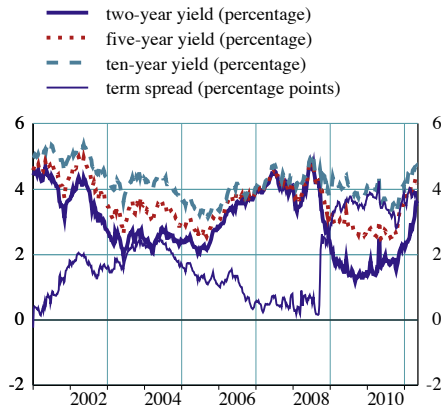
(Jan. 2001 - Mar. 2011; EUR billions; maturities up to one year)



Sources: ECB and ECB calculations.

### Chart S73 Euro area government bond yields and the term spread

(Jan. 2001 - May 2011; weekly averages)



Sources: ECB, Thomson Reuters, Bloomberg and ECB calculations.  
 Note: The term spread is the difference between the yield on ten-year bonds and that on three-month T-bills.

### Chart S74 Option-implied volatility for ten-year government bond yields in Germany

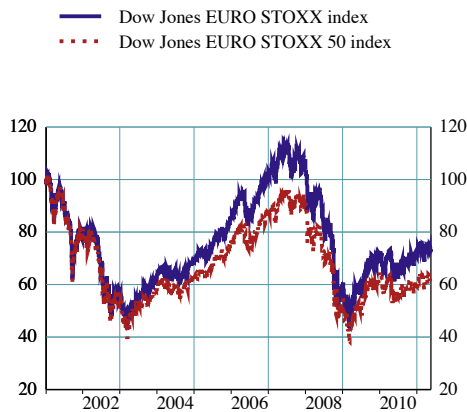
(Jan. 2001 - May 2011; percentages; implied volatility; 20-day moving average)



Sources: Bloomberg and ECB calculations.

### Chart S75 Stock prices in the euro area

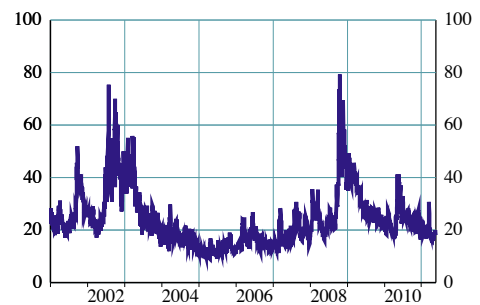
(Jan. 2001 - May 2011; index: Jan. 2001 = 100)



Sources: Bloomberg and ECB calculations.

### Chart S76 Implied volatility for the Dow Jones EURO STOXX 50 index

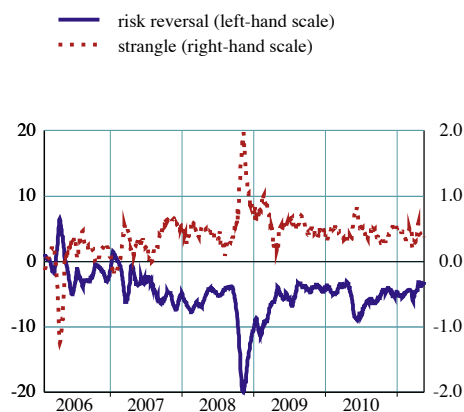
(Jan. 2001 - May 2011; percentages)



Sources: Bloomberg and ECB calculations.

**Chart S77 Risk reversal and strangle of the Dow Jones EURO STOXX 50 index**

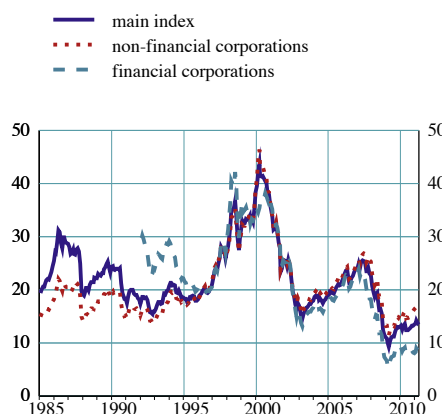
(Jan. 2006 - May 2011; percentages; implied volatility; 20-day moving average)



Sources: Bloomberg and ECB calculations.  
Notes: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The strangle is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the at-the-money volatility of calls and puts with 50 delta.

**Chart S78 Price/earnings (P/E) ratio for the euro area stock market**

(Jan. 1985 - Apr. 2011; ten-year trailing earnings)



Sources: Thomson Reuters and ECB calculations.  
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

**Chart S79 Open interest in options contracts on the Dow Jones EURO STOXX 50 index**

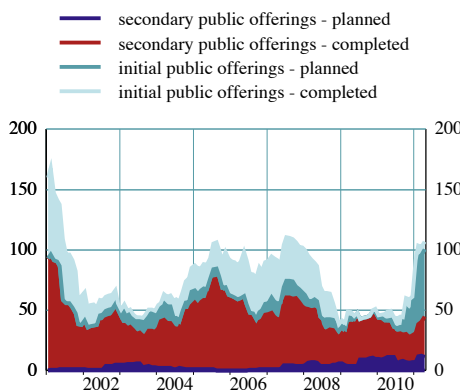
(Jan. 2001 - Apr. 2011; millions of contracts)



Sources: Eurex and Bloomberg.

**Chart S80 Gross equity issuance in the euro area**

(Jan. 2001 - Apr. 2011; EUR billions; 12-month moving sum)

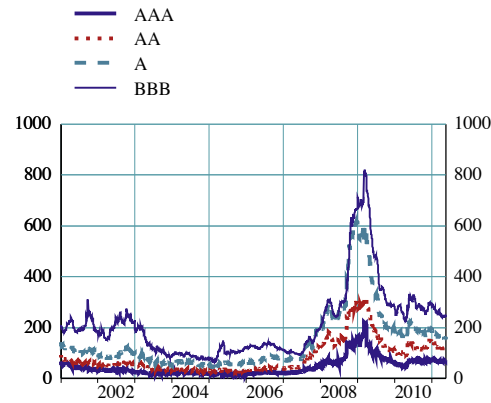


Source: Thomson ONE Banker.



### Chart S81 Investment-grade corporate bond spreads in the euro area

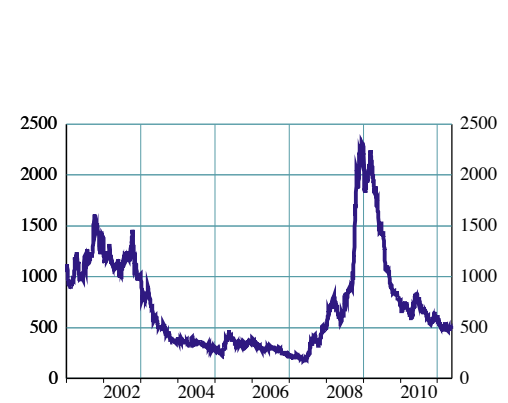
(Jan. 2001 - May 2011; basis points)



Source: Merrill Lynch.  
Note: Options-adjusted spread of seven to ten-year corporate bond indices.

### Chart S82 Speculative-grade corporate bond spreads in the euro area

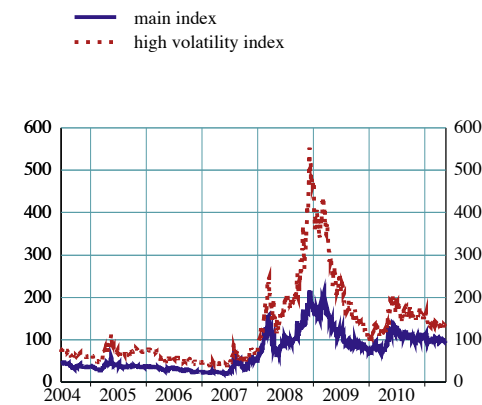
(Jan. 2001 - May 2011; basis points)



Source: Merrill Lynch.  
Note: Options-adjusted spread of euro area high-yield index (average rating BB3, average maturity of around 6 years).

### Chart S83 iTraxx Europe five-year credit default swap indices

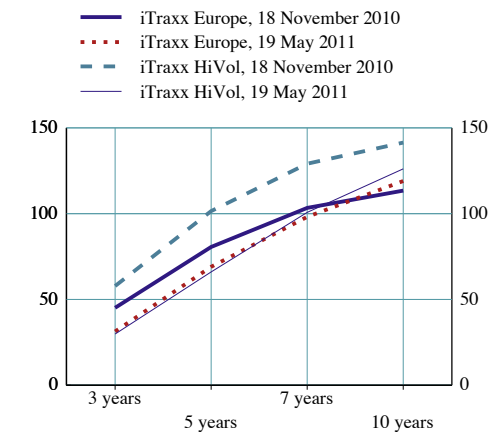
(June 2004 - May 2011; basis points)



Sources: Bloomberg and ECB calculations.

### Chart S84 Term structures of premiums for iTraxx Europe and HiVol

(basis points)

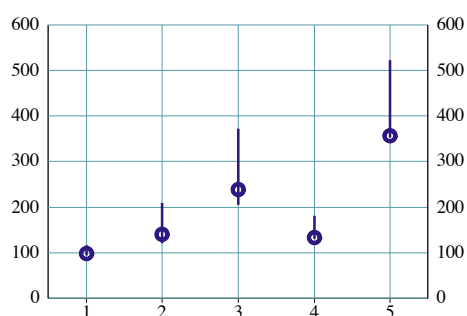


Source: Bloomberg.

### Chart S85 Latest developments of the iTraxx Europe five-years indices

(Nov. 2010 - May 2011; basis points)

- 1 main index
- 2 financial senior
- 3 financial subordinated
- 4 high volatility
- 5 crossover



Source: Bloomberg.

Note: The points show the most recent observation (19 May 2011) and the bars show the range of variation over the six months to the most recent daily observation.

## 5 EURO AREA FINANCIAL INSTITUTIONS

**Table S5** Financial condition of large and complex banking groups in the euro area

(2005 - 2010)

	Minimum	First quartile	Median	Average	Weighted average <sup>b)</sup>	Third quartile	Maximum
<b>Return on Tier 1 capital (%)</b>							
2005	2.39	7.62	13.25	13.64	14.88	17.63	30.81
2006	7.66	12.11	14.83	16.86	17.58	21.55	30.46
2007	0.77	5.23	12.12	14.19	15.34	22.57	31.26
2008	-33.44	-15.03	1.75	-2.75	1.82	8.22	22.43
2009	-17.70	-5.12	3.87	1.56	4.36	8.55	15.76
2010	-2.52	4.41	7.91	7.16	8.48	11.11	14.00
<b>Return on shareholders' equity (%)</b>							
2005	2.32	7.17	10.04	11.93	12.01	13.18	33.80
2006	7.51	12.41	14.81	14.61	13.91	17.52	26.01
2007	0.85	6.69	11.97	11.65	12.34	15.81	24.69
2008	-143.32	-15.67	2.26	-14.65	1.67	5.62	18.88
2009	-19.15	-8.29	2.97	0.34	3.92	8.98	14.34
2010	-3.49	4.69	7.68	6.76	7.52	9.58	12.72
<b>Return on risk-weighted assets (%)</b>							
2005	0.19	0.65	1.06	1.11	1.20	1.53	2.26
2006	0.55	1.02	1.31	1.37	1.40	1.71	2.66
2007	0.05	0.43	0.98	1.10	1.17	1.69	2.55
2008	-2.57	-1.20	0.15	-0.19	0.15	0.62	1.77
2009	-1.93	-0.52	0.36	0.16	0.44	0.88	1.82
2010	-0.29	0.52	0.81	0.80	0.92	1.28	1.47
<b>Net interest income (% of total assets)</b>							
2005	0.49	0.57	0.70	0.94	0.92	1.30	1.87
2006	0.33	0.53	0.72	0.93	0.92	1.22	2.03
2007	0.26	0.55	0.78	0.91	0.88	1.20	1.95
2008	0.52	0.64	0.87	1.05	1.01	1.43	2.19
2009	0.57	0.84	1.23	1.28	1.30	1.52	2.68
2010	0.58	0.77	1.16	1.25	1.29	1.46	2.51
<b>Net trading income (% of total assets)</b>							
2005	0.01	0.05	0.15	0.22	0.28	0.32	0.83
2006	0.04	0.09	0.22	0.30	0.34	0.49	1.08
2007	-0.28	-0.06	0.13	0.20	0.29	0.42	0.96
2008	-0.98	-0.44	-0.16	-0.17	-0.14	0.02	0.43
2009	-1.07	0.06	0.19	0.12	0.18	0.29	0.47
2010	-0.24	0.02	0.12	0.13	0.17	0.26	0.47
<b>Fees and commissions (% of total assets)</b>							
2005	0.07	0.24	0.41	0.51	0.57	0.84	1.27
2006	0.08	0.24	0.47	0.53	0.60	0.80	1.10
2007	0.08	0.24	0.51	0.51	0.58	0.70	1.10
2008	0.07	0.21	0.45	0.45	0.49	0.68	0.90
2009	0.07	0.22	0.44	0.47	0.54	0.72	0.84
2010	0.08	0.26	0.43	0.48	0.58	0.75	0.91
<b>Other income (% of total assets)</b>							
2005	-0.02	0.05	0.13	0.15	0.14	0.18	0.64
2006	0.00	0.06	0.16	0.19	0.16	0.25	0.71
2007	-0.12	0.05	0.11	0.14	0.15	0.21	0.51
2008	-0.58	-0.16	0.06	0.01	0.10	0.24	0.54
2009	-0.35	-0.09	0.03	0.01	0.02	0.10	0.33
2010	-0.30	0.00	0.03	0.04	0.04	0.11	0.31
<b>Total operating income (% of total assets)</b>							
2005	0.78	1.23	1.72	1.82	1.90	2.30	3.32
2006	0.77	1.29	1.82	1.95	2.01	2.49	3.81
2007	0.51	1.02	1.78	1.77	1.89	2.40	3.61
2008	-0.18	0.52	1.31	1.35	1.46	1.96	3.66
2009	0.79	1.18	1.86	1.88	2.03	2.23	3.86
2010	0.61	1.09	1.95	1.91	2.08	2.43	3.79

**Table S5 Financial condition of large and complex banking groups in the euro area (continued)**

(2005 - 2010)

	Minimum	First quartile	Median	Average	Weighted average <sup>1)</sup>	Third quartile	Maximum
<b>Net income (% of total assets)</b>							
2005	0.08	0.31	0.41	0.45	0.48	0.50	0.97
2006	0.19	0.41	0.50	0.55	0.54	0.66	1.15
2007	0.02	0.18	0.38	0.46	0.46	0.55	1.22
2008	-1.35	-0.37	0.05	-0.06	0.05	0.28	0.93
2009	-0.77	-0.21	0.12	0.06	0.16	0.33	0.81
2010	-0.09	0.14	0.23	0.30	0.32	0.42	0.83
<b>Net loan impairment charges (% of total assets)</b>							
2005	0.01	0.05	0.08	0.11	0.10	0.17	0.34
2006	0.01	0.05	0.07	0.11	0.10	0.13	0.36
2007	0.01	0.03	0.05	0.10	0.10	0.08	0.38
2008	0.04	0.20	0.27	0.31	0.28	0.40	0.91
2009	0.17	0.35	0.45	0.55	0.48	0.68	1.60
2010	0.07	0.14	0.24	0.32	0.33	0.41	0.85
<b>Cost-to-income ratio (%)<sup>2)</sup></b>							
2005	40.75	53.28	60.69	58.87	61.20	64.85	73.70
2006	38.16	49.90	55.95	56.40	59.00	61.10	70.20
2007	41.25	55.18	63.00	62.95	60.70	69.05	86.34
2008	41.86	62.50	73.36	160.96	71.16	115.80	1,503.40
2009	40.44	52.51	60.35	62.47	60.50	71.45	103.31
2010	42.88	55.22	60.40	62.01	59.76	69.47	90.53
<b>Tier 1 ratio (%)</b>							
2005	6.50	7.55	7.89	8.20	8.08	8.75	11.60
2006	6.50	7.41	7.75	8.07	7.98	8.82	10.10
2007	6.40	6.73	7.40	7.72	7.66	8.60	10.70
2008	5.10	7.60	8.59	8.58	8.53	9.51	12.70
2009	8.40	9.55	10.15	10.33	10.14	10.73	13.80
2010	8.58	10.15	11.20	11.38	10.91	12.25	15.70
<b>Overall solvency ratio (%)</b>							
2005	8.50	10.37	11.05	11.23	11.13	11.90	13.50
2006	9.50	10.50	11.01	11.16	11.08	11.77	12.90
2007	8.80	9.65	10.60	10.72	10.62	11.55	13.00
2008	8.30	10.05	11.70	11.37	11.31	12.27	13.90
2009	9.70	12.56	13.60	13.37	13.22	14.20	16.10
2010	11.10	12.80	14.10	14.38	13.72	15.30	22.40

Sources: Individual institutions' financial reports and ECB calculations.

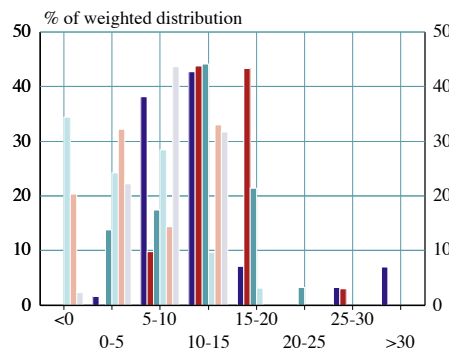
Notes: Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

- 1) The respective denominators are used as weights, i.e. the total operating income is used in the case of the "Cost-to-income ratio", while the risk-weighted assets are used for the "Tier 1 ratio" and the "Overall solvency ratio".
- 2) The cost-to-income ratio does not consider the banking groups with negative operating income.

**Chart S86 Frequency distribution of returns on shareholders' equity for large and complex banking groups in the euro area**

(2005 - 2010; percentages)

2005 2006 2007 2008 2009 2010



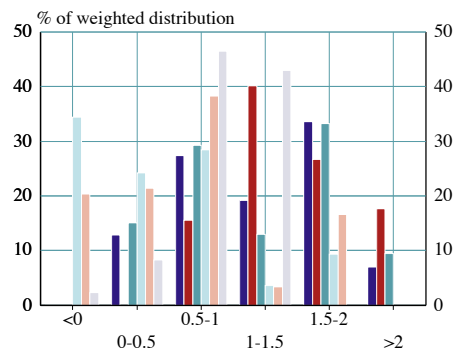
Sources: Individual institutions' financial reports and ECB calculations.

Notes: Distribution weighted by total assets. Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

**Chart S87 Frequency distribution of returns on risk-weighted assets for large and complex banking groups in the euro area**

(2005 - 2010; percentages)

2005 2006 2007 2008 2009 2010



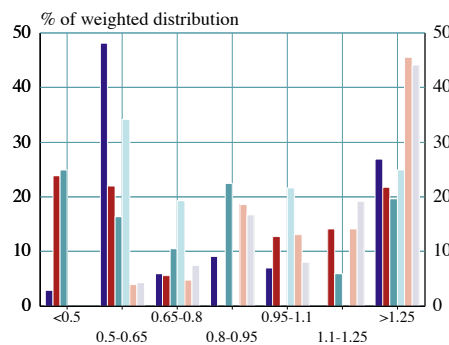
Sources: Individual institutions' financial reports and ECB calculations.

Notes: Distribution weighted by total assets. Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

**Chart S88 Frequency distribution of net interest income for large and complex banking groups in the euro area**

(2005 - 2010; percentage of total assets)

2005 2006 2007 2008 2009 2010



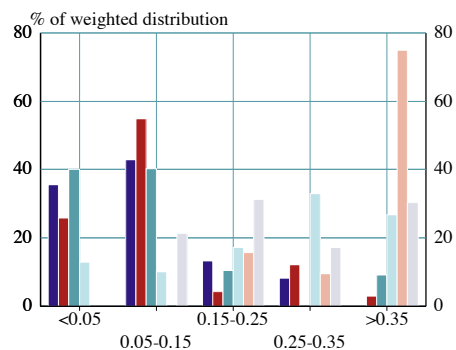
Sources: Individual institutions' financial reports and ECB calculations.

Notes: Distribution weighted by total assets. Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

**Chart S89 Frequency distribution of net loan impairment charges for large and complex banking groups in the euro area**

(2005 - 2010; percentage of total assets)

2005 2006 2007 2008 2009 2010



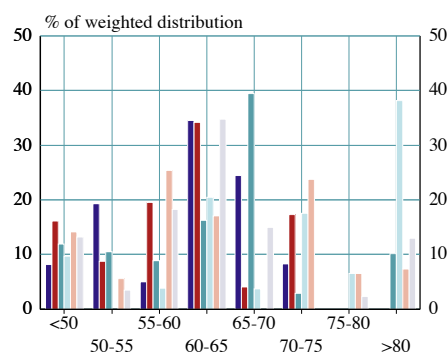
Sources: Individual institutions' financial reports and ECB calculations.

Notes: Distribution weighted by total assets. Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

**Chart S90 Frequency distribution of cost-to-income ratios for large and complex banking groups in the euro area**

(2005 - 2010; percentages)

2005 2006 2007 2008 2009 2010



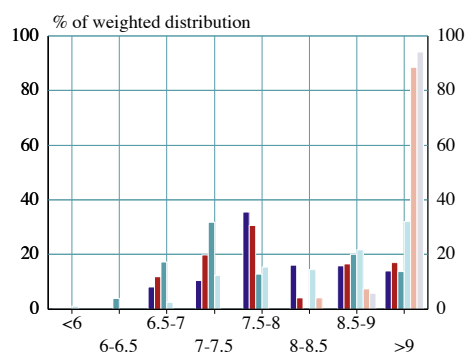
Sources: Individual institutions' financial reports and ECB calculations.

Notes: Distribution weighted by total assets. Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

**Chart S91 Frequency distribution of Tier I ratios for large and complex banking groups in the euro area**

(2005 - 2010; percentages)

2005 2006 2007 2008 2009 2010



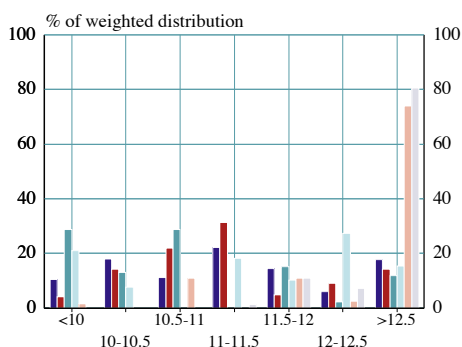
Sources: Individual institutions' financial reports and ECB calculations.

Notes: Distribution weighted by total assets. Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

**Chart S92 Frequency distribution of overall solvency ratios for large and complex banking groups in the euro area**

(2005 - 2010; percentages)

2005 2006 2007 2008 2009 2010



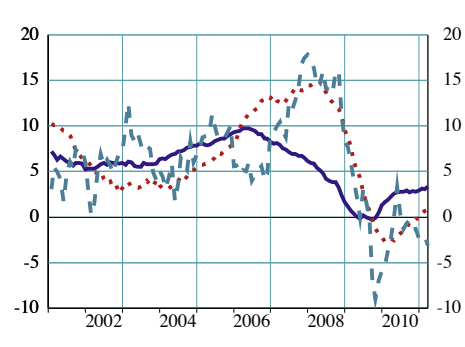
Sources: Individual institutions' financial reports and ECB calculations.

Notes: Distribution weighted by total assets. Based on available figures for 20 IFRS-reporting large and complex banking groups in the euro area.

**Chart S93 Annual growth in euro area MFI loans, broken down by sectors**

(Jan. 2001 - Mar. 2011; percentage change per annum)

households non-financial corporations MFIs

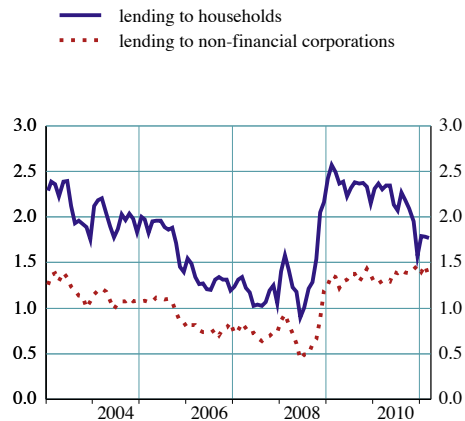


Sources: ECB and ECB calculations.

Notes: Data are based on financial transactions of MFI loans, not corrected for the impact of securitisation. For more details, see the note of Chart S47.

### Chart S94 Lending margins of euro area MFIs

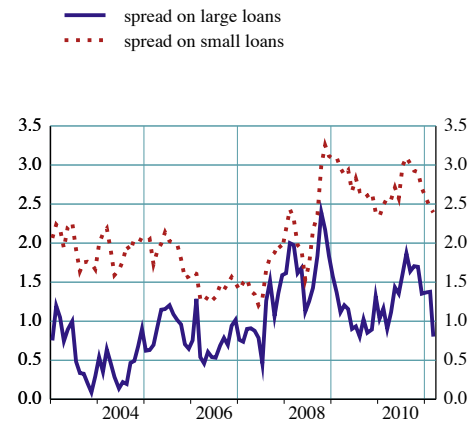
(Jan. 2003 - Mar. 2011; percentage points)



Sources: ECB, Thomson Reuters and ECB calculations.  
Notes: Margins are derived 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.

### Chart S95 Euro area MFI loan spreads

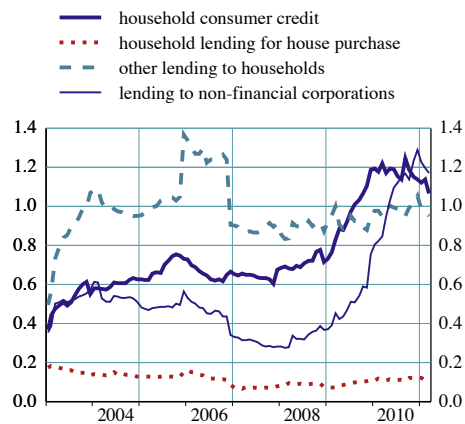
(Jan. 2003 - Mar. 2011; basis points)



Sources: ECB, Thomson Reuters and ECB calculations.  
Notes: The spread is the difference between the rate on new business loans to non-financial corporations with an initial period of rate fixation of one to five years and the three-year government bond yield. Loans are categorised as small for amounts of up to EUR 1 million and as large for amounts above EUR 1 million.

### Chart S96 Write-off rates on euro area MFI loans

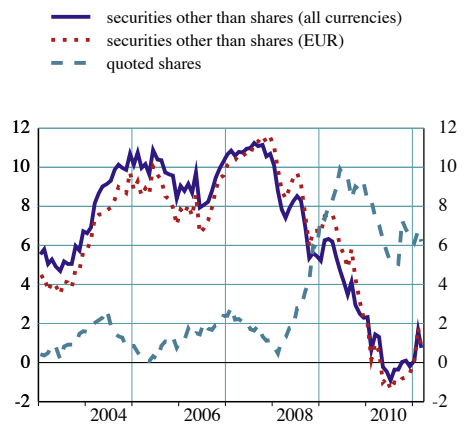
(Jan. 2003 - Mar. 2011; 12-month moving sums; percentage of the outstanding amount of loans)



Sources: ECB and ECB calculations.

### Chart S97 Annual growth in euro area MFIs' issuance of securities and shares

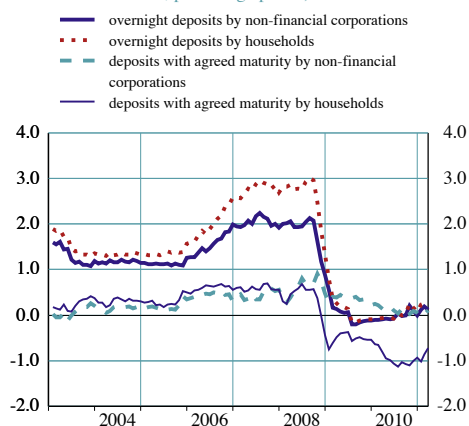
(Jan. 2003 - Mar. 2011; percentage change per annum)



Source: ECB.

**Chart S98 Deposit margins of euro area MFIs**

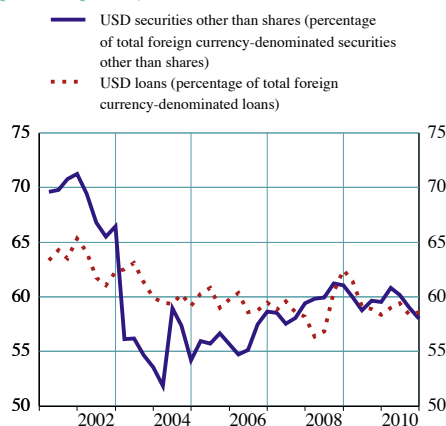
(Jan. 2003 - Mar. 2011; percentage points)



Sources: ECB, Thomson Reuters and ECB calculations.  
 Notes: For overnight deposits, margins are derived as the difference between MFI interest rates and the EONIA. For deposits with agreed maturity, margins are derived as the average of the spreads for the relevant breakdowns by maturity, using new business volumes as weights. The individual spreads are the difference between the swap rate and the MFI interest rate for new deposits, where both have corresponding maturities.

**Chart S99 Euro area MFI foreign currency-denominated assets, selected balance sheet items**

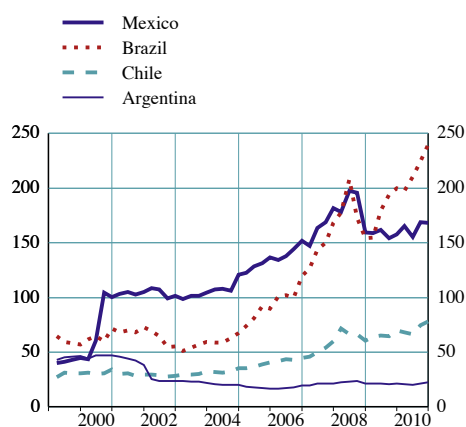
(Q1 2001 - Q4 2010)



Sources: ECB and ECB calculations.

**Chart S100 Consolidated foreign claims of domestically owned euro area banks on Latin American countries**

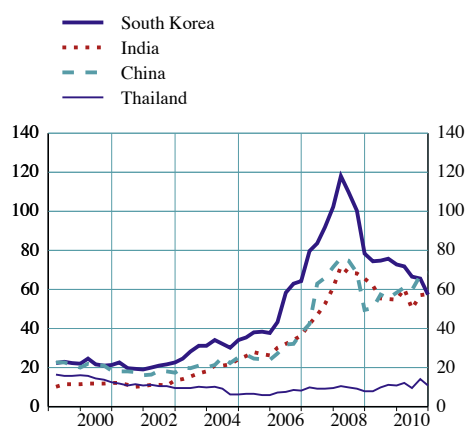
(Q1 1999 - Q4 2010; USD billions)



Sources: BIS and ECB calculations.

**Chart S101 Consolidated foreign claims of domestically owned euro area banks on Asian countries**

(Q1 1999 - Q4 2010; USD billions)



Sources: BIS and ECB calculations.



**Table S6 Consolidated foreign claims of domestically owned euro area banks on individual countries**

(percentage of total consolidated foreign claims)

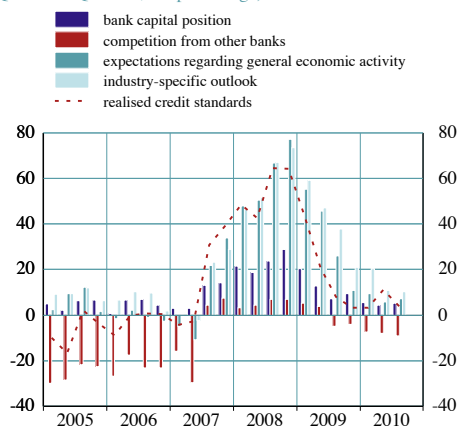
	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4
<b>Total offshore centres</b>	<b>8.0</b>	<b>7.5</b>	<b>7.1</b>	<b>7.0</b>	<b>6.7</b>	<b>7.0</b>	<b>7.1</b>	<b>7.3</b>	<b>7.0</b>	<b>6.9</b>
<i>of which</i>										
Hong Kong	0.8	0.8	0.7	0.7	0.7	0.7	0.9	0.8	0.8	0.9
Singapore	0.9	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.2
<b>Total Asia and Pacific EMEs</b>	<b>4.0</b>	<b>3.9</b>	<b>3.9</b>	<b>3.9</b>	<b>4.0</b>	<b>4.2</b>	<b>4.5</b>	<b>4.3</b>	<b>4.6</b>	<b>4.7</b>
<i>of which</i>										
China	0.8	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0
India	0.7	0.8	0.8	0.7	0.7	0.7	0.8	0.7	0.8	0.8
Indonesia	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3
Malaysia	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Philippines	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
South Korea	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8
Taiwan	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
Thailand	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2
<b>Total European EMEs and new EU Member States</b>	<b>12.6</b>	<b>13.4</b>	<b>13.1</b>	<b>13.5</b>	<b>13.9</b>	<b>14.4</b>	<b>14.5</b>	<b>13.9</b>	<b>14.6</b>	<b>15.1</b>
<i>of which</i>										
Czech Republic	2.0	2.0	2.0	2.2	2.4	2.3	2.3	2.2	2.4	2.6
Hungary	1.5	1.7	1.7	1.8	1.8	1.8	1.8	1.7	1.7	1.6
Poland	2.8	2.9	2.7	2.9	3.1	3.4	3.5	3.2	3.6	3.7
Russia	1.9	2.1	2.0	1.9	1.7	1.7	1.7	1.6	1.7	1.7
Turkey	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.5
<b>Total Latin America</b>	<b>5.9</b>	<b>5.9</b>	<b>6.2</b>	<b>6.4</b>	<b>6.4</b>	<b>6.9</b>	<b>7.0</b>	<b>7.4</b>	<b>7.6</b>	<b>8.4</b>
<i>of which</i>										
Argentina	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Brazil	1.9	1.9	2.0	2.3	2.5	2.7	2.7	3.1	3.1	3.5
Chile	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.1
Colombia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Ecuador	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mexico	2.1	2.0	2.1	2.1	2.0	2.1	2.3	2.3	2.3	2.5
Peru	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Uruguay	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Venezuela	0.3	0.3	0.4	0.4	0.2	0.3	0.2	0.2	0.2	0.2
<b>Total Middle East and Africa</b>	<b>2.6</b>	<b>2.9</b>	<b>3.1</b>	<b>3.0</b>	<b>3.0</b>	<b>3.2</b>	<b>3.2</b>	<b>3.0</b>	<b>3.3</b>	<b>3.5</b>
<i>of which</i>										
Iran	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Morocco	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4
South Africa	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<b>Total non-developed countries</b>	<b>33.1</b>	<b>33.6</b>	<b>33.5</b>	<b>33.9</b>	<b>34.1</b>	<b>35.7</b>	<b>36.4</b>	<b>35.9</b>	<b>37.0</b>	<b>38.5</b>

Sources: BIS and ECB calculations.

Notes: Aggregates derived as the sum of foreign claims of euro area 12 countries (i.e. euro area excluding Cyprus, Malta, Slovakia, Slovenia and Estonia) on the specified counterpart areas.

**Chart S102 Credit standards applied by euro area banks to loans and credit lines to enterprises, and contributing factors**

(Q1 2005 - Q4 2010; net percentage)

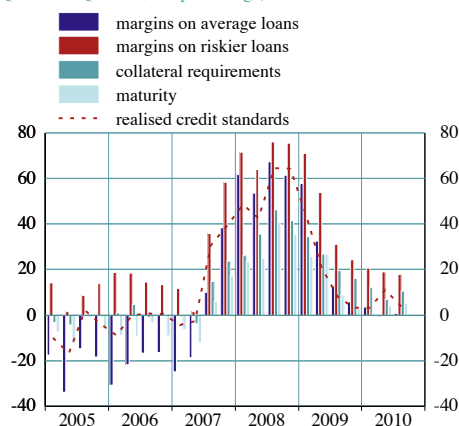


Sources: ECB and ECB calculations.

Notes: For credit standards, the net percentages refer to the difference between those banks reporting that they have been tightened in comparison with the previous quarter and those reporting that they have been eased. For the contributing factors, the net percentages refer to the difference between those banks reporting that the given factor has contributed to a tightening compared with the previous quarter and those reporting that it contributed to an easing.

**Chart S103 Credit standards applied by euro area banks to loans and credit lines to enterprises, and terms and conditions**

(Q1 2005 - Q4 2010; net percentage)

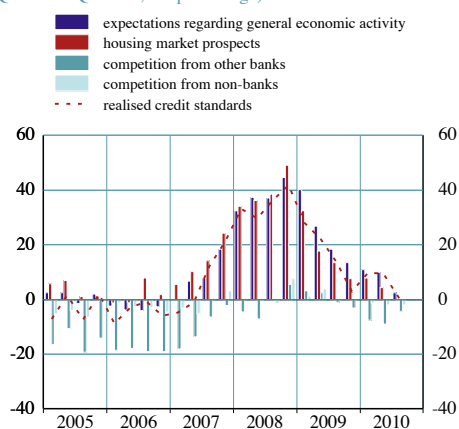


Sources: ECB and ECB calculations.

Notes: The net percentages refer to the difference between those banks reporting that credit standards, terms and conditions have been tightened in comparison with the previous quarter and those reporting that they have been eased.

**Chart S104 Credit standards applied by euro area banks to loans to households for house purchase, and contributing factors**

(Q1 2005 - Q4 2010; net percentage)

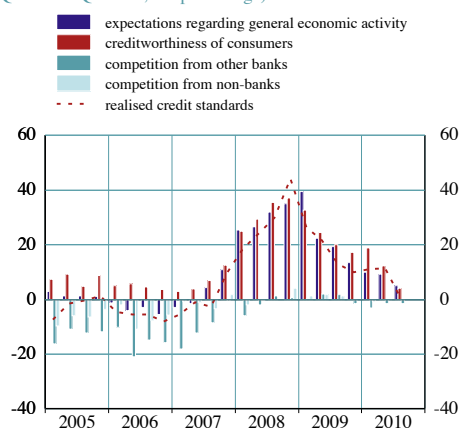


Sources: ECB and ECB calculations.

Note: See the note of Chart S102.

**Chart S105 Credit standards applied by euro area banks to consumer credit, and contributing factors**

(Q1 2005 - Q4 2010; net percentage)

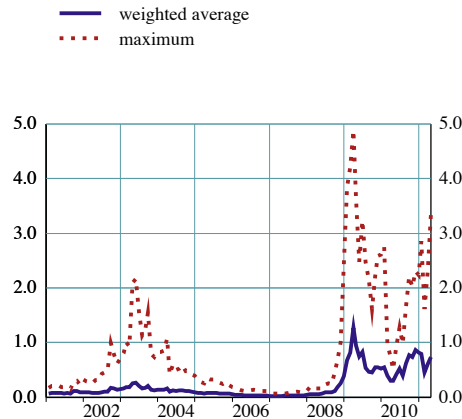


Sources: ECB and ECB calculations.

Note: See the note of Chart S102.

### Chart S106 Expected default frequency (EDF) for large and complex banking groups in the euro area

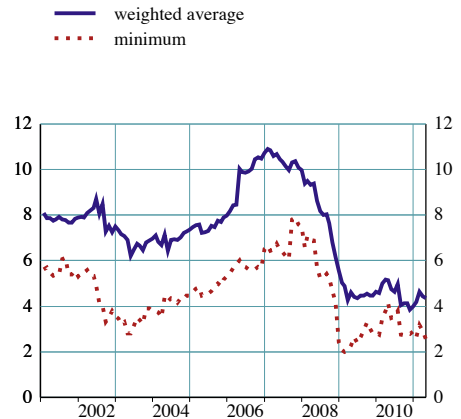
(Jan. 2001 - Apr. 2011; percentage probability)



Sources: Moody's KMV and ECB calculations.  
Notes: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%. The weighted average is based on the amounts of non-equity liabilities outstanding.

### Chart S107 Distance to default for large and complex banking groups in the euro area

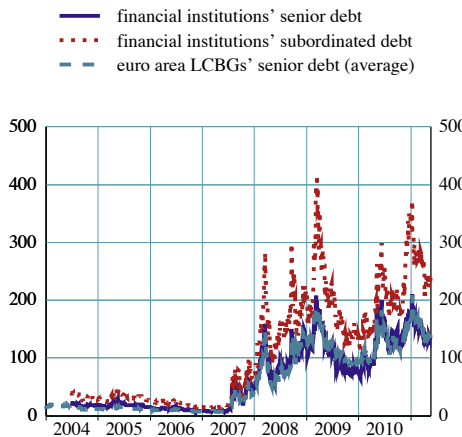
(Jan. 2001 - Apr. 2011)



Sources: Moody's KMV and ECB calculations.  
Notes: An increase in the distance to default reflects an improving assessment. The weighted average is based on the amounts of non-equity liabilities outstanding.

### Chart S108 Credit default swap spreads for European financial institutions and euro area large and complex banking groups

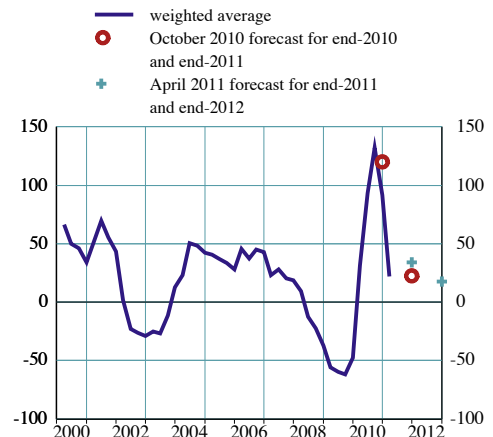
(Jan. 2004 - May 2011; basis points; five-year maturity)



Sources: Bloomberg and ECB calculations.

### Chart S109 Earnings and earnings forecasts for large and complex banking groups in the euro area

(Q1 2000 - Q4 2012; percentage change per annum; weighted average)

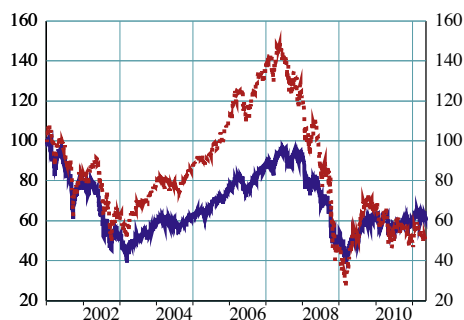


Sources: Thomson Reuters, I/B/E/S and ECB calculations.  
Notes: Growth rates of weighted average earnings for euro area large and complex banking groups, using their market capitalisations at March 2011 as weights. Actual earnings are derived on the basis of historical net income; forecasts are derived from IBES estimates of earnings per share.

**Chart S110 Dow Jones EURO STOXX total market and bank indices**

(Jan. 2001 - May 2011; index: Jan. 2001 = 100)

— Dow Jones EURO STOXX 50 index  
 ..... Dow Jones EURO STOXX bank index

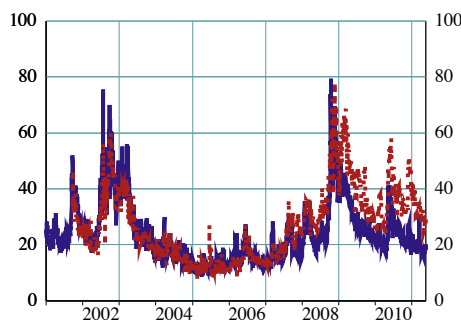


Sources: Bloomberg and ECB calculations.

**Chart S111 Implied volatility for Dow Jones EURO STOXX total market and bank indices**

(Jan. 2001 - May 2011; percentages)

— Dow Jones EURO STOXX 50 index  
 ..... Dow Jones EURO STOXX bank index

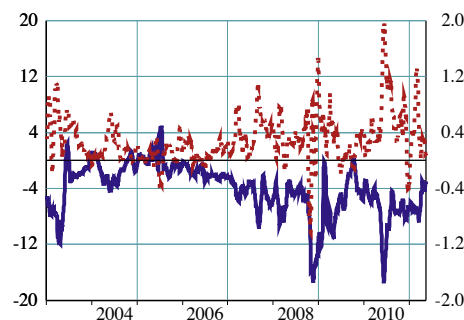


Sources: Bloomberg and ECB calculations.  
 Note: Weighted average of the volatility of the two closest options.

**Chart S112 Risk reversal and strangle of the Dow Jones EURO STOXX bank index**

(Jan. 2003 - May 2011; percentages; implied volatility; 20-day moving average)

— risk reversal (left-hand scale)  
 ..... strangle (right-hand scale)

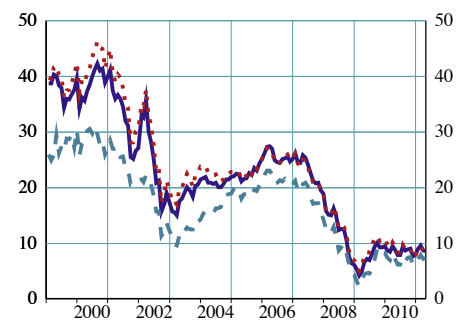


Sources: Bloomberg and ECB calculations.  
 Notes: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The strangle is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the at-the-money volatility of calls and puts with 50 delta.

**Chart S113 Price/earnings (P/E) ratios for large and complex banking groups in the euro area**

(Jan. 1999 - Apr. 2011; ten-year trailing earnings)

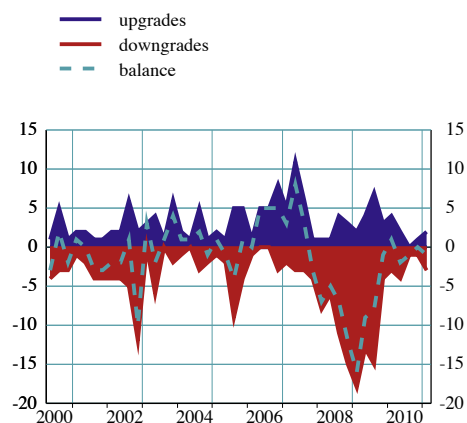
— simple average  
 ..... weighted average  
 - - - 25th percentile



Sources: Thomson Reuters, I/B/E/S and ECB calculations.  
 Notes: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings. The weighted average is based on the market capitalisation in April 2011.

**Chart S114 Changes in the ratings of large and complex banking groups in the euro area**

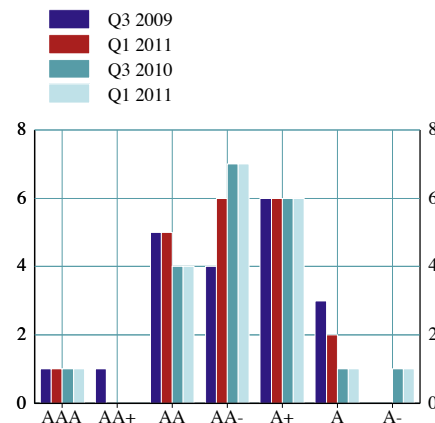
(Q2 2000 - Q1 2011; number)



Sources: Bloomberg and ECB calculations.  
Note: These include both outlook and rating changes.

**Chart S115 Distribution of ratings for large and complex banking groups in the euro area**

(number of banks)



Sources: Moody's, Fitch Ratings, Standard and Poor's and ECB calculations.

**Table S7 Rating averages and outlook for large and complex banking groups in the euro area**

(April 2011)

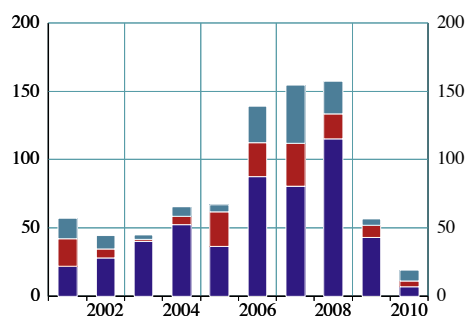
	Moody's	S&P	Fitch	Total
Ratings available out of sample	19	16	20	55
Outlook available	19	19	20	58
Rating average	Aa2	AA-	AA-	4.4
Outlook average	-0.5	-0.4	-0.2	-0.3
Number of positive outlooks	0	0	0	0
Number of negative outlooks	9	7	3	19
Rating codes	Moody's	S&P	Fitch	Numerical equivalent
	Aaa	AAA	AAA	1
	Aa1	AA+	AA+	2
	Aa2	AA	AA	3
	Aa3	AA-	AA-	4
	A1	A+	A+	5
	A2	A	A	6
	A3	A-	A-	7
Outlook	Stable	Positive	Negative	
Numerical equivalent	0	1	-1	

Sources: Moody's, Fitch Ratings, Standard and Poor's and ECB calculations.

**Chart S116 Value of mergers and acquisitions by euro area banks**

(2001 - 2010; EUR billions)

■ domestic  
■ euro area other than domestic  
■ rest of the world



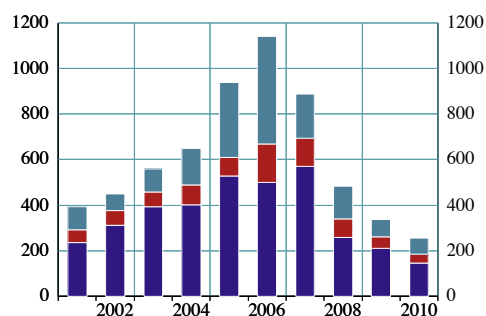
Sources: Bureau van Dijk (ZEPHIR database) and ECB calculations.

Note: All completed mergers and acquisitions (including institutional buyouts, joint ventures, management buyout/ins, demergers, minority stakes and share buybacks) where a bank is the acquirer.

**Chart S117 Number of mergers and acquisitions by euro area banks**

(2001 - 2010; total number of transactions)

■ domestic  
■ euro area other than domestic  
■ rest of the world

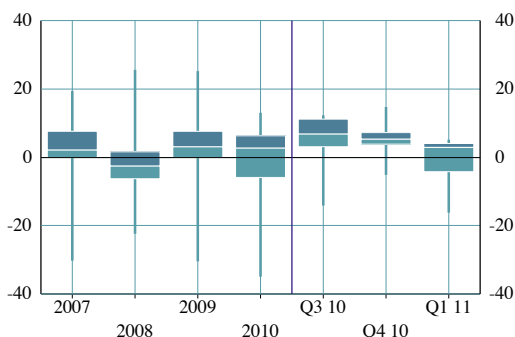


Sources: Bureau van Dijk (ZEPHIR database) and ECB calculations.

Note: All completed mergers and acquisitions (including institutional buyouts, joint ventures, management buyout/ins, demergers, minority stakes and share buybacks) where a bank is the acquirer.

**Chart S118 Distribution of gross-premium-written growth for a sample of large euro area primary insurers**

(2007 - Q1 2011; percentage change per annum; nominal values; maximum, minimum, interquartile distribution)

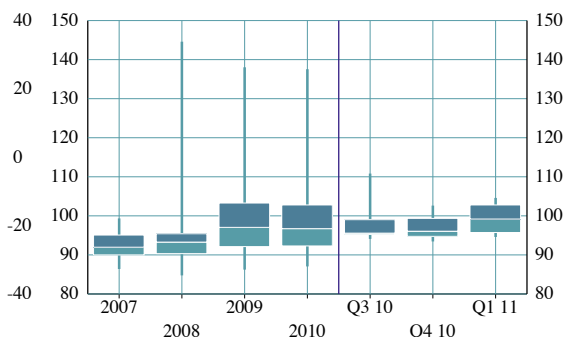


Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

Note: Based on the figures for 20 large euro area insurers.

**Chart S119 Distribution of combined ratios in non-life business for a sample of large euro area primary insurers**

(2007 - Q1 2011; percentage of premiums earned; maximum, minimum, interquartile distribution)

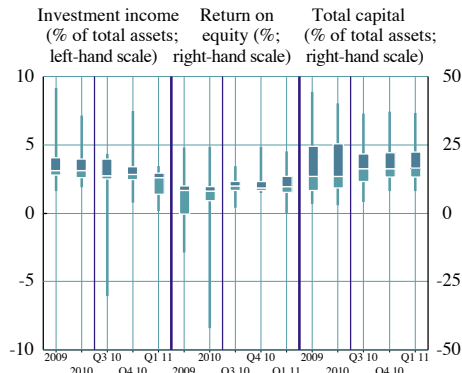


Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

Note: Based on the figures for 20 large euro area insurers.

**Chart S120 Distribution of investment income, return on equity and capital for a sample of large euro area primary insurers**

(2009 - Q1 2011; maximum, minimum, interquartile distribution)

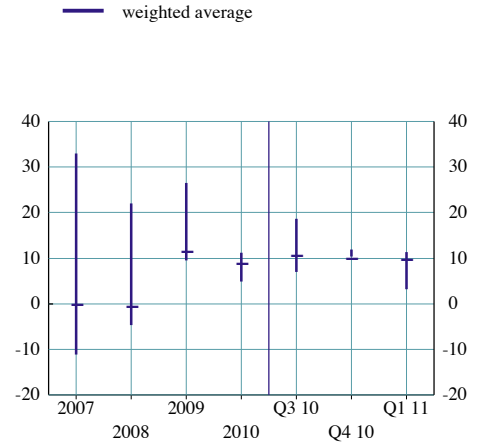


Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

Note: Based on the figures for 20 large euro area insurers.

**Chart S121 Distribution of gross-premium-written growth for a sample of large euro area reinsurers**

(2007 - Q1 2011; percentage change per annum; maximum-minimum distribution)

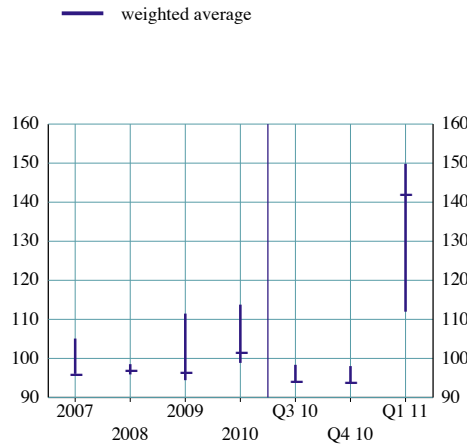


Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

Notes: Based on the figures for four large euro area reinsurers. The weighted average is based on the amounts of total assets outstanding.

**Chart S122 Distribution of combined ratios for a sample of large euro area reinsurers**

(2007 - Q1 2011; percentage change per annum; nominal values; maximum-minimum distribution)

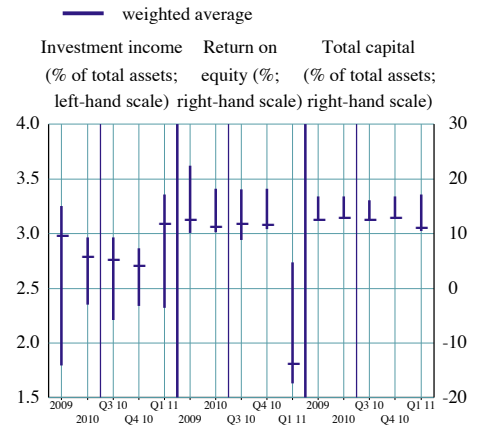


Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

Notes: Based on the figures for four large euro area reinsurers. The weighted average is based on the amounts of total assets outstanding.

**Chart S123 Distribution of investment income, return on equity and capital for a sample of large euro area reinsurers**

(2009 - Q1 2011; percentage of premiums earned; maximum-minimum distribution)

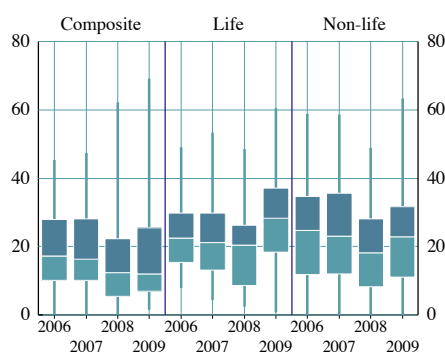


Sources: Bloomberg, individual institutions' financial reports and ECB calculations.

Notes: Based on the figures for four large euro area reinsurers. The weighted average is based on the amounts of total assets outstanding.

**Chart S124 Distribution of equity asset shares of euro area insurers**

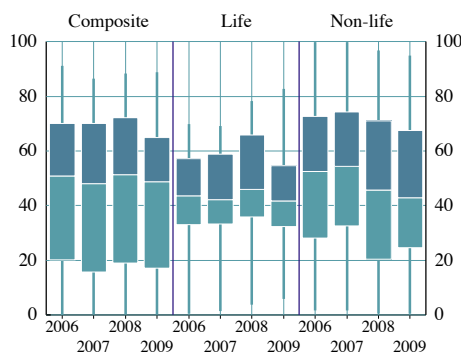
(2006 - 2009; percentage of total investment; maximum, minimum, interquartile distribution)



Source: Standard and Poor's (Eurothesys database).

**Chart S125 Distribution of bond asset shares of euro area insurers**

(2006 - 2009; percentage of total investment; maximum, minimum, interquartile distribution)

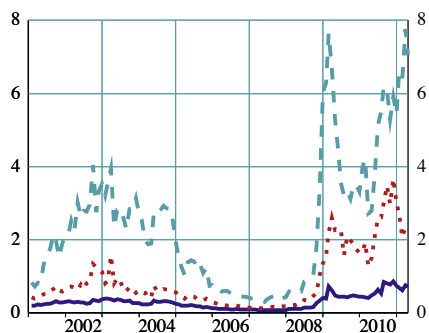


Source: Standard and Poor's (Eurothesys database).

**Chart S126 Expected default frequency (EDF) for the euro area insurance sector**

(Jan. 2001 - Apr. 2011; percentage probability)

- median
- 75th percentile
- - - 90th percentile

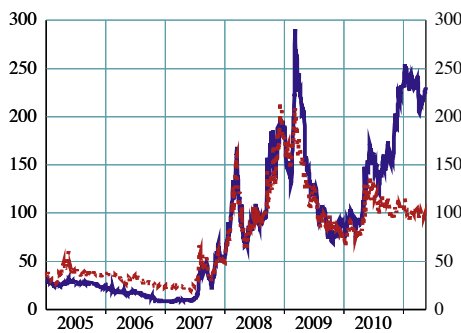


Source: Moody's KMV.  
 Note: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

**Chart S127 Credit default swap spreads for a sample of large euro area insurers and the iTraxx Europe main index**

(Jan. 2005 - May 2011; basis points; five-year maturity)

- euro area insurers' average CDS spread
- iTraxx Europe

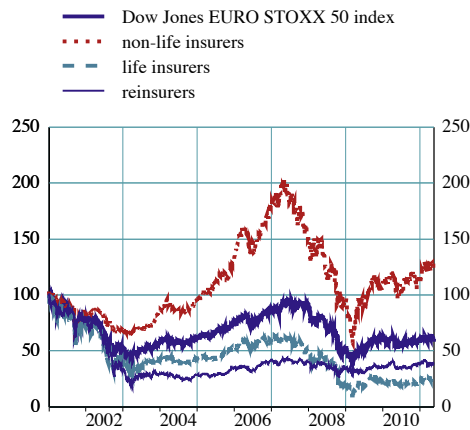


Sources: Bloomberg and ECB calculations.



### Chart S128 Dow Jones EURO STOXX total market and insurance indices

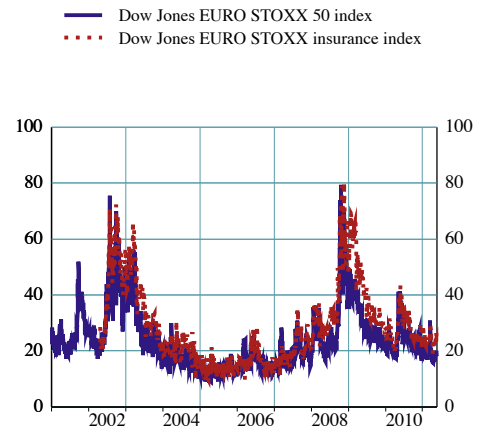
(Jan. 2001 - May 2011; index: Jan. 2001 = 100)



Source: Thomson Reuters.

### Chart S129 Implied volatility for Dow Jones EURO STOXX total market and insurance indices

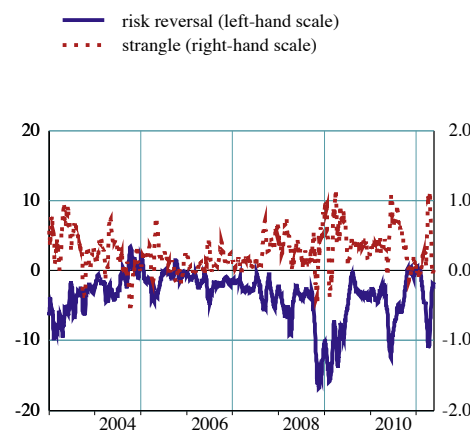
(Jan. 2001 - May 2011; percentages)



Sources: Bloomberg and ECB calculations.  
Note: Weighted average of the volatility of the two closest options.

### Chart S130 Risk reversal and strangle of the Dow Jones EURO STOXX insurance index

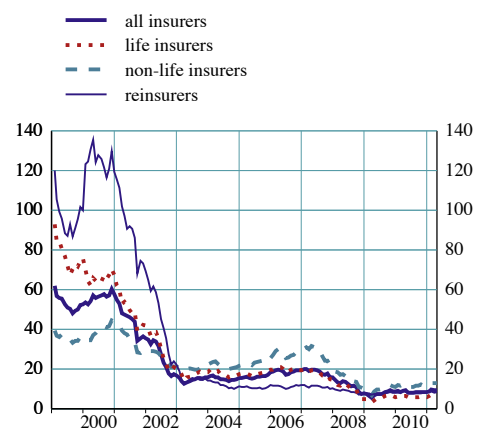
(Jan. 2003 - May 2011; ten-year trailing earnings)



Sources: Bloomberg and ECB calculations.  
Notes: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The strangle is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the at-the-money volatility of calls and puts with 50 delta.

### Chart S131 Price/earnings (P/E) ratios for euro area insurers

(Jan. 1999 - Apr. 2011; ten-year trailing earnings)



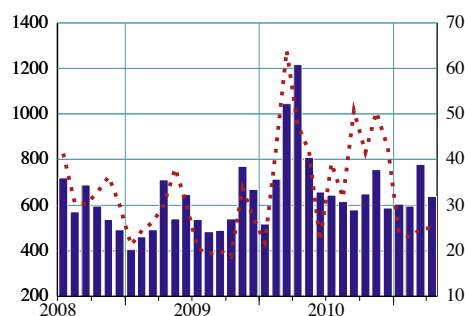
Sources: Thomson Reuters and ECB calculations.  
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

## 6 EURO AREA FINANCIAL SYSTEM INFRASTRUCTURES

**Chart S132 Non-settled payments on the Single Shared Platform (SSP) of TARGET2**

(July 2008 - Apr. 2011)

■ volume (left-hand scale, number of transactions)  
 ●●● value (right-hand scale, EUR billions)



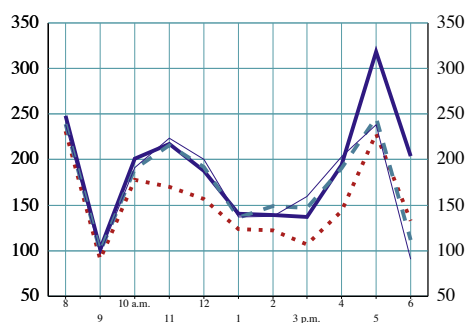
Source: ECB.

Note: Monthly averages of daily observations.

**Chart S133 Value of transactions settled in TARGET2 per time band**

(Q2 2010 - Q1 2011; EUR billions)

— Q2 2010  
 ●●● Q3 2010  
 - - - Q4 2010  
 — Q1 2011

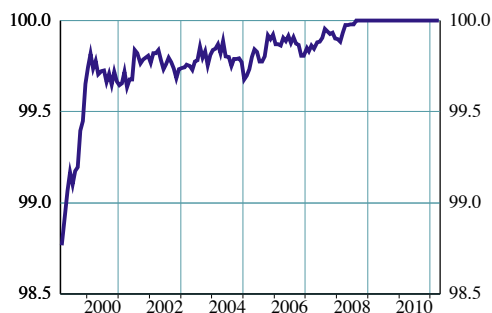


Source: ECB.

Note: Averages based on TARGET2 operating days.

**Chart S134 TARGET and TARGET2 availability**

(Mar. 1999 - Apr. 2011; percentages; three-month moving average)

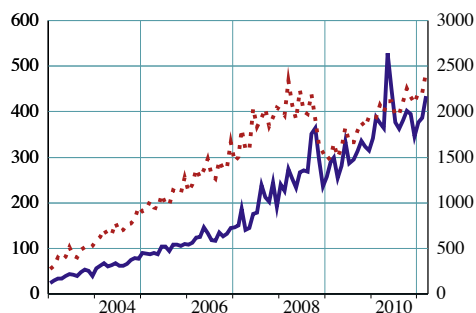


Source: ECB.

**Chart S135 Volumes and values of foreign exchange trades settled via Continuous Linked Settlement (CLS)**

(Jan. 2003 - Mar. 2011)

— volume in thousands (left-hand scale)  
 ●●● value in USD billions (right-hand scale)



Source: ECB.







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