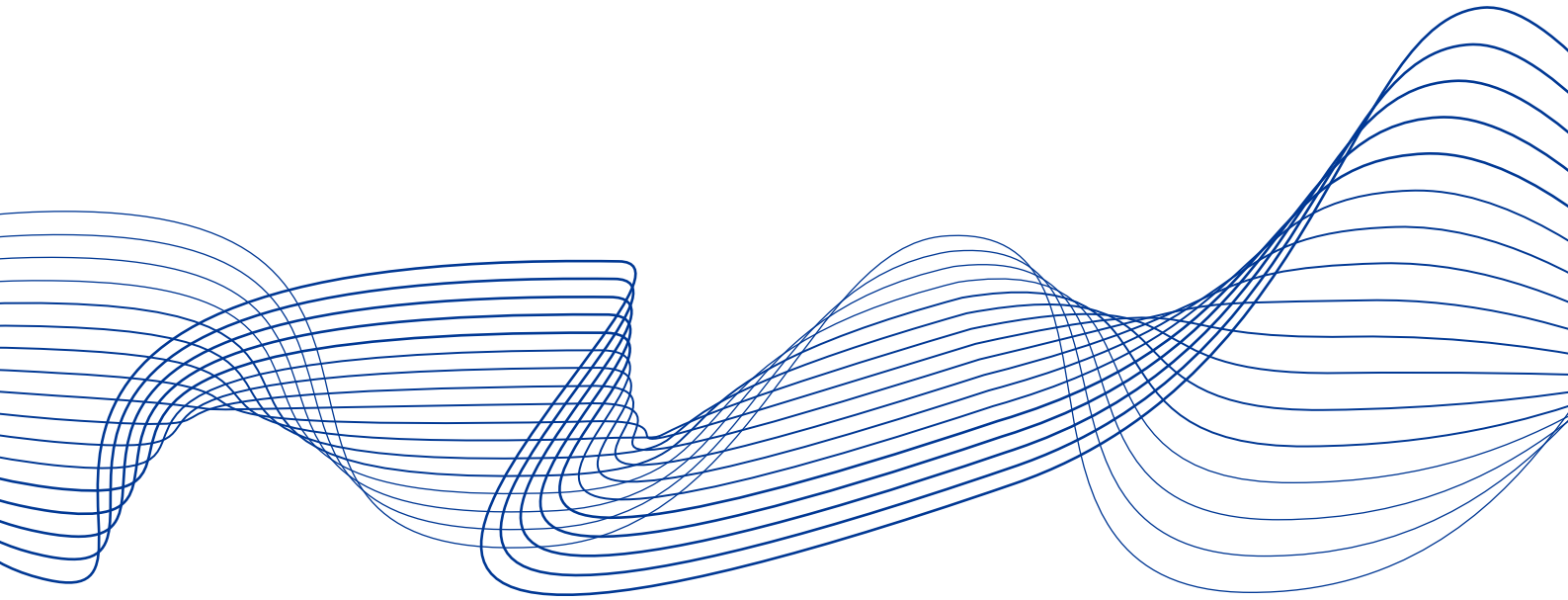
Annual Report

2015



ESRB
European Systemic Risk Board
European System of Financial Supervision

Contents

Foreword

Mario Draghi,
Chair of the
European Systemic Risk Board

In the course of 2015, the European Systemic Risk Board (ESRB) continued its close monitoring of possible sources of systemic risks in the European financial system and economy. There were at times signs of an aggravation of vulnerabilities in three areas. Above all, there was significant market volatility, which was triggered by developments in key emerging market economies in the autumn of 2015 and rapidly spread to global financial markets, including European markets. The ESRB had been alert to the risk of re-pricing in global financial markets and upgraded it to the highest category in response to these developments. In early 2016, these vulnerabilities partly materialised in an environment which was characterised by continuing uncertainty about the global economic recovery, by continued weaknesses in the balance sheets of banks and insurers in the EU, and by a high level of public and private debt. Secondly, the EU shadow banking sector continued to increase in size and interconnectedness, meaning that potential shocks and contagion from the shadow banking sectors could transmit to the rest of the financial system. Finally, geopolitical uncertainty in almost all regions surrounding Europe contributed to keeping levels of concern elevated.

At the same time, macroprudential authorities had at their disposal, for the first time, a relatively broad set of policy tools to increase the resilience of the banking sector to those risks, even if similar instruments are lacking for the rest of the financial sector. The ESRB has been supporting the national macroprudential authorities by developing an institutional framework that will allow for national measures to be mutually reciprocated, therefore reducing the risks of regulatory arbitrage. The ESRB has also provided macroprudential adverse scenarios to all European Supervisory Authorities in the respective area of competence (notably, banking, insurance and central counterparties). Lastly, the ESRB has studied structural areas of risks, and in particular the systemic role which exposure to the residential and commercial real estate sectors may have for households, banks and the economy as a whole, as well as the systemic nature of some risks propagating from the insurance industry.

The ESRB has continued to provide its members with a forum for a confidential exchange of views on short-, medium- and long-term vulnerabilities of a systemic nature. In almost all EU Member States macroprudential policy became operational.

Frankfurt am Main, July 2016

Mario Draghi

ESRB Chair

Executive Summary

2015 marked the fifth year of operation of the European Systemic Risk Board. Since its inception in 2010, the ESRB has continued to be confronted with exceptional conditions, reflecting the aftermath of the financial and sovereign debt crisis across Europe. Although market-based indicators of systemic risk have returned to pre-crisis levels, significant vulnerabilities continued to exist in the EU financial system. Consequently, the ESRB has identified four main risks to financial stability in the EU: (i) a re-pricing of risk premia in global financial markets, amplified by low market liquidity; (ii) a further weakening of banks' and insurers' balance sheets; (iii) a deterioration of debt sustainability in the sovereign, corporate and household sectors; and (iv) shocks and contagion from the shadow banking sectors to the financial system.

The ESRB raised the assessment of risk premia in global financial markets to its highest category of risk because of the significant market volatility. This volatility, which was triggered by developments in key emerging market economies in the autumn of 2015, spread rapidly to global financial markets, including European markets. In early 2016, the risk of a re-pricing of risk premia in global financial markets partly materialised in an environment that was characterised by continuing uncertainty about the global economic recovery, continued weaknesses in the balance sheets of banks and insurers in the EU, and a high level of public and private debt. The risk of a renewed flare-up of the sovereign debt crisis increased in the spring and summer of 2015, given, among other things, political uncertainty in Greece. Although asset prices in Greece plummeted, contagion to other countries with high debt levels was limited. Since the summer of 2015, market concerns related to Greece have abated considerably. In the light of structural developments, the EU shadow banking system continued to grow in size and interconnectedness in 2015. This growth has raised the need for increased monitoring by macroprudential authorities. Finally, geopolitical uncertainty in almost all regions surrounding Europe contributed to the elevated levels of concern.

In 2015, the ESRB continued to develop macroprudential policies and guidance on the use of macroprudential instruments covering the banking and non-bank financial sectors. First, the ESRB examined the systemic risks arising from the activities of European insurers and reinsurers. The resulting report recommended assessing whether additional tools may be needed for macroprudential authorities to deal with systemic risks relating to the EU insurance sector. Second, the ESRB performed a structural analysis of the relationship between developments in the real estate sector and financial stability. Third, further work was undertaken on the possible systemic risks arising from a late and sudden transition to a low-carbon economy. Finally, in cooperation with the European Central Bank (ECB), the ESRB initiated work on monitoring and assessing financial stability risks that arise over a prolonged period of low interest rates.

In addition, the ESRB also contributed to the stress tests launched by the three European Supervisory Authorities. In early 2015, the ESRB provided adverse macro-financial scenarios to be used in an exercise for testing the resilience of defined-benefit pension funds conducted by the European Insurance and Occupational Pensions Authority (EIOPA). One year on, in early 2016, the ESRB elaborated the adverse macro-financial scenarios which were passed on to the European Banking Authority (EBA) for the banking sector stress test, and to EIOPA for the insurance sector stress test. The ESRB also contributed for the first time to the European Securities and Markets Authority (ESMA) stress tests for central counterparties (CCPs).

The ESRB continued its work on CCPs and submitted two contributions for the consideration of the European Commission in the context of the review of the European Market Infrastructure Regulation (EMIR). While agreeing with the overall design of EMIR, the ESRB took the view that the anticyclical contribution of the legal framework could be significantly enhanced. The insertion of

a review clause in EMIR, specifically on the macroprudential use of margins and haircuts, would allow for the principles governing such instruments to be further developed.

Compared with the previous year, 2015 saw a substantial increase in the number of measures covering macroprudential matters. As was expected, there continued to be wide differences across EU countries regarding the number and types of measures taken. The increase in the number of measures was partly due to the designation of systemically important institutions and the implementation of the regime for the counter-cyclical capital buffer. In addition, the residential real estate sector continued to be a highly relevant area for macroprudential policy action. Furthermore, in the course of 2015, several EU countries considered, and often took, policy initiatives aimed at addressing the risks from the stock of loans in foreign currencies. At the end of 2015, the ESRB put in place a coordination framework for the assessment of the cross-border effects of and voluntary reciprocity for macroprudential policy measures. More precisely, in an integrated financial system like the single European market, greater policy coordination is needed to ensure that national macroprudential policies are effective.

Finally, during the period under review, the ESRB continued to evaluate the implementation of past ESRB recommendations. The assessment of the ESRB Recommendation on the funding of credit institutions (ESRB/2012/2) revealed significant progress in the harmonisation of national covered bond frameworks. The same ESRB recommendation was also successful in fostering risk management policies, procedures and controls for the related risks, as well as a monitoring framework for asset encumbrance.

Systemic risks in the financial system of the European Union

During the period under review, the ESRB has identified four main risks to financial stability in the EU. These risks were defined as (i) a re-pricing of risk premia in global financial markets, amplified by low market liquidity, (ii) a further weakening of banks' and insurers' balance sheets, (iii) a deterioration of debt sustainability in sovereign, corporate and household sectors and (iv)shocks and contagion from the shadow banking sectors to the financial system. Table 1 summarises the main risks to financial stability in the EU.

The risk of re-pricing of risk premia in global financial markets partly materialised during the review period. The significant market volatility, which was triggered by developments in key emerging market economies (EMEs) in autumn 2015 and spread rapidly to global financial markets, including European markets, led the ESRB to raise the risk of re-pricing of risk premia in global financial markets to its highest category of risks. The first phase of market volatility in the autumn of 2015 centred on market concerns over the global implications of weaker growth in key EMEs. In particular, this had a negative effect on the global equity markets. The second phase of turbulence in early 2016 went beyond stock markets, impacting widely different types of asset prices, including commodities, corporate bonds and high-yield securities, which all fell significantly. This led the ESRB to conclude that the risk of re-pricing of risk premia in global financial markets had indeed partly materialised.

Table 1
Main risks to financial stability in the EU

1	Re-pricing of risk premia in global financial markets, amplified by low market liquidity
2	Further weakening of banks' and insurers' balance sheets
3	Deterioration of debt sustainability in sovereign, corporate and household sectors
4	Shocks and contagion from the shadow banking sectors to the financial system

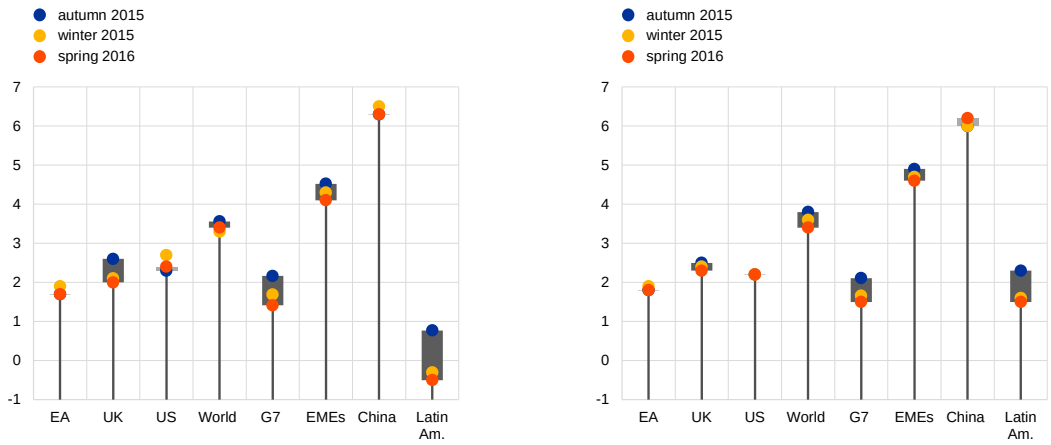
Note: Identified key systemic risks up to the time horizon of three years. Yellow denotes risk, orange denotes medium-level risk and red denotes high risk.

The key factor underlying all risks was the fragile economic recovery. The broad-based financial market volatility was reinforced by general uncertainty about the global economic recovery. In particular, the growth outlook for the main economic regions and for some EU Member States deteriorated in winter 2015, intensifying the underlying vulnerabilities of the main risks to financial stability in the EU. Uncertainty related to the global economic recovery remained, as a consequence of medium-term growth pressures in some key EMEs, particularly China, as well as in other oil and commodity exporters (see Chart 1). Moreover, a combination of vulnerabilities in other key EMEs, such as Brazil and Russia, of heightened geopolitical risks as well as of a likely increase in divergence of rates and yields across the main currency areas added to the uncertainty.

Chart 1

Growth outlook for key regions

(percentages)



Sources: ECB, Bank of England, Federal Reserve System and International Monetary Fund (IMF).
Notes: The chart shows gross domestic product (GDP) growth forecasts for the main regions for 2016 and 2017, as published in autumn 2015, winter 2015 and spring 2016. Euro area: published Eurosystem/ECB staff macroeconomic projections; UK: Monetary Policy Committee indicative projections in the Bank of England quarterly Inflation Reports; US: mean forecasts from the Federal Reserve System's Federal Open Market Committee members; other regions: IMF World Economic Outlook. EMEs include emerging economies and developing countries, as categorised by the IMF.

1 Re-pricing of risk premia in global financial markets, amplified by low market liquidity

Starting in April 2015, increased bond market volatility indicated that the risk of re-pricing of risk premia in global markets was increasingly likely to materialise. During the spring of 2015, developments in Greece posed the main institutional risk to financial stability in the EU, while instability in Ukraine and in both the Middle East and North Africa posed the main geopolitical risks to financial stability in the EU.

In the second half of 2015, uncertainty about the global economic recovery increased and the growth outlook for the main regions and for some EU countries deteriorated, coinciding with significant declines in oil and other commodity prices. Moreover, a combination of vulnerabilities in key EMEs – such as China, Brazil and Russia – as well as geopolitical risks increasingly added to the uncertainty. In August 2015, sharp declines in the Chinese equity markets triggered increased uncertainty and significant market moves in the global and European financial markets.

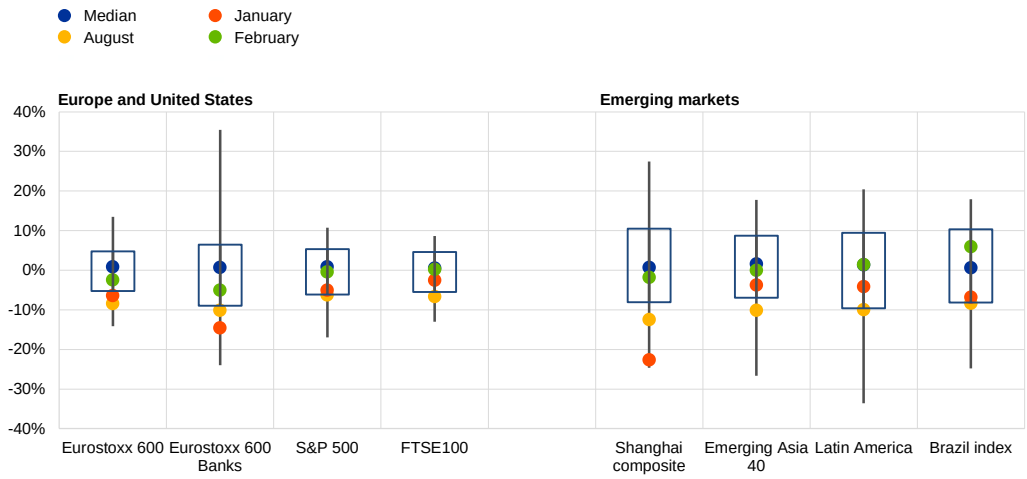
In partial response to these developments, yields in many European money and bond market segments reached unprecedented low – and sometimes even negative – levels, reflecting low inflation and growth expectations as well as low risk pricing. The monetary policy stance of European central banks remained accommodative and included non-standard measures to counter risks to price stability. At the same time, an increasing divergence in rates and yields between the EU and the US added to the uncertainty about bond market developments.

At the end of 2015 and in the first quarter of 2016, European and global financial markets recorded substantial volatility, exacerbated by general uncertainty about the global economic recovery. European and global financial markets recorded substantial declines (see Charts 2 and 3). Beyond the general decline in stock markets, prices of commodities, energy company shares and high-yield securities fell significantly, with EMEs and high-yield markets

experiencing capital outflows. However, towards the end of the review period, there were signs of a market recovery.

Chart 2
Re-pricing in global markets

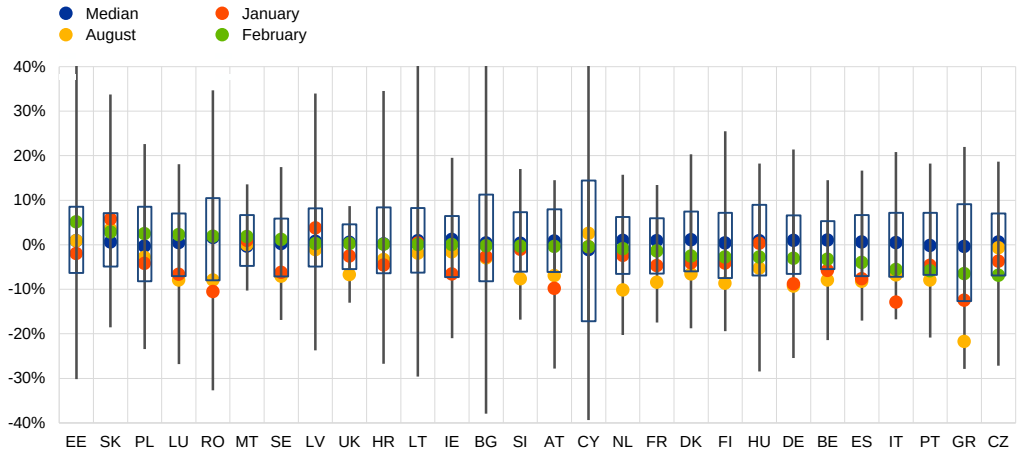
(percentages)



Sources: Bloomberg and ESRB Secretariat calculations.
Notes: The chart shows the median, the min-max range (vertical lines), the 10%-90% quartile range (box) of monthly returns (Jan. 2000 – Dec. 2016). Dots indicate monthly returns in Aug. 2015, as well as Jan. and Feb. 2016. Indices used are China: Shanghai Composite; Emerging Asia: S&P 40 (data since April 2006); Latin America: SPLACE; Brazil: IBOV; Europe: EURO STOXX 600; European banks: EURO STOXX 600 Banking index, as well as the main market indices for European countries (Chart 2). Last observation: February 2016.

Chart 3
Re-pricing in European markets

(percentages)



Sources: Bloomberg and ESRB Secretariat calculations.
Notes: The chart shows the median, the min-max range (vertical lines), the 10%-90% quartile range (box) of monthly returns (Jan. 2000 – Dec. 2016). Dots indicate monthly returns in Aug. 2015, as well as Jan. and Feb. 2016. Indices used are China: Shanghai Composite; Emerging Asia: S&P 40 (data since Apr. 2006); Latin America: SPLACE; Brazil: IBOV; Europe: EURO STOXX 600, European banks: EURO STOXX 600 Banking index, as well as the main market indices for European countries (Chart 2). Last observation: February 2016.

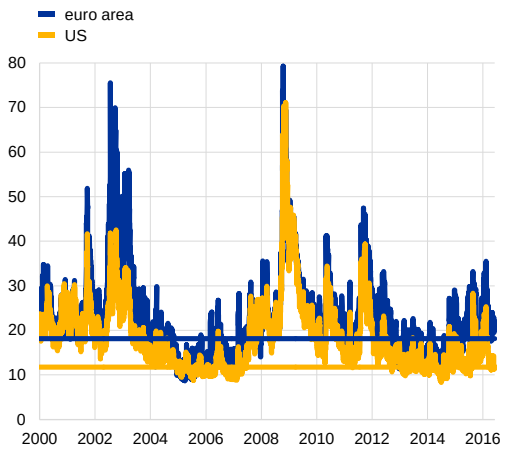
Many market-implied measures of asset price uncertainty pointed to a continuation of an elevated risk of market re-pricing. Stock market uncertainty, as reflected in implied volatility over a five-year horizon, rose considerably in August 2015, and again in early 2016 (see Chart 4).

Moreover, during the spring of 2016, yields in the EU corporate bond markets were at very low levels, which suggested corporate default risks and liquidity risks associated with such holdings are relatively low priced. That would imply certain scope for a further re-pricing and the possibility of market volatility ahead (see Chart 5).

Chart 4

Risk of re-pricing in global markets: stock market uncertainty

(percentages)

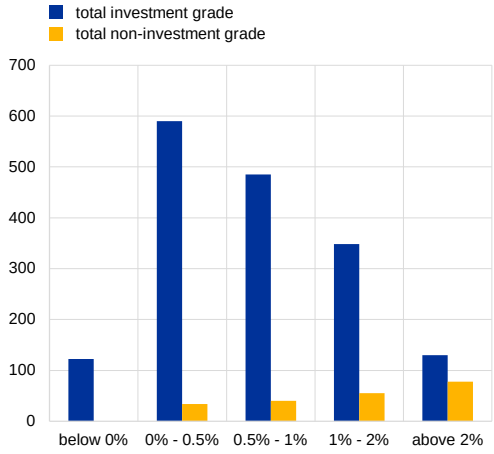


Source: Reuters.
Notes: The chart shows implied euro area and US stock market volatilities over a five-year horizon. The latest data as of 7 June 2016 is marked out with horizontal lines.

Chart 5

Number of EU corporate bonds trading at low yields

(number of bonds)



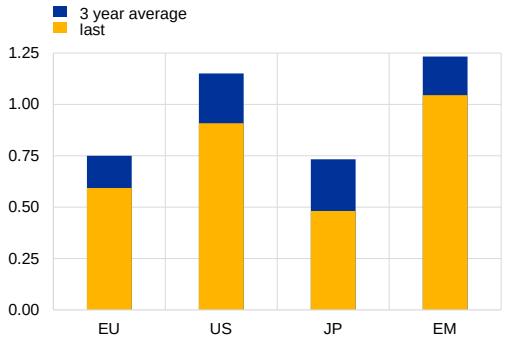
Sources: Bloomberg data on bonds included in the Merrill Lynch corporate bond index and ESRB Secretariat calculations.
Notes: Includes bonds with a maturity of over six months. Non-rated bonds included in non-investment grade. Last observation: 7 June 2016.

2 Further weakening of banks' and insurers' balance sheets

Ongoing weaknesses in banks' balance sheets in the form of poor asset quality and the uncertain outlook for sustainable medium-term profitability were the key vulnerabilities in the EU banking sector in the review period. Although EU banks have significantly increased the level of regulatory capital to enhance their resilience, and both the overall quality of EU banks' assets and levels of profitability have improved since 2010, vulnerabilities in the EU banking system continued to exist.

Chart 6

Banks' price-to-book ratios



Sources: Bloomberg and ESRB Secretariat calculations.
Notes: The chart shows price-to-book ratios for the following bank indices: EURO STOXX banks, S&P 500 banks, TOPIX banks and MSCI emerging market banks. Last observation: 7 June 2016.

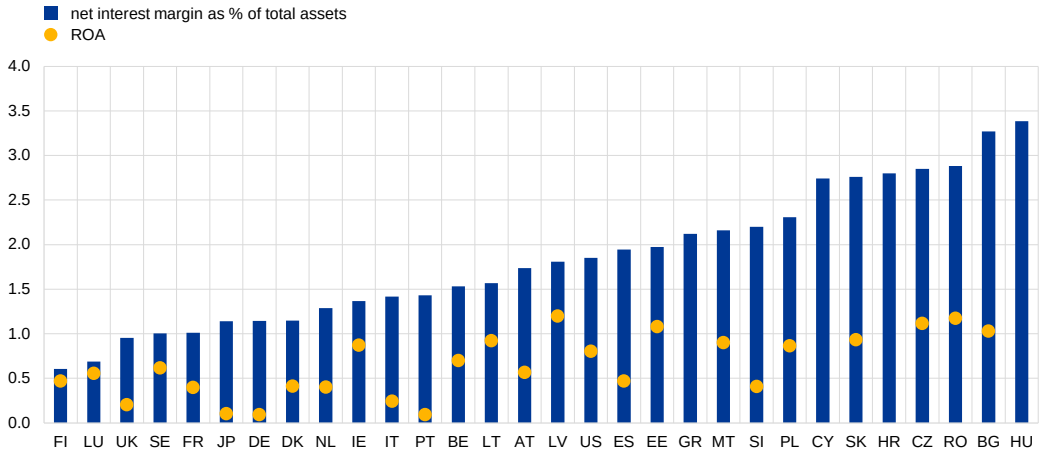
Profitability and asset quality concerns by market participants were reflected in increased volatility and lowered valuations of the asset prices of EU banks, in the context of global market turbulence at the beginning of 2016. Since then, banks' price-to-book ratios have remained at low levels (see Chart 6).

Banks' net interest margins and profitability indicators continued to show weaknesses in many national banking systems. In fact, the profitability of EU banks has slowly decreased since 2008, and the current profitability of several EU banking systems is not far from that of Japan during its lost decade (see Chart 7).

Chart 7

Net interest margin and return on assets of EU banking systems

(percentages)

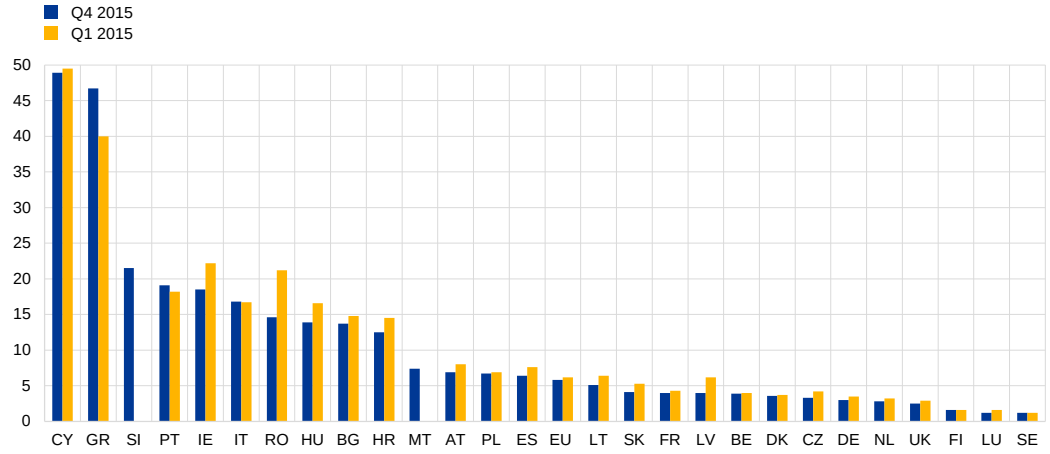


Sources: ECB Consolidated Banking Data and OECD Banking Database.
Notes: Data for the EU banking systems refer to the year 2015. Japanese and US data refer to the average in the period 1989-2010. The return on assets (ROA) of Greek, Cypriot, Croatian and Hungarian banks were negative in 2015 and, for presentational purposes, are not shown in the chart.

As regards asset quality, despite the non-performing loan (NPL) ratio improving in 2015 in the majority of EU Member States, banks in several countries maintained a high stock of NPLs, especially for loans to non-financial corporations (see Chart 8). Going forward, the handling of such high stocks poses a growing challenge given the trends being observed in banks' profitability.

Chart 8
NPL ratio

(percentages)



Sources: European Banking Authority Risk Dashboard and a sample of key risk indicators from 194 European banks (weighted average per country).
Note: The NPL ratio is non-performing loans and advances divided by total gross loans and advances weighted by total assets.

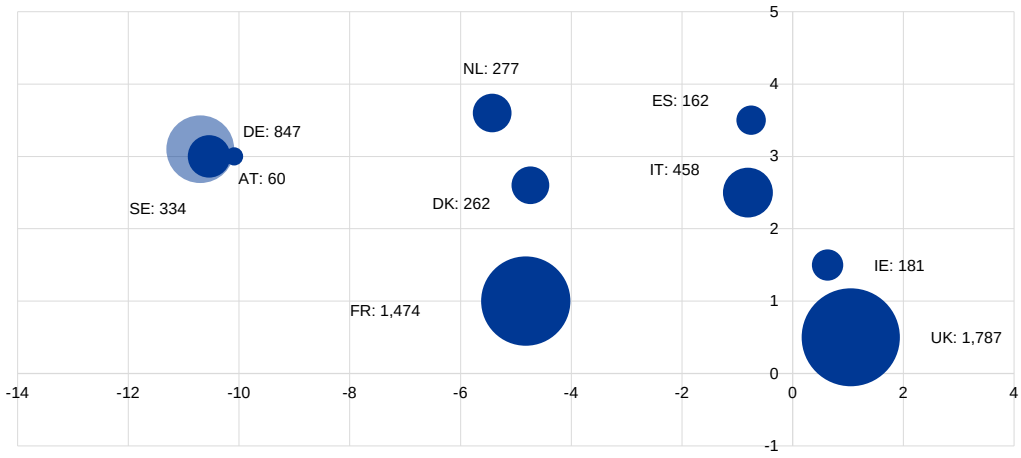
As concerns the insurance sector during the period under review, the ongoing low interest rate environment posed continuing challenges. Insurers may be particularly sensitive to what is known as a "double hit" scenario consisting of (i) a persistently low level of risk-free interest rates and (ii) a simultaneous shock to asset prices.

The low interest rate environment makes it difficult to earn high returns, particularly on fixed income investments, which causes problems for business models with high volumes of long-term liabilities offering guaranteed rates. In many European countries, the average guaranteed rates are over 2% annually in the life insurance sector, and the duration mismatch is negative, i.e. the liabilities are longer in maturity compared with assets (see Chart 9). In connection with the turbulence in global financial markets in 2015 and in the first quarter of 2016, the risk of the "double hit" scenario manifesting itself became more probable, and was therefore at the centre of the ESRB adverse scenario for the 2016 EIOPA stress test.

Chart 9

Life insurance: average guaranteed rate and duration mismatch in ten European countries

(y axis: average guaranteed rate in percentages p.a.; x axis: duration mismatch in years; bubble size: size of the industry in EUR bn)



Sources: EIOPA Insurance Stress Test Report 2014 and ESRB calculations.

3 Deterioration of debt sustainability in the sovereign, corporate and household sectors

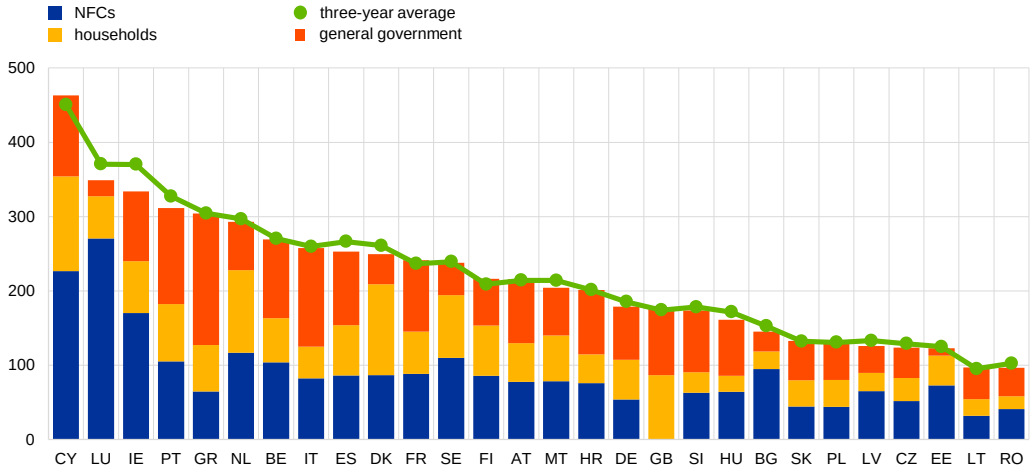
During the review period, the risk of a deterioration in debt sustainability in sovereign, corporate and household sectors remained a source of systemic risk for financial stability in the EU, particularly due to the persistently weak economic outlook. The aggregate level of debt in different sectors in most EU countries changed little during the review period. In fact, in many EU countries the three-year average debt level was very close to the latest observation (see Chart 10), which shows that significant deleveraging in the aggregate economy has occurred in only a few EU countries. By the end of 2015, the deteriorating growth outlook for 2016 in many EU countries had the effect of weakening debt sustainability in economies that have elevated levels of debt.

During the spring of 2015, developments in Greece posed the main institutional risk to financial stability in the EU. The risk of a renewed flare-up of the sovereign debt crisis increased in the spring and summer of 2015, given among other things the political uncertainty in Greece. Although asset prices in Greece plummeted, contagion to other countries with high debt levels was limited. Since the summer of 2015, market concerns related to Greece have abated considerably.

Chart 10

Aggregate debt-to-GDP ratio

(percentages)



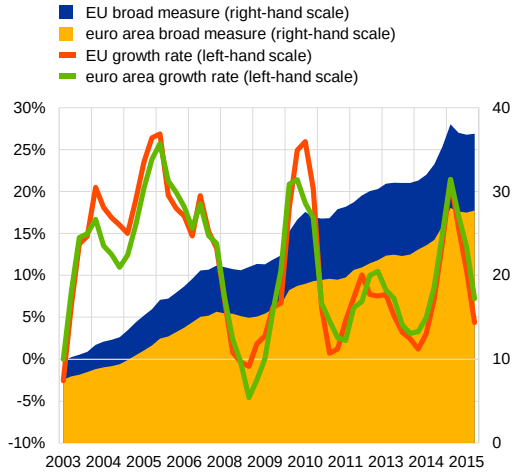
Sources: ESRB Risk Dashboard, as based on ECB and European Commission data.
Notes: Debt-to-GDP ratios for non-financial corporations (NFCs) are based on consolidated debt figures. Private sector debt is not available for BG due to national confidentiality constraints. Consolidated NFC debt is not available for FI and UK. Three-year averages are not available for BG, FI, LU and UK. Consolidated non-financial corporate debt figures also include cross-border inter-company loans which tend to account for a significant part of debt in countries where a large number of foreign entities, often multinational groups, ale located. Last observation: Q4 2015.

4 Shocks and contagion to the financial system arising from the shadow banking sectors

The EU shadow banking system (in particular the asset management sector) continued to grow in 2015. The size of the broadly defined shadow banking system in the EU amounted to EUR 37 trillion in total assets in the fourth quarter of 2015, or 36% of total EU financial sector assets. Assets in the broad EU shadow banking system have grown by 22% since the end of 2012. In the euro area, the size of the broad shadow banking system was EUR 28 trillion in the fourth quarter of 2015, having grown by 27% since the end of 2012 (see Chart 11). As a result of these developments, the broad shadow banking system has increased rapidly relative to the EU banking sector and represented 87% of credit institutions' total assets in the fourth quarter of 2015, up from 50% at the end of 2008.

Chart 11

Broad measure of EU and euro area shadow banking (investment funds and OFIs)



Sources: ECB and ECB calculations.
Note: Annual growth rates are based on outstanding amounts, i.e. they include the impact of foreign exchange or other revaluations and statistical reclassifications.

The EU shadow banking system is highly interconnected, and thus shocks and contagion from the shadow banking sectors can transmit to the rest of the financial system. The direct and indirect linkages of shadow banks between banks and insurance corporations as well as the household and corporate sectors remained significant over the review period. In particular, the exposures of euro area investment funds and other financial institutions (OFIs) to other euro area sectors remained notable. As concerns institutions, those that were most closely involved in shadow banking activities over the review period through maturity and liquidity transformation as well as through leverage were financial vehicle corporations (FVCs), securities and derivatives dealers (SDDs) and hedge funds.

Box 1

The European Market Infrastructure Regulation and derivative transactions

In the recent global financial crisis, one major concern was the lack of data about counterparties' exposures and the protection sold against their default. In the EU, the European Market Infrastructure Regulation (EMIR) was adopted in response to the need for greater transparency; in the derivatives markets, entities resident in the EU are required to report the details of all derivative transactions to trade repositories registered by the European Securities and Markets Authority (ESMA). There are currently six such trade repositories,[1] which provide daily information to over 50 authorities in the EU. These authorities have access to the data pertaining to their respective jurisdiction; the ESRB and ESMA have unique access to the full EU-wide dataset. **The ESRB is currently leading a substantial Union-wide research agenda to garner insights from the derivatives data and thereby inform financial policymaking.** This research agenda focuses on two broad policy questions. First, how are derivatives markets used to hedge risk or to take on new exposures? Second, how do different institutional arrangements – such as bilateral trading versus central clearing, over-the-counter versus exchange trading, and different degrees of compression – affect market functioning and systemic risk? The ESRB is addressing these two policy questions through the lens of interest rate and credit derivatives, with new work under way for foreign exchange derivatives.

Interest rate derivatives represented 80% of the gross notional of all derivatives markets. The market is large in part because of latent demand for hedging: as part of their business model,

1 The six registered trade repositories are as follows: CME Trade Repository Ltd. ("CME"); DTCC Derivatives Repository Ltd ("DTCC"); ICE Trade Vault Europe Ltd. ("ICE"); Krajowy Depozyt Papierów Wartościowych S.A. ("KDPW"); Regis-TR S.A. ("Regis-TR"); and UnaVista Limited ("UnaVista"). DTCC is one of four subsidiaries of the DTCC Global Trade Repository ("DTCC GTR"), which is a global trade repository with worldwide operations.

banks typically borrow at short maturities and lend long, while insurers and pension funds borrow long and lend short. In line with this hedging motive, banks' interest rate derivative portfolios generally increase in value when interest rates rise, while those of insurers and pension funds decrease. However, this aggregate picture masks substantial firm-level heterogeneity. In addition, the analysis reveals that some large banks play an important intermediation role in interest rate derivatives, taking small net positions vis-à-vis interest rate risk, despite maintaining large gross portfolios. Nonetheless, network analysis suggests that intermediation was less important than in the credit default swap (CDS) market.

A large proportion of single-name CDS contracts are not centrally cleared, in contrast to interest rate derivatives. As a result, market participants assume most of the counterparty credit risk arising from single-name CDSs. In addition, the CDS market is highly concentrated in two dimensions. First, the bulk of trades relate to a few reference entities, which also account for a large share of the notional traded. Second, a few market participants (including all dealers and some banks) tied the market together through their intermediation activity. The same group conducts the lion's share of transactions. Moreover, these players hold generally matched books (i.e. their relative net exposures are close to zero), while other financial institutions are either net buyers or net sellers of protection through CDSs. Aggregating across CDS reference entities, non-financial corporations are mainly net buyers of protection, while insurance corporations and pension funds were, by and large, net sellers.

5 Selected structural issues

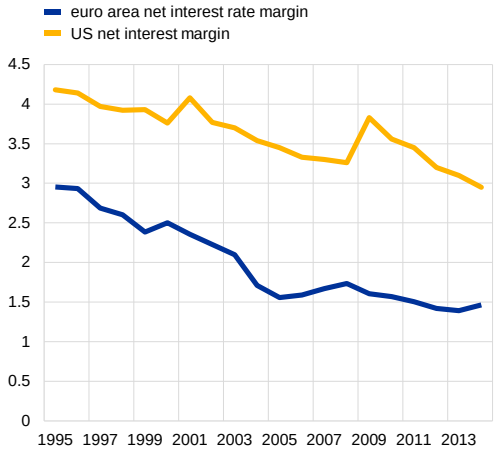
5.1 Prolonged period of low interest rates may lead to a build-up of vulnerabilities in the financial system

The current macro-financial environment is characterised by the exceptionally low level of nominal short- and long-term interest rates in the European Union – the lowest in at least five decades. The decline in yields started in the mid-1980s, as part of a global phenomenon in advanced economies related to the "Great Moderation". The decline in yields accelerated in the aftermath of the global financial crisis and the euro area sovereign debt crisis, when there were severe crisis-induced recessions and related monetary policy responses by the major central banks. The decline in market rates has been associated with a decline in the financing costs of banks, non-financial corporations, households and governments (see Charts 12 and 13). Against this background, the ESRB, along with its member institutions and jointly with the ECB, launched a project in 2015 to monitor and assess potential financial stability risks arising from low interest rates and to evaluate the possible macroprudential policy responses. Some key findings of this work are summarised below.

Low interest rates put pressure on the profitability of financial institutions, in particular those providing longer-term return guarantees (i.e. guaranteed-return life insurers and defined-benefit pension funds) and banks via suppressed net interest income (see Chart 12). In the long run, traditional guaranteed-return and maturity transformation business models may become unviable, posing challenges in terms of the resolution of less-diversified entities.

Chart 12
Net interest margin

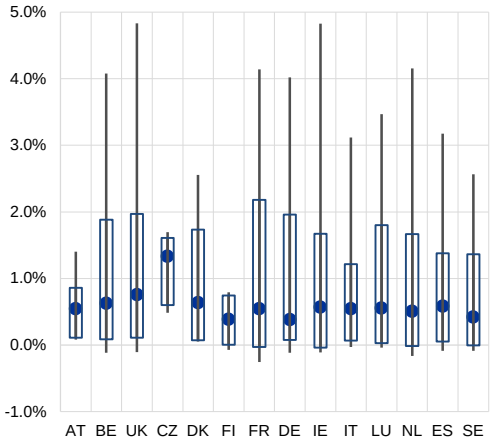
(percentages)



Sources: Thomson Reuters, ECB calculations and Federal Reserve Bank of St Louis.
Note: Weighted average of 66 euro area banks.

Chart 13
Yields of EU corporate bonds: non-investment grade

(percentages)



Sources: Bloomberg data on bonds included in the Merrill Lynch corporate bond index and ESRB Secretariat calculations.
Notes: See also Technical Documentation, Section E. Includes bonds with a maturity of over six months. For all markets shown, at least five corporate bonds are available. The distributions of yields are presented by lines (min-max range), boxes (10th-90th percentiles) and markers for the average yield. Non-rated bonds are included in non-investment grade bonds. Last observation: 7 June 2016.

Given low interest rates, there may be an increase in financial stability risks related to financial markets due to a search for sources of profit, resulting in crowded positions and uncertainty about fundamental asset price values. The resulting risk of asset re-pricing may materialise both via (i) a reassessment of risk premia in view of low growth, if interest rates remain low and (ii) losses on fixed income assets and synchronised unwinding of crowded positions, if interest rates gradually increase. A revaluation of assets may be exacerbated by lower structural market liquidity and have a simultaneous adverse effect on a number of financial sectors, which become more strongly interconnected via correlated asset exposures.

Low interest rates are likely to accelerate the transition towards a more market-based structure. New lending by banks may be constrained due to several factors, including (i) costs in terms of capital requirements for balance sheet expansion, (ii) deleveraging needs and (iii) forbearance on outstanding loans. At the same time, competition for credit and deposit provision from other financial intermediaries is expected to intensify. These developments may result in regulatory arbitrage and increased risk-taking, which call for enhanced supervision of risks in the shadow banking sector.

5.2 Commercial real estate and residential real estate closely connected to financial stability in the EU

Commercial real estate and residential real estate markets play a significant role in the economy and can have a material influence on developments in the financial system and financial stability. During the review period, commercial and residential real estate markets were

the focus of the ESRB's macroprudential analysis, and two extensive reports based on work carried out by dedicated expert groups were published[2].

Commercial real estate (CRE) report findings

When assessing risks related to CRE and working out what may be the most appropriate strategies to mitigate these risks, some important issues need to be considered:

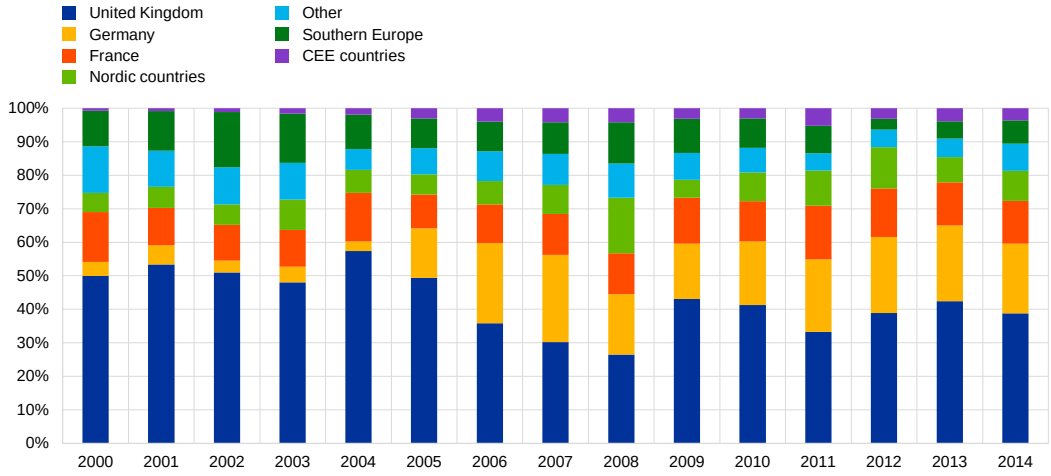
- **First, there is no clear-cut or commonly shared definition of CRE within the EU.** Reaching a common understanding across EU countries of what comprises CRE is important, as analytical and data work will depend heavily on a harmonised definition.
- **Moreover, data on CRE are in general scarce, incomplete or inconsistent – especially compared with residential real estate (RRE) data – making it difficult to describe accurately and compare risks in and across national markets.** In the medium term, granular and consistent data should be made available to central banks and supervisors to allow a more precise assessment of the financial system's exposure to CRE and associated risks; similarly, statistical agencies should build a strong data framework to capture broader developments in real estate markets.
- **In contrast to RRE markets, in CRE markets a significant proportion of financing is provided by entities that are not banks ("non-banks").** Historically, across Europe, the relative importance of debt and equity financing of CRE has been similar on average, but since the financial crisis the proportion of equity financing has risen. Moreover, within debt financing, a shift is apparent from bank lending towards non-bank financing (e.g. by insurance companies and asset managers). This is of significance because, up until now, macroprudential toolkits have consisted mainly of instruments targeting banks, such as sectoral capital requirements.
- **Finally, cross-border financing is important for some CRE markets within the EU, and should be taken into consideration when designing macroprudential policies for the sector.** Reciprocity should be strongly encouraged within the EU for measures targeting the CRE markets. However, additional work may be warranted in relation to reciprocity, both regarding non-EU countries (e.g. the United States) and on its possible application to non-bank sectors.

The available data indicate that the European CRE market is rather concentrated, with the United Kingdom, France and Germany accounting for more than two-thirds of transactions in recent years (see Chart 14).

2 See the reports by dedicated ESRB expert groups: "Report on commercial real estate and financial stability in the EU" and "Report on residential real estate and financial stability in the EU", December 2015.

Chart 14

Geographical distribution of CRE transaction volumes in the EU



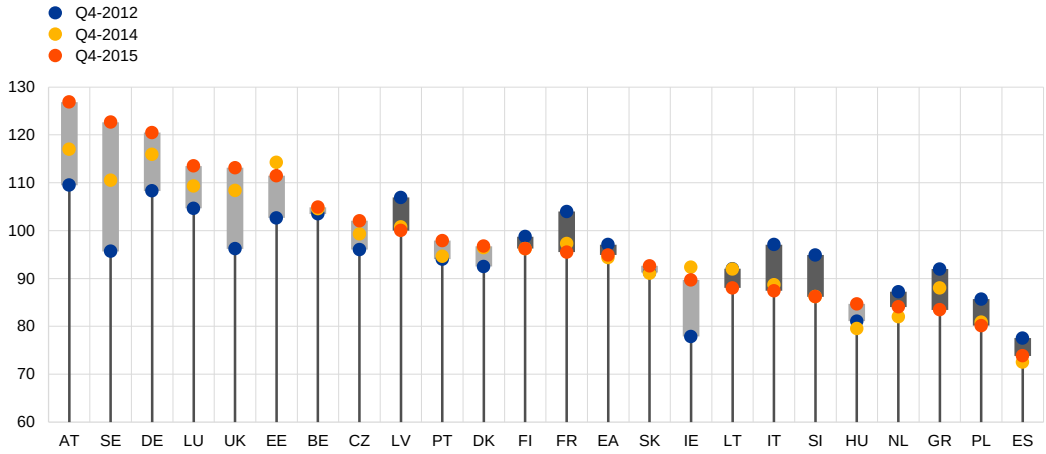
Source: ESRB, "Report on commercial real estate and financial stability in the EU", December 2015, based on Cushman & Wakefield.

Residential real estate (RRE) report findings

- **The structural features of RRE markets can be grouped into demand-side, supply-side and institutional factors.** Demand-side factors include household income, credit availability and interest rates, home-ownership rates and demographic factors. Supply-side elements encompass factors such as residential investment, housing construction and construction costs. Institutional factors include housing taxes and subsidies, mortgage contract features (e.g. variable versus fixed rate contracts) and foreclosure and insolvency procedures. These structural features differ widely across EU Member States.
- **Possible relevant indicators for the build-up of financial stability risks in RRE markets were identified.** Different indicators may be useful, depending on the phase of the real estate cycle. Possible early warning indicators of a rapid real estate expansion may include cyclical indicators of credit and/or real estate prices, combined with their corresponding structural indicators (such as bank credit-to-GDP and price-to-rent ratios); relevant indicators for the contractionary phase include decreases in loan supply and house prices, and rising rates of NPLs and bankruptcies. Among EU Member States, there is also much diversity in terms of the indicators (see Charts 15 and 16 and also Table 2, on structural market characteristics).

Chart 15

Price-to-income ratio in 20 EU countries

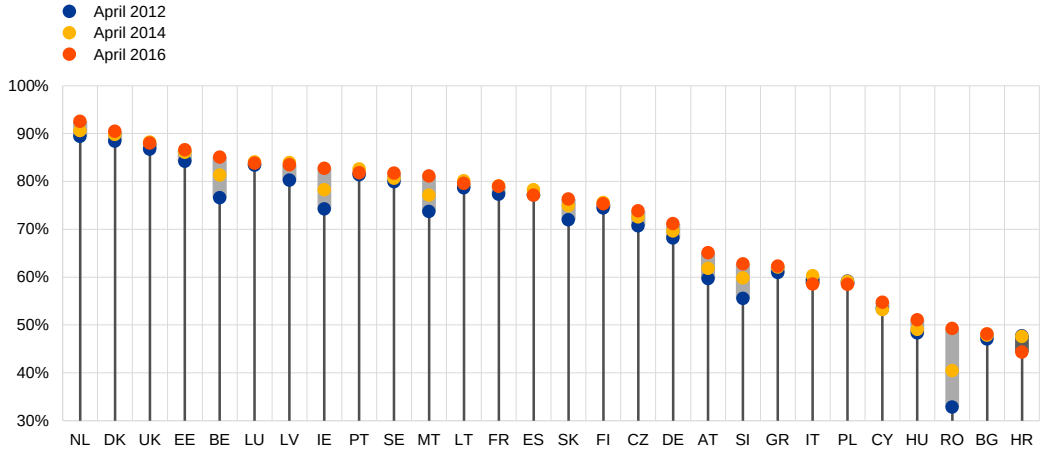


Source: OECD. Price-to-income ratio is obtained by dividing nominal house prices by nominal gross disposable income.
Notes: Light grey bars indicate increasing ratios over time, dark grey bars indicate decreasing ratios.

Chart 16

Loans for house purchase in 28 EU countries

(percentages of total loans to domestic households)



Source: ECB balance sheet items.
Note: Light grey bars indicate an increasing share of housing-related credit in total credit, while dark grey bars indicate a decreasing share.

- **The analysis points to sharp differences across countries both in the incidence and depth of RRE-related crises.** Structural market features may, before the onset of real estate-related crises, bring about an increase in vulnerabilities and exert an amplifying or dampening effect when a crisis materialises. However, assessing the role of structural features of real estate markets in shaping the real estate cycle and how they affect financial stability is difficult.
- **Real estate macroprudential instruments can be grouped into those tackling three "stretches", notably relating to borrowers' income, the underlying collateral backing loans, and banking system resilience.** In recent years, instruments related to the income stretch, such as loan-to-income (LTI) and debt service-to-income (DSTI) caps, affordability requirements and amortisation requirements, the collateral stretch such as loan-to-value (LTV)

caps, amortisation requirements and the banking system stretch (sectoral capital requirements) have been introduced in a number of Member States.

Table 2
Structural factors in EU RRE markets

	Market characteristics				Taxes and transaction costs		
	Dwellings per capita	Home ownership	Typical mortgage maturities (years)	Prevailing type of interest rate	Mortgage tax relief	Contribution of tax to marginal cost of housing	Transaction tax
AT		57.3		Variable	None	6.9	< 5%
BE	0.35	72.3		Long-term fixed	Bounded	24.0	≥ 10%
BG		85.7	20	-	Bounded and limited	-0.3	
CY		74		-	None		
CZ		80.1		Short-term fixed	Bounded and limited	1.6	< 5%
DE	0.32	52.6	30	Medium-term fixed	None	9.8	5-9%
DK	0.42	63	30	Long-term fixed	Bounded	20.0	< 5%
EE		81.1	23	Variable	Bounded and limited	-5.3	
ES	0.37	77.7	23	Variable	None	24.1	5-9%
FI	0.41	73.6	22	Variable	Bounded	7.5	< 5%
FR	0.39	64.3	19	Long-term fixed	None	32.5	5-9%
GR	0.42	75.8		Variable	None	30.2	< 5%
HR		88.5		-	None		5-9%
HU		89.6	15	Variable	None	11.0	< 5%
IE	0.22	69.9	26	Variable	None	15.8	< 5%
IT	0.42	73	22	Variable	Bounded and limited	22.1	5-9%
LT		92.2	21	Variable	None	8.4	
LU	0.26	73	21	Variable	Bounded and limited	8.0	5-9%
LV		81.2	16	-	None	14.1	< 5%
MT		80.3		Variable	None	5.0	5-9%
NL	0.36	67.1	30	Long-term fixed	High or unbounded	-7.2	< 5%
PL		83.8	26	Variable	None	20.5	< 5%
PT	0.40	74.2	29	Variable	None	18.5	5-9%
RO		95.6	25	Variable	None	9.3	
SE	0.42	69.6	41	Short-term fixed	High or unbounded	11.9	< 5%
SI		76.6	19	Variable	None	10.3	
SK		90.5		-	None	6.3	
UK	0.37	64.6	25	Variable	None	25.2	5-9%
Av.	**0.4**	**76.0**	**24.0**			**12.7**	

Sources: Eurostat, EU Commission, ECB (Statistical data Warehouse) and EU statistics on Income and Living conditions, as published in the Report on residential real estate and financial stability in the EU, December 2015. The data concern years 2013 – 2014.

- **Policy responses must be carefully thought through so as to ensure their effectiveness and avoid any possible unintended consequences. A combination of instruments seems likely to be the most suitable response to vulnerabilities stemming from excessive credit growth and leverage related to RRE lending.** The fact that Member States have implemented the measures in different ways and because the measures were only recently introduced means that, in most cases, there is still too little information available to determine what amounts to “best practice”. Capital-based instruments may prove to be the most effective method of directly enhancing resilience, whereas restrictions related to income and collateral stretches are comparatively more effective in curbing the financial cycle. Income stretch instruments are likely to be the most constraining in the build-up phase, whereas a collateral buffer also contributes to system resilience in a downturn.

Moreover, the ESRB has carried out an in-depth analysis of current vulnerabilities related to the EU real estate sector and launched a workstream to improve data quality for both commercial and residential real estate markets.

5.3 Systemic risks related to a transition to a low-carbon society: too late, too sudden

In 2015, the ESRB analysed possible systemic risks arising from a late and sudden transition to a low-carbon economy.

As stated in the recent report by the Advisory Scientific Committee (ASC) on this topic[3], in an adverse scenario of a late, sudden and disorderly transition to a low-carbon economy, the EU financial sector could be affected via three primary channels, namely: (1) the macroeconomic impact of energy supply or price shocks; (2) the revaluation of carbon-intensive assets (e.g. those related to fossil-fuel extraction and energy production); and (3) an increase in the physical risk associated with climate change, i.e. natural disasters.

The systemic risk implications depend in part on the level of exposure of the financial sector to carbon-intensive assets and the specific form of emission abatement policies, both of which are highly uncertain. In a benign scenario, the transition to a low-carbon economy occurs gradually: adjustment costs are manageable and the repricing of carbon assets would probably not entail systemic risk. In an adverse scenario, the underlying political economy leads to a late and sudden implementation of constraints on the use of carbon-intensive energy and assets. This implies a sharp spike in energy costs, temporarily inadequate energy supply, the sudden economic obsolescence of the capital stock, a sudden revaluation of fossil-fuel reserves and a revaluation of the market value of firms according to their exposure to carbon-intensive resources, inputs or technologies.

Enhanced information collection and disclosure, and the incorporation of climate-related prudential risks into stress tests, are two possible operational responses. From a macroprudential perspective, these initiatives would ensure a timely assessment of potential threats to financial stability and the development of remedial macroprudential policies. Moreover, efforts by macroprudential policymakers could help to increase public awareness about the financial stability challenges posed by climate change, and thereby increase the likelihood of an orderly transition.

In the medium term, further policy actions might be considered – if additional data and research suggest that the financial system is indeed significantly exposed to carbon risk. In particular, regulators could run dedicated “carbon stress tests”, which would help to define the most pertinent systemic risks and would be adapted to the specificities of the “hard landing” scenario (such as the long time horizon over which adverse events would occur). If stress tests ultimately found that systemic risks were material, research and consultation would be necessary in order to assess which policies are best suited in the light of the pre-existing prudential stance.

3 Available at **https://www.esrb.europa.eu/pub/pdf/asc/Reports_ASC_6_1602.pdf**

Policy measures addressing systemic risks

This section reviews the ESRB's work in the area of macroprudential policy. It starts by providing a general overview of the measures adopted in the course of 2015. It then turns to the guidance that the ESRB developed on the use of macroprudential instruments covering the banking sector and the non-bank financial sectors. The European capital requirements framework for banks that was adopted in 2013, comprising the fourth Capital Requirements Directive and the Capital Requirements Regulation (CRD IV/CRR), has given the national authorities in the European Union a new, broad set of policy instruments with which to address financial stability risks. With regard to other parts of the financial sector, such as insurance and securities markets, the macroprudential policy and potential instruments are much less developed.

1 Review of the national measures

Overview of measures

Compared with the previous year, 2015 saw a substantial increase in the number of measures of macroprudential relevance. In the course of 2015, more than 130 new measures were identified, an increase of around 25% compared with the previous year. This figure drops by half when only those measures that can be considered to be economically substantial are taken into account, thereby excluding merely procedural decisions.[4] All new measures reported by the EU countries related to the banking sector and most were taken under the CRD IV/CRR framework.

The increase in the number of measures was partly due to the designation of systemically important institutions and the implementation of the regime of the counter-cyclical capital buffer (CCB) under the CRD IV/CRR framework (see Chart 17). At the end of 2015, the EU countries that had not opted for an early introduction of the CCB started fixing buffer rates in view of the compulsory introduction of the regime in 2016. Most EU countries also proceeded in the same period with the identification of Global Systemically Important Institutions (G-SIIs) and Other Systemically Important Institutions (O-SIIs), as well as the determination of their corresponding capital buffer rates.

The residential real estate sector continued to be a highly relevant area for macroprudential policy action. The few measures taken under national law related mostly to prudent credit standards, for example caps on loan-to-value ratios, debt-service-to-income ratios and mortgage loan maturities.

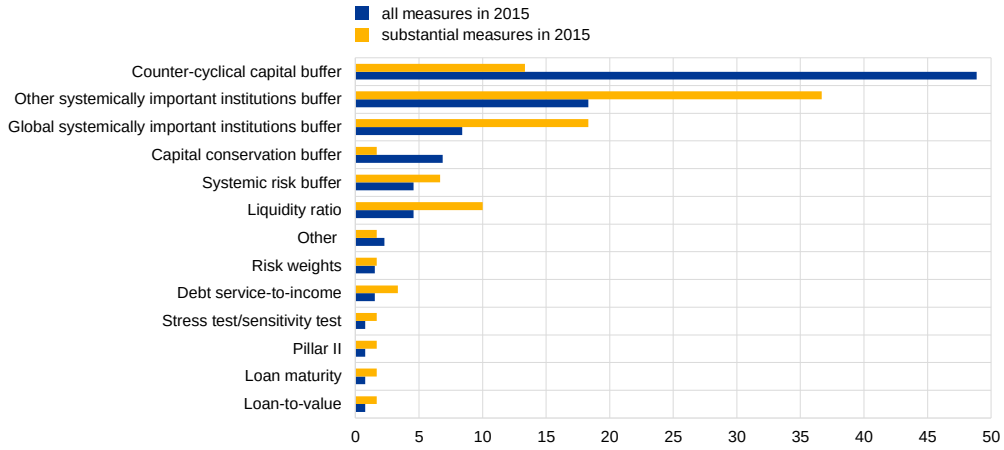
The systemic risk buffer remained an attractive instrument for national authorities. There are now 11 EU countries actively using it or planning to use it. The motives for using this instrument vary widely across countries and include considerations such as the small and open nature of the domestic economy and specific features of the national banking sector (e.g. its degree of

4 In this Annual Report, all measures are deemed to be economically substantial, with the exception of measures of a more procedural or administrative nature, such as the early introduction of the capital conservation buffer, the early introduction of the counter-cyclical capital buffer, setting the counter-cyclical capital buffer rate at 0% or keeping the rate unchanged, and exempting small and medium-sized investment firms from the capital conservation buffer and/or the counter-cyclical capital buffer.

concentration, importance of exposure concentrations and common exposures across banks, and the role of systemically important banks).

Chart 17
Relative frequency of use of various types of measures

(percentages)

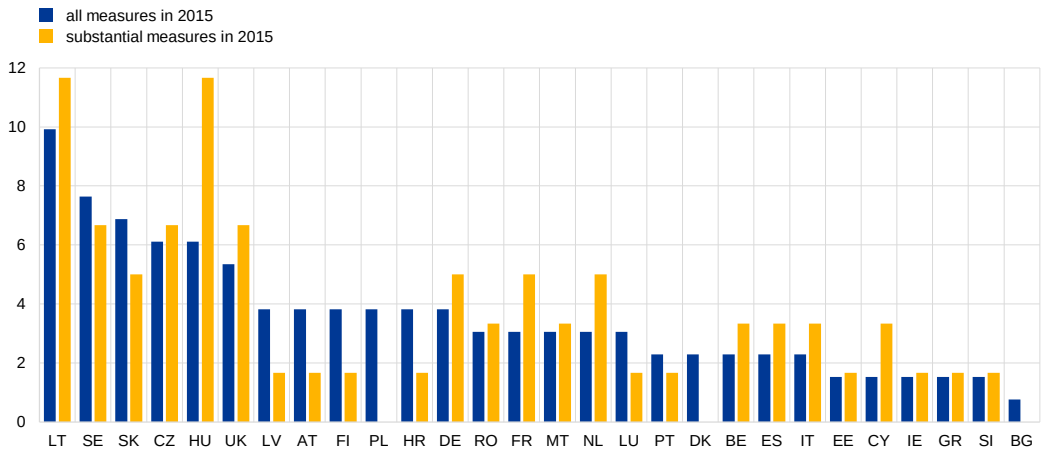


Source: ESRB.
Note: As a percentage of the total measures in the respective category (all measures and substantial measures).

The past year showed again wide differences across EU countries regarding the number and types of measures taken (see Chart 18). Counting the measures at face-value across countries, and ignoring the relevance or impact of the measures, the list of most active countries for macroprudential policy measures is topped by Lithuania, Sweden, Slovakia and the Czech Republic. These four countries account for more than a quarter of all measures and a third of all substantial measures.

Chart 18
Relative frequency of use of measures by Member State

(percentages)



Source: ESRB.
Note: As a percentage of the total measures in the respective category.

Residential real estate

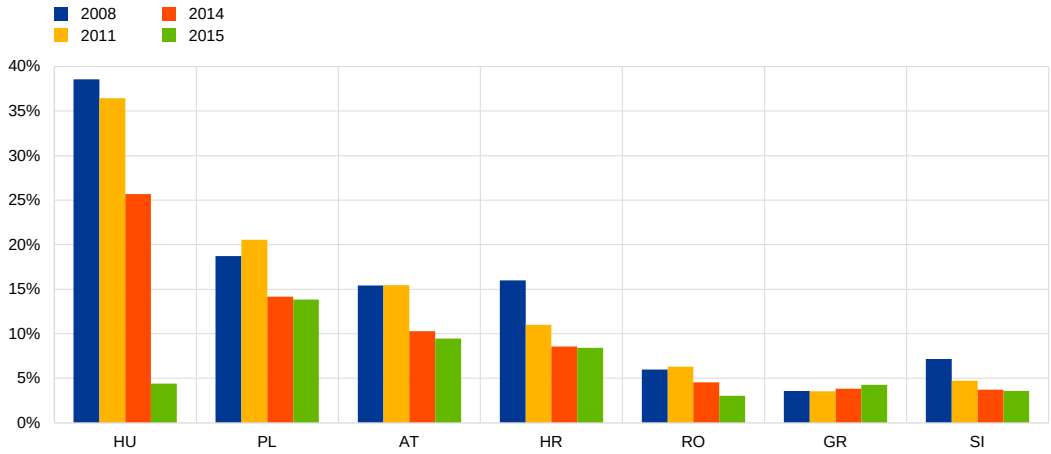
Relatively few new measures addressing risks emanating from the residential real estate sector were taken in 2015. However, in terms of the stock of active policy measures, this sector remains one of the most frequently addressed by macroprudential authorities in the European Union. This may reflect the availability of targeted instruments addressing the residential real estate sector in existing EU and national regulation and the relatively high frequency of crises related to this sector in recent decades.

In the course of 2015, several EU countries considered, and often took, policy initiatives aimed at addressing the risks from the stock of loans in foreign currencies. Following Recommendation ESRB/2011/1 on lending in foreign currencies, the flow of new foreign currency loans was curbed but the stock of such loans, in particular mortgage loans in Swiss francs, continued to be important in several Member States (see Chart 19).

Chart 19

Loans to non-monetary financial institutions: share of Swiss franc-denominated loans in total loans

(stocks of loans; percentages)



Source: ESRB calculations on the basis of data from the ECB's Statistical Data Warehouse.

Following the decision of the Swiss National Bank in January 2015 to unpeg its currency from the euro, the Swiss franc immediately appreciated strongly. This translated into a higher debt service burden and a less favourable collateral position (higher loan-to-value ratios) of borrowers. Many of these borrowers were households that had taken on mortgage or consumer loans in Swiss francs, which placed a lot of social and political pressure on authorities to act. This resulted in a number of initiatives to address the related risk. Sometimes these initiatives were of a voluntary nature (e.g. a commitment by the banks to support customers), but usually this was deemed to be insufficient and public policy measures were considered to be necessary. The latter often included the conversion, by law, of such loans into local currency at favourable conditions for the borrower.

More generally, the ESRB continued its analytical and policy work on the important topic of residential real estate. This work resulted in a report on residential real estate and financial stability published in December 2015.[5] The report had three aims, namely: arrive at a better

5 "Report on residential real estate and financial stability in the EU", ESRB, December 2015.

understanding of the structural features of Member States' real estate markets; explore ways of further improving the availability and comparability of data on sources of risk in national real estate markets; and take stock of emerging approaches for the use of real estate instruments with a view to developing best practices. As a follow-up to this report, the ESRB established dedicated teams to carry out preparatory work on how real estate data gaps for the residential and commercial real estate sectors could be further closed.

Commercial real estate

The commercial real estate sector poses particular challenges for financial stability relating to data, market characteristics and the very limited experience of using macroprudential instruments. This is documented in greater detail in the report on commercial real estate and financial stability published by the ESRB in December 2015.[6] In theory, policymakers have access to a suite of macroprudential instruments to address risks from the commercial real estate sector, but experience in using these instruments is much more limited than in the case of the residential real estate sector.

In the course of 2015, only Hungary announced the use of an instrument to address concerns related to the commercial real estate sector. Following persistently high problematic bank exposures to this sector, Hungary decided to impose a systemic risk buffer on banks whose problematic commercial real estate exposures exceed a certain threshold, effective from 1 January 2017. Other instruments that may potentially be used by authorities include sectoral capital requirements, stricter large exposures criteria, stricter lending standards, higher disclosure requirements and stress tests specifically for commercial real estate exposures.

The counter-cyclical capital buffer

The CCB regime is part of a set of macroprudential instruments designed to help counter pro-cyclicality in the financial system. Under this regime, capital is accumulated in periods of excessive aggregate credit growth when systemic risk is judged to be increasing. In this way, buffers over minimum capital requirements are created, which increase the resilience of the banking sector during periods of stress when losses materialise. This is expected to help maintain a healthy supply of credit to the real economy and dampen the downswing of financial cycles. The CCB regime can also help dampen excessive credit growth during the upswing of the financial cycle.

The ESRB has a role to play in the application of the CCB regime in Member States. First, on the basis of the notifications received from Member States, the ESRB is required to publish on its website all notified buffer rates and related information.[7] Since early 2014, the ESRB has published such notifications; in late 2015 the ESRB enhanced the disclosure of this information by improving its comprehensiveness and timeliness, and by making its presentation more user-friendly. Second, the ESRB has given guidance by way of recommendation on setting buffer rates (Recommendation ESRB/2014/1[8]). Third, the ESRB has recently developed a framework for setting and reciprocating

6 "Report on commercial real estate and financial stability in the EU", ESRB, December 2015.

7 An overview of applicable CCyB rates is available at **http://www.esrb.europa.eu/national_policy/ccb/applicable/html/index.en.html**

8 Recommendation of the European Systemic Risk Board of 18 June 2014 on guidance for setting countercyclical capital buffer rates.

buffer rates applying to exposures outside the European Union (Recommendation ESRB/2015/1[9] and Decision ESRB/2015/3[10]), as discussed in greater detail further below.

In the course of 2015, three more Member States (Finland, Latvia and Lithuania) opted for an early introduction of the CCB. As a result, the group of early adopters consisted of Croatia, the Czech Republic, Denmark, Finland, Latvia, Lithuania, Slovakia, Sweden and the United Kingdom. Two of these countries raised their buffer rates in 2015: Sweden further increased its rate from 1% to 1.5%[11] and the Czech Republic increased its buffer rate from 0% to 0.5%[12]. Those countries that had not yet opted for an early introduction of the regime started setting their buffer rates in late 2015, in view of the implementation of the CCB regime in 2016. All of these latter countries set a buffer rate of 0%.

The first experiences with the CCB regime have shed light on the methods and indicators used by the national authorities in determining the buffer rate. The deviation of the credit-to-GDP ratio from its long-term trend (known as the standardised credit-to-GDP gap), calculated according to a harmonised methodology, forms the basis for determining the benchmark buffer rate. However, Recommendation ESRB/2014/1 also allows the calculation of another benchmark buffer rate according to a different methodology, which some authorities have opted to use. Moreover, the national authority can take into account a range of quantitative and qualitative information in addition to the credit-to-GDP gap, and in practice other indicators are also considered – for example bank leverage, bank capital ratios and exposures to specific economic sectors. Moreover, authorities are observed to take into account (expected) developments of the credit-to-GDP gap over time and across economic sectors rather than an overall, single-point-in-time measure.

Additional capital buffers for systemically important banks

Most Member States started identifying systemically important banks in 2015 and fixing their additional capital buffer requirements. G-SIIs and O-SIIs are identified on the basis of a scoring model that uses indicators to gauge the systemic importance of the institution along relevant dimensions such as size, interconnectedness, (lack of) substitutability, complexity and cross-border activity.

Three types of measures can be used under CRD IV to introduce additional capital requirements for systemically important institutions. These measures include G-SII buffers, O-SII buffers and the systemic risk buffer. While the G-SII and O-SII buffers are instruments specifically designed to address the risks relating to systemically important banks, in practice Member States also use the systemic risk buffer as a substitute for the O-SII buffer because of its greater flexibility.

Around 160 banks had been identified as systemically important by the end of 2015, which further increased to around 170 by the end of the first quarter of 2016. The identification can result from a formal designation of G-SIIs or O-SIIs, or because the systemic risk buffer is in practice applied to a relatively small set of individual institutions. The list of identified institutions will further expand as

9 Recommendation of the European Systemic Risk Board of 11 December 2015 on recognising and setting countercyclical buffer rates for exposures to third countries

10 Decision of the European Systemic Risk Board of 11 December 2015 on the assessment of materiality of third countries for the Union's banking system in relation to the recognition and setting of countercyclical buffer rates.

11 The increased buffer rate applies from June 2016 onwards.

12 The increased buffer rate applies from January 2017 onwards.

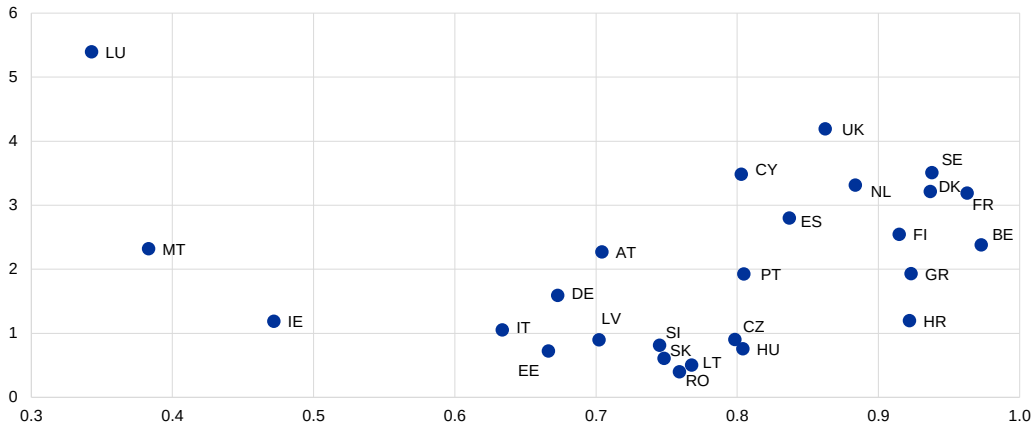
Bulgaria and Poland, which had not notified their O-SII decisions before the cut-off date of the present annual report, are expected to make such notifications in the course of 2016. However, the notifications to date already suggest some noticeable differences across countries, for example in terms of the number of designated institutions, which range from 16 institutions in Germany to only two institutions in Estonia and Ireland.

The relative importance of systemically important banks varies considerably across Member States (see Chart 20). In some EU countries they cover almost the entire domestic banking sector, but in others their share is less than 50%. Similarly, while in some EU countries the assets of the systemically important banks account for multiples of the GDP, in others they represent just a fraction.

Chart 20

Total assets of systemically important banks over total banking assets and GDP by Member State

(x axis: systemically important institutions' assets to total banking assets; y axis: systemically important institutions' assets to GDP)



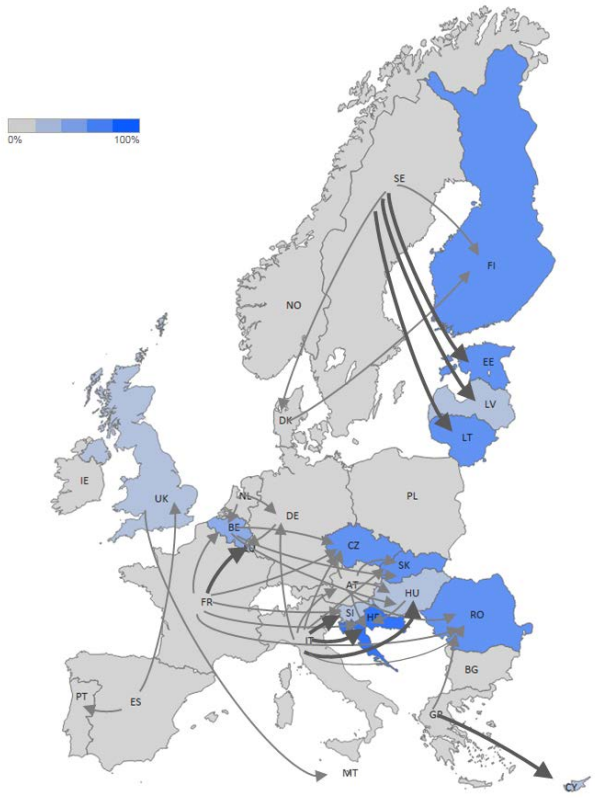
Sources: ESRB and ECB consolidated banking data (total banking assets by Member State).
Notes: No O-SII data for Bulgaria and Poland were yet available at the cut-off date of the report. Assets for institutions refer to the last available accounting date. GDP refers to the third quarter of 2015 (annual). Total banking assets refers to year-end 2014. Total banking assets by Member State includes assets of domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.

Banking groups that are systemically important in one Member State can also be systemically important in several others. Around 20 such banking groups, particularly relevant in assessing cross-border contagion risk, have been identified to date. Of the large Member States, France and Italy stand out as the home countries of such European cross-border groups; of the smaller and medium-sized EU countries, the cross-border activity of the Austrian, Belgian, Dutch and Swedish banking groups are most noteworthy. Figure 1 graphically illustrates how the banking systems of different EU countries are connected through the presence of systemically important institutions that are part of the same banking group.

Figure 1

Cross-border links between Member States through the presence of systemically important institutions

(market share of foreign-controlled systemically important institutions, as a percentage of a country's total banking assets)



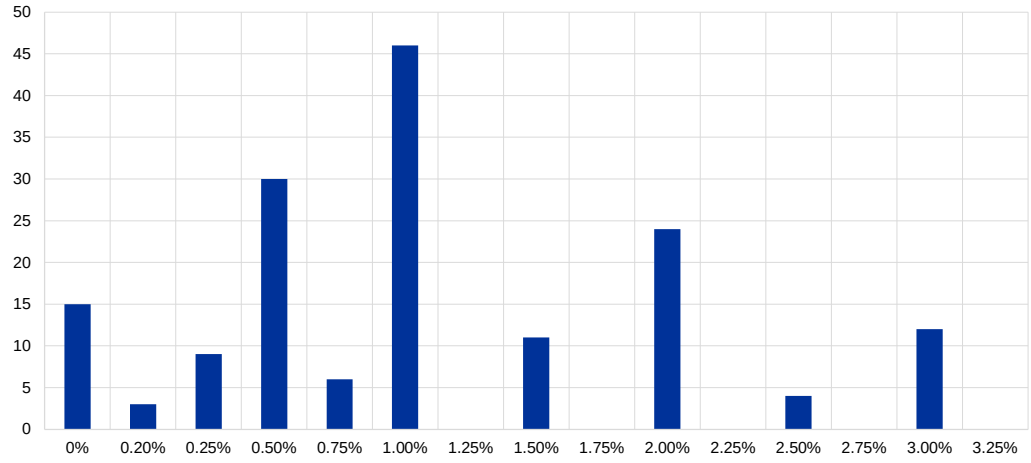
Sources: ESRB and SNL Financial (ownership and total assets).
Notes: The arrows between countries indicate the link between the home country of systemically important institutions (SIIs) that control SIIs in another country (host country). The thickness of the arrow is proportional to the number of such links. The colour of a country reflects the share of its banking market that is controlled by foreign-owned SIIs (the darker the colour, the larger the share based on total assets). No data for Bulgaria and Poland were available at the cut-off date for this report.

There are substantial differences across Member States in terms of additional capital buffer requirements for systemically important banks (see Chart 21). The differences include factors such as the nature of the buffer (G-SII buffer, O-SII buffer and/or systemic risk buffer), the level of the buffer, and how the capital requirements are phased in over time. Moreover, some of the Member States that identified systemically important institutions in 2015 have not yet imposed additional capital requirements on all such institutions.

Chart 21

Frequency of buffer requirements

(x axis: buffer level; y axis: number of systemically important institutions)



Source: ESRB.
Notes: No data for Bulgaria and Poland were available at the cut-off date of the report. Banks on which no buffer has been applied (in the case of the United Kingdom) are not presented on the chart.

2 Developing guidance on the use of instruments

2.1 Coordination framework for the cross-border aspects of national measures

In an integrated financial system like the single European market, strong policy coordination is needed to ensure the effectiveness of national macroprudential policy. While macroprudential policy is primarily conducted at the national level, notwithstanding the competences of the ECB in the banking union, coordination of national measures and approaches within the EU is essential. Such coordination helps to ensure consistent policy implementation across borders and limit the scope for undesirable spillovers between Member States and regulatory arbitrage among financial institutions.

At the end of 2015, the ESRB put in place a coordination framework for the assessment of the cross-border effects of and voluntary reciprocity for macroprudential policy measures.[13] The coordination framework is codified in three documents, which are available on the ESRB's website.[14] The coordination framework consists of two parts: an analytical framework and a reciprocity framework.

The analytical framework aims at a deeper understanding of the cross-border effects of macroprudential policy. In the past, national authorities did not systematically assess the cross-

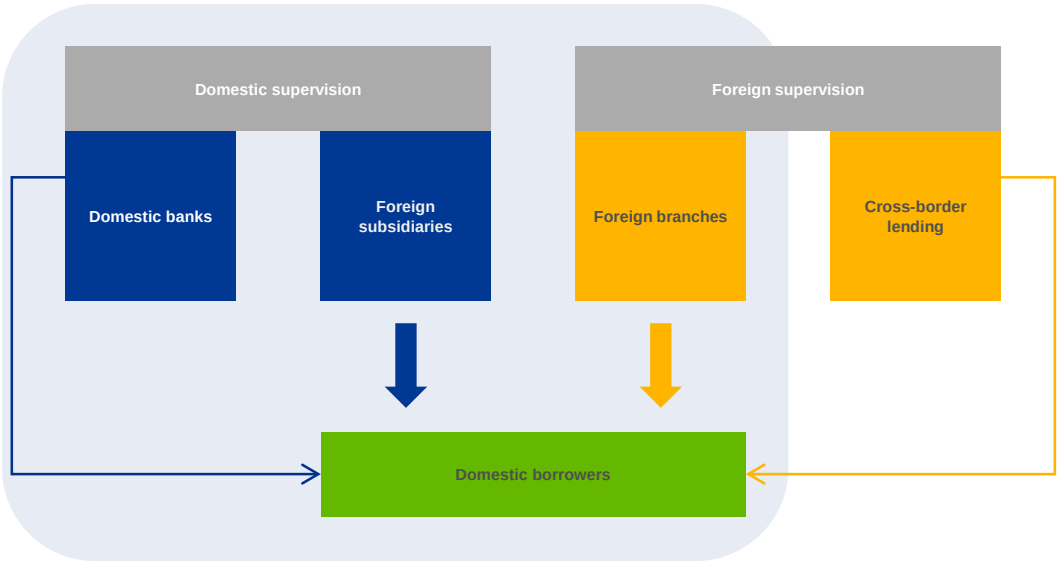
13 "Reciprocity" means an arrangement whereby the relevant authority in one jurisdiction applies the same, or equivalent, macroprudential measure as is set by the activating relevant authority in another jurisdiction to any financial institutions under its jurisdiction, when such financial institutions are exposed to the same risk in the latter jurisdiction.

14 (i) Recommendation ESRB/2015/2; (ii) Decision ESRB/2015/4; and (iii) the new Chapter 11 ("Cross-border effects of macroprudential policy and reciprocity") of "**The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector**".

border implications of their macroprudential policy. Hence, the analytical framework provides a structure for assessing such effects in a systematic manner (see Box 2). The analytical framework will foster a common understanding of policy measures and support Member States in assessing the impact of their policies, both before their activation and on an ongoing basis where needed. Assessing (potential) cross-border spillovers of macroprudential measures is also an essential part of any reciprocity framework, as it helps Member States to decide whether to request the reciprocation of a macroprudential measure from other Member States.

The reciprocity framework allows for a coordinated policy approach, thereby safeguarding the effectiveness and consistency of macroprudential policy across borders within the European Union. Without reciprocity, macroprudential measures taken in a given Member State in principle only apply to domestic institutions and subsidiaries of foreign financial service providers operating in that Member State. They do not necessarily affect branches of foreign financial service providers in that Member State or foreign financial service providers based elsewhere in the European Union that may still be directly exposed to macroprudential risks in the activating Member State. Since foreign branches and cross-border lending fall, in principle, under the responsibility of the home supervisors of the banking group they are – without reciprocity – not bound by macroprudential measures (see Figure 2).

Figure 2
A schematic view of the application of macroprudential measures



What the reciprocity framework tries to achieve is that a macroprudential measure aimed at targeting a specific risk is applied to all financial service providers exposed to the targeted risk, irrespective of the location of the financial service provider. In this way, the reciprocity framework ensures a consistent policy implementation at the EU level and prevents financial service providers from circumventing national macroprudential measures.

The reciprocity framework targets exposure-based measures. The case for reciprocity is not equally compelling for all measures. Measures that target exposures but do not automatically apply to foreign branches and cross-border lending should always be reciprocated to ensure the same macroprudential treatment for the same risk (e.g. higher risk weights or caps on loan-to-value ratios on lending). By contrast, measures that target specific institutions (e.g. buffers for systemically important institutions) are not expected to be reciprocated. In between the two clear cut cases lie

measures that can be used for exposures or for institutions (e.g. the systemic risk buffer). The decision whether such measures should be reciprocated will hence require the ESRB's judgement. Table 3 provides a non-exhaustive list of measures, with an indication of which ones should – always, or only in certain cases – be reciprocated.

Table 3
Indicative list of measures to be reciprocated and guiding principles

Rationale for measure	Examples of instruments	Reciprocity
To address specific domestic exposures (risk of inward negative spillovers due to regulatory arbitrage)	Loan-to-value cap, loan-to-income cap, debt-to-income cap, sectoral capital requirement on domestic exposures	Strong reciprocity assumption
To address risks faced or posed by a subset of institutions considered jointly	Systemic risk buffer, Pillar 2 used for macroprudential purposes	Case-by-case assessment
To address risks to the economy posed by a specific institution or by a subset of institutions considered individually	G-SII buffer, O-SII buffer	No reciprocity expectation

Note: G-SII stands for "Global Systemically Important Institutions" and O-SII stands for "Other Systemically Important Institutions".

The reciprocity framework has a wide reach. First, it covers all macroprudential measures taken in the European Union, irrespective of the part of the financial sector they target. It is therefore designed to go beyond the provisions foreseen in EU law for the banking sector and also covers measures that are not harmonised across the European Union. Second, the reach is also wide with respect to the application of reciprocity, as reciprocity would be expected from all Member States once the ESRB recommends the reciprocation of a specific measure.

Box 2
Analytical framework to assess cross-border effects of macroprudential policy

The analytical framework permits a systematic assessment of the cross-border effects of macroprudential policy. It is built on the concept of transmission channels and indicators to assess and monitor these channels.

Transmission channels

There are several transmission channels through which macroprudential policy action can affect other countries. The cross-border transmission channels may operate via: (i) the cross-border adjustment of risk exposures, for example through changes in lending to the real economy of other counties; (ii) changing network formation and thereby the propagation of shocks, especially relevant in cross-border networks among financial institutions; (iii) regulatory arbitrage, whereby financial institutions exploit cross-country differences in regulatory frameworks to circumvent macroprudential requirements; (iv) altering credit conditions through the relative cost of lending to other countries; or (v) trade effects.

The transmission channels vary in their importance for different types of macroprudential instruments. Some cross-border transmission channels may be particularly relevant in the context of one macroprudential instrument, but negligible for another. Other channels may exist theoretically but have virtually no impact in practice. The following transmission channels were identified as the most important:

- for capital instruments – capital strengthening in international markets and capital regulatory arbitrage (in particular within groups);

- for sectoral instruments – adjustment of cross-border credit exposures and securitisation activity, capital regulatory arbitrage and shifts to non-bank activity;
- for liquidity instruments – liquidity regulatory arbitrage, shifts to non-bank activity and changes to the term structure of the yield curve;
- for market/non-bank instruments – adjustment of cross-border liquidity/funding lines, adjustment of asset prices and liquidity regulatory arbitrage.

Indicators

The various cross-border transmission channels can be assessed with the help of indicators. For this purpose, the ESRB provided a list of relevant indicators. These indicators should inform the assessment of the potential for cross-border spillovers. It goes without saying that in their assessment of cross-border spillovers, policy makers require a detailed dataset. Such a comprehensive dataset, which does not yet exist, would ideally include locational data, bank consolidated data, securities holdings statistics and, ultimately, supervisory statistics. While data in relation to some channels are publicly available, other channels can only be analysed with confidential, mostly supervisory, data. Therefore, a combination of public and confidential data sources is needed, which in turn calls for plausibility and cross-checks in order to provide a consistent assessment of spillovers.

2.2 Stress testing as a macroprudential tool – banking and non-banking

Stress tests are important macroprudential tools. They can help ensure the resilience of financial institutions and systems to adverse macro-financial developments. By creating transparency about remaining vulnerabilities and how such vulnerabilities are to be addressed, they can increase confidence in individual financial institutions and the financial system as a whole.

The ESRB has a key role with regard to stress tests in the European Union. In particular, the regulations establishing the three European Supervisory Authorities – the European Banking Authority (EBA), the European Insurance and Occupational Pensions Authority (EIOPA) and the European Securities and Markets Authority (ESMA) – require them, in cooperation with the ESRB, to initiate and coordinate EU-wide assessments of the resilience of financial institutions to adverse market developments, including through stress testing.[15]

The ESRB continued to contribute to the stress tests launched by the EBA and the EIOPA. In early 2015, the ESRB provided adverse macro-financial scenarios to be used in an exercise for testing the resilience of defined benefit pension funds. The exercise was launched in May 2015. In early 2016, the ESRB provided the adverse macro-financial scenarios to the EBA's banking sector stress test and EIOPA's insurance sector stress test. These scenarios reflect the systemic risks that

15 See Regulation (EU) No 1093/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC; Regulation (EU) No 1094/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Insurance and Occupational Pensions Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/79/EC; and Regulation (EU) No 1095/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC.

the ESRB assessed as presenting the most pertinent threats to the stability of the EU banking and insurance sectors at that time.

For the banking sector, the narrative of the adverse scenario reflected four systemic risks identified by the ESRB: (i) an abrupt reversal of compressed global risk premia, amplified by low secondary market liquidity; (ii) weak profitability prospects for banks and insurers in a low nominal growth environment, amid incomplete balance sheet adjustments; (iii) increasing debt sustainability concerns in the public and non-financial private sectors, relating to low nominal growth; and (iv) prospective stress in a rapidly growing shadow banking sector, amplified by spillover and liquidity risk. For the insurance sector, the scenario reflected the risk of a "double hit" – a fall in asset prices weakening the asset side of insurers' balance sheets, combined with a fall in discount rates that increases the present value of insurers' liabilities.

The ESRB contributed for the first time to the ESMA stress tests for central counterparties (CCPs). CCPs were set up to reduce systemic risk resulting from a complex web of bilateral exposure connections. As a CCP is the counterparty to all its clearing members, it is systemic by its very nature and its default could endanger a significant part of the financial system. For this reason, CCPs are designed to be particularly resilient. The ESRB's contribution to the ESMA stress test of CCPs had to take into account the specificities of CCPs, including their business model and the regulatory requirements imposed on them. Reflecting this, the ESRB provided two scenarios representing adverse financial market movements to the ESMA.

2.3 Communication policy

In early 2016, the ESRB published an update of its Handbook Chapter on macro-prudential policy communication in "The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector".[16] Communication policy constitutes an integral part of the macroprudential policy framework. The main objectives of communication are to notify on policy action, enhance market discipline and manage expectations, as well as foster accountability.

The Handbook chapter defines five main components that make up the content of macroprudential communication: the institutional framework, macroprudential strategy, risk assessments, activation (and de-activation) of macroprudential measures and the follow-up. It then classifies target audiences of macroprudential policy communication, which include the general public, financial institutions, journalists, politicians and other relevant public authorities. The chapter further analyses key communication tools, including publications (such as financial stability reviews), internet-based tools, media relations or events. Both the content and the tools used in communication need to be adjusted according to the target audience and the objectives of communication.

The Handbook chapter also defines major challenges for effective communication on macroprudential policies. These relate to:

- coordination problems between multiple authorities engaged in macroprudential policy;
- technical and complex macroprudential measures that need to be explained in plain language;
- a need for consistency in communication that is tailored to the particular target audience;
- proper timing of communication.

16 See Chapter 10 in "**The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector**".

Clear solutions to many of these challenges are hard to find at this early stage, although some general principles are outlined in the Handbook chapter with the aim of providing practical guidance. Many of the challenges will become easier to tackle as macroprudential authorities increase their experience in communicating macroprudential policy.

2.4 Framework for CCB rates of third countries

The ESRB has defined a framework for the setting and recognition of CCB rates for exposures of EU banks to third countries, pursuant to Articles 138 and 139 of the CRD IV. The framework is aimed at ensuring that EU banks are adequately protected from the risk of excessive credit growth in a third country. This includes situations when actions by designated authorities in the third country are not sufficient to protect EU institutions from risks emanating from that third country. It follows that the ESRB must act to mitigate those risks. Article 139 of the CRD allows designated authorities in certain circumstances to set a CCB rate for exposures to a third country, which domestically authorised institutions have to apply in calculating their institution-specific CCB. Similarly, Article 138 of the CRD empowers the ESRB in certain circumstances to issue a recommendation to designated authorities on the appropriate CCB rate for exposures to third countries.

The framework designed by the ESRB is in line with the reciprocity framework of the Basel Committee on Banking Supervision for the CCB. According to this framework, if an authority in one jurisdiction increases the CCB to protect its domestic banking sector from excessive credit growth, authorities in other jurisdictions should apply the same buffer rate to the exposures of their domestic banks to that country. Mandatory jurisdictional reciprocity applies for CCB rates of up to 2.5%, subject to transitional provisions.[17]

Recommendation ESRB/2015/1[18] promotes a coherent approach across the European Union for the recognition and setting of CCBs for exposures to third countries. If the recognition and setting of CCBs for exposures to third countries is done in an uncoordinated manner across the European Union, different capital requirements may apply for the same third country and for the same risk. That would typically be undesirable as it would undermine the level playing field in the EU banking system and provide opportunities for regulatory arbitrage. An unlevel playing field and regulatory arbitrage could threaten financial stability in the European Union.

In situations where different CCB rates for exposures to third countries may apply across the European Union, designated authorities should seek guidance from the ESRB. This guidance could take the form of the ESRB issuing specific recommendations – on a case-by-case basis – to designated authorities in the European Union on the setting of a specific buffer rate for exposures to a specific third country at a specific point in time. According to Recommendation ESRB/2015/1, these situations include those cases where (i) a designated authority in a third country has set a CCB in excess of 2.5%; (ii) designated authorities in the European Union are unclear as to whether a particular measure taken by a third country may be recognised under the CRD as a CCB; (iii) mitigating actions across the European Union should be coordinated to address excessive credit growth in a third country and it is considered that designated authorities in

17 For further information, see **http://www.bis.org/bcbs/publ/d339.htm**

18 See Recommendation of the ESRB of 11 December 2015 on recognising and setting countercyclical buffer rates for exposures to third countries (ESRB/2015/1), **http://www.esrb.europa.eu/pub/pdf/recommendations/2016/Recommendation_ESRB_2015_1.pdf**

that third country are not taking sufficient action; and (iv) previous setting and recognition of CCBs for the exposures to a third country were adopted following an ESRB recommendation.

The ESRB has created an Assessment Team that is tasked with discussing, at technical level, the CCBs for exposures to third countries. Decision ESRB/2015/4[19] mandates the Assessment Team to, among other responsibilities, discuss at the technical level whether excessive credit growth in a third country may warrant macroprudential policy action by the ESRB. Designated authorities for the third country under consideration may be invited to take part, as observers, in the Assessment Team's discussions.

Decision ESRB/2015/3[20] establishes criteria for the identification of third countries to which EU financial institutions have material exposures ("material third countries"). Material third countries are defined as those to which exposures of EU credit institutions[21] are higher than 1% of the total exposures of the EU banking system. Decision ESRB/2015/3 also describes the internal ESRB process for the addition of countries to, and their removal from, the list of material third countries. The first revision to the list of material third countries will take place in the first half of 2017.

The ESRB has up to now identified six material third countries: Brazil, China, Hong Kong, Russia, Turkey and the United States. Based on supervisory information with a reference date of 30 June 2014, exposures of the EU banking system to Brazil, China, Hong Kong, Russia, Turkey and the United States exceeded 1% of the total exposures for one of the metrics considered in Decision ESRB/2015/3. Consequently, the ESRB is currently monitoring credit growth in these six countries.

Owing to their materiality in terms of financial stability for the European Union, the ESRB will continuously monitor credit developments in these six countries. The impact that excessive credit growth in a third country may have on the European Union depends on the size and nature of the exposures of banks in the European Union towards that third country. It is therefore useful to define a monitoring framework at the ESRB that is able to identify, in a timely manner, whether there is excessive credit growth in any material third country, with a view to having a discussion by the Assessment Team about the potential impact of identified situations on financial stability in the European Union.

Designated authorities are recommended to identify third countries that are material for their jurisdiction and monitor developments of credit in those third countries. Similar to the framework set up by Decision ESRB/2015/3, Recommendation ESRB/2015/1 recommends that designated authorities identify third countries that are material for their jurisdiction and to monitor developments in credit in those third countries (except for countries which are already monitored by the ESRB in accordance with Decision ESRB/2015/3). If designated authorities are concerned about excessive credit growth in one of their material third countries and if they consider that setting a counter-cyclical capital buffer is needed, they should seek involvement of the ESRB.

19 See Decision of the ESRB of 16 December 2015 on a coordination framework for the notification of national macroprudential policy measures by relevant authorities, the issuing of opinions and recommendations by the ESRB, and repealing Decision ESRB/2014/2 (ESRB/2015/4), **http://www.esrb.europa.eu/pub/pdf/other/Decision_ESRB_2015_4.pdf**

20 See Decision of the ESRB of 11 December 2015 on the assessment of materiality of third countries for the Union's banking system in relation to the recognition and setting of countercyclical buffer rates (ESRB/2015/3), **http://www.esrb.europa.eu/pub/pdf/other/Decision_ESRB_2015_3.pdf**

21 On the basis of metrics relating to original exposures, risk-weighted assets and defaulted exposures.

2.5 Real estate instruments

In the course of 2015, the ESRB pursued further work on the relationship between developments in the real estate sector and financial stability. This work resulted in two reports, one on residential real estate, the other on commercial real estate, which were subsequently published.[22] Both reports, which have dedicated sections on tackling macroprudential risks originating from the real estate sector, complement the ESRB's earlier work on real estate instruments.[23]

The set of possible real estate instruments can be usefully organised around three "stretches" (see Figure 3). Income stretch instruments, such as caps on loan-to-income (LTI), debt-to-income (DTI) and debt service-to-income (DSTI), limit the loan amount relative to the income of the borrower and may therefore be helpful in dampening credit growth. Loan-to-value (LTV) caps restrict the loan amount to the value of the underlying property and are therefore examples of collateral stretch instruments; they work as a cushion before losses reach lenders' balance sheets or before consumption is scaled back, and limit the impact of risks if they materialise. Banking system stretch instruments relate to regulatory capital requirements on banks' real estate exposures and aim to limit the impact of materialising risks by enhancing the loss-absorbing capacity of banks. A combination of instruments, addressing different specific risks and channels, often seems to be the most suitable and comprehensive response to vulnerabilities originating in the real estate sector.

A carefully thought-through design is crucial to instruments' effectiveness and for reducing the risk of leakages and unintended consequences. Design includes aspects such as definitions used[24] (e.g. as regards the type of income included or how the collateral is valued), exemptions granted and calibration. One type of innovative exemption includes the proportionate cap that exempts part of the loan portfolio from a limit. This type of cap gives banks some flexibility in their lending, acknowledging that there might be instances where it would be justified to grant loans not respecting the cap, thereby also reducing incentives to circumvent the cap. A wide array of methods is potentially available to help calibrate instruments. They vary in their degree of complexity and data intensity, going from simple descriptive analysis to advanced models. While such methods can usefully inform the setting of an instrument, expert judgement still remains critical.

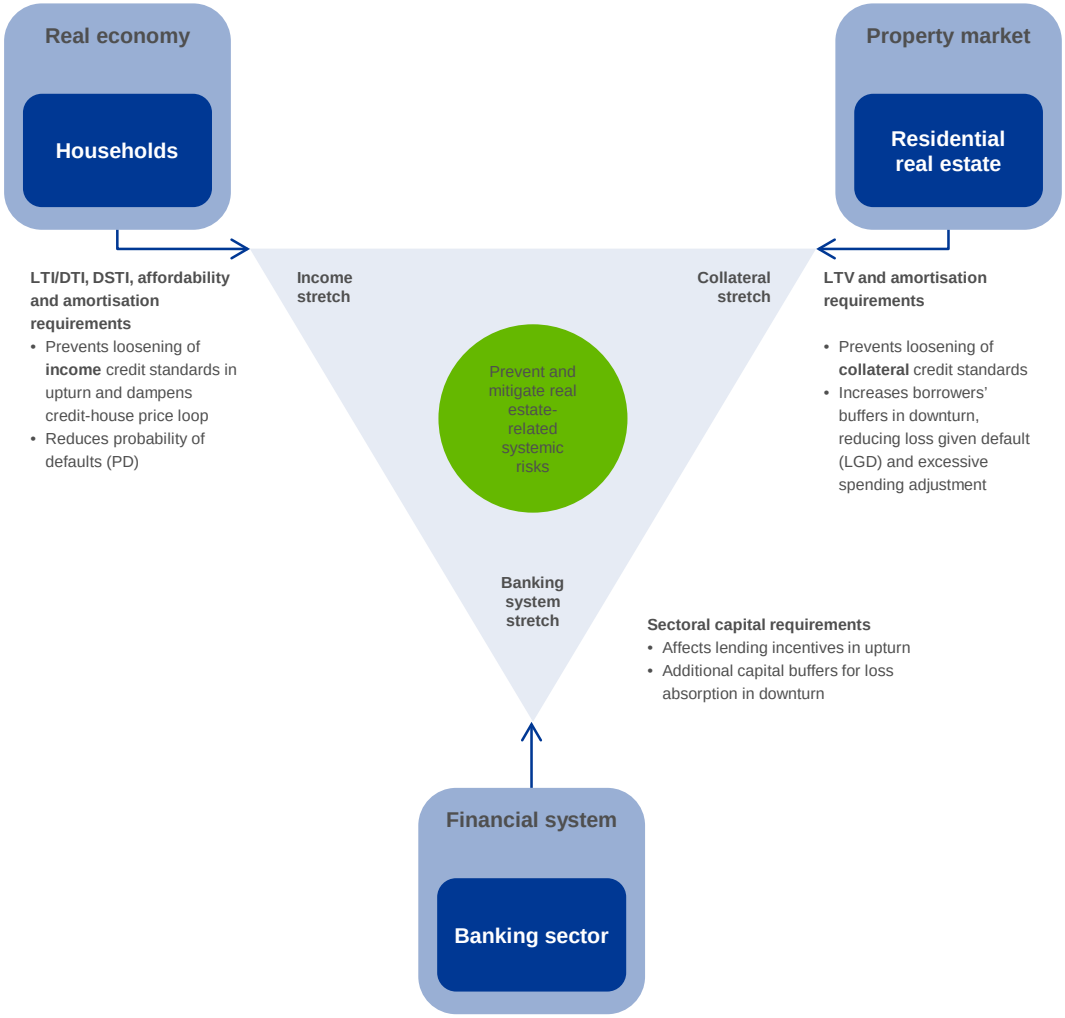
22 "Report on residential real estate and financial stability in the EU" and "Report on commercial real estate and financial stability in the EU", ESRB, December 2015.

23 "The ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector", Chapter 3, 2014.

24 See in this respect the ESRB work on closing real estate data gaps mentioned in Section 2.1.

Figure 3

Instruments by stretches related to real estate lending



With some adjustments, the "three stretches" model can also be used for the commercial real estate sector, although the practical challenges are much greater. For example, the debt service-coverage ratio and the interest-coverage ratio are frequently used income stretch instruments for commercial real estate. However, the commercial real estate sector still poses major challenges for macroprudential policymaking, including the lack of a clear definition of commercial real estate and serious data gaps. Moreover, a significant proportion of financing is provided by non-banks (e.g. insurance companies and asset managers), whereas currently the macroprudential toolkit consisted mainly of instruments targeting banks. Finally, cross-border financing (also from outside the European Union) is important in some commercial real estate markets, which should be taken into consideration when designing macroprudential policies for this sector.

2.6 Systemic risks arising from insurers and re-insurers

The ESRB published a report on the systemic risks arising from the activities of European insurers and re-insurers. The report contributes to the ongoing debate on the systemic relevance

of this sector. Insurance fulfils an important role in the economy by taking on risks and mobilising savings; it contributes to economic growth and financial stability if it functions well.

The ESRB has identified four main ways in which insurers and re-insurers can be a source of, or can amplify, systemic risks:

- Insurers can amplify shocks owing to their involvement in so-called non-traditional and non-insurance activities such as, for example, speculative derivative transactions.
- Certain asset allocation behaviours such as sales of assets in downturns may have a pro-cyclical impact, thus putting pressure on already falling prices.
- Life insurers in parts of Europe could create disruption by failing collectively under a scenario with prolonged low risk-free rates and suddenly falling asset prices (the so-called "double hit"). Insurance guarantee schemes and recovery and resolution arrangements, currently in place at national level, are unlikely to be fit to handle such a scenario. From a shorter-term perspective, this is considered to be the most imminent risk under the current economic conditions.
- Underpricing by an insurer, if left unchecked as part of microprudential supervision, could lead to a lack of supply in those classes of insurance that are vital to economic activity.

The ESRB report further recommends to assess whether additional tools may be needed for macroprudential authorities to deal with systemic risks relating to the EU insurance sector; at the moment, competent authorities may make use of a variety of tools, some of which are available under the Solvency II framework. Additional tools may include enhanced liquidity monitoring, a recovery and resolution framework for European (re)insurers and the flexibility to require insurers to build-up their resilience.

2.7 Central counterparties and new macroprudential instruments

The ESRB engaged in a number of activities with respect to central counterparties and new macro-prudential instruments in this area. This includes input into the review of the European Market Infrastructure Regulation (EMIR), considerations on the clearing obligation for OTC interest rate derivatives in a range of less frequently traded currencies and systemic risk implications of CCP interoperability arrangements.

The ESRB submitted two reports for the consideration of the European Commission in the context of the review of the EMIR.[25] These reports were prepared in the context of the European Commission's obligation to review EMIR by 17 August 2015 and, in particular, to assess – in cooperation with ESMA and the ESRB – the efficiency of margining requirements in limiting pro-cyclicality and the need to define additional intervention capacity in this area. This provided an opportunity for the ESRB to also evaluate whether other issues falling within the scope of EMIR warrant a rethink, also taking into account international and European developments during the implementation of the EMIR provisions.

In its report focussing on the efficiency of margining requirements, the ESRB noted that the anticyclical contribution of the EMIR legal framework could be significantly enhanced. The report stressed that it is too early to empirically assess the performance of the EMIR provisions,

25 See the "ESRB report on the efficiency of margining requirements to limit pro-cyclicality and the need to define additional intervention capacity in this area" and the "ESRB report on issues to be considered in the EMIR revision other than the efficiency of margining requirements", both dated 28 July 2015 and available on the ESRB's website.

since margins and haircuts have only been set by CCPs in accordance with EMIR since 2014. Furthermore, over the period considered few large market swings occurred that could have triggered significant changes in margins and/or haircuts. Against this background, the ESRB noted that no significant evidence of pro-cyclical implications stemming from margining and haircut requirements of European CCPs had emerged. The report also noted that, based on qualitative analysis, the overall anticyclical equipment of EMIR could be reinforced, while confirming the current design. In particular, the report mentions that the regulation provides CCPs with significant discretion in implementing the requirements on pro-cyclicality and that there are no regulatory requirements explicitly addressing the potential strong correlation between margins and haircuts during a stress scenario. Furthermore, EMIR does not explicitly provide specific requirements to mitigate pro-cyclicality for the "add-ons" that CCPs can (and often do) add to initial margins. Against this background the report made specific proposals aimed at providing clear guidance on the parameters to be used by CCPs in order to avoid potentially significant differences in their interpretation. It also proposed more granular transparency requirements on pro-cyclicality, a definition of pro-cyclicality in the EMIR level 1 text, and that each CCP would have to develop a documented policy covering overall tolerance for pro-cyclicality.

The ESRB proposed a further review of EMIR in 2018, specifically on the macroprudential use of margining and haircuts to address and prevent systemic risks. The ESRB also evaluated EMIR with a view to ensuring that policy-makers are afforded the necessary flexibility to deploy instruments as required for the prevention and mitigation of systemic risk. This includes risks associated with pro-cyclical margin and haircut requirements for centrally and non-centrally cleared transactions and the potential build-up of leverage in the financial system. CCPs face a trade-off between the private benefits of minimising over-margining in periods of low volatility and high market liquidity and the social costs of having to cope with higher pro-cyclicality of margin requirements. Authorities can have a macroprudential role in ensuring that this trade-off does not result in margins being too low in periods of low volatility and high market liquidity and in addressing financial and synthetic leverage in the financial system or parts of the financial system. This can be done through conservative and potentially counter-cyclical margins and haircuts for both centrally and non-centrally cleared transactions. Operationalising such macroprudential instruments poses challenges. For example, indicators and thresholds to guide the setting of counter-cyclical floors would have to be developed and a broad application of macroprudential margins and haircuts would be necessary to avoid regulatory arbitrage and the shifting of activities. Some of these issues would be better addressed if a global framework were in place. The ESRB is actively engaged in facilitating international discussions,[26] while continuing analytical work on the principles that would govern a new macroprudential instrument. To ensure progress is also made in international discussions and to provide authorities with the appropriate instrument without unnecessary delay the ESRB considered it necessary to include in the revised text of EMIR an illustrative considerandum and a fixed deadline for the review of this important issue.

In the report on other issues to be considered in the EMIR review, the ESRB provided its opinion on other aspects where additional regulatory intervention could contribute to further enhancing EMIR. This included introducing a procedure for the swift removal or suspension of mandatory clearing obligation, clarifying that systemic risk for mandatory clearing purposes should be evaluated by ESMA both at the EU and at the national level, aligning the amount of the so-called skin-in-the-game held by a CCP with the level of the CCP's clearing activity, clarifying the timing

26 Among other things, the ESRB organised an International Conference on Macroprudential Use of Margins and Haircuts on 6 June 2016 in Frankfurt, in order to gather views all stakeholders from different jurisdictions on the subject. See the related ESRB press release of 6 June 2016, **http://www.esrb.europa.eu/news/pr/date/2016/html/pr160606.en.html**

and procedures of the replenishment of a default fund, introducing an obligation for CCPs to publish quantitative and qualitative requirements consistent with the international disclosure framework, publishing a list of interoperability arrangements approved by the ESMA, and broadening of national authorities' access to trade repository data.

The ESRB would have liked to have seen more progress on mandatory clearing. The regulation introducing a clearing obligation for over-the-counter (OTC) interest rate derivatives denominated in euro, pound sterling, yen and US dollars entered into force in 2015.[27] The ESRB expressed strong support for this clearing obligation and for extending it to other instruments. In particular, in 2015 the ESRB expressed support for introducing a clearing obligation for OTC interest rate derivatives denominated in a range of less frequently traded currencies.[28] When assessing the rationale for a clearing obligation, it is important to take into account the positive impact it might have in reducing systemic risks considered not only at the EU level, but also at the regional and national levels. At the same time, the ESRB stressed the importance of introducing, without undue delay, a comprehensive EU regulatory framework for the recovery and resolution of CCPs, in order to provide adequate tools for the unlikely, but not impossible event that a CCP finds itself in a distressed situation.

The ESRB provided the European Commission with its first assessment of systemic risk implications of CCP interoperability arrangements.[29] An arrangement between two or more CCPs that involves a cross-system execution of transactions is defined as an interoperability arrangement. The European Commission shall, after receiving the assessments of the ESRB in cooperation with Member States and ESMA, draw up an annual report assessing any possible systemic risk and cost implications of interoperability arrangements. CCP interoperability arrangements can have implications for financial stability in two different ways. On the one hand, such arrangements can help to contain systemic risks in a situation where a number of different CCPs clear the same financial instruments, insofar as they allow intermediaries to hold their position with one CCP instead of "fragmenting" it across different CCPs. This increases netting possibilities, helps to limit demand for eligible collateral and avoids situations where the default of a clearing member triggers parallel default procedures at different CCPs. On the other hand, however, CCP interoperability arrangements can have systemic risk implications, since the establishment of interoperable links introduces a significant element of complexity into the overall risk management system and adds a channel for direct contagion between two or more CCPs. The most significant implications of interoperability arrangements in terms of systemic risk materialise in the event of an interoperable CCP defaulting.

With this in mind, the report points to a number of policy issues which, in the ESRB's opinion, merit further consideration from a macroprudential point of view. These include the need for more granular and prescriptive regulation, the consideration of interoperable CCPs in a recovery and resolution framework, and further analysis on the specificities and complexities relating to potential new interoperability arrangements for derivatives. This is particularly the case for complexities relating to potential interoperability arrangements for OTC derivatives.

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[27] Commission Delegated Regulation (EU) 2015/2205 of 6 August 2015 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on the clearing obligation.

28 See the "ESRB response to ESMA Consultation Paper No 4 on the clearing obligation for other OTC interest rate derivatives" of 13 July 2015, **http://www.esrb.europa.eu/pub/pdf/other/150713_ESRB_response.pdf**

29 See the "ESRB report to the European Commission on the systemic risk implications of CCP interoperability arrangements" of 18 January 2016, available at **https://www.esrb.europa.eu/pub/pdf/other/2016-01-14_Interoperability_report.pdf**

Ensuring implementation and accountability

1 Follow-up to ESRB recommendations

ESRB recommendations have no direct binding power but are subject to an "act or explain" regime. This means that the addressees of recommendations – such as Member States, National Supervisory Authorities (NSAs), national macroprudential authorities and European institutions – have an obligation to communicate to the ESRB and the EU Council the actions they have taken to comply with a recommendation, or to provide adequate justification in the case of inaction. In order to provide guidance to the addressees on how to assess the implementation of ESRB recommendations, the "Handbook on the follow-up to ESRB recommendations" (hereinafter the "Handbook") was published in July 2013. A revised version of the Handbook has been drafted in order to take into account the experience gained during past follow-up assessments and was approved by the General Board in April 2016. The main changes include: (1) a reconfiguration of the pre-assessment phase, which is crucial for addressees and assessors in terms of the correct implementation and assessment of the recommendations; (2) strengthened communication between the relevant addressees of the recommendations and the assessment team members; and (3) a revised methodology for assigning weights and grading.

The following paragraphs outline the two assessments conducted throughout the year as a follow-up to Recommendation ESRB/2012/2 on funding of credit institutions. The first assessment team has been tasked to assess the national covered bond frameworks established by addressees, while the second assessment team has provided a compliance assessment of addressees with respect to part of the relevant recommendations on asset encumbrance.

1.1 Recommendation ESRB/2012/2 on funding of credit institutions – sub-recommendations E.1, E.2 and E.4 on covered bonds

On 20 December 2012 the ESRB adopted Recommendation ESRB/2012/2 on funding of credit institutions. It was addressed to NSAs, national macroprudential authorities and the EBA, with the aim of incentivising sustainable funding structures for credit institutions and mitigating any related systemic risks. According to recommendation E, NSAs were requested to identify best practices regarding covered bonds and encourage the harmonisation of their national frameworks. It was recommended that the EBA coordinate measures taken by NSAs and assess whether financial instruments other than covered bonds could generate encumbrance.

In general, there was significant progress in the harmonisation of national covered bond frameworks, partly due to the considerable support of the EBA. However, more work remains to be done, particularly on the implementation of sub-recommendations E.1 and E.4 by NSAs. In fact, only one-third of addressees took distinctive action to identify best practices and encourage harmonisation at their respective national level. Another nine addressees at the time of the assessment already had in place a harmonised national framework for covered bonds, including best practices that mostly or completely fulfilled the requirements of the recommendation. The remaining addressees did not take any distinctive action to implement the recommendation, the majority of which argued that they would have preferred a harmonised approach at European level – involving representatives of different Member States at the level of the EBA – rather than unilateral national action. In addition, some addressees put forward the additional argument that, in line with the principle of proportionality, not taking action on their part was appropriate, since their national covered bond markets are insignificant.

Table 4

Addressees' compliance with the ESRB/2012/2 on funding of credit institutions – sub-recommendation E.1

	Identification of best practices		Harmonisation of frameworks		Grade
Country	☑/☒	Comment	☑/☒	Comment	
Austria	☑	Already implemented	☑	Existing framework	FC
Belgium	☑	Prior legislation	☑	Harmonised framework	FC
Bulgaria	☒	No process initiated	☒	National law in place	SE
Croatia	☒	No process initiated	☒	No national law	SE
Cyprus	☒	No process initiated	☒	National law in place	SE
Czech Republic	☒	No process initiated	☒	National law in place	SE
Denmark	☑	Already implemented	☑	Existing framework	FC
Estonia	☒	No process initiated	☒	National law initiated	SE
Finland	☑	Partly implem. (no evidence)	☑	Existing framework	LC
France	☑	Process initiated	☒	Future harmon. envisaged	LC
Germany	☑	Already implemented	☑	Existing framework	FC
Greece	☑	Prior legislation	☑	Harmonised framework	FC
Hungary	☒	No process initiated	☒	National law in place	SE
Ireland	☑	Already implemented	☑	Existing framework	FC
Italy	☑	Prior legislation	☑	Harmonised framework	FC
Latvia	☒	No process initiated	☒	National law in place	SE
Lithuania	☒	No process initiated	☒	National law in place (old)	SE
Luxembourg	☑	Prior amended legislation	☑	Harmonised framework	FC
Malta	☒	No process initiated	☒	No national law	SE
Netherlands	☑	Prior amended legislation	☑	Harmonised framework	FC
Poland	☑	Partly implemented	☑	Existing framework	LC
Portugal	☑	Already implemented	☑	Harmonised framework	FC
Romania	☑	Process initiated	☑	Harmonisation initiated	LC
Slovakia	☑	Partly implemented	☑	Existing framework	LC
Slovenia	☑	Prior amended legislation	☑	Harmonised framework	FC
Spain	☑	Already implemented	☑	Existing framework	FC
Sweden	☑	Prior amended legislation	☑	Harmonised framework	FC
United Kingdom	☑	Already implemented	☑	Existing framework	FC

FC fully compliant
LC largely compliant with minor discrepancies
SE inaction sufficiently explained

Implementation by the EBA of Recommendation ESRB/2012/2 has been found to be fully compliant. On 1 July 2014 the EBA published a report that provides comprehensive guidelines for NSAs in relation to the quality and segregation of cover pools, insolvency remoteness of covered bonds, the asset and liability risks affecting cover pools, and disclosure of the composition of cover pools. As regards financial instruments other than covered bonds that could generate encumbrance, the EBA provided sound reasoning for postponing its assessment of these instruments.

1.2 Recommedation ESRB/2012/2 on funding of credit institutions – recommendations B and D, and sub-recommendation C.3 on asset encumbrance

The second assessment on Recommendation ESRB/2012/2 on funding of credit institutions took into account some of the recommendations regarding asset encumbrance. According to

recommendation B, NSAs with responsibility for banking supervision were recommended to require credit institutions to put in place risk management policies, procedures and controls for identifying, assessing and monitoring risks associated with collateral management and asset encumbrance, as well as a general monitoring framework for identifying and assessing the level, evolution and types of asset encumbrance. The EBA, meanwhile, was requested to develop guidelines on transparency requirements for credit institutions on asset encumbrance in accordance with recommendation D. In addition, it was recommended that the EBA issue guidelines on harmonised templates and definitions in order to facilitate the monitoring of asset encumbrance.

Table 5

Addressees' compliance with Recommendation ESRB/2012/2 on funding of credit institutions – recommendation B

	B.1			B.2			B.3			
Country	Substance	Appropriateness	Status	Substance	Appropriateness	Status	Substance	Appropriateness	Status	Overall
Austria	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Belgium	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Bulgaria	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Croatia	LC	LC	FC	LC	LC	FC	LC	LC	FC	LC
Cyprus	LC	LC	FC	LC	LC	FC	LC	LC	FC	LC
Czech Republic	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Denmark	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Estonia	FC	FC	FC	LC	LC	FC	FC	FC	FC	FC
Finland	LC	LC	FC	LC	LC	FC	LC	LC	FC	LC
France	FC	FC	FC	FC	FC	FC	LC	LC	FC	FC
Germany	LC	LC	FC	LC	LC	FC	LC	LC	FC	LC
Greece	FC	FC	LC	FC	FC	LC	FC	FC	LC	FC
Hungary	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Ireland	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Italy	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Latvia	FC	FC	FC	LC	LC	FC	FC	FC	FC	FC
Lithuania	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Luxembourg	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Malta	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Netherlands	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Poland	LC	LC	FC	LC	LC	FC	LC	LC	FC	LC
Portugal	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Romania	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Slovakia	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Slovenia	FC	FC	LC	FC	FC	LC	FC	FC	LC	FC
Spain	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
Sweden	FC	FC	FC	LC	LC	FC	LC	LC	FC	LC
UK	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC

FC fully compliant

LC largely compliant with minor discrepancies

In general, the ESRB Recommendation was successful in establishing risk management policies, procedures and controls for the related risks, as well as a monitoring framework for asset encumbrance. The assessment of the implementation of the Recommendation on funding of credit institutions shows a large degree of compliance (see Table 6) with the relevant provisions of recommendation B. However, after clarifying the participation of the ECB in its

capacity of supervisory authority, it was agreed by the ESRB to assess it separately at a later stage.

Implementation by the EBA of the recommendation referred to above was found to be fully compliant. The Implementing Technical Standard (ITS) and the associated uniform templates developed by the EBA include reporting of all categories/items envisaged by sub-recommendation C.3. In addition to this, the ITS facilitates the monitoring of risks associated with asset encumbrance, such as funding and credit risks, while the templates provide both the NSAs and the EBA with the necessary information to monitor the level, evolution and types of asset encumbrance for all reporting institutions on a quarterly basis. To address recommendation D, on 27 June 2014 the EBA issued the "Guidelines on disclosure of encumbered and unencumbered assets". The guidelines provide three templates that institutions will have to use for disclosure together with narrative information relating to the impact of their business model on their level of encumbrance and the importance of encumbrance in their funding model.

2 Reporting to the European Parliament and other institutional aspects

Pursuant to Article 19 of ESRB Regulation,[30] the ESRB reports regularly to the European Parliament on its activities.

In line with this obligation of accountability, the Chair of the ESRB is invited to hearings before the Committee on Economic and Monetary Affairs of the European Parliament (ECON). These hearings are public and transmitted by webcast, which can be accessed via the ESRB's website.

The introductory statements of the ESRB's Chair and Vice-Chairs are published on the ESRB's website and provide the Members of the European Parliament (MEPs) with an overview of the ESRB's stance on current systemic risks arising from financial sectors and on macroprudential policy options recommended in its fora.

At the hearings, the policy recommendations which the ESRB has adopted during the year are presented, with a view to providing MEPs with first-hand information on the rationale for them.

The main points of the two most recent hearings are summarised as follows:

At the hearing on 12 November 2015 before ECON, the Chair of the ESRB, when outlining the ESRB's main achievements of the last five years, recalled some of the recent measures that had been taken. Primarily, the Chair of the ESRB emphasised that the creation of national macroprudential authorities, in accordance with ESRB Recommendation 2011/3, had been successfully completed by the large majority of Member States, with the exceptions of a small number of countries (Spain, Italy and Romania). The ESRB played a substantial role in helping macroprudential authorities by identifying clear intermediate financial stability objectives and instruments, which set out the basis for over 100 policy measures adopted across the European Union after the entry into force of the CRD IV/CRR. The Chair went on to remark on, among other things, the following activities undertaken by the ESRB:

- the insertion of a new chapter on macroprudential leverage ratios in "The ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector";
- the imminent publication of the ESRB reports on residential and commercial real estate and financial stability in the European Union;[31]

30 Regulation (EU) No 1092/2010 of the European Parliament and of the Council of 24 November 2010 on European Union macroprudential oversight of the financial system and establishing a European Systemic Risk Board, OJ L 331/1

- the significant progress made on the framework for the coordination of national macroprudential policy, which is essential to limit the scope of possible cross-border spillovers and regulatory arbitrage, and the coordination for setting up counter-cyclical capital buffer rates for third countries.[32]

Last, the Chair of the ESRB observed that the broad macroprudential mandate of the ESRB entails the financial system as a whole, with macroprudential policies developed beyond the banking system. In this respect, he reported on current discussions, at General Board level, about setting a recovery and resolution regime for CCPs. This recovery and resolution framework would be particularly important in the light of the clearing obligation for OTC interest rate swaps. At the same time, a specific recovery and resolution framework in the insurance sector would constitute an essential tool to increase the resilience of the financial system as a whole.

At the hearing on 7 December 2015 before ECON, the first Vice-Chair of the ESRB, Mark Carney, highlighted some of the contributions made by the ESRB, including:

- its role in building stronger macroprudential frameworks and encouraging best practices to the national macroprudential authorities – for example producing specific guidance on the macroprudential use of the leverage ratio;
- its contribution to making capital markets more resilient - achieved by both promoting a shared understanding of what drives market liquidity and through its power of data collection of consistent information on the nature and size of the risks associated with market-based finance;
- its encouragement of sensible actions to rebuild trust in the financial system following episodes of misconduct.

In addition to the public hearings, the Chair holds confidential discussions on the work of the ESRB with the Chair and Vice-Chairs of ECON, when appropriate.

The ESRB's publications are available on its website and include: (i) the Macroprudential Commentaries; (ii) the Reports of the Advisory Scientific Committee; (iii) the Occasional Paper Series; and (iv) the Working Paper Series. The purpose of the Working Paper Series, launched on the website in February 2016, is to gather research papers on systemic risks and macroprudential policy, so as to inform the policymaking side of the ESRB. The views expressed in these publications are those of the authors and do not necessarily reflect the official stance of the ESRB.

31 The ESRB reports on residential and commercial real estate and financial stability in the EU were published on 4 January 2016 on the ESRB's website.

32 As announced by the Chair of the ESRB, both issues have been addressed by means of a formal recommendation: Recommendation on recognising and setting countercyclical buffer rates for exposures to third countries (ESRB/2015/1), complemented by Decision ESRB/2015/3 of the European Systemic Risk Board of 11 December 2015 on the assessment of materiality of third countries for the Union's banking system in relation to the recognition and setting of countercyclical buffer rates; and Recommendation on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2015/2) accompanied by Decision ESRB/2015/4 of the European Systemic Risk Board of 16 December 2015 on a coordination framework for the notification of national macroprudential policy measures by relevant authorities, the issuing of opinions and recommendations by the ESRB, and repealing Decision ESRB/2014/2. These legal acts were made available on the ESRB's website on 29 January 2016.

Recommendations, commentaries, reports and papers published on the ESRB's website from 1 April 2015 to 31 March 2016

23/02/2016

Working Paper No 2: "Macroprudential Supervision: From Theory to Policy", by Dirk Schoenmaker, Peter Wierts

23/02/2016

Working Paper No 1: "Macro-financial stability under EMU", by Philip R. Lane

11/02/2016

Report of the Advisory Scientific Committee No 6: "Too late, too sudden: Transition to a low-carbon economy and systemic risk"

18/01/2016

ESRB report to the European Commission on the systemic risk implications of CCP interoperability arrangements

04/01/2016

ESRB reports on residential and commercial real estate and financial stability in the EU

16/12/2015

ESRB report on systemic risks in the EU insurance sector

27/08/2015

Occasional Paper No 8: "Identifying early warning indicators for real estate-related banking crises", by Stijn Ferrari, Mara Pirovano, Wanda Cornacchia

29/07/2015

ESRB report on issues to be considered in the EMIR revision other than the efficiency of margining requirements

29/07/2015

ESRB report on the efficiency of margining requirements to limit pro-cyclicality and the need to define additional intervention capacity in this area (issued within the framework of the EMIR assessment)

13/07/2015

Occasional Paper No 7: "Network analysis of the EU insurance sector", by Ivan Alves, Jeroen Brinkhoff, Stanislav Georgiev, Jean-Cyprien Héam, Iulia Moldovan, Marco Scotto di Carlo

25/06/2015

The ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector – Addendum: Macroprudential Leverage Ratios

25/06/2015

ESRB report on misconduct risk in the banking sector

25/06/2015

ESRB report: "A review of macro-prudential policy in the EU one year after the introduction of the CRD/CRR"

3 The institutional framework

The ESRB comprises a General Board, a Steering Committee, an Advisory Scientific Committee (ASC), an Advisory Technical Committee (ATC) and a Secretariat. The ESRB is chaired by the President of the ECB, Mario Draghi. The Chair of the ATC is Stefan Ingves, Governor of Sveriges Riksbank. After the selection of the new composition of the ASC in 2015, the Chair of the ASC was Professor Philip R. Lane, until he was appointed Governor of the Central Bank of Ireland. Since then, Professor Marco Pagano has taken over the ASC chairmanship, while Professor Prasanna Gai has been selected from the reserve list to be appointed as an ASC member. Following the successful first edition of the 2015 Ieke van den Burg prize for research on systemic risk, the ASC launched, with the support of the ESRB Secretariat, a 2016 call for papers. The winning paper will be published under a dedicated section on the ESRB's website by fall 2016.

The day-to-day business of the ESRB is carried out by its Secretariat. The ECB provides the ESRB with a Secretariat and ensures analytical, statistical, logistical and administrative support to it. The Head of the ESRB's Secretariat is Francesco Mazzaferro, while the Deputy Head is Tuomas Peltonen.

The work of the ATC and the ASC is supported by a number of expert groups, details of which are provided in an organisational chart published on the ESRB's website.[33]

In terms of resources, in 2015 the ECB provided the ESRB with 56.4 full-time equivalent staff. Of these, 21.8 are employed within the Secretariat and 34.6 are dedicated to other forms of support. The direct costs incurred by the ECB amounted to €8.5 million, to which indirect costs relating to other support services shared with the ECB (e.g. human resources, IT, general administration) have to be added. Over the same period other member institutions of the ESRB provided approximately 52 full-time equivalent staff for analytical support within the context of ESRB groups and ESRB chair positions.

33 See **ESRB Organisational Chart**.

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