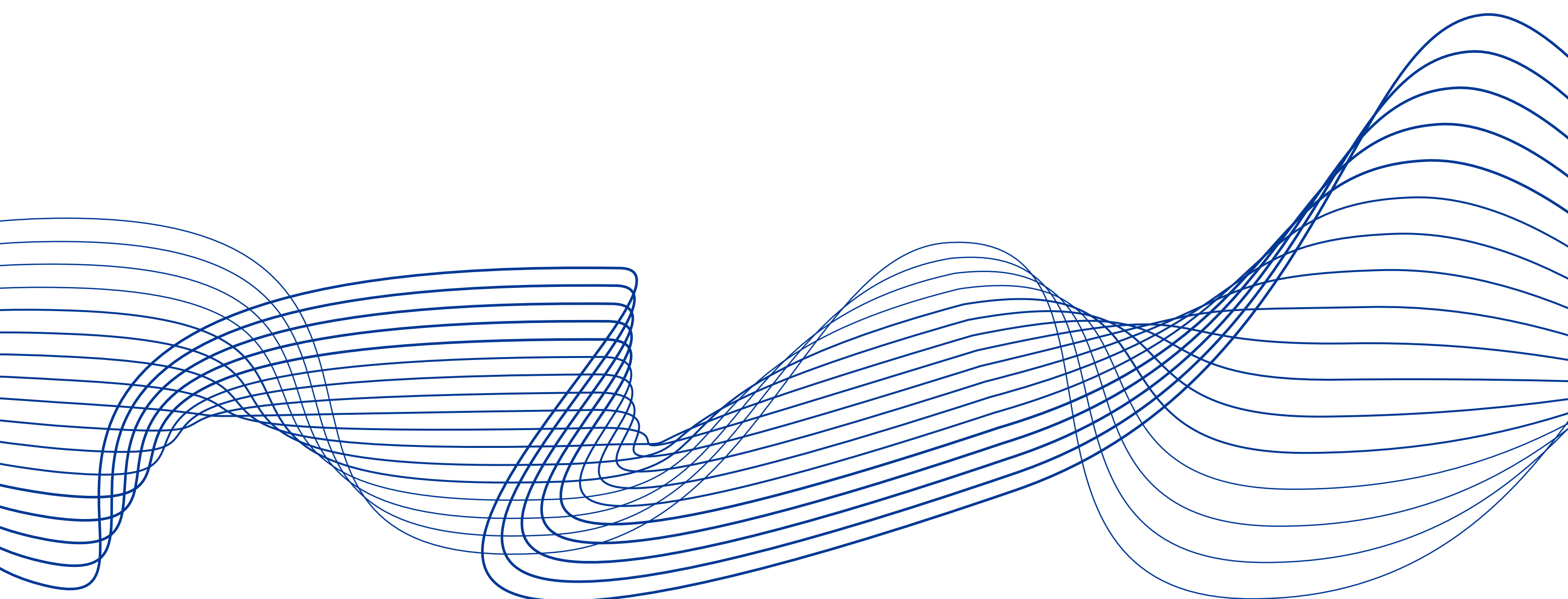
Annual Report

2016



ESRB
European Systemic Risk Board
European System of Financial Supervision

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Foreword

Mario Draghi,
Chair of the
European Systemic Risk Board

This is the sixth Annual Report of the European Systemic Risk Board (ESRB), which covers the period between 1 April 2016 and 31 March 2017. In the review period, the ESRB continued its close monitoring of vulnerabilities in the European Union (EU) financial system and contributed to the related policy debate. The ESRB paid particular attention to two overriding areas of risk. The first relates to the risks entailed by the continued low interest rate environment. The analysis of these risks jointly undertaken by the ESRB and the ECB was published in a report on macroprudential policy issues arising from low interest rates. This analysis also led the ESRB to consider the identified risk of weaknesses in the balance sheets of banks, insurers and pension funds as one of the two most prominent risks to financial stability in the EU, putting it at par with the risk of repricing of risk premia in global financial markets.

The second area of risk concerns vulnerabilities related to residential real estate. Based on a forward-looking EU-wide assessment, the ESRB concluded that medium-term vulnerabilities prevail in eight Member States and issued public warnings to these Member States. The ESRB also issued a recommendation on closing data gaps to establish a more harmonised framework for monitoring developments in residential and commercial real estate markets in the EU.

In the review period, the ESRB also expanded its capacity to monitor the non-banking sector. In particular, the ESRB published the first edition of an annual EU Shadow Banking Monitor, which identified sources and amplifying mechanisms of systemic risks. In connection with this, the ESRB contributed to shaping the debate on macroprudential policy beyond the banking sector. For instance, it set out both short-term policy options and a long-term agenda in this area.

Furthermore, the ESRB was closely involved in fostering the discussion on macroprudential policy by hosting a number of conferences and workshops. Most notably, it held its first Annual Conference in September, which focused on the macroprudential policy stance and some of the most prominent topics on the agenda of macroprudential policymakers, such as the low interest rate environment, the implications of the central clearing obligation to make trading on standardised OTC derivatives safer, and the apparent scarcity of safe assets in the markets.

Finally, I would like to warmly thank Stefan Ingves, Governor of Sveriges Riksbank, for his support to the ESRB over the last six years in his capacity as Chair of the ESRB's Advisory Technical Committee (ATC). The new ATC Chair, Philip R. Lane, Governor of the Central Bank of Ireland, will take over the role from August 2017.

Frankfurt am Main, July 2017

Mario Draghi
ESRB Chair

Executive summary

The period under review was characterised by an environment of low economic growth and low interest rates, although the European and global economic outlook improved towards the end of the review period. The ESRB (jointly with the ECB) devoted significant resources to analysing the effect of this environment on the financial stability of the EU and published a report on the macroprudential policy issues arising from low interest rates. Moreover, the growing EU shadow banking system led the ESRB to step up its monitoring efforts and publish its first annual EU Shadow Banking Monitor, which identified sources and amplifying mechanisms of systemic risks.

The ESRB continued to identify four main risks to financial stability in the EU, namely 1) a re-pricing of risk premia in global financial markets; 2) weaknesses in balance sheets of banks, insurers and pension funds; 3) debt sustainability challenges in sovereign, corporate and household sectors; and 4) shocks and contagion from the non-bank financial sectors to the wider financial system. As in the previous ESRB Annual Report, an abrupt reversal of global risk premia continued to be considered as a particularly prominent risk to financial stability. The low growth and low interest rate environment led the ESRB to deem weaknesses in the balance sheets of banks, insurers and pension funds to be of similar importance.

In addition to its mandate to conduct macroprudential oversight of the financial system of the EU, the ESRB has a mandate to issue warnings when significant systemic risks are identified and it proves necessary to flag such risks. In view of this, the ESRB analysed the medium-term vulnerabilities in the EU Member States relating to the residential real estate sector. Based on its assessment, the ESRB issued public warnings to eight countries (Austria, Belgium, Denmark, Finland, Luxembourg, the Netherlands, Sweden and the United Kingdom). These were the first public warnings issued by the ESRB since its establishment. The ESRB also found significant gaps in the data available to analyse the real estate sector. It therefore adopted a Recommendation on closing real estate data gaps to establish a more harmonised framework for monitoring developments in residential and commercial real estate markets in the EU.

The main financial stability risks that were identified by the ESRB formed the basis for the design of adverse scenarios for the EU-wide stress tests of the European Supervisory Authorities (ESAs). Over the review period, the ESRB provided adverse scenarios for the stress test of central counterparties (CCPs) by the European Securities and Markets Authority (ESMA) and the stress test of occupational pension funds by the European Insurance and Occupational Pensions Authority (EIOPA). Details of these scenarios are provided in this Annual Report. The scenarios the ESRB provided in early 2016 to the banking sector stress test by the European Banking Authority (EBA) and the insurance sector stress test by EIOPA were described in the ESRB's 2015 Annual Report.

The review period also marked the first year of operation of the voluntary reciprocity framework introduced by the ESRB in December 2015. In 2016, Belgium and Estonia were the first countries to request reciprocation of two of their measures under the new framework. The ESRB's subsequent recommendation to all Member States that both measures be reciprocated eventually led to a significant increase in reciprocating actions across the EU.

The ESRB also contributed to the European Commission's consultation document on the Review of the EU Macro-prudential Policy Framework. The ESRB highlighted that it should continue to be independent, remaining nevertheless closely linked to the ECB. It proposed that the membership of the General Board remain broad and stressed that the macroprudential toolkit should be comprehensive and simple to use. In addition, it proposed some improvements in the design of

specific tools targeting the structural and cyclical dimensions of systemic risk. Furthermore, the ESRB proposed that instruments addressing systemic risks originating mainly from residential real estate exposures be available to macroprudential policymakers in all EU Member States. Finally, the ESRB recognised the need to set up a legal framework for macroprudential policy beyond the banking sector.

In addition, the ESRB contributed to the macroprudential framework for banking. First, it provided its views to the EBA on the introduction of the leverage ratio. Based on its preliminary analysis, the ESRB sees little evidence of the leverage ratio having a negative impact on market liquidity. Second, the ESRB contributed to the regular report coordinated by the EBA on the cyclicality of capital requirements. While acknowledging some analytical challenges, the report found weak evidence on the existence of procyclical effects arising from the Capital Requirements Regulation and Directive (CRR/CRD IV) package. It therefore proposed retaining the current risk-sensitive framework for bank regulatory capital. Third, the ESRB provided its views to the EBA on the definition of a net stable funding ratio (NSFR). The response identified the NSFR as the best available instrument to address structural issues related to liquidity and maturity transformation by banks. It noted that the ultimate goal of the European authorities should therefore be the implementation of a credible and sound NSFR requirement in the EU.

Moreover, the ESRB contributed to the development of a macroprudential policy framework beyond the banking sector. The ESRB published a strategy paper in July 2016, presenting short-term policy options and a long-term policy agenda to mitigate financial stability risks linked to the non-banking sector. During the review period, the ESRB made progress on some of the key tasks set out in the strategy paper. First, the ESRB undertook steps towards creating innovative macroprudential instruments to address the procyclicality of initial margins and haircuts, especially in securities financing transactions and derivatives. Second, the ESRB provided a macroprudential perspective to the prudential supervision of CCPs and insurance companies, in particular providing input to ongoing legislative reviews.

Compared with the previous year, 2016 saw a substantial increase in the number of measures covering macroprudential matters. It was the first year when all Member States set the countercyclical capital buffer on a quarterly basis and carried out the annual review of the designation and setting of buffer rates for other systemically important institutions. In the case of instruments that are not subject to periodic review, around half of the Member States took macroprudential policy actions, with a particular focus on instruments targeting risks related to residential real estate.

During the period under review, the ESRB continued to evaluate the implementation of past ESRB recommendations. The assessment of compliance with the ESRB Recommendation on funding of credit institutions revealed a particularly high level of compliance by addressees. The assessment of compliance with the ESRB Recommendation on intermediate objectives and instruments of macroprudential policy showed that all Member States pursue the intermediate objectives recommended by the ESRB and link them to specific macroprudential instruments. The finalisation of the compliance assessment for the ESRB Recommendation on money market funds was postponed so as to take account of the finalisation of the EU Regulation on money market funds.

Finally, the ESRB organised a number of conferences and workshops to foster discussion on macroprudential policy. In particular, the ESRB held its first annual conference, in which panellists debated the macroprudential policy stance and some of the most prominent topics on the agenda of macroprudential policymakers, such as the low interest rate environment, the implications of the central clearing obligation to make trading of standardised OTC derivatives safer, and the apparent scarcity of safe assets.

Section 1 – Systemic risks in the financial system of the European Union

During the review period the ESRB identified four main risks to financial stability in the European Union (EU). These risks are summarised in Table 1 and relate to 1) a repricing of risk premia in global financial markets; 2) weaknesses in the balance sheets of banks, insurers and pension funds; 3) debt sustainability challenges in sovereign, corporate and household sectors; and 4) shocks and contagion from the non-bank financial sectors to the wider financial system. These four risks are interrelated and could reinforce each other if they materialised. A common factor that underlies these four risks is the environment of low economic growth and associated low interest rates, although the European and global economic outlook improved towards the end of the review period. These financial stability risks identified by the ESRB formed the basis for the design of adverse scenarios for various EU-wide stress tests (see subsection 2.4 in Section 2 for details).

An abrupt and sharp repricing of risk premia in global financial markets was assessed as being the most severe risk to financial stability in the EU. As in the previous ESRB Annual Report, an abrupt reversal of global risk premia continued to be ranked as the most severe financial stability risk. This risk reflects excessive risk-taking amid historically low returns on savings and search for yield by financial investors, as well as increased geopolitical and economic policy uncertainties. A repricing of risk premia in global financial markets could have an adverse impact on the solvency position of EU banks and other financial institutions.

Risks related to the weaknesses in the balance sheets of banks, insurers and pension funds were raised to the highest risk category. The main factor underlying this increase in the risk assessment was the continued low-yield environment and associated challenges to certain business models. Although market sentiment towards EU banks improved during autumn 2016, vulnerabilities related to low profitability, overcapacity and high stocks of non-performing assets in certain jurisdictions continued to pose challenges that need to be addressed. Moreover, the profitability and solvency of financial institutions that offer guaranteed returns (notably life insurers and pension funds) may come under pressure in an environment of low interest rates and returns over a prolonged period of time.

Unresolved challenges to sovereign, corporate and household debt sustainability continued to pose risks to financial stability in the EU. High debt levels in certain EU Member States in a low nominal growth environment continued to represent a key vulnerability that could become a more pressing financial stability risk in the event of an increase in global risk premia or in risk-free interest rates. The ESRB is analysing whether the creation of sovereign bond-backed securities (SBSs) could play an important role in alleviating the sovereign-bank nexus if such risks were to materialise, without the mutualisation of sovereign debt across EU Member States.

Potential shocks and contagion from the shadow banking system posed further challenges to financial stability. In 2016 the EU shadow banking system continued to grow. However, there was substantial heterogeneity in the size of the shadow banking system relative to the banking sector across EU Member States. If a stressed situation were to arise, the high degree of interconnectedness of the shadow banking system with other parts of the financial system could lead to spillovers and contagion. Although efforts to improve the monitoring of risks outside the banking system continued, the lack of harmonised, granular data constrained a comprehensive risk monitoring of the shadow banking system.

The ESRB continued to develop the framework and tools for the identification of systemic risk, with a particular focus on residential real estate, low interest rates and the non-bank financial sector (see Box 1). Topics that received particular attention in 2016 were vulnerabilities in the EU residential real estate sector[1] (see subsection 1 below and subsection 1 in Section 2) and macroprudential policy issues that arise from low interest rates and structural changes in the EU financial system[2] (see Box 2). In addition, the ESRB also focused on analysing systemic risks originating in the shadow banking system[3] (see subsection 4 below) and macroprudential policy beyond the banking sector (see subsection 2.3 in Section 2).

Table 1

Overview of main risks to financial stability in the EU

1	**Repricing of risk premia in global financial markets**
	Vulnerabilities: mispricing of risks and excessive risk-taking amid historically low cost of funding/low returns on savings and search for yield by financial investors
	Potential triggers: shocks to risk-free rates (such as monetary policy developments in main currency areas, inflation or fiscal shocks) or to risk premia (for example, as a result of geopolitical events or the materialisation of vulnerabilities in key emerging market economies)
2	**Weaknesses in the balance sheets of banks, insurers and pension funds**
	Vulnerabilities (banks): challenges to sustainable sources of profit in the low interest rate environment, overcapacity and cost inefficiencies in some countries, slow progress in resolving high stocks of non-performing loans
	Vulnerabilities (life insurers and pension funds): low-yield environment increases life insurers' and pension funds' liabilities and creates challenges for long-term investments in high-quality assets
	Potential triggers: revaluation of liabilities at low interest rates (life insurers), weak returns on financial investments, losses on problem assets, significant prolonged profitability pressures (banks)
3	**Challenges to debt sustainability in sovereign, corporate and household sectors**
	Vulnerabilities: high indebtedness in public and/or private sectors, weak nominal growth
	Potential triggers: repricing in financial markets, unsustainable fiscal spending, shocks to the outlook for growth
4	**Shocks and contagion from the shadow banking system**
	Vulnerabilities: rapidly increasing size and complexity of the shadow banking sector, lack of data for comprehensive risk monitoring, strong direct and indirect linkages with bank/insurance and household/corporate sectors
	Potential triggers: repricing in financial markets with a potential for fire sales and liquidity squeezes

Notes: Key financial stability risks identified for a time horizon of up to three years. Yellow denotes risk, orange denotes medium risk and red denotes high risk. The assessment of the severity of each risk reflects a combination of the likelihood of the risk and its potential impact.

Box 1

In the course of 2016 the ESRB continued to develop the framework and tools for identifying systemic risk with a particular focus on the non-bank financial sector

The ESRB is responsible for the macroprudential oversight of the EU financial system and the prevention and mitigation of systemic risk. The ESRB therefore has a broad remit, covering banks, insurers, pension funds, asset managers, financial market infrastructures and other financial institutions and markets. To fulfil this remit, the ESRB needs to be able to monitor developments across both financial entities and financial activities. As financial sector growth has in recent years

[1] Report on **Vulnerabilities in the EU residential real estate sector**, ESRB, November 2016.

[2] **Report on Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system**, ESRB, November 2016.

[3] See **EU Shadow Banking Monitor**, No 1, ESRB, July 2016, and Grillet-Aubert, L., Haquin, J.-B., Jackson, C., Killeen, N. and Weistroffer, C., "Assessing shadow banking – non-bank financial intermediation in Europe", *Occasional Paper Series*, No 10, ESRB, July 2016.

occurred primarily outside the banking sector – a development that is expected to continue, supported by a move to a European capital markets union – the ESRB has focused on enhancing its ability to monitor risks beyond the banking sector.

In July 2016 the ESRB published the first EU Shadow Banking Monitor along with its methodology for monitoring financial stability risks in the EU shadow banking system. The Monitor presents an annual overview of developments in the EU shadow banking system and focuses on assessing financial stability risks.[4] It was accompanied by a methodological background paper that provides further information on the data sources and risk indicators employed by the ESRB for identifying and monitoring risks and vulnerabilities within the EU shadow banking system.[5] The ESRB's monitoring framework for the shadow banking system employs an entity-based and activity-based mapping approach. While the entity-based approach uses aggregate balance sheet data, the activity-based monitoring approach employs higher frequency transaction-based data to capture risks that are common to different types of financial entities. The ESRB also hosted the second ESRB shadow banking workshop, which focused on assessing the risks posed by shadow banking to financial stability and reflected on supervisory and other policy actions to address those risks.[6] The workshop discussions confirmed that a holistic approach is needed in order to fully map and assess the risks posed by shadow banking entities and activities.

The ESRB continued to analyse the EU-wide dataset on derivatives transactions resulting from the European Market Infrastructure Regulation (EMIR)[7] with the aim of improving understanding of systemic risks in derivatives markets.[8] For example, an analysis of three of the largest derivatives markets by notional amounts (i.e. interest rate swaps, credit default swaps and foreign exchange forwards) showed a high degree of concentration of notional amounts within a small number of large intermediaries. In general, the EMIR dataset represents a key improvement in policymakers' ability to monitor the potential risks that may arise in derivatives markets. The topic of derivatives and systemic risk was also discussed in detail at the first ESRB Annual Conference in September 2016.[9]

The ESRB also continued to monitor developments in real estate markets from a financial stability perspective and it enhanced its methodology for conducting country-level risk assessments. The monitoring of vulnerabilities in residential real estate markets led to eight country-specific warnings being issued and the publication of the ESRB report on Vulnerabilities in the EU residential real estate sector (see subsection 1 in Section 2). The methodology used in the process was continuously enhanced throughout the year, for example by improving the understanding of the interaction of risks and refining threshold values above which indicators signal vulnerabilities. The methodology was based on a three-stretch approach composed of the household stretch (or borrower stretch), the collateral stretch and the lender stretch, whereby risks

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4 See *EU Shadow Banking Monitor*, op. cit.

5 See Grillet-Aubert, L., Haquin, J.-B., Jackson, C., Killeen, N. and Weistroffer, C., op. cit.

6 For further information see the press release from 26 September 2016 regarding the second ESRB shadow banking workshop on the ESRB's website.

7 **Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories** (OJ L 201, 27.7.2012, p. 1).

8 See Abad, J., Aldasoro, I., Aymanns, C., D'Errico, M., Fache Rousová, L., Hoffmann, P., Langfield, S., Neychev, M., Roukny, T., "Shedding light on dark markets: First insights from the new EU-wide OTC derivatives dataset", *Occasional Paper Series*, No 11, ESRB, September 2016.

9 See the ESRB's website for further information on the **programme for its first Annual Conference**.

related to households' indebtedness, the value of properties and the resilience of banks were identified. The interaction between these risks and the potential policies applied were subsequently taken into account. This enhanced method was aimed at obtaining a systematic and comprehensive overview of the vulnerabilities relating to residential real estate (see subsection 1 in Section 2).[10]

The ESRB also further strengthened its framework for monitoring developments in material third countries. In line with Article 138 of CRD IV[11], the ESRB may recommend setting a countercyclical capital buffer rate for exposures to third countries. For that purpose, the ESRB monitors the risks deriving from excessive credit growth in third countries identified as material for the EU banking system.[12] In order to do so, the ESRB extended its framework for monitoring cross-border credit exposures among Member States to also cover credit exposures between Member States and third countries. In addition, it developed a framework for monitoring developments in material third countries.

As part of its annual review, the ESRB Risk Dashboard was developed further, with the changes implemented in the first issue of the Dashboard in 2017. The main proposed enhancements concerned the inclusion of new insurance sector indicators, based on Solvency II data. In addition, work was carried out on a set of experimental indicators describing risks of EU central counterparties (CCPs). Furthermore, work continued on an ESRB Heatmap (for internal use), with the aim of enhancing the framework for monitoring country-level risk. The ESRB Heatmap will be developed further and operationalised throughout 2017.

The ESRB also completed a comprehensive analysis of macroprudential policy issues arising from low interest rates and structural changes in the EU financial system (see Box 2 for further details).[13]

1 Repricing of risk premia in global financial markets

At the start of 2016 there was a partial repricing of risk premia in European and global financial markets, amid a subdued growth outlook (see Chart 1). During that period of turmoil, European and global financial markets recorded substantial declines, while the prices of commodities, energy companies, corporate bonds and high-yield securities dropped significantly. In addition, emerging markets experienced sizeable capital outflows. The increase in financial market volatility at the beginning of 2016 was underpinned by general uncertainty about the global economic recovery. In particular, the growth outlook for some EU Member States deteriorated further.

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[10] Report on *Vulnerabilities in the EU residential real estate sector*, op. cit.

[11] **Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC** (OJ L 176, 27.6.2013, p. 338).

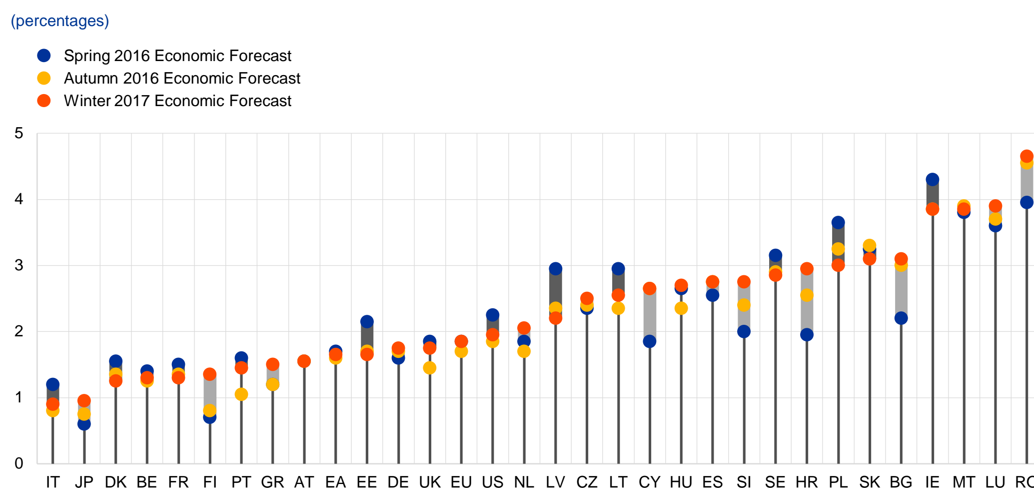
[12] In line with Decision ESRB/2015/3, the ESRB maintains a list of third countries that are material for the EU banking system. The list currently comprises the United States, Hong Kong, China, Turkey, Brazil and Russia.

[13] Report on *Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system*, op. cit.

Chart 1

European Commission's GDP growth forecast

(percentages)



Sources: European Commission's Spring 2016, Autumn 2016 and Winter 2017 economic forecasts.
Note: The average GDP growth forecast is calculated separately for 2016 and 2017 for each round of forecasts.

Long-term nominal interest rates continued to be at historically low levels throughout 2016 amid an environment of subdued nominal growth, despite sizeable yield increases since autumn 2016. While the EU economy had continued to recover over the past year, the actual real GDP growth rates and growth outlook remained subdued in most EU Member States. In line with this environment of subdued growth, short-term and long-term nominal interest rates remained at historically low levels, amid the accommodative monetary policy stance of major central banks (see Chart 2). Even though ten-year EU sovereign bond yields increased on average by around 50 basis points between September 2016 and March 2017, the yield level barely entered positive territory in those countries with the lowest financing costs.

Chart 2

Long-term nominal interest rates continued to be at historically low levels throughout 2016

(ten-year government bond yields; percentages)

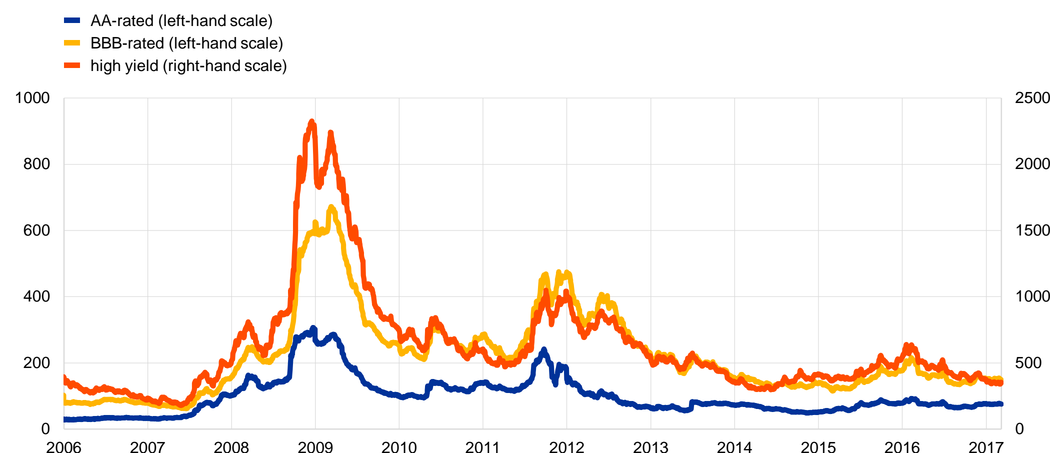
Source: ECB.

Despite bouts of market volatility, risk premia remained compressed across various asset classes during the period under review. In the context of the low-yield environment, the continued behaviour among investors in terms of searching for yield has led to increased exposure to credit and duration risk. At the same time, valuations in the EU corporate bond markets were at high levels, which reflected low risk-free rates (see Chart 2), but also low corporate bond spreads (see Chart 3). Moreover, standard metrics for stock market valuations, such as the price/earnings ratio, showed indications of stretched valuations (see Chart 4).

Chart 3

High-yield corporate bond spreads narrowed considerably during the course of 2016

(spreads in basis points)

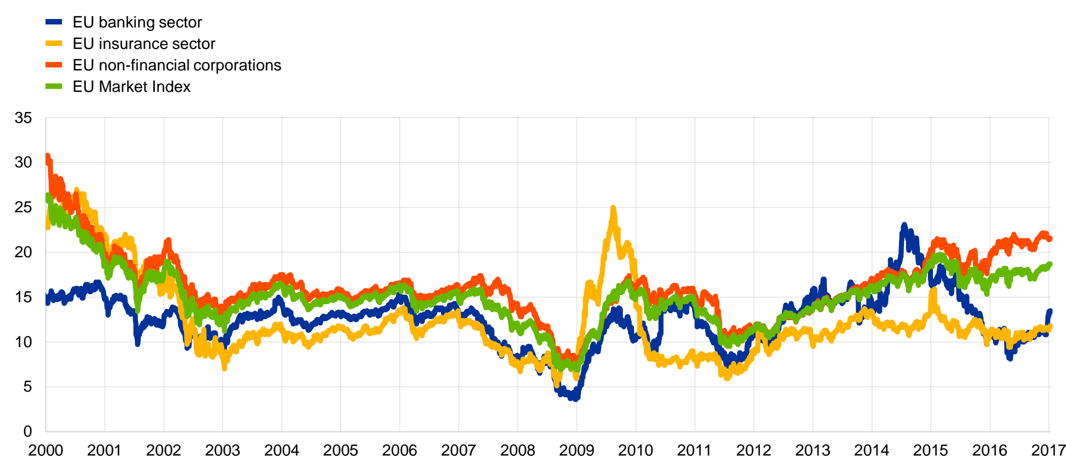


Source: Bank of America Merrill Lynch.
Notes: Spreads in basis points over German government bonds for both plain vanilla bonds and bonds with embedded options (for which the value of the option is stripped using proprietary models). The latest observation is for 14 March 2017.

Chart 4

Equity price/earnings ratios for EU non-financial corporations increased further during 2016

(percentages)



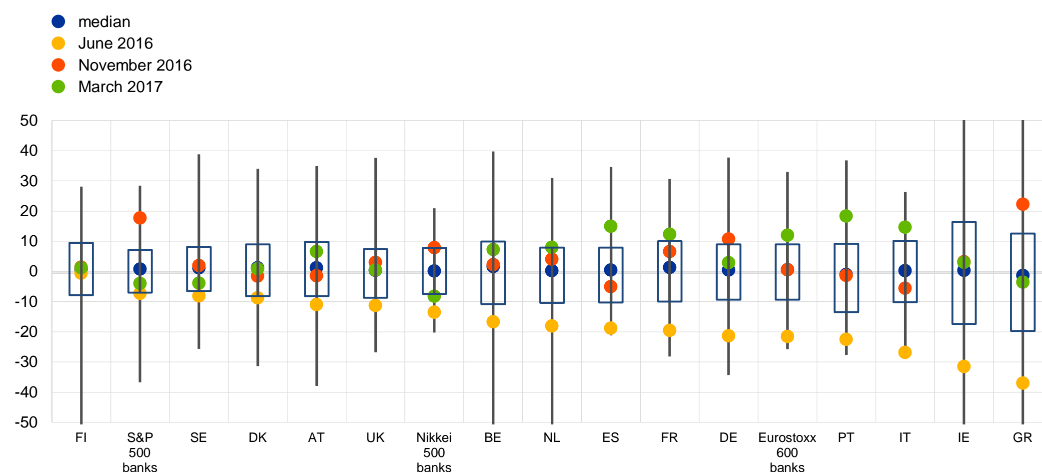
Sources: Thomson Reuters and Datastream.
Note: The latest observation is for 9 March 2017.

Political events, such as the UK referendum and the US election, were triggers for substantial market movements, although these did not lead to market stress. Following the outcome of the UK referendum on withdrawal from the EU on 23 June 2016, EU financial markets experienced sharp declines (see Chart 5). Despite historically large moves in some market segments, market infrastructures remained resilient. During this period, particularly large declines were observed in asset prices in the EU banking sector. Moreover, the outcome of the US presidential election in November 2016 led to a significant reaction in the bond markets, with US government bond yields increasing rapidly owing to an upward shift in inflation and growth expectations in the United States. This increased US and global yields, leading to steeper yield curves, and portfolio shifts from bonds into equities for example.

Chart 5

Stock markets dropped significantly following the results of the UK referendum

(percentages; monthly data)



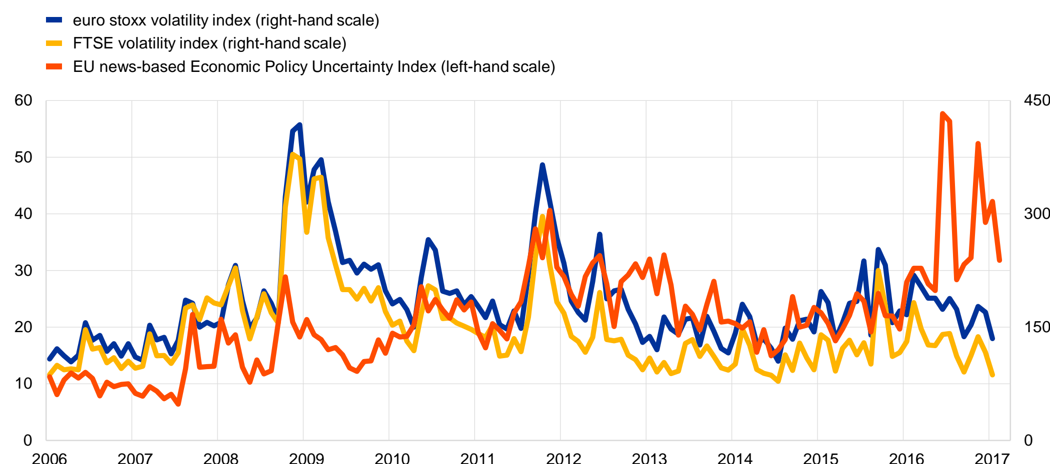
Sources: Bloomberg and ECB.
Note: The latest observation is for 31 March 2017.

Elevated uncertainty concerning political and economic policy remained prevalent towards the end of the review period, with the potential to trigger large market movements in the event of unexpected outcomes. The index of economic policy uncertainty for the EU increased significantly in the second half of 2016, amid the UK referendum and the US presidential election results. However, unlike during previous similar episodes of elevated economic policy uncertainty, volatility in financial markets did not increase together with the uncertainty index (see Chart 6). One concern towards the end of the review period was that the divergence in policy uncertainty and market volatility posed a risk for potential abrupt market movements going forward.

An area of concern towards the end of the review period was that large abrupt increases in risk premia could lead to substantial losses for unhedged investors. EU non-money market investment funds, monetary financial institutions and insurance corporations each held around €3.5 trillion to €4.5 trillion in debt securities at the end of the third quarter of 2016 (see Chart 7). Unexpected increases in credit risk, liquidity risk and term premia were considered to be potential triggers for an abrupt downward repricing of these debt securities. If such a repricing occurred, it could have potential negative consequences for the solvency position of unhedged holders of debt securities and thus an impact on financial stability in the EU.

Chart 6
Economic policy uncertainty in the EU was at an all-time high, while volatility remained low

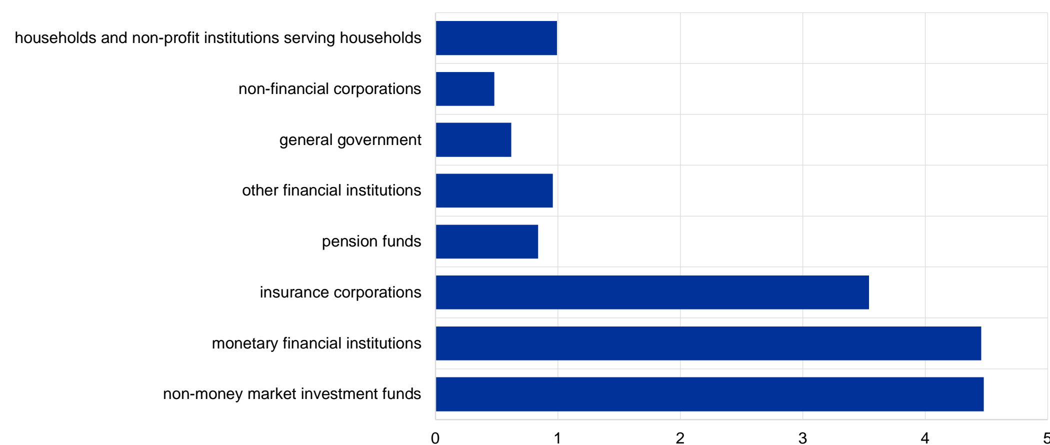
(left-hand scale: volatility index; right-hand scale: economic policy uncertainty)



Sources: Federal Reserve Bank of St. Louis and Datastream.
Note: The latest observation is for 2 February 2017.

Chart 7
Holdings of debt securities are large for non-money market investment funds, monetary financial institutions and insurers

(EUR trillions; third quarter of 2016)



Sources: Balance Sheet Items (BSI), ECB, Eurostat and ESRB calculations.
Notes: The data refers to all debt securities owned by the national institutional sector (thereby excluding the rest of the world) as of the third quarter of 2016 and includes all EU Member States. The data for monetary financial institutions excludes the Eurosystem (source: BSI).

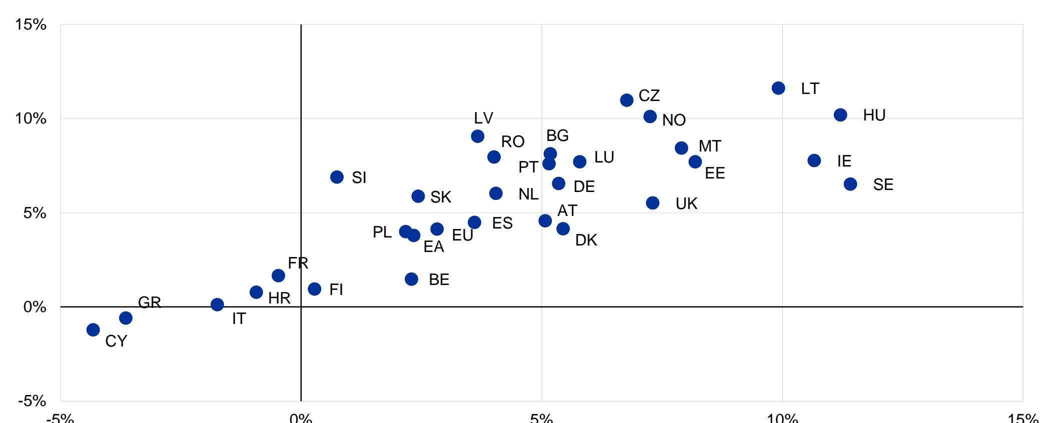
Vulnerabilities in residential real estate markets were identified in certain EU Member States, partly related to valuations or price dynamics. Following a forward-looking, EU-wide assessment of vulnerabilities relating to residential real estate (RRE), the ESRB found that

vulnerabilities that could be sources of systemic risk in the medium term prevailed in a number of EU Member States (see also Box 1 and Section 2).[14] The key vulnerabilities highlighted by the ESRB assessment related to the indebtedness and ability of households to repay their mortgage debt (see also subsection 3 below), or to the valuation or price dynamics of RRE (see Chart 8). One concern was that a sharp increase in risk premia could cause price reversals in these RRE markets. The ESRB also performed an analysis of risks to the banking system from RRE. At that time no direct near-term risks arising from RRE exposures in the banking systems were identified, although second-round effects could not be excluded in the medium term.

Chart 8

RRE prices continued to grow at a robust rate in many EU Member States

(x-axis: three-year annualised change; y-axis: one-year change)



Sources: BSI, ECB, national sources and ECB calculations.
Note: The latest observation is for the fourth quarter of 2016 (third quarter of 2016 for CY, LT and EU average).

2 Weaknesses in the balance sheets of banks, insurers and pension funds

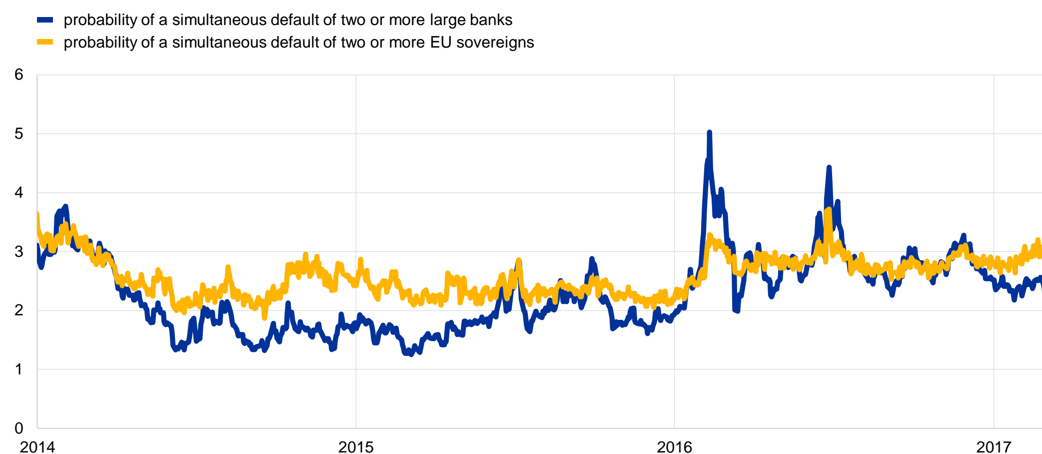
Financial stability risks related to weaknesses in the balance sheets of banks, insurers and pension funds increased during 2016. This increase arose primarily as a result of the continued low interest rate environment and related challenges to certain business models. At the beginning of 2016 volatility in European and global financial markets was elevated, partly driven by uncertainty over the global economic recovery. During this period model-based estimates of the probability that two or more large and complex banking groups would default increased from around 2% to 5% (see Chart 9). In addition, the prices of subordinated debt and equity instruments issued by EU banks dropped substantially and by more than those issued by other financial institutions. These price declines reflected concerns over both asset quality and challenges to the sustainable medium-term profitability of EU banks.

[14] Report on *Vulnerabilities in the EU residential real estate sector*, op. cit.

Chart 9

Concerns about the EU banking sector increased at the beginning and middle of 2016

(percentages)



Sources: Bloomberg, Thomson Reuters and ECB calculations.
Notes: See Annex 1 of the ESRB's Risk Dashboard for further details on the methodology used to estimate these default probabilities. One caveat of the methodology is that it is based on market prices, which can at times be distorted. The latest observation is for 7 March 2017.

European banks continued to be challenged by (i) low profitability in an environment of low nominal growth and interest rates, (ii) structural issues and (iii) high stocks of non-performing assets in certain jurisdictions. First, the persistence of low profitability levels of EU banks (see Chart 11) put into question the viability of institutions with business models that might not be able to adapt to the new operating environment characterised by low interest rates, increased competition and the arrival of fintechs. Second, low profitability levels were also driven to some extent by more structural factors, such as signs of excess capacity in certain EU banking systems, or high cost/income ratios which can be partly caused by strong competition (see Chart 12).[15] Finally, the need for some EU banking systems to address the legacy of non-performing loans (NPLs) from the crisis remained a pressing issue (see Chart 10) in order to strengthen banks' balance sheets and the banking sector's resilience to adverse shocks.

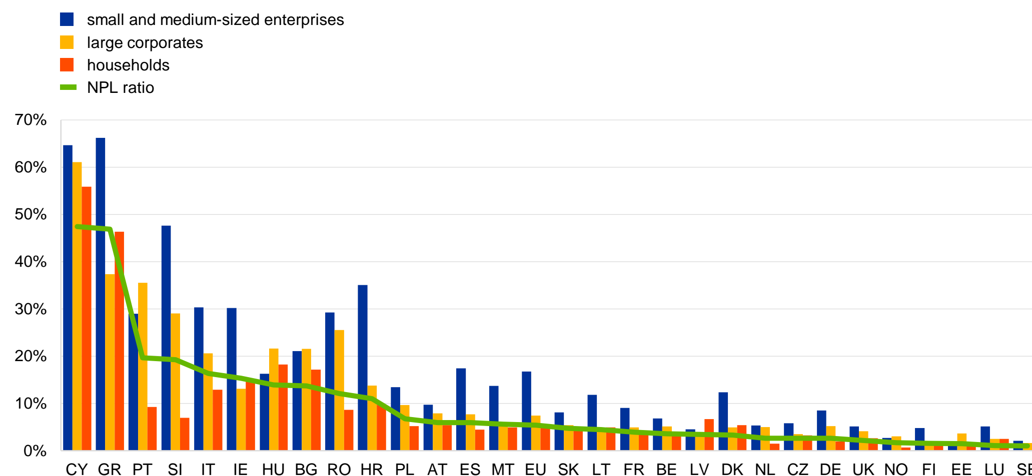
With regard to asset quality, the overall stock of non-performing loans remained elevated in several EU Member States. The NPL ratio was highly dispersed across EU Member States, ranging from 1% to almost 50%, and exceeding 10% for more than one-third of the EU Member States (see Chart 10). NPLs for exposures to small and medium-sized enterprises remained particularly high, and significantly higher than to large corporates and households.

[15] See, for example, the Advisory Scientific Committee (ASC) Report, *Is Europe overbanked?*, No 4, ESRB, June 2014.

Chart 10

Ten EU Member States have aggregate NPL ratios of more than 10 percentage points

(non-performing loans (NPLs) as a share of total loans)



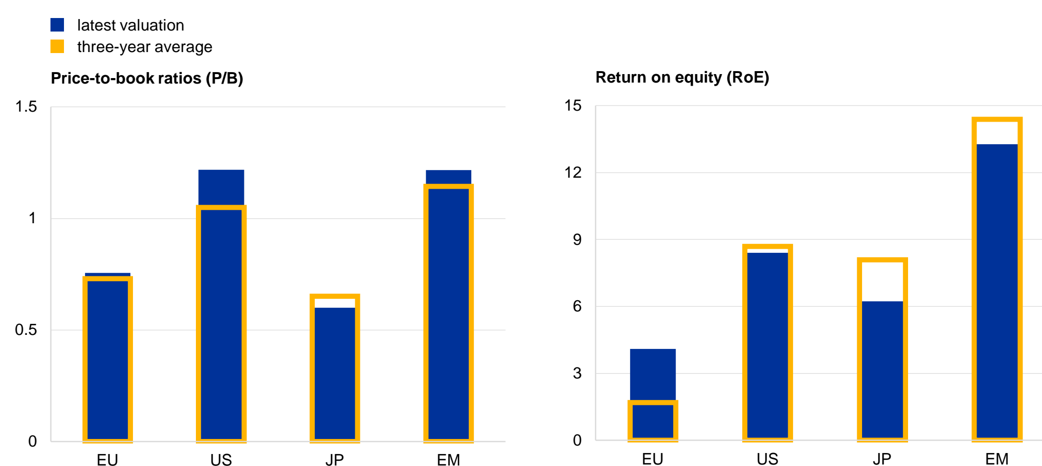
Source: European Banking Authority (EBA).
Notes: The country aggregates are based on the EBA bank sample. The observations refer to June 2016.

As a result of these risks, market valuations of European banks dropped to historical lows (see Chart 11). For many banks, this trend continued after publication of the European Banking Authority's stress test results at the end of July 2016. Overall, several factors had an impact on investors' trust in banks, for example low profitability and concerns about asset quality, the impact of forthcoming pieces of regulation, structural changes and repeatedly observed misconduct cases. The lack of investor confidence was not only visible in market pricing, but also in unusually low demand for bank equity and debt instruments such as contingent convertibles (CoCos).

Chart 11

Valuations of EU banks remain low, amid low return on equity (RoE)

(ratios (left panel); percentages (right panel))

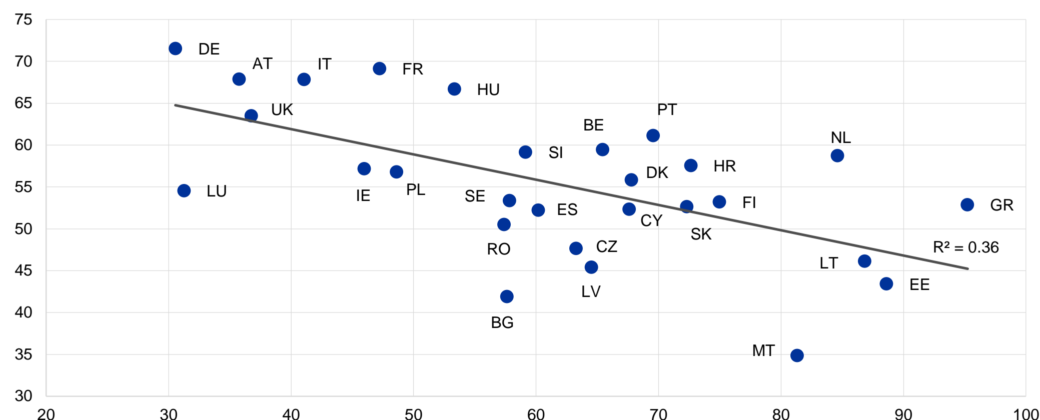


Sources: Bloomberg and ESRB calculations.
Note: The chart shows price-to-book ratios (P/B) for the following bank indices: EURO STOXX Banks, S&P 500 Banks Index, TOPIX Banks Index and MSCI Emerging Markets Banks. International comparisons of price-to-book ratios must take into account the different accounting standards in place in each jurisdiction and how they can affect the denominator of the ratio. The latest observation is for 13 March 2017.

Chart 12

High correlation between cost/income ratios and market concentration in EU Member States

(x-axis: share of the five largest credit institutions per country in total assets; y-axis: percentages, cost/income ratio)



Sources: Banking structural statistical indicators (ECB) and Consolidated Banking Data (ECB). Data on cost/income ratios relate to the third quarter of 2016, except those for Croatia, which are from the fourth quarter of 2015. The shares of the five largest credit institutions per country in total assets (CR5) relate to 2015.

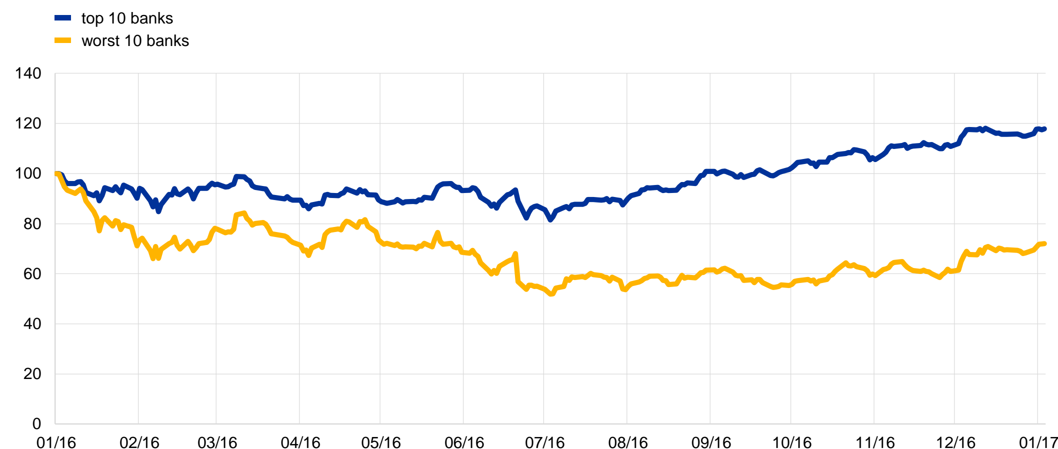
Notes: Market concentration is based on unconsolidated data, whereas cost/income ratios are based on consolidated data that include foreign subsidiaries. Market concentration can differ if measured at the consolidated level (as in the case of cost/income ratios), which could therefore also affect the correlation shown in the chart above. In the case of France, its position on the chart would be different if both indicators were to be measured at the same level of consolidation: when using consolidated data, it can be observed that in relation to the share of the five biggest banks, the French banking system is fairly concentrated, as the market share of the top five banking groups is close to 80% instead of the less than 50% reported by the chart when using unconsolidated data. The cost/income ratio is defined as total operating expenses divided by total operating income. The underlying profitability data are not annualised.

Although market views of EU banks improved towards the end of the review period, the EU banking sector continued to face cyclical and structural challenges. Market sentiment towards the majority of European banks improved in the last quarter of 2016 in line with a global recovery in the asset prices of financial institutions. The main reasons for this change in sentiment were improvements in the nominal growth outlook that led to a steepening of the yield curve and a better profitability outlook for banks. However, challenges for EU banks remained in the form of low profitability and weak asset quality as well as the structural challenges mentioned above. This was also reflected in the fact that market participants made a clearer distinction between banks with high NPLs and low profitability compared with banks with low NPLs and higher profitability (see Chart 13). While there were numerous factors underlying the persistently low bank profitability, the low interest rate environment was a common factor and was the focus of a comprehensive review by the ESRB (see Box 2).

Chart 13

The market increasingly differentiated between banks based on their profitability and asset quality

(bank stock prices; January 2016 = 100)



Sources: SNL Financial and ESRB calculations.
Notes: A sample of 33 banks was ranked according to their non-performing loan (NPL) ratio and return on equity (RoE) at the end of 2015. A score was calculated based on the joint position of each institution in an "NPL ranking" (higher ratio = lower score) and an "RoE ranking" (higher ratio = higher score). The "top 10 banks" are the ten banks with the highest scores, while the "worst 10 banks" are the ten banks with the lowest scores. The latest observation is for 6 January 2017.

The profitability and solvency of guaranteed-return life insurers and defined-benefit pension funds may come under pressure in an environment of low interest rates over a prolonged period.[16] For defined-benefit pension schemes and life insurance companies, the duration of liabilities is often longer than the duration of assets. A scenario of prolonged low interest rates would make it difficult for these institutions to earn sufficiently high asset returns to meet guaranteed values for long-term liabilities. In the long run this could render traditional guaranteed-return business models unviable and cause solvency problems. The European Insurance and Occupational Pensions Authority (EIOPA) 2016 insurance stress test indeed identified some vulnerabilities in a low-for-long adverse scenario. In addition, the evidence in the ESRB report on macroprudential policy issues arising in the low interest rate environment showed that the insurance and pension sectors were already moving from guaranteed-return products to products without guarantees (unit-linked business models and defined-contribution pension schemes). While this might be desirable for these sectors, it also means that the financial sector is withdrawing from the provision of longer-term return guarantees, and that risks are allocated to the household sector.

[16] See Report on *Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system*, op. cit.

Box 2

Risks from low interest rates and structural changes in the financial system were a key topic analysed by the ESRB during the review period

In November 2016 the ESRB published a comprehensive report on the macroprudential issues arising from low interest rates and ongoing structural changes in the financial system of the EU.[17] The report was jointly prepared by the ESRB's Advisory Scientific Committee and Advisory Technical Committee, and the ECB's Financial Stability Committee. It analysed potential macroprudential issues arising from both a prolonged period of low interest rates and structural changes in the financial system, and discussed what impact these may have on financial stability and the real economy in the long term. The report took a forward-looking and holistic approach by considering all major sectors in the financial system, cross-sectoral spillovers and contagion channels.

The ESRB report identified three main developments that are driven by an environment of prolonged low interest rates and may pose challenges to financial stability. These developments are 1) challenges to the sustainability of certain business models, 2) broad-based risk-taking and 3) structural changes towards a more market-based financial system. The ESRB report concluded that these developments were interrelated and that their magnitude varied across financial sectors and EU Member States. Financial stability risks related to the sustainability of business models and broad-based risk-taking (see subsection 1 above) were already present to some extent and thus should be given priority in terms of policy response. Other risks, including those related to changes in the structure of the financial system, had more of an emerging or conjectural nature (see subsection 4 below).

The report also found that the low interest rate environment was weakening the resilience of the EU banking sector. In the longer term low interest rates could have a negative impact on bank profitability by exercising downward pressure on net interest income, in addition to the dampening impact on bank profitability of low loan growth. Credit standards could be relaxed excessively by banks facing longer-term profitability pressures and growing competition from non-banking sectors, if they sought to increase profitability by engaging in riskier activities. This, combined with protracted low growth, may lead to a deterioration in asset quality, although this could be counteracted in part by the higher debt servicing capacity of borrowers due to low interest rates.

The ESRB also identified a series of policy options to mitigate and prevent the emergence of the financial stability risks highlighted in the report. Examples of policy options included the monitoring of credit standards by macroprudential authorities, the review of the regulatory yield curve which insurers use to establish the present value of their future liabilities within the Solvency II framework, and the development and operationalisation of a recovery and resolution framework to deal with insurers that are at risk of failure or failing. The policy options in the report are not to be taken as ESRB recommendations within the meaning of the ESRB Regulation, but rather as a set of proposals for further consideration by the relevant stakeholders. Furthermore, the policy options should be considered from a holistic and system-wide perspective given interrelations between the risks and the need to mitigate regulatory arbitrage.

[17] Report on *Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system*, op. cit.

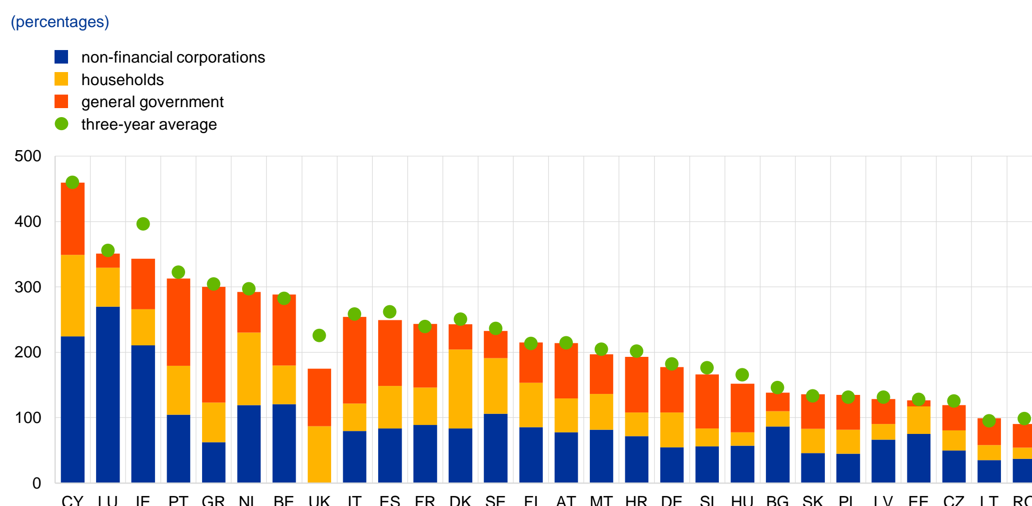
3 Debt sustainability challenges in sovereign, corporate and household sectors

Debt sustainability challenges in sovereign, corporate and household sectors continued to pose potential risks to financial stability in some EU Member States. Apart from some short-lived bouts of volatility, sovereign bond markets were relatively calm during the period of review. This situation was reflected in the rather low levels of sovereign bond yields and spreads of most EU Member States, compared with those at the height of the sovereign debt crisis in 2012. However, persistently high debt levels, especially for some EU sovereigns, remained a key vulnerability during the period of review. High debt levels can pose financial stability risks as they reduce borrowers' ability to handle economic and financial shocks. This risk was also reflected in rising levels of credit default swaps for several EU sovereigns. Overall, significant deleveraging in the aggregate economy has occurred in only a few EU Member States, given that the aggregate debt-to-GDP ratio in the third quarter of 2016 was very close to the three-year average in many EU Member States (see Chart 14). However, this aggregate picture masked heterogeneous developments across countries and sectors within a given country. Some deleveraging progress has indeed been made, for example in Ireland, Portugal and Spain (see Chart 14).

Chart 14

Aggregate debt-to-GDP ratios remained close to the three-year average in most EU Member States

(percentages)



Sources: ECB and European Commission.
Notes: Debt-to-GDP ratios for non-financial corporations are based on consolidated debt figures. Data for consolidated non-financial corporation debt are not available for the United Kingdom. The non-financial corporation debt of Cyprus includes the debt of Special Purpose Entities (SPEs), which do not have a material economic presence in Cyprus. SPE debt amounts to 77.4% of GDP. The latest observation is for 30 September 2016.

The weak macroeconomic environment and growth outlook was an important factor underlying remaining debt sustainability concerns in EU Member States. While the EU economic recovery continued during the period of review, realised and expected real GDP growth rates remained low in most countries. During most of 2016, the growth outlook for 2016 and 2017 for the EU as a whole and some EU Member States even deteriorated slightly, particularly in countries where growth was already subdued (see Chart 1). As debt sustainability is closely linked to the expected future income path, the low growth environment continued to pose challenges to the timely reduction of the remaining debt overhang. Towards the end of 2016, realised and

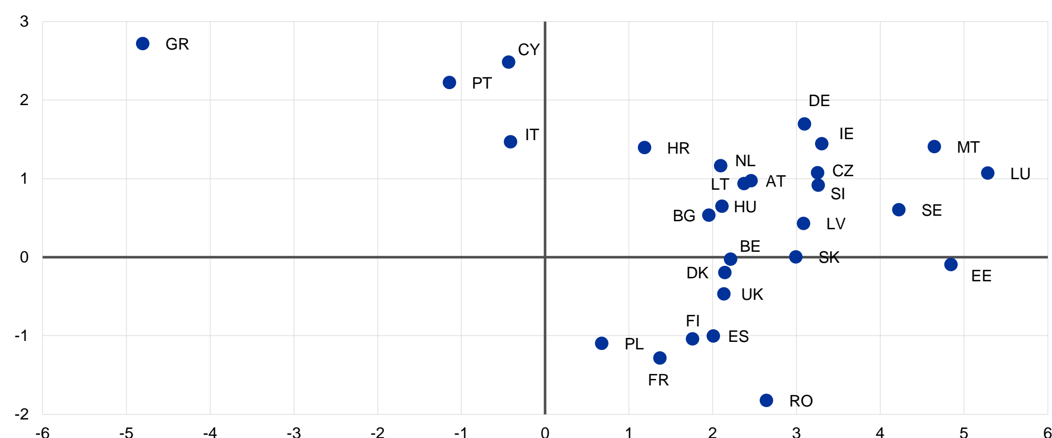
expected growth improved slightly, as reflected in upward revisions of growth estimates by the International Monetary Fund and the European Commission for 2016 and 2017 for several EU economies (see Chart 1).

Primary budget surpluses and low interest rates eased sovereign debt sustainability concerns during the period under review, but risks still remained for the most vulnerable EU Member States. Expected nominal GDP growth rates, although low in general, were above long-term interest rates over the past year in most EU Member States (see Chart 15), which made debt sustainability concerns less acute. Moreover, government budget balances before interest expenses (primary balances) were projected to be positive for 2017 and 2018 in most EU Member States (see Chart 15), which further eased acute debt sustainability concerns. However, nominal interest rates were higher than projected GDP growth rates particularly for the most vulnerable EU Member States, where sovereign debt-to-GDP ratios were highest (see Chart 14). This highlighted potential vulnerabilities in the event that interest rates increase across the EU without a concomitant increase in productivity and GDP growth rates.

Chart 15

Favourable primary budget balances and interest-growth differentials in most EU Member States

(percentages; x-axis: Δ growth – yields; y-axis: primary budget balances)



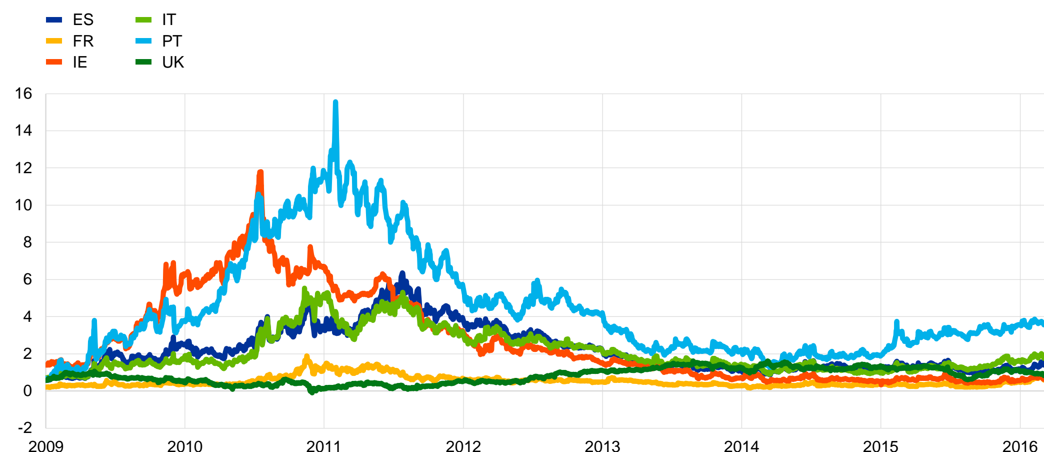
Sources: ECB and annual macroeconomic database of the European Commission.
Notes: The x-axis describes the differences of nominal GDP growth (European Commission forecast for 2016-18) and the ten-year government bond yield (mid-February 2017). The y-axis shows the primary budget balances as a percentage of GDP (European Commission forecast for 2016-18). The latest observation for long-term yields is for 15 February 2017.

Long-term interest rates increased and sovereign bond spreads widened again towards the end of the review period, partly as a result of political uncertainty (see Chart 16). In the course of autumn 2016 long-term government bond yields across EU Member States started to increase from low levels in parallel with yield increases in the United States (see subsection 1 above). At the same time the above-mentioned political events and uncertainties led to increases in sovereign spreads in a number of EU Member States. Between September 2016 and March 2017, ten-year yields therefore increased by around 50 basis points on average across all EU Member States (see Chart 17).

Chart 16

Sovereign yields remained low across EU Member States during the review period

(ten-year sovereign bond yields; percentages)

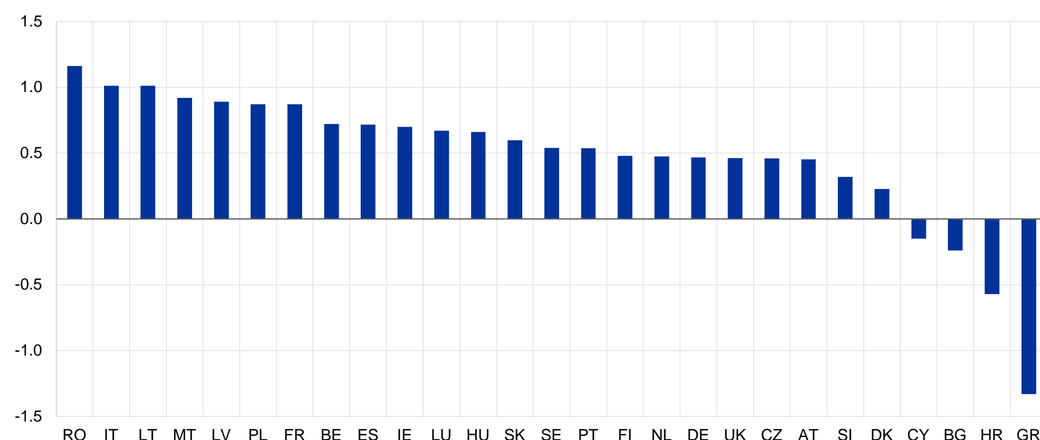


Sources: ECB and ESRB calculations.
Note: The latest observation is for 30 March 2017.

Chart 17

But there have been large increases in yields since autumn 2016

(changes in ten-year sovereign bond yields between 29 September 2016 and 6 March 2017; percentage points)



Sources: ECB and ESRB calculations.

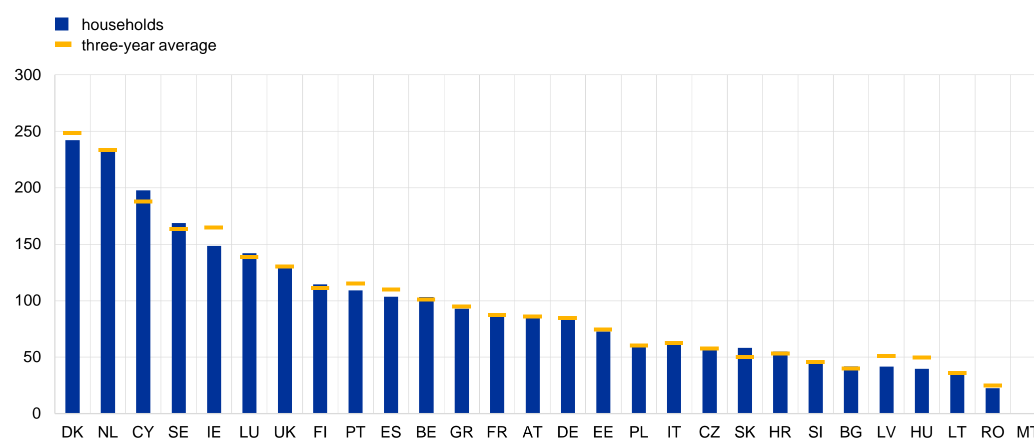
The level of household debt continued to be high in a number of EU Member States (see Chart 18). In more than a third of EU Member States, household debt in 2016 stood at more than 100% of disposable income. High household debt can pose a risk to financial stability because it makes households less able to handle economic and financial shocks.

High levels of household indebtedness were also identified as a key factor underlying existing vulnerabilities related to residential real estate in a number of EU Member States.[18] In many of the countries that received ESRB warnings on medium-term vulnerabilities related to RRE (see Section 2), vulnerabilities were linked to the indebtedness and ability of households to repay their mortgage debt (see Chart 18) or to the valuation or price dynamics of RRE. RRE risks can be linked closely to households' debt sustainability situation, as mortgages and RRE assets usually represent a major part of their balance sheets, and RRE assets constitute a major source of collateral for lenders. Hence, RRE vulnerabilities and household debt sustainability concerns can have severe implications for banks' balance sheets and financial stability (see subsection 1 in Section 2).

Chart 18

High household debt levels were a key factor underlying RRE vulnerabilities in a few countries

(household debt as a share of disposable income; percentages)



Sources: ECB and European Commission.

Notes: Data for BE and HR are based on the first quarter of 2016. Data for BG and EE are based on the annual European System of Accounts (ESA) 2010 series for 2014. Data for CY, HU, LT, LV and SK are based on the annual ESA 2010 series for 2015. Data for LU are based on the annual ESA 95 series for 2012. Data for MT are not available.

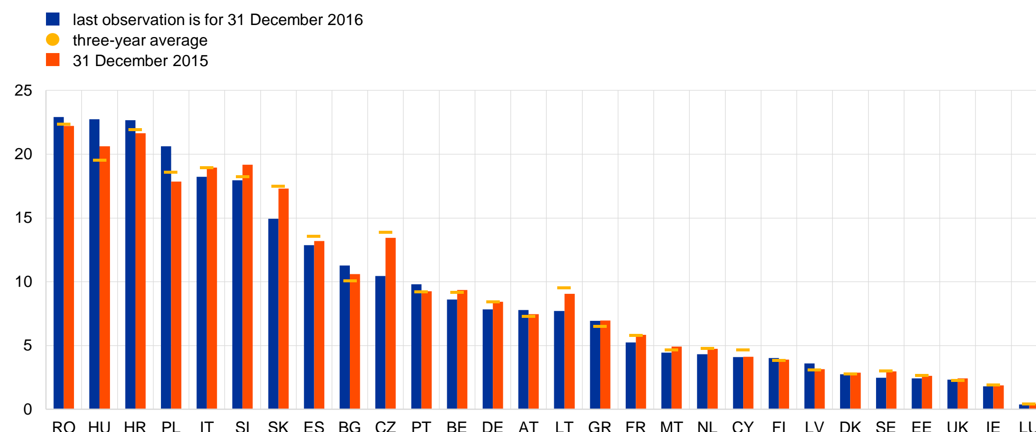
Political tail risks, a repricing of global risk premia or abrupt increases in global risk-free interest rates were considered relevant triggers to turn remaining debt sustainability concerns into more pressing financial stability risks once again. In particular, the materialisation of risk 1 (see Table 1 above) was assessed to have the potential to reignite debt sustainability concerns. In the event that these risks materialised, the continued large exposures of some EU banking systems to their domestic sovereign (see Chart 19) were considered to have the potential to reignite the sovereign-bank nexus. In addition, insurance companies and pension funds also have significant domestic bond exposures. The ESRB is analysing whether the creation of sovereign bond-backed securities (SBSs) to alleviate the sovereign-bank nexus without mutualising sovereign debt across the EU Member States could be a feasible option and beneficial from a financial stability perspective (see Box 3 for details).

[18] See Report on *Vulnerabilities in the EU residential real estate sector*, op. cit.

Chart 19

Exposures of some EU banking systems to their domestic sovereign remain high

(share of total assets; percentages)



Source: ECB.

Notes: Credit extended by monetary financial institutions (excluding the European System of Central Banks) to domestic general government. Credit comprises granted loans and holdings of debt securities issued. Total assets exclude remaining assets. For some countries, such as Italy and France, government-owned agencies mandated to finance primarily public administrations are listed as monetary financial institutions.

Box 3

In the first year of the ESRB Working Paper Series, 33 papers were published on systemic risk and macroprudential policy that help to inform the policymaking activities of the ESRB

The ESRB Working Paper Series was launched in 2016 as an outlet for the publication of high quality research related to systemic risk and macroprudential policy.[19] The series is run by the Advisory Scientific Committee. Its purpose is to collate high-quality research on systemic risk to inform the macroprudential policymaking activities of the ESRB. In the first year of the Series, the ESRB published 33 working papers. Although these papers do not necessarily represent the official views of the ESRB, they nevertheless inform policy by shedding light on various aspects of systemic risk, the calibration of existing macroprudential policy instruments and the development of new ones. For example, in the first Working Paper entitled “Macro-financial stability under EMU”, Philip R. Lane examined the cyclical behaviour of country-level macro-financial variables under Economic and Monetary Union and stated the policy reform agenda required to improve macro-financial stability.

Many of the working papers were positioned at the cutting edge of policy deliberations. Working Paper No 21 on ESBies: Safety in the tranches examines a new financial instrument, namely European Safe Bonds (ESBies), which is designed to weaken the nexus between sovereign risk and bank risk through diversification and tranching. Subsequently, the ESRB has investigated the feasibility of such instruments in a high-level task force chaired by Philip R. Lane,

[19] Submissions to the Working Paper Series are welcome when at least one co-author is affiliated to the ESRB or an ESRB member institution, or when the paper has been presented at an ESRB event. To submit a paper for consideration, email a pdf file to **wpseries@esrb.europa.eu**

Governor of the Central Bank of Ireland. Sovereign risk and the nexus between sovereign risk and bank risk was also the topic of three other ESRB working papers. First, Working Paper No 9 on Regime-dependent sovereign risk-pricing during the euro crisis looks at how sovereign risk pricing is regime-dependent and subject to threshold effects. The authors conclude that domestic fiscal discipline and structural reforms are insufficient to reduce yields insofar as the bank-sovereign feedback loop remains unaddressed. Second, Working Paper No 11, entitled Bank exposures and sovereign stress transmission, investigates the causes and effects of banks' sovereign exposures during and after the sovereign debt crisis. The authors find that the publicly owned, recently bailed-out and less strongly capitalised banks reacted to sovereign stress by increasing their domestic sovereign holdings more than other banks. Third, in Working Paper No 35 on Addressing the safety trilemma: a safe sovereign asset for the Eurozone, Ad van Riet assesses the merits of introducing a safe sovereign asset for the euro area. The author describes two options: a credible multipolar system of safe national sovereign assets and a common safe sovereign asset for the euro area, concluding that the latter would be a more effective solution.

ESRB Working Papers have often been timely and topical, providing academic insight into ongoing policy work. In Working Paper No 27 on (Pro?)-cyclicality of collateral haircuts and systemic illiquidity, Florian Glaser and Sven Panz provide empirical evidence on the topic of procyclicality of collateral haircuts. Contrary to expectations, the authors do not find evidence in the data for haircuts increasing with growing systemic illiquidity, and these therefore do not seem to trigger liquidity spirals. This work also informed the ESRB's ongoing policy work around procyclicality of margins and haircuts.

New datasets relevant for the analysis of financial stability, which are available at the ESRB, were also explored in the working papers. Working Paper No 33, entitled How does risk flow in the credit default swap market?, investigates a global, transaction-level dataset on credit default swaps (CDSs). The authors use this dataset to analyse the CDS market as a network of risk transfers among counterparties. They find that the flow-of-risk originates from a large number of ultimate risk sellers (for example, hedge funds) and ends up in a few leading ultimate risk buyers, most of which are non-banks (in particular asset managers). The analysis of the CDS portfolio of the latter shows a high level of concentration, potentially hinting at systemic vulnerabilities. Working Paper No 15, entitled Credit default swap spreads and systemic financial risk, also uses CDS market data to derive insights about systemic vulnerabilities, in particular, the probability that many banks fail simultaneously.

The working papers often included novel methodological approaches to tackling issues of financial stability and systemic risk. Working Paper No 32 on Financial contagion with spillover effects: a multiplex network approach uses a novel approach stemming from the growing literature on financial networks. In particular, the authors use multiplex networks, a special type of multilayer network in which nodes cannot be interconnected with other nodes in other layers. Owing to the cutting edge methodology, the authors construct a comprehensive model of financial contagion encompassing both direct and indirect transmission channels. The analysis is particularly relevant to systemic risk, as it shows how positively correlated multiplexity can severely undermine market resilience. In the same vein, Working Paper No 20 on Multiplex interbank networks and systemic importance – An application to European data uses data on exposures between large European banks broken down by both maturity and instrument type to characterise the main features of the multiplex structure of the network of large European banks. They show that the specific level of network aggregation matters in the determination of interconnectedness and thus in the policymaking process.

In the first year of the Series, working papers included a wide range of novel, policy-relevant studies. Not only did they contribute to the overall understanding of the systemic vulnerabilities within the financial system, but they will also inform ongoing discussions about systemic risk. With the use of novel approaches and new supervisory datasets, the Working Paper Series has the potential to inspire numerous research projects on systemic risk going forward, both within the academic realm and in research conducted by public institutions.

4 Shocks and contagion from the shadow banking system

Structural changes and a prolonged period of low interest rates could result in a shift to a more market-based financial system.[20] This would be a welcome development and in line with the initiative of the European Commission for a capital markets union. However, it may also lead to the emergence of new financial stability risks. For example, the development of bank-like activities by non-banks might lead to regulatory arbitrage and result in challenges in terms of monitoring and supervision from a macroprudential perspective, as different regulations apply to institutions engaged in similar activities. Indeed, the shadow banking system in the EU has grown in importance in recent years, and the ESRB is developing frameworks and tools to monitor potential associated systemic risks (see Box 1).

The EU shadow banking system continued to grow in 2016 albeit at a markedly slower pace compared with previous years. A broad measure of the shadow banking system in the EU, comprising total assets of investment funds[21] and other financial institutions (OFIs), amounted to €40 trillion in the fourth quarter of 2016 (see Chart 20). This represented approximately 38% of the total assets of the EU financial sector in the fourth quarter of 2016. This broad measure of the shadow banking system grew by 30% over the period 2012-16. There was, however, substantial heterogeneity across EU Member States in the size of the shadow banking system, both in absolute terms and relative to the size of the national banking sector.

Wholesale funding provided by entities engaged in shadow banking continued to decline in 2016, although at a slower pace than in previous years. This measure of wholesale funding by shadow banking entities includes debt securities of monetary financial institutions (MFIs) held by investment funds and money market funds (MMFs) plus total assets of financial vehicle corporations (FVCs).[22] Funding provided by these types of entities fell by 0.6% in 2016, after the measure declined by an average annual growth rate of -4.1% over the period 2012-15. The overall contraction in this measure masks some heterogeneous developments in its sub-components. MFI debt securities held by MMFs expanded during 2016 by 5.6%, while MFI debt securities held by investment funds and total assets of FVCs continued to decline.

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[20] Report on *Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system*, op. cit.

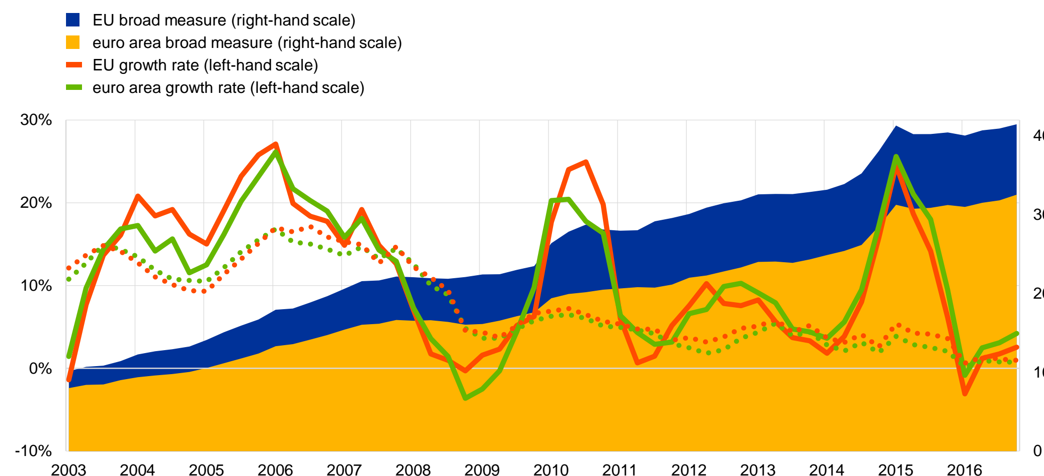
[21] Investment funds include money market funds.

[22] Available data allow this measure to only be estimated for entities domiciled in the euro area, rather than for the EU as a whole.

Chart 20

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

(EUR trillions and annual growth rates)



Sources: ECB and ECB calculations.
Notes: Annual growth rates based on changes in outstanding amounts are indicated by the continuous lines. Dotted lines indicate annual growth rates based on transactions – i.e. excluding the impact of revaluations, exchange rate variations and statistical reclassifications. The latest observation is for the fourth quarter of 2016.

The ESRB expanded its capacity for monitoring risks in the shadow banking system, as systemic risk may emanate directly from this part of the non-bank financial sector.[23] To this end, the ESRB published the first edition of the EU Shadow Banking Monitor, while substantial work was undertaken to further develop the monitoring framework in preparation for the publication of the second edition. The first EU Shadow Banking Monitor identified a number of issues that can be a source of, and amplify, systemic risks. Risks that are associated with shadow banking activities and relevant from a systemic perspective include financial leverage, which is particularly present in hedge funds, but also in real estate funds. Maturity and liquidity transformation are relevant risks especially for some bond funds, while systemic interconnectedness can be pronounced between MMFs and the banking system. Furthermore, entities such as FVCs, securities and derivatives dealers, and hedge funds often engage in significant maturity and liquidity transformation and leverage.

The ESRB continued to examine cross-sector and cross-border linkages, particularly the interconnectedness of the shadow banking system with other parts of the financial system. During the review period, the ESRB published the results of its analysis on mapping EU banks' exposures to shadow banking entities, which was undertaken in cooperation with the European Banking Authority.[24] The analysis highlighted the global and cross-border nature of existing linkages, as approximately 60% of EU banks' total exposures are towards non-EU domiciled shadow banking entities. The analysis also found that the exposures are concentrated by type of counterparty with approximately 65% of the exposures to securitisation entities, non-money market

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[23] See *EU Shadow Banking Monitor*, op. cit.; and Grillet-Aubert, L., Haquin, J.-B., Jackson, C., Killeen, N. and Weistroffer, C., op. cit.

[24] See Abad, J., D'Errico, M., Killeen, N., Luz, V., Peltonen, T., Portes, R., and Urbano, T., "Mapping the interconnectedness between EU banks and shadow banking entities", *Working Paper Series*, No 40, ESRB, March 2017.

investment funds, and finance companies. In general, work on interconnectedness is ongoing with several initiatives under way at ESRB level.

The ESRB also contributed to the ongoing debate on market liquidity conditions by providing new empirical evidence on the supply of liquidity services by market-makers.[25] In its broadest sense, market liquidity refers to the ease with which securities can be bought or sold without having an undue impact on prices. Liquid markets help to facilitate the financing of investments in the real economy and should support economic growth. There has been widespread concern from market participants and a range of international bodies that a significant decline in market liquidity could result in some fixed-income markets becoming impaired, which could pose a threat to financial stability.[26] Moreover, there were concerns that a combination of diminished market liquidity and liquidity mismatch in investment funds might exacerbate both the scale and impact on market liquidity of fire sale-type behaviour by funds attempting to meet redemption requests in times of stress.[27] However, whether these concerns were unfounded or not remained unclear, mainly because of a lack of available data. Against this background, the ESRB collected data from the largest market-makers operating in Europe.[28]

The data collected by the ESRB showed mixed evidence of developments in market liquidity, with the results varying by asset market and the market liquidity indicator used. A decreasing trend in both gross and net inventories was observed in corporate bond markets – possibly indicating a reduced ability or willingness among market-makers to act as intermediaries in these markets (see Chart 21). However, trends in market-making inventories for other asset classes were more mixed, and trading volumes remained relatively constant across asset classes. Median trade sizes decreased across asset classes, indicating a potential reduction in liquidity and changes in market behaviour.

The ESRB continued to analyse the EU-wide dataset on derivatives transactions resulting from EMIR with the aim of improving the understanding of systemic risks in derivatives markets.[29] The opacity of over-the-counter (OTC) derivatives markets was a key determinant of the 2007-08 financial crisis. EMIR enacted the commitment made by the G20 leaders in 2009 to enhance the transparency of OTC derivatives markets by requiring contracts to be reported to trade repositories and making the information available to authorities. The ESRB analysed in detail a snapshot as of 2 November 2015 of the three largest segments of the OTC derivatives market, namely interest rate, credit and foreign exchange derivatives.

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[25] Report on *Market liquidity and market-making*, ESRB, October 2016.

[26] See, among others, *Global Financial Stability Report*, International Monetary Fund, October 2015; *Fixed income market liquidity*, Bank for International Settlements, January 2016; *Joint Committee Report of the European Supervisory Authorities on Risks and Vulnerabilities in the EU Financial System*, Spring 2016; and *Global Financial Market Liquidity Study*, PricewaterhouseCoopers, August 2015.

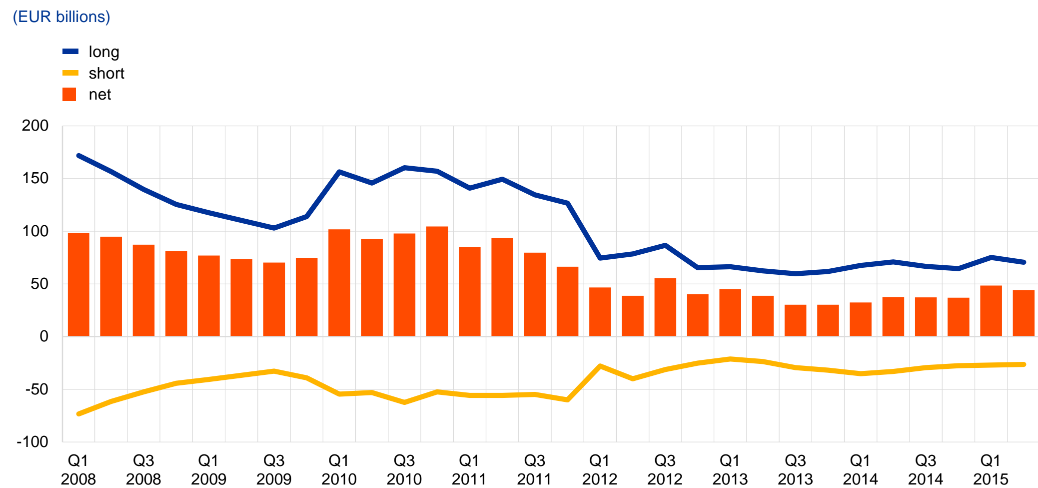
[27] See, among others, *Financial Stability Review*, European Central Bank, May 2016; *Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system*, ESRB, November 2016; *Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities*, Financial Stability Board, January 2017.

[28] Market-making plays an important role in a market that is functioning correctly. A key element of market liquidity in bond markets, and in corporate bond markets in particular, is market-makers' ability to absorb temporary order imbalances by warehousing risk for short periods of time.

[29] See Abad, J., Aldasoro, I., Aymanns, C., D'Errico, M., Fache Rousová, L., Hoffmann, P., Langfield, S., Neychev, M., Roukny, T., "Shedding light on dark markets: First insights from the new EU-wide OTC derivatives dataset", *Occasional Paper Series*, No 11, ESRB, September 2016.

Chart 21
Market-makers' European corporate bond inventories

(EUR billions)



Source: ESRB data collection.
Note: The latest observation is for the second quarter of 2015.

A series of common determinants emerged from the analysis of the three largest segments of the OTC derivatives market. First, these markets were sizeable in terms of outstanding notional amounts. Second, they all showed a high degree of concentration within a limited number of large intermediaries (and in a small number of reference entities for CDS markets). Third, these markets reflected key regulatory changes aimed at managing and limiting counterparty risk, such as the introduction of mandatory central clearing and portfolio compression. For example, the interest rate swap market was in the process of becoming in large part centrally cleared, as opposed to being a bilateral market. The detailed micro data also made it possible to see that banks' positions in interest rate derivatives increase in value when interest rates rise, whereas insurers' and pension funds' positions decrease in value. This may indicate how banks use these derivatives for hedging purposes as they transform their short-term liabilities into long-term ones.

The growing importance of the EU non-bank financial system was also reflected in various ESRB initiatives to develop the macroprudential policy framework beyond the banking sector. Further details regarding these various policy-related initiatives of the ESRB related to the non-bank financial system are provided in subsection 2.3 of Section 2.

Section 2 – Policies addressing systemic risk

This section reviews the ESRB's work in the area of macroprudential policy. Subsection 1 below provides an overview of ESRB warnings and recommendations issued during 2016, while the ESRB's contributions to the policy framework for banking and beyond the banking sector are discussed in subsection 2. Subsection 3 concludes with a general overview of the measures adopted in the course of 2016.

1 ESRB warnings and recommendations

This subsection provides an overview of the warnings and recommendations issued by the ESRB in 2016. Subsection 1.1 below summarises the ESRB warnings and recommendations on real estate while subsection 1.2 discusses the applications of the reciprocity framework during the year.

1.1 Systemic risk originating from the real estate sector

Assessing vulnerabilities within the EU financial system is a key task of the ESRB. The ESRB is mandated to conduct macroprudential oversight of the financial system of the European Union (EU) in order to contribute to the prevention or mitigation of systemic risks.[30] It also has a mandate to issue warnings, either on a confidential basis or publicly, when significant systemic risks are identified and it is necessary to flag such risks. With this aim, the ESRB analyses the vulnerabilities in the EU Member States relating to the residential real estate sector. Given the importance of this sector for financial and macroeconomic stability, analysing potential vulnerabilities in this area is a key responsibility of macroprudential authorities. In order to prevent the build-up of vulnerabilities, it is especially important to take a forward-looking approach in the analysis.

Building on the three stretches model, the assessment of vulnerabilities has been comprehensive in its approach. Building on previous work by the ESRB,[31] vulnerabilities were identified and classified into three "stretches": collateral, household and banking. Collateral stretch refers to the price levels and dynamics in residential real estate markets; household stretch covers the implications of household borrowers' debt, in terms of their ability to repay their debt and other behaviour (in particular, consumption); and banking stretch applies to the potential impact of residential real estate developments on lenders.

The analysis undertaken consisted of both horizontal and country-specific analysis. First, an indicator-based cross-country framework was applied to identify a set of focus countries for further analysis. This framework, developed jointly by the ESRB and the ECB, used a range of risk indicators to identify a group of 11 focus countries where vulnerabilities had risen to the extent that

[30] Regulation (EU) No 1092/2010 of the European Parliament and of the Council of 24 November 2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board (OJ L 331, 15.12.2010, p.1).

[31] The previous work includes the Report on residential real estate and financial stability in the EU, December 2015, ESRB Recommendation 2013/1 on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1) and The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector (2014).

they required further analysis from a systemic perspective. Second, a country-specific analysis of the focus countries was carried out. This analysis took into account the structural and institutional features of the Member State, as well as any policy measures that were taken.

Based on this assessment of medium-term vulnerabilities relating to the residential real estate sector, the ESRB decided to issue public country-specific warnings to eight countries.[32] These were the first public warnings to have been issued by the ESRB since its establishment. They were communicated to the relevant ministers of the following eight Member States: Austria, Belgium, Denmark, Finland, Luxembourg, the Netherlands, Sweden and the United Kingdom. A brief overview of the vulnerabilities identified is provided in Section 1; full details of the assessment and methodology used are included in the ESRB report[33] that was published together with the warnings on 28 November 2016. Going forward, the ESRB will continue to exercise its mandate of macroprudential oversight of the financial system in the EU, including identifying financial stability vulnerabilities related to the real estate sector in all Member States.

Apart from vulnerabilities, the ESRB also found significant gaps in the data available for analysing the real estate sector. Earlier work by the ESRB on residential and commercial real estate and financial stability in the EU had found that considerable data gaps exist in this area. The above-mentioned work carried out in the context of the warnings led to a similar conclusion. Lack of adequate data may hamper financial stability monitoring and macroprudential policymaking and therefore needs to be addressed.

Therefore, the ESRB also adopted a Recommendation on closing real estate data gaps.[34] With this Recommendation, the ESRB aims to establish a more harmonised framework for monitoring developments in real estate markets in the EU. The Recommendation, which was adopted on 31 October 2016, provides a common set of indicators that national macroprudential authorities are recommended to monitor in assessing risks originating from the real estate sector along with working definitions of those indicators. The Recommendation covers both the residential and commercial real estate sectors. The ESRB will monitor compliance with the Recommendation by means of the “act or explain” procedure. The deadline for implementing the Recommendation is end-2020. As a follow-up to the Recommendation, the ESRB is of the view that regular data collection on these indicators should take place at EU level and that the ECB is well placed to play a leading role in this.

1.2 Applications of the reciprocity framework

2016 saw the first year of operation of the voluntary reciprocity framework introduced by the ESRB in December 2015.[35] This framework foresees the reciprocation of exposure-based macroprudential measures taken by Member States. Following a request from the Member State that activates a macroprudential measure, the ESRB recommends to all other Member States to reciprocate the measure if deemed justified. Other Member States should reciprocate, ideally with the same instrument, within a set time period. Member States have the option to exempt individual

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[32] See the **warnings on medium-term vulnerabilities in the residential real estate sector**.

[33] **Vulnerabilities in the EU residential real estate sector**, ESRB, November 2016.

[34] **Recommendation ESRB/2016/14 on closing real estate data gaps**.

[35] **Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures**.

financial service providers that have non-material exposures (in accordance with the de minimis principle).

Two measures were requested for reciprocation in 2016. The first request came from Belgium. The Belgian measure consists of a 5 percentage point risk weight add-on applied under Article 458(2)(d)(vi) of the Capital Requirements Regulation (CRR) to Belgian mortgage loan exposures of credit institutions using the internal ratings-based (IRB) approach for measuring credit risk. Although the market share of branches and direct cross-border lending in Belgium is currently small, it was nevertheless considered important that the Belgian measure apply to these exposures given the significant market share of subsidiaries.

The second request for reciprocation came from Estonia. The Estonian authorities requested reciprocation of the 1% systemic risk buffer rate on domestic exposures of all credit institutions authorised in Estonia, in line with the national transposition of Article 133 of the Capital Requirements Directive (CRD IV). Estonia's request for reciprocation was motivated by the significant share of branches of foreign banks in the domestic market. Informally, Estonia provided an institution-specific materiality threshold of €200 million to guide the application of the de minimis principle by reciprocating Member States.

The ESRB recommended reciprocation in both cases, but faced issues specific to each instrument.[36] In the case of Belgium, Article 458(5) of the CRR foresees reciprocation by other Member States for branches only and not for direct cross-border exposures. Covering these direct cross-border exposures would require reciprocating with equivalent measures, which could take longer to implement. The ESRB took a pragmatic approach and recommended that where there are no IRB credit institutions with material exposure via their branches located in Belgium or via direct cross-border claims, Member States were given the option not to reciprocate. If there was no reciprocation, Member States were recommended to monitor the situation and reciprocate if exposures become material. As concerns Estonia, reciprocation would be possible under national law by transposing Article 134 of CRD IV, which allows for reciprocation of a systemic risk buffer. Some Member States do not have a procedure in place in their relevant legal framework similar to the one set out in Article 134 of CRD IV and/or cannot activate it at this point (Finland, Italy and the United Kingdom). In these cases, the ESRB recommended that Member States should reciprocate the Estonian measure with equivalent measures.

2 ESRB contributions to the EU macroprudential policy framework

This subsection provides an overview of the ESRB's contribution to the macroprudential policy framework in 2016. Subsection 2.1 below summarises the ESRB response to the European Commission's consultation on the review of the EU macroprudential policy framework. Subsection 2.2 discusses ESRB input into various banking sector instruments while subsection 2.3 discusses the input for non-banking sectors. Subsection 2.4 summarises the ESRB's activities in the area of stress testing during the review period.

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[36] To include the two measures in the list of measures to be reciprocated, the ESRB amended its Recommendation ESRB/2015/2 via Recommendation ESRB/2016/3 (adopted in March 2016) and Recommendation ESRB/2016/4 (adopted in June 2016).

2.1 ESRB input to the Commission consultation on the review of the EU macroprudential policy framework

In October 2016 the ESRB published its response to the European Commission's Consultation Document entitled Review of the EU Macro-prudential Policy Framework.[37] The ESRB highlighted that it should continue to be independent, with a distinct organisational identity separate from the ECB. Nevertheless, the ESRB should also remain closely linked to the ECB by maintaining the present administrative and budgetary support provided by the ECB. The link with the ECB could be further enhanced by the de jure chairmanship of the ESRB by the President of the ECB.[38]

The ESRB proposed that the membership of the General Board should remain broad and that the new institutional macroprudential set-up should be adequately reflected in its composition. Public or central government authorities mandated to implement macroprudential policy at national level should therefore become members of the ESRB without voting rights. The ESRB is of the view that the extended composition of the General Board would enhance coordination among all relevant stakeholders and facilitate the identification and mitigation of risks across all EU jurisdictions and sectors of the financial system.

The ESRB stressed that the macroprudential toolkit should be comprehensive and simple to use. This is essential for macroprudential authorities to be able to adequately and promptly respond to systemic risks. The transparency and effectiveness of macroprudential policy needs to be further improved by a clear delineation of mandates, powers and tools between micro- (competent) and macroprudential (designated) authorities. The ESRB also considered that the coordination between competent and designated authorities should be further improved. This is particularly the case when specific instruments are used on financial stability grounds, such as the macroprudential use of Pillar 2 and for the application of risk weights and loss given default floors under Articles 124 and 164 of the CRR. The ESRB further emphasised that flexibility in the activation and use of the available tools is needed. It therefore advocates that the current mandatory sequencing in the use of certain tools under Article 458 of the CRR should be streamlined. Finally, the ESRB stressed that the reciprocation (mutual recognition) of national exposure-based measures should generally become the rule. This would further enhance the effectiveness of and consistency in macroprudential policy and would avoid regulatory arbitrage by ensuring a level playing field within the EU.

Some improvements in the design of specific tools targeting the structural dimension of systemic risk are warranted. The ESRB suggested that the existing cap of 2% on the buffer for other systemically important institutions be substantially increased. This should also be mirrored at subsidiary level when the EU parent institution is already subject to that buffer requirement on a consolidated basis. The ESRB is further of the view that the definition of the systemic risk buffer should be clarified and narrowed so that the buffer is not used to address risks pertaining to systemically important institutions. Moreover, national authorities should be able to impose more than one buffer rate if distinct structural risks were to be addressed within one jurisdiction; and

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[37] The response to the consultation is available online **here**.

[38] While the ESRB remains autonomous and its distinguished organisational identity has been established, it has also strongly benefited from the visibility, independence and reputation of the ECB's President; this would be strengthened by making the link between the ECB's President and the ESRB's Chair permanent.

national authorities should also be able to apply the systemic risk buffer to sectoral exposures that are structurally relevant for the country in question.

The ESRB considered that the macroprudential use of liquidity instruments could be a way forward to address the cyclical risks related to excessive maturity mismatch. In addition, the ESRB considered that a macroprudential leverage ratio would add another useful element to the toolkit. The liquidity instruments include the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). In case a macroprudential dimension of these two instruments were to be incorporated into Union law, the possible features could be an additional time-varying liquidity buffer capturing cyclical risks that would apply over and above the static minimum prudential LCR or NSFR requirement. Moreover, an additional liquidity buffer could also be considered as a structural measure addressing, for example, similar liquidity risks resulting from specific funding sources or business models. In the same vein as the macroprudential liquidity buffers, the ESRB considered a macroprudential leverage ratio, targeting both the structural and cyclical aspects of systemic risk, as another useful element of the macroprudential toolkit that should be enshrined in Union law.

The ESRB acknowledged that many Member States are using instruments under national law to address systemic risks originating mainly from residential real estate exposures. It recommended that these instruments should be available to macroprudential policymakers in all EU Member States. However, the ESRB is also of the view that such instruments – including decisions concerning their design, implementation and application – should be in the hands of national macroprudential authorities. Examples of borrower-based instruments that are not harmonised under Union law include caps on loan to value (LTV), loan to income (LTI) and debt service to income (DSTI). Further efforts are required to overcome the problems of existing data gaps (as discussed in subsection 1.1 above), the lack of coherent definitions, and other operational impediments affecting consistency and coordination in the application of these instruments in the EU.

Finally, the ESRB recognised that there is a need to set up a legal framework for macroprudential policy beyond the banking sector. Such a framework is needed to address risks and vulnerabilities in the insurance and pension fund sector, the investment fund sector, central counterparties (CCPs) and financial markets. The present gap in the macroprudential policy toolkit to address risks outside the banking sector in the EU could hamper the effective prevention and mitigation of systemic risks originated or transmitted by a rapidly growing non-banking segment of the financial sector. The ESRB's work in this area is discussed further in subsection 2.3 below.

2.2 ESRB contributions to the macroprudential framework for the banking sector

a) Impact of the leverage ratio on market liquidity

The ESRB provided the European Banking Authority (EBA) with its views on the introduction of the leverage ratio. The ESRB considers the leverage ratio to be a useful

instrument as part of the overall regulatory toolkit.[39] The leverage ratio was initially proposed by the Basel Committee on Banking Supervision (BCBS) in December 2009 and is expected to be introduced as a Pillar 1 standard by 1 January 2018.[40] The EBA was mandated to submit a detailed report on the impact assessment and calibration of the leverage ratio under Article 511 of the CRR. The EBA published this report in August 2016.[41] The ESRB was not formally required by the CRR to give its opinion on or contribute to the EBA report. However it was considered that there are material reasons why the ESRB should convey some macroprudential messages to the EBA before leverage requirements are harmonised and introduced at EU level. In particular, the ESRB provided input to the EBA on the leverage ratio and the state of market liquidity. The EBA published this contribution in the final report, noting that the ESRB has access to data which is relevant to this assessment.

The ESRB analysis[42] investigated the potential positive and negative effects of the leverage ratio requirement on market liquidity. Recent discussions on the introduction of a leverage ratio have focused on the topic of market liquidity. In particular, the leverage ratio has come under criticism by some industry participants and observers for having affected the supply of liquidity and intermediation services by broker-dealers in a significant way. Against this background, the focus of the ESRB's work on potential effects of the leverage ratio requirement on market liquidity has been to (i) set out the conceptual channels by which the leverage ratio may affect banks and their role in facilitating liquid markets, and (ii) investigate whether there is any empirical evidence of an impact due to the anticipation of a leverage ratio requirement.

The conceptual analysis suggests there may be some costs associated with the leverage ratio for broker-dealers, but that there are also expected to be benefits. There are channels by which the leverage ratio could reduce incentives to act as a market-maker or provide market financing. The ESRB identified two relevant activities that may be affected: (i) dealers providing inventory, particularly for low risk-weighted assets; and (ii) banks that finance leveraged intermediaries who take positions in markets, in what is known as "funding liquidity". In this way, the leverage ratio could make some market liquidity-related activities less attractive for part of the banking sector and result in increased capital costs for firms with low average risk weights. Aside from any costs related to these potential adjustment actions, the leverage ratio can also be expected to support market liquidity, particularly during periods of stress. First, it ensures a minimum degree of resilience at all stages in the financial cycle, making banks better able to absorb shocks. Second, there may also be an impact through banks' own funding costs. Better capitalised banks may be more able to absorb short-term stresses and maintain financial services.

The empirical analysis suggests there is very little evidence of the leverage ratio negatively impacting market liquidity. An empirical method was used to investigate whether the leverage ratio requirement had any causal impact on banks' market liquidity-related business after the date

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[39] In its Recommendation on intermediate objectives and instruments of macro-prudential policy (**ESRB/2013/1**), the ESRB identified the prevention of excessive credit growth and leverage as one intermediate objective of macroprudential policy and noted that a macroprudential leverage ratio instrument could contribute to achieving this intermediate objective.

[40] **Strengthening the resilience of the banking sector**, BCBS, December 2009.

[41] **EBA report on the leverage ratio requirements under Article 511 of the CRR**, EBA-Op-2016-13, EBA, August 2016.

[42] It is important to remember that the potential for analysing this topic was limited for a few reasons: several factors may have been influencing the state of market liquidity in recent years and it is difficult to disentangle the effect of specific factors; the leverage ratio is still only an anticipated capital requirement for the majority of EU banks; and there is no agreed theoretical framework for market liquidity, market-making and regulation which can be used to model the impact of introducing a leverage ratio requirement.

of the initial BCBS announcement in 2009. The findings suggest that banks which needed to improve their leverage ratios to meet a 3% requirement or market expectation have been doing so in part by reducing their trading assets relative to the amount they would have held if not bound by the leverage ratio; however neither trading assets nor repos have significantly fallen as a share of these banks' total assets since 2010. Arguably, a general deleveraging has been a desired effect of the leverage ratio for banking regulators, and it is positive for market liquidity considerations that trading and financing activities have not been reduced disproportionately as part of this process. Some further statistical analysis to investigate the relationship between dealers' inventories and their leverage ratio position shows very little evidence of a significant relationship between the two since 2014.

b) Cyclicality of capital requirements

The ESRB contributed to the regular report coordinated by the EBA on the cyclicality of capital requirements. This report, which is required under Article 502 of the CRR, was coordinated by the EBA and benefited from contributions by the ECB and ESRB. The aim of the report was to clarify whether risk-sensitive bank capital requirements, as laid down in the CRR and CRD IV, create any unintended procyclical effects by reinforcing the endogenous relationships between the financial system and the real economy.

While acknowledging some analytical challenges, the report found weak evidence on the existence of procyclical effects arising from the CRR/CRD IV package. The report recommended retaining the current risk-sensitive framework for bank regulatory capital. If procyclicality risks were to become more material, the EU financial regulatory framework has various tools at its disposal which could be used. These include the capital conservation buffer, the countercyclical capital buffer, the leverage ratio with a macroprudential component, risk weights for real estate exposures and other supervisory measures. For those purposes, the impact of the regulatory framework for EU banks on the economic cycle should be monitored regularly and the potential impact, effectiveness and efficiency of countercyclical instruments should be further analysed.

c) Net stable funding ratio

The ESRB provided its views to the EBA on the definition of an NSFR.[43] In accordance with Article 510 of the CRR, the EBA consulted the ESRB on the methodologies for determining the amount of stable funding available to, and requested by, institutions, as well as on appropriate uniform definitions for calculating such a net stable funding requirement. The ESRB response was later incorporated into the EBA response to the European Commission's call for advice on the NSFR.[44]

The response identified the NSFR as the best available instrument to address structural issues related to liquidity and maturity transformation by banks. The ESRB has already

[43] See **ESRB response to the consultation on the Net Stable Funding Ratio (NSFR) as mandated by Article 510 CRR**.

[44] See **EBA Report on Net Stable Funding Requirements under Article 510 of the CRR**, EBA/Op/2015/22, EBA, December 2015.

published several documents discussing the possible macroprudential use of liquidity instruments and has identified the NSFR as one of the most promising of such tools.[45]

Members of the ESRB broadly agree that it would be possible to use the NSFR as a macroprudential instrument. This macroprudential use could have two aspects: (i) a time-varying requirement, potentially composed of a minimum requirement and the possibility to complement it with a macroprudential buffer, which could be released in times of stress; and (ii) a cross-sectional requirement, calibrated according to each institution's contribution to systemic liquidity risk. Incorporating these two aspects into the NSFR would pose considerable challenges to macroprudential authorities as regards the calibration of the ratio. The ESRB therefore encouraged further work in this area, including analysis through the economic cycle and a quantitative analysis on the potential costs and benefits.

The ESRB noted that the ultimate goal of the European authorities should be the implementation of a credible and sound NSFR requirement in the EU. To that end, the ESRB supported (i) the use of the same weights for both the required stable funding and the available stable funding, as agreed by the BCBS and (ii) the requirement for an NSFR on both a consolidated and solo basis (the latter subject to appropriate waivers or exemptions). The ESRB is also of the view that no preferential treatment for specific business models should be introduced in the NSFR unless it can be proved that such business models do not pose systemic liquidity risk. Furthermore, a majority of ESRB members considered that proportionality of the NSFR should be applied at the level of supervisory reporting and not on the methodology for the calculation of the NSFR. These members consider that liquidity and maturity mismatch, which the NSFR aims to address, are also of relevance to smaller institutions.

2.3 ESRB contributions to the macroprudential framework beyond the banking sector

The ESRB set out both short-term policy options and a long-term agenda for macroprudential policy beyond the banking sector. Although the framework for monitoring risks outside the banking sector is taking shape (see Box 1 in Section 1), macroprudential policy beyond the banking sector remains in its formative stage. In particular, the policy strategy, regulatory data and instruments required to address risks beyond the banking sector are underdeveloped. In response, the ESRB published a strategy paper in July 2016 setting out steps designed to gradually fill this gap in financial stability policy.[46] The paper provides an overview of the legal and institutional framework governing macroprudential policies beyond the banking sector. It further presents short-term policy options and a long-term policy agenda to reflect new opportunities outside the banking sector and mitigate corresponding financial stability risks.

Progress has been made on some of the key tasks set out in the strategy paper for the ESRB and its members. Short- to medium-term tasks set out in the paper include contributing to the development of new macroprudential instruments, such as instruments to address the procyclicality of initial margins and haircuts, especially in securities financing transactions (SFTs)

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[45] See, among others, **The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector** or Clerc, L., Giovannini, A., Langfield, S., Peltonen, T., Portes, R. and Scheicher, M., "**Indirect contagion: the policy problem**", Occasional Paper Series, No 9, January 2016.

[46] **Macroprudential policy beyond banking: an ESRB strategy paper**, ESRB, July 2016.

and derivatives. They also include contributing to the development of the wider financial stability toolkit (such as top-down stress tests for CCPs, insurers and pension funds) and recovery and resolution frameworks for CCPs and insurers. Providing ESRB input to ongoing legislative reviews so as to ensure the macroprudential perspective is included in relevant regulation in the EU is also one of the tasks identified in the strategy paper. The remainder of this subsection 2.3 describes how the ESRB has progressed on these tasks.

a) Macroprudential use of margins and haircuts

The ESRB has undertaken initial steps in exploring innovative macroprudential instruments that might be able to address procyclicality of initial margins and haircuts. The use of collateral is playing an increasingly important role in the financial system, with risk management practices in place that comprise margin and haircut requirements. These risk management practices may be able to amplify the inherent cyclicality in collateral requirements and exacerbate leverage cycles. Against this background, the ESRB published a comprehensive report that sets out how margins and haircuts could in principle be used as macroprudential tools.[47] Although they apply primarily to SFTs and derivatives, new macroprudential instruments could have the potential to mitigate systemic risk from excessive leverage and procyclicality in collateral requirements in non-centrally and centrally cleared transactions. The report also highlights the practical challenges in the implementation of such tools and proposes further work to help address these challenges. The report was informed by a conference the ESRB held in June 2016 with the aim of gathering the views of policymakers, representatives from academia and market participants from different jurisdictions on the use of margins and haircuts as potential new instruments, and what main benefits and challenges might be anticipated when applying them for macroprudential purposes.[48]

The ESRB assessed the role of SFTs in contributing to the build-up of excessive leverage and considered options to address these risks. The ESRB's opinion[49] was designed to inform the work of the European Commission, which is mandated by Article 29(3) of the Securities Financing Transaction Regulation (SFTR)[50] to assess the progress in international efforts to mitigate the risks associated with SFTs. Based on the initial finding that the use of SFTs can give rise to the build-up of significant leverage in the financial system, the ESRB's opinion supports the implementation of the Financial Stability Board's framework for haircuts on non-centrally cleared SFTs[51] in the EU. However, it notes the current lack of a comprehensive framework to address the build-up of leverage at a systemic level. Therefore, the ESRB's opinion highlights the need to develop a macroprudential approach towards the setting of margins and haircuts in order to limit the build-up of systemic risk in both centrally and non-centrally cleared SFTs.

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[47] **The macroprudential use of margins and haircuts**, ESRB, February 2017.

[48] More information on the conference can be found **here**.

[49] **ESRB opinion to ESMA on securities financing transactions and leverage under Article 29 of the SFTR**, ESRB, October 2016.

[50] **Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012** (OJ L 337, 23.12.2015, p. 1).

[51] **Transforming Shadow Banking into Resilient Market-based Finance**, Financial Stability Board, November 2015.

b) Macroprudential perspective on the prudential supervision of CCPs

In view of the key role that CCPs play in the post-crisis financial system, the ESRB has continued to provide a macroprudential perspective to the prudential supervision of CCPs. Following the commitments made by G20 leaders at the Pittsburgh Summit in 2009 to have standardised derivatives contracts centrally cleared, a corresponding EU regulatory framework – the European Market Infrastructure Regulation (EMIR)[52] – was enacted in 2012. The reforms have made the financial system safer, with increased transparency in previously opaque OTC derivatives markets and less counterparty credit risk. By making CCPs central hubs for systemic risk management, the reforms have placed considerable responsibility on CCPs, their regulators and supervisors whereby any disorderly failure of a CCP would pose a significant risk to financial stability. In view of this, the ESRB has continued to provide a macroprudential perspective to the prudential supervision of CCPs.

The ESRB contributed to an assessment carried out by the European Commission by analysing the systemic risk implications of CCP interoperability arrangements. An interoperability arrangement is an arrangement between two or more CCPs that involves a cross-system execution of transactions between CCPs. Such arrangements may result in some benefits from a systemic risk perspective but can also provide a potential additional channel for contagion between CCPs if risks are not properly managed. The ESRB noted that those risks are addressed in the current regulatory framework in the EU but could be further enhanced by including more granular requirements in EMIR.[53] The report points out the need for further analysis on what impact potential OTC derivatives links between CCPs would have on systemic risk.

In response to a consultation by the European Securities and Markets Authority (ESMA), the ESRB published an analysis of the clearing obligation for financial counterparties with a limited volume of activity. In its response, the ESRB acknowledged that some small financial counterparties might face difficulties in gaining access to a CCP in order to meet the clearing obligation. However, it encouraged authorities and the industry to solve these issues in order to ensure that the clearing obligation is applied broadly. The opinion emphasised that any analysis concerning which derivatives classes would be subject to the clearing obligation should consider systemic risk not only at the level of the EU, but also at the level of individual Member States.

c) Macroprudential perspective on the insurance sector

As insurers can be the source of systemic risks or amplify existing systemic risks, the ESRB continued to provide a macroprudential perspective on the insurance sector. This sector fulfils an important role in the economy by taking on risks and mobilising savings. The sector contributes to economic growth and financial stability if it is functioning well. The ESRB noted in a report in 2015 that insurers can, however, also be the source of systemic risk or can amplify it. In view of this, the ESRB has continued to provide a macroprudential perspective on the insurance sector.

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[52] See footnote 7.

[53] **ESRB report to the European Commission on the systemic risk implications of CCP interoperability arrangements**, ESRB, January 2016.

The ESRB contributed from a macroprudential perspective to work undertaken by the European Insurance and Occupational Pensions Authority (EIOPA) on the ultimate forward rate (UFR). Insurers' liabilities – the present discounted value of future promises to policyholders – cannot be observed and yet need to be estimated. The UFR is part of the regulatory risk-free yield curve that insurers use in this estimation; therefore the level of the UFR has a direct impact on insurers' solvency ratios. Accordingly, the ESRB provided a macroprudential perspective to EIOPA's consultation on a proposal for a methodology to derive the UFR in the form of an informal contribution to EIOPA's Board of Supervisors. In this contribution, the ESRB noted that the large majority of its member institutions were of the view that the current level of the UFR may be too high. This could lead to a systemic underestimation of the fair value of insurers' liabilities and a build-up of hidden losses.

The ESRB responded to EIOPA's public consultation on a potential harmonisation of recovery and resolution frameworks for insurers. On 2 December 2016 EIOPA released a Discussion Paper on the potential harmonisation of recovery and resolution frameworks for insurers. The ESRB had previously noted that, under certain circumstances, failures in the insurance sector could pose systemic risks and that an effective recovery and resolution framework for the insurance sector could be used to mitigate the financial stability implications of such failures.[54] Therefore the ESRB decided to respond to the consultation, providing a macroprudential perspective, in the form of an ESRB Secretariat staff response.[55] The staff response argued that there is need for a recovery and resolution framework for insurers in the EU and that this framework should have a broad scope and financial stability as one of the main objectives, together with policyholder protection. Moreover, ESRB Secretariat staff took the view that the framework would need to combine a certain degree of harmonisation across the EU with the necessary freedom for national authorities to take account of country specificities. In particular, the staff response argued for a broad set of recovery and resolution tools which would provide competent authorities with the flexibility to tailor each resolution strategy to specific cases. The staff response also stressed that further consideration should be given to setting up financing arrangements funded with ex ante contributions from the insurance sector, such as ensuring that resolution costs would not be borne by taxpayers.

2.4 ESRB contributions to stress testing

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 EU. In particular, the regulations establishing the three European Supervisory Authorities (ESAs) – the EBA, EIOPA and 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

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[54] **Report on systemic risks in the EU insurance sector**, ESRB, December 2015; **Macroprudential policy beyond banking: an ESRB strategy paper**, ESRB, July 2016; **Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system**, ESRB, November 2016.

[55] **ESRB Secretariat staff response to the EIOPA Discussion Paper on the potential harmonisation of recovery and resolution frameworks for insurers (EIOPA-CP-16-009)**, ESRB, February 2017.

testing.[56] This cooperation has typically taken the form of the ESRB providing adverse scenarios for the stress tests of the ESAs that take as their starting point the risks identified by the ESRB (see Section 1 for a description of the risks the ESRB considered most pertinent). Over the review period the ESRB provided adverse scenarios to the stress test of CCPs by ESMA and the stress test of occupational pension funds by EIOPA. These scenarios are detailed below. The scenarios the ESRB provided in early 2016 to the EBA banking sector stress test and the EIOPA insurance sector stress test have been described in the ESRB's 2015 Annual Report.[57]

In view of the differences in the financial products cleared by CCPs, the ESRB contributed three scenarios to ESMA's CCP stress test. CCPs were set up to reduce systemic risk resulting from a complex web of bilateral exposures. 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. In particular, to account for differences in the financial products that CCPs clear and to ensure that all CCPs are subjected to sufficient stress, the ESRB provided ESMA with three scenarios representing adverse financial market developments.

The scenarios for the CCP stress test assumed a surge in risk premia, leading to major shifts in market prices across a broad range of asset classes and increased volatility. The ECB, in collaboration with the ESRB, developed a novel methodology and calibrated adverse financial scenarios for this exercise. The ESRB assumed that a release of new information or data that hints at a likely or actual materialisation of one or more of the risks identified by the ESRB (see Section 1) would trigger the scenario. This, in turn, was assumed to result in a surge in risk premia, leading to major shifts in market prices across a broad range of asset classes. It was assumed that, in such an event, market price movements would be coupled with increased volatility. The dependence between asset prices observed during normal times was deemed likely to change materially during a short period of time, with no clear direction of safe-haven flows across countries and markets. While such unprecedented asset price movements were considered to be short lived and global financial markets might stabilise swiftly, it was assumed that a broad range of financial markets would undergo pronounced stress lasting for at least five days.

The ESRB contributed one scenario to EIOPA's occupational pension fund sector stress test. In some EU Member States, institutions for occupational retirement provision (hereafter "pension funds") play a key role in the provision of retirement savings. Understanding how pension funds are affected by adverse market movements is thus important and for this reason the ESRB contributed to the EIOPA 2017 stress test by providing an adverse scenario. The scenario has been designed for the harmonised valuation of defined-benefit (DB) and hybrid pension funds, using a common balance sheet approach and the market valuation of assets of defined-contribution

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[56] 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 (OJ L 331, 15.12.2010, p. 12); 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 (OJ L 331, 15.12.2010, p. 48); 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 (OJ L 331, 15.12.2010, p. 84).

[57] **Annual Report**, ESRB, 2015.

(DC) pension funds.[58] Assumptions about long-term risk premia, which are needed for other components of EIOPA's stress test, were developed by EIOPA.

The scenario for EIOPA was designed to explore how resilient occupational pension funds would be to a "double hit" scenario. The ECB, in collaboration with the ESRB, developed the narrative and methodology and calibrated the adverse financial scenario for this exercise. In view of their sizeable investment portfolios and long-term liabilities, DB pension funds are particularly vulnerable to a "double hit" scenario, which would be characterised by an abrupt and large drop in asset prices in conjunction with a decrease in risk-free interest rates. To take this into account, the adverse scenario is triggered by a shock to EU equity markets. In response, risk premia for a number of other asset classes to which pension funds are exposed would increase, leading to losses in the asset holdings of pension funds. Risk-free interest rates were assumed to fall further in the scenario, reflecting a continuation of structural demographic changes associated with a further drag on productivity growth and cyclically low interest rates as a result of accommodative central bank policy, thus increasing the present value of pension liabilities.

The ESRB complemented the EBA stress test with a survey designed to better understand second-round effects from the collective reaction of banks to a stress event. The global financial crisis revealed that the way in which financial institutions respond to shocks can amplify an initial shock that hits the financial system. As the EBA stress test is not designed to capture these second-round effects, the ESRB had – in addition to providing the adverse scenario described in the 2015 Annual Report – designed a survey to better understand these effects. The survey was sent to the 30 largest banks in the EU, and the results were discussed with participating banks at a workshop in October 2016. The exercise showed that these second-round effects can be large and that banks might find it difficult to take account of and internalise the actions of other banks when considering their own response to a stress event.

3 Review of national measures

This subsection provides a general overview of the measures adopted by Member States during the review period.[59] Given its broad mandate and EU-wide perspective, the ESRB is well placed to act as an information hub on macroprudential measures taken by Member States. The ESRB publishes any such notified measures on its website. Actions taken by Member States in the review period are discussed in this subsection according to the different types of instruments used, including reciprocating actions taken in response to requests from other Member States.

3.1 Overview of measures

In 2016 most elements of macroprudential frameworks were in place and fully operational in all Member States. It was the first year when all Member States set the countercyclical capital buffer (CCyB) on a quarterly basis and carried out the annual review of the designation and the setting of buffer rates for other systemically important institutions (O-SIIs), leading to a higher

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[58] EIOPA proposed the common balance sheet approach, which entails a market-based, risk-sensitive valuation for pension funds' balance sheets. See **Opinion to EU Institutions on a Common Framework for Risk Assessment and Transparency for IORPs**, EIOPA-BoS-16/075, 14 April 2016.

[59] For further details on measures taken throughout 2016, see **A Review of Macroprudential Policy in the EU in 2016**, ESRB, April 2017.

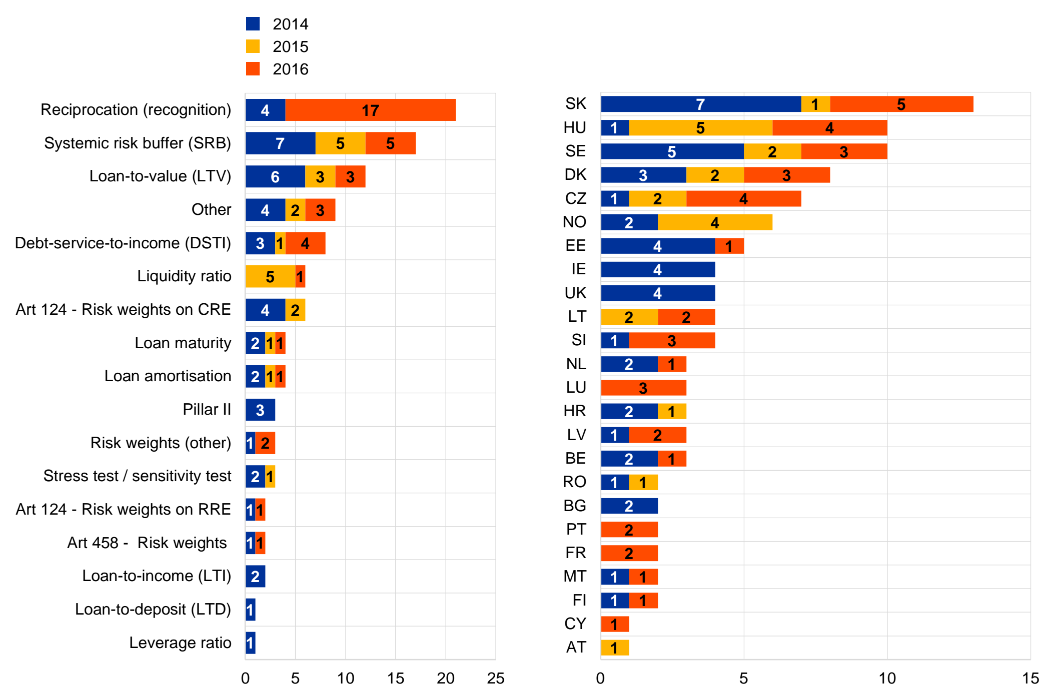
number of macroprudential decisions than in previous years. In addition, there was a large increase in the number of reciprocating actions taken compared with previous years owing to the implementation of the voluntary reciprocation framework developed by the ESRB.

When considering instruments that are not subject to a periodic review, around half of the Member States actively took macroprudential policy actions in 2016. Most of these were tightening actions, predominately relating to the residential real estate sector (see Chart 22). Several Member States tightened measures that were already in place.

Chart 22

Number of substantial measures notified to the ESRB (2014-16), excluding instruments subject to a periodic review

(number of measures by measure type (left-hand panel) and by Member State (right-hand panel))



Source: ESRB.

Notes: All measures are deemed to be substantial apart from measures of a more procedural or administrative nature (such as the early introduction of the capital conservation buffer and exemption of small and medium-sized investment firms from the capital conservation buffer). The chart does not include the countercyclical capital buffer and the buffers of systemically important institutions because of the periodical setting of the buffer rate.

A number of CCyB developments took place in 2016. Five countries confirmed or announced a non-zero CCyB rate and three countries increased the level of the CCyB in 2016 (with one of these, the United Kingdom, decreasing the rate shortly thereafter to its initial level, as discussed in subsection 3.2 below). The framework for the CCyB for third (i.e. non-EU) countries developed by the ESRB also became operational in 2016 with the identification and monitoring of third countries that are material for the EU and for individual Member States, as discussed in Box 1 in Section 1.

Residential real estate lending continued to be an important area of focus for macroprudential authorities in 2016. The ESRB issued warnings to eight Member States on medium-term vulnerabilities in the residential real estate sector; the ESRB further issued Recommendation ESRB/2016/14 on closing real estate data gaps (see subsection 1.1 above). Several Member States introduced measures to target risks from residential real estate while others

tightened existing measures. Many measures were aimed at maintaining prudent lending standards as well as addressing the risks emanating from the different stretches (collateral, household and banking).

The systemic risk buffer continues to be one of the most frequently used instruments, but measures taken in 2016 mainly entailed changes to existing frameworks; there were no instances of a Member State introducing a new systemic risk buffer. As discussed by the ESRB in A Review of Macroprudential Policy in the EU in 2016[60], the implementation of this instrument continues to vary significantly across countries, both in terms of scope of the buffer and the type of risk being addressed. Under Union law, the systemic risk buffer must be reviewed at least every second year.

This year saw the first annual review by national authorities of the framework for systemically important institutions across all Member States. All Member States identified systemically important institutions and started imposing capital buffer requirements, with phase-in periods of up to four years. Around 200 institutions were identified in the EU (and in Norway), many of which are part of 30 larger cross-border groups. The majority of these institutions were credit institutions but 6 investment firms were identified as systemically important in Cyprus. The number of the identified institutions varies across countries, from 16 in the United Kingdom to 2 in Estonia; the characteristics of these institutions also varied significantly across countries.

Finally, 2016 also saw the implementation of the voluntary reciprocity framework developed by the ESRB. Reciprocity was recommended for a real estate measure adopted by Belgium under Article 458 of the CRR and a systemic risk buffer measure taken by Estonia. The response to these two recommendations shows that the ESRB's new reciprocity framework has led to a substantial increase in reciprocating actions. However, it also shows that the decision whether or not to reciprocate differs widely across Member States.

3.2 The countercyclical capital buffer

a) Setting of domestic buffers

During the review period, five countries confirmed or announced non-zero CCyB rates (see Chart 23). These include the Czech Republic, Norway, Slovakia, Sweden and the United Kingdom. Sweden and Norway had positive CCyB rates which were already in effect in 2016. In March 2016 Sweden decided to increase its rate from 1.5% to 2% (to take effect in March 2017). In December 2016 Norway decided to increase its rate from 1.5% to 2% (to take effect in December 2017). The Czech Republic had already decided on a 0.5% buffer rate (effective from January 2017) and confirmed this in the period under review.

Two countries announced non-zero CCyB rates for the first time in 2016. Slovakia set a 0.5% rate in July 2016 and the United Kingdom announced a 0.5% rate in March 2016, with both rates due to come into effect one year later. The United Kingdom reduced the rate to 0% with immediate effect following the outcome of its referendum on membership of the EU and the resulting material change in risk outlook. This marks the only experience to date in the EU of a buffer release.

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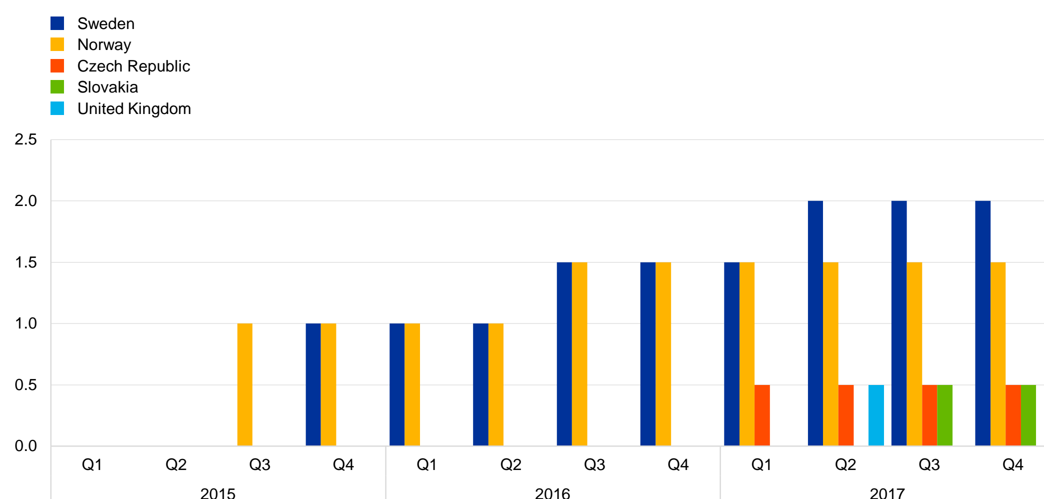
[60] See **A Review of Macroprudential Policy in the EU in 2016,** op. cit.

The credit-to-GDP gap is the main reference indicator in setting the CCyB rate, but the ESRB recommends a range of additional indicators that may point to a build-up of system-wide risk. The EU rules on the CCyB framework are complemented by guidance from the ESRB, including a recommendation on the setting of CCyB rates.[61] Member States take a wide variety of approaches to the number and types of additional indicators used in their decision to activate or increase the CCyB. While some countries use only a small number of additional indicators, others are monitoring more than 15 additional indicators.[62]

Chart 23
Countries that applied a non-zero CCyB rate

(percentages, according to implementation date)



Source: ESRB.
Notes: The United Kingdom's decision at the end of March 2016 on a future buffer rate of 0.5% was subsequently changed to a buffer rate of 0% in early July 2016. This has been reflected in a single bar for the United Kingdom for the second quarter of 2017.

The first experiences with the CCyB confirm that there is no mechanical relationship between the credit-to-GDP gap and the level of the buffer set by authorities. Analyses show that while there is a clear positive relationship between the two, it does not mechanically follow the buffer guide laid out in the recommendation. Indicators from the categories recommended by the ESRB also show a clear relationship between their levels and buffer rates, particularly for those indicators related to the overvaluation of residential real estate prices, credit developments and the strength of banks' balance sheets.

b) Setting of buffers for third countries

The framework for the CCyB for third (i.e. non-EU) countries developed by the ESRB became operational in 2016. Under this framework, both Member States and the ESRB share the

[61] Recommendation ESRB/2014/1 on guidance for setting countercyclical buffer rates.

[62] Pekanov, A. and Dierick, F., "Implementation of the countercyclical capital buffer regime in the European Union", *ESRB Macro-prudential Commentaries*, No 8, December 2016.

responsibility of identifying and monitoring material third countries.[63] The ESRB identifies third countries to which the EU banking system as a whole has material exposures, reviews this list annually, and monitors developments in these countries for signs of excessive credit growth. Member States also identify and monitor third countries to which the banking system has material exposures in their respective jurisdictions. Member States may decide not to monitor certain third countries, relying instead on the monitoring already carried out by the ESRB.

The ESRB established an initial list of six material third countries, while the number of material third countries for individual Member States varies widely. The ESRB's list comprises, in descending order of exposures by the EU banking sector, the United States, Hong Kong, China, Turkey, Brazil and Russia. The number of identified material third countries ranges from zero (nine Member States) to eleven (the Netherlands). The overlap in the identification of countries is highest for the six material countries identified by the ESRB, varying from thirteen for the United States to two for Hong Kong.

The majority of Member States apply the same methodology used by the ESRB when identifying material third countries, although how these countries are monitored can differ. While the ESRB methodology for identifying material third countries is prescriptive for the ESRB but not for the Member States, most countries opted to apply the methodology in its original form or with slight amendments. Member States take different approaches to monitoring the six material countries identified and already monitored by the ESRB. Thirteen Member States entrust the monitoring of these six material third countries to the ESRB, while four Member States also monitor the countries themselves, in some cases for other reasons as well.

3.3 Real estate measures

Real estate, mainly the residential sector, was a particular area of focus for macroprudential policymaking by the ESRB and its members in 2016. This reflects the importance of real estate markets to financial stability and signs of emerging vulnerabilities in the residential real estate markets of some Member States. The ESRB issued warnings to eight Member States on medium-term vulnerabilities in the residential real estate sector and adopted Recommendation ESRB/2016/14 on closing real estate data gaps (see subsection 1 above for further details).

A range of measures to address residential real estate risks were introduced at national level throughout 2016, mostly relating to borrower-based measures. The most frequent measures taken to address residential real estate risks during the review period were those concerning lending standards. Some Member States tightened or amended such measures already in existence. Some Member States announced or confirmed measures relating to risk weights on residential or commercial property lending. Belgium requested an extension of an existing measure introduced under Article 458 of the CRR, which applied a 5 percentage point risk weight add-on for Belgian residential mortgage loans by banks using the IRB approach for measuring credit risk.[64]

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[63] **Recommendation ESRB/2015/1 on recognising and setting countercyclical capital buffer rates for exposures to third countries** and **Decision ESRB/2015/3 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**.

[64] **A review of macro-prudential policy in the EU one year after the introduction of the CRD/CRR**, ESRB, June 2015, pp. 18 and 23.

The European Commission, drawing on an opinion by the ESRB[65] and the EBA, did not object to this extension.[66] At the request of the Belgian authorities, the ESRB recommended reciprocation of the measure under Recommendation ESRB/2015/2.[67] Several Member States, including France and the Netherlands, both of which hold a significant share of the mortgage loans market in Belgium, reciprocated the measure, although their banks operate mostly through subsidiaries.

A helpful typology for grouping real estate instruments is the classification in household stretch (or borrower stretch), collateral stretch and lender stretch instruments.[68] The first covers instruments that target the repayment capacity of the borrower, such as caps on loan-to-income, debt-to-income, profit-to-income and debt-service-to-income ratios; the second refers to instruments that focus on the collateral of the loans, such as caps on loan-to-value (LTV) ratios; the third category points to instruments that directly increase the resilience of the lender, such as risk weights, sectoral capital buffers and stress tests with capital add-ons. Some instruments have a hybrid character. Amortisation requirements, for example, affect both the repayment burden (household stretch) and also bring down the LTV ratio over time (collateral stretch).

Most Member States addressing vulnerabilities originating from the residential real estate sector now have a combination of such instruments in place (see Chart 24).[69] Different stretches cover different risk channels, and a combination of instruments may increase the overall effectiveness of the measures.

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[65] **Opinion ESRB/2016/1 regarding Belgian notification of an extension of the period of application of a stricter measure based on Article 458 of Regulation (EU) No 575/2013 of the European Parliament and of the Council on prudential requirements for credit institutions**, ESRB, 18 February 2016.

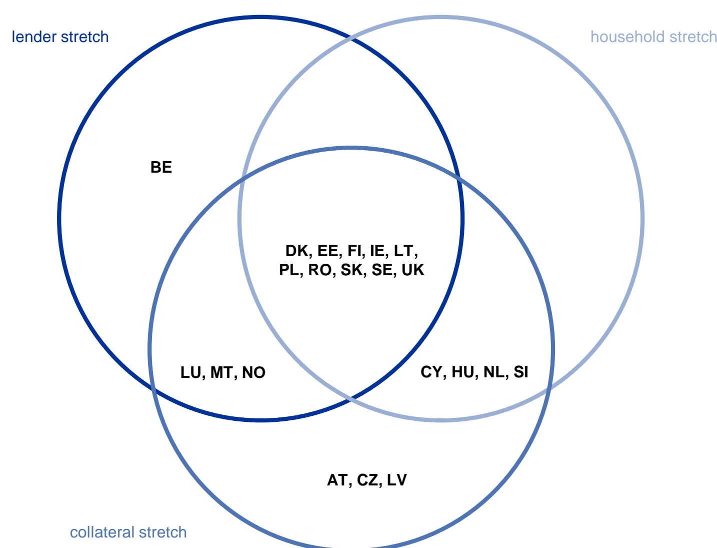
[66] Decision not to propose an implementing act to reject the intended extension of the national measure under Article 458 of Regulation (EU) No 575/2013 notified by the Kingdom of Belgium under Article 458(9) in conjunction with Article 458(4) of Regulation (EU) No 575/2013, European Commission, 15 March 2016.

[67] The ESRB issued Recommendation ESRB/2016/3, which amends Recommendation ESRB/2015/2, to include the Belgian measure among the measures to be reciprocated.

[68] Report on **residential real estate and financial stability in the EU**, ESRB, December 2015, pp. 86 et seq.

[69] For a discussion on commercial real estate, see **A Review of Macroprudential Policy in the EU in 2015**, ESRB, May 2016, pp. 20-23.

Chart 24
Use of residential real estate instruments according to the stretches typology



Source: ESRB.
Note: Amortisation requirements have been included under both the household and the collateral stretch categories.

3.4 Systemic risk buffer

The systemic risk buffer continues to be a macroprudential instrument that is often used, although this varies widely across countries. While the measures taken during the review period were mainly changes to existing systemic risk buffer frameworks, these reflect the broad range of uses of this instrument. In its response to the European Commission's consultation document on the Review of the EU Macro-prudential Policy Framework (see subsection 2.1 above), the ESRB pointed out that the flexibility of the systemic risk buffer creates the risk of adversely affecting the use of other instruments for their intended purpose, and that there would be merit in further clarifying and improving the rules regarding the use of this buffer.

A number of Member States made changes to the systemic risk buffer following changes in their systemically important institutions. Some Member States use the systemic risk buffer as an alternative to the O-SII buffer or to top up the O-SII buffer. Hence, when changes are made in the identification of O-SIIs or in O-SII buffer levels, this may also result in a recalibration of the systemic risk buffer. The Czech Republic reviewed the list of O-SIIs in 2016 and increased the number of banks (from four to five) as well as some of the applicable buffer rates. These changes came into effect in 2017. Denmark also uses the systemic risk buffer to mitigate the risk from systemically important banks and made a change to the list of O-SIIs from 2017 onwards following a change in the legal structure in the Nordea group. Slovakia uses the systemic risk buffer in combination with the O-SII buffer to reach a target aggregate buffer for five O-SIIs. During the review period, these buffers were recalibrated following the identification of the parent banks of four of these institutions as O-SIIs in their home countries (Austria, Belgium and Italy). In the United

Kingdom, the Bank of England's Financial Policy Committee published its framework for the systemic risk buffer.[70] This buffer will be applied to systemically important institutions from 2019.

Other changes to the systemic risk buffers were made for a range of reasons. Estonia reduced the systemic risk buffer from 2% on total exposures to 1% on domestic exposures from the third quarter of 2016 onwards in order to avoid double-counting with the O-SII buffer. The O-SII buffer was introduced at this time for two institutions that hold more than 60% of total banking sector assets. The ESRB recommended reciprocation of this measure, following a request from the Estonian authorities.[71] The Member States that decided to reciprocate the Estonian systemic risk buffer included Sweden, which is the most important home country in terms of foreign banks with operations in Estonia. The objective of the planned systemic risk buffer in Hungary is to address systemic risk from problem exposures to the commercial real estate sector and to incentivise banks to deal with these exposures. During the year, Hungary decided to postpone the introduction of this buffer until 1 July 2017, six months later than originally planned, in order to support lending to the economy. Romania announced that the systemic risk buffer would be deactivated from 1 March 2017 onwards. The buffer was introduced in 2016 to address the external contagion risk arising from certain bank ownership structures. The deactivation is due to the perceived reduction in this contagion risk, the activation of the O-SII buffer and legislative developments at national level that may lower the capital adequacy of banks. Austria introduced the systemic risk buffer in 2016 to address the risks stemming from a combination of factors. These include Austria's relatively large banking system; high exposure to emerging markets; the Austrian banking system's insufficient preparation for the reduction/removal of the implicit government guarantee; the banking system's low level of capitalisation in relation to European peers; and the specific ownership structure of institutions (high share of non-stock companies) that renders recapitalisation difficult in times of crisis.

3.5 Buffers for systemically important institutions

All Member States completed the review of the list of identified O-SIIs during the review period. Around 200 O-SIIs have now been identified in the EU (and in Norway), ranging from 16 in the United Kingdom to 2 in Estonia. The majority of these are credit institutions, with only 6 investment firms identified as systemically important (in Cyprus). While some changes to the list of O-SIIs and the accompanying buffer rates did take place in 2016, these were often due to corporate restructurings, changes in the systemic risk score of institutions or changes in the methodology for setting O-SII buffers.[72] For the most part, the list and buffer rates of O-SIIs remained relatively unchanged. Of the European O-SIIs, 13 are also global systemically important institutions (G-SIIs); these are located in France, Germany, Italy, the Netherlands, Spain, Sweden and the United Kingdom.

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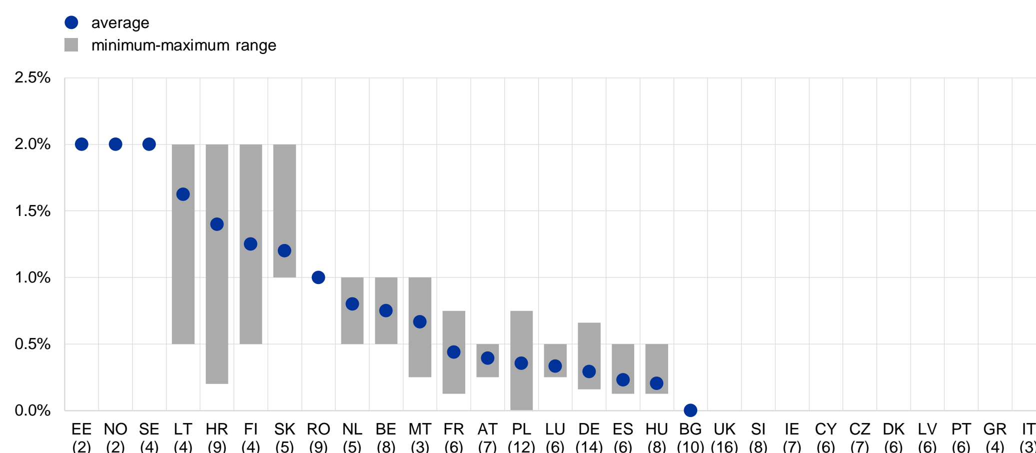
[70] **The Financial Policy Committee's framework for the systemic risk buffer**, Bank of England, May 2016.

[71] The ESRB issued **Recommendation ESRB/2016/4**, which amends Recommendation ESRB/2015/2, to include the Estonian measure among the measures to be reciprocated.

[72] The ECB has adopted a methodology for assessing O-SII buffers set by national authorities, in line with its responsibilities under Article 5 of Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions (OJ L 287, 29.10.2013, p. 63).

Chart 25

O-SII buffer requirements for credit institutions as at January 2017



Source: ESRB.

Notes: Figures in brackets denote the number of other systemically important institutions (O-SIIs) in each country. "Average" refers to the arithmetic average of the phased-in buffers for the O-SIIs in the country concerned as at 1 January 2017. The Czech Republic, Denmark, Ireland, Greece, Italy, Cyprus, Latvia, Portugal, Slovenia and the United Kingdom do not have applicable buffer rates as at 1 January 2017.

The characteristics of O-SIIs and the buffer rates applied vary considerably across countries, reflecting to some extent different national banking systems. In general, the larger the country, the larger the average size of the O-SII, but there are exceptions. The level and dispersion of O-SII buffer rates and phase-in periods are also different across Member States. The highest buffer requirements coming into force in 2017 were in Estonia, Sweden and Norway. Many Member States have not yet put O-SII buffers in place for 2017 or set them at 0%. Most countries have a range of buffer rates for different institutions. Phase-in periods range between two and four years, while some countries opt to introduce buffer rates with immediate effect. In 2016, 13 Member States started phasing in the O-SII buffer. Recently, the ESRB and the ECB have started to publish overviews of the different capital buffers applicable in the EU and the euro area.[73]

Many O-SIIs are part of bigger cross-border banking groups where the parent entity is an O-SII or G-SII located in another Member State. Around 30 such cross-border groups can be identified and some groups control O-SIIs in up to 10 different Member States. Groups with a particularly strong cross-border presence through many O-SIIs include the Erste, Raiffeisen, Société Générale and UniCredit groups. From a financial stability perspective, cross-border ownership links may be a potential transmission channel for risks.

[73] Example overview of the different capital buffers applicable in the EU and the euro area.

Section 3 – Ensuring implementation and accountability

This section provides an overview of the action taken to enhance the ESRB's accountability. First, it explores how compliance with the ESRB's recommendations is assessed by examining the results from the follow-up processes carried out in the reporting period. Second, it gives an account of the ESRB's reporting to the European Parliament, including the presentations given by the Chair of the ESRB at the hearings before the Committee on Economic and Monetary Affairs and other institutional aspects. Finally, this section concludes with a brief description of the ESRB's institutional framework.

1 Assessment of compliance with ESRB recommendations

ESRB recommendations are not legally binding 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 addressees on how to assess the implementation of ESRB recommendations, the Handbook on the follow-up to ESRB recommendations (hereafter the "Handbook") was published in July 2013. The Handbook was revised in order to take into account the experience gained during past compliance assessments. The amended version of the Handbook 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 four compliance assessments conducted throughout the reporting period. The compliance assessments were undertaken for Recommendation ESRB/2012/1 on money market funds, Recommendation ESRB/2012/2 on funding of credit institutions, Recommendation ESRB/2013/1 on intermediate objectives and instruments of macroprudential policy, and Recommendation ESRB 2015/1 on recognising and setting countercyclical buffer rates for exposures to third countries.

1.1 Assessment of compliance with Recommendation ESRB/2012/1 on money market funds

This ESRB Recommendation aimed to reduce the systemic risks arising from money market funds (MMFs). A recommendation was made to the European Commission to ensure, through European Union (EU) legislation, the implementation of the change from a constant to a fluctuating net asset value model, the introduction of stricter liquidity requirements, the public disclosure of specific information by MMFs and the adoption by MMFs of enhanced reporting obligations to supervisory authorities.

The assessment of compliance with this Recommendation started in June 2016 and initially focused on the original legislative proposal of the European Commission.[74] However, as an agreement between the co-legislators was reached at the end of 2016 and publication of the final EU Regulation on MMFs in the Official Journal of the European Union was pending at the end of March 2017, it was decided to take into account an analysis of the final legislation in the ESRB's Summary Compliance Report. Therefore, finalisation of the compliance assessment and publication of the compliance report for this Recommendation were postponed.

1.2 Assessment of compliance with Recommendation ESRB/2012/2 on funding of credit institutions

Recommendation ESRB/2012/2 on funding of credit institutions seeks to incentivise sustainable funding structures for credit institutions and mitigate related systemic risks. It recommends that the NSAs intensify their assessments of funding and liquidity risks, monitor credit institutions' plans to reduce reliance on public sector funding sources, and assess the impact of credit institutions' funding plans on the flow of credit to the real economy. Moreover, it also recommended that the European Banking Authority (EBA) should develop guidelines on harmonised definitions and templates in order to facilitate the reporting of funding plans and coordinate their assessment at EU level.[75]

Furthermore, the Recommendation addressed risks arising from management policies, asset encumbrance and market transparency. More specifically, NSAs were requested to establish a requirement for credit institutions to put in place risk management policies and general monitoring frameworks for managing the risks related to asset encumbrance. Concurrently, the EBA was requested to issue guidelines on the monitoring of the level, evolution and types of asset encumbrance, as well as transparency requirements on asset encumbrance for credit institutions.

Finally, the Recommendation deals with covered bonds and other instruments that generate encumbrance. In this respect, the NSAs were required to identify best practices for covered bonds and to promote harmonisation of their national frameworks. The EBA was requested to coordinate the action taken by NSAs, to consider whether it is appropriate to issue guidelines or recommendations endorsing best practices, and to assess whether there are other financial instruments that generate encumbrance.

In general, the Summary Compliance Report showed a particularly high level of compliance by addressees. The NSAs were graded either fully compliant (FC) or largely compliant (LC) not only with the Recommendation as a whole, but also with each specific sub-recommendation. A similar result can be observed for the level of compliance achieved by the ECB and the EBA, which were also assessed overall as being fully compliant. As the main aim of this Recommendation was to enhance the monitoring of risks stemming from recent developments in banks' funding sources and structures within the EU, the results of the assessments show a clear commitment on the part of the NSAs, the EBA and the ECB (see Table 2).

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[74] **Proposal for a Regulation of the European Parliament and of the Council on Money Market Funds, 4 September 2013, COM/2013/0615 final.**

[75] This sub-recommendation A(5) will be assessed in the course of 2017.

Table 2

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

	A	B	C	D	E	Overall grade
BE	FC	FC	FC		FC	FC
BG	FC	FC	FC		SE	FC
CZ	LC	FC	LC		SE	LC
DK	FC	FC	FC		FC	FC
DE	FC	LC	FC		FC	FC
EE	FC	FC	LC		SE	FC
IE	FC	FC	FC		FC	FC
GR	FC	FC	FC		FC	FC
ES	FC	FC	FC		FC	FC
FR	LC	FC	FC		LC	LC
HR	FC	LC	FC		SE	FC
IT	FC	FC	FC		FC	FC
CY	FC	LC	LC		SE	LC
LV	FC	FC	FC		SE	FC
LT	FC	FC	FC		SE	FC
LU	FC	FC	FC		FC	FC
HU	FC	FC	FC		SE	FC
MT	FC	FC	FC		SE	FC
NL	FC	FC	FC		FC	FC
AT	FC	FC	FC		FC	FC
PL	FC	LC	LC		LC	LC
PT	FC	FC	FC		FC	FC
RO	FC	FC	FC		FC	FC
SI	FC	FC	LC		FC	FC
SK	FC	FC	FC		LC	FC
FI	FC	LC	FC		LC	LC
SE	LC	LC	LC		FC	LC
UK	FC	FC	FC		FC	FC
ECB	FC	SE	FC			FC
EBA	FC		LC	FC	FC	FC

FC	fully compliant
LC	largely compliant
PC	partially compliant
MN	materially non-compliant
NC	non-compliant
SE	inaction sufficiently explained
IE	inaction insufficiently explained

However, a number of issues that were not entirely within the scope of the Recommendation were also identified during the assessment process, leading to further analysis and discussion. One such issue was related to the allocation of tasks between the ECB and the NSAs following the establishment of the Single Supervisory Mechanism (SSM), which had taken place during the assessment phase and could not have been fully foreseen at the time of drafting the Recommendation. In addition, new legislative initiatives contributed to the effective implementation of this Recommendation, notwithstanding the fact that the addressees benefited from the policy inputs proposed by the ESRB. Finally, although the heterogeneous nature of the information collected during the assessments does not allow for in-depth cross-country comparisons and definitive conclusions, it can be concluded that the Recommendation largely contributed to the adoption of new frameworks, common monitoring procedures and best practices to address risks arising from secured and unsecured funding sources used by credit institutions.

1.3 Recommendation ESRB/2013/1 on intermediate objectives and instruments of macroprudential policy – Summary Compliance Report

On 4 April 2013 the ESRB published a Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB/2013/1) to pursue the ultimate objective of macroprudential policy, which is to safeguard the financial system as a whole. The Recommendation was addressed to national macroprudential authorities, Member States and the European Commission. This Recommendation was aimed at defining intermediate macroprudential policy objectives, in order to facilitate the attainment of the ultimate objective: the safety and soundness of the financial system as a whole. The intermediate objectives cover five target areas and should be linked to at least one relevant instrument selected by the national competent authority or NSA. The Recommendation included an indicative list of instruments for each intermediate objective. Moreover, it recommended that a comprehensive strategy for macroprudential policy should be devised and that this framework should be evaluated periodically.

The assessment of the implementation of the Recommendation across the EU Member States was completed by the end of January 2017. The Summary Compliance Report for Recommendation ESRB/2013/1 reveals a very high level of implementation by Member States, with intermediate objectives, macroprudential instruments and macroprudential strategies having been largely embedded in their frameworks (see Table 3).

The results show that all Member States pursue the intermediate objectives of macroprudential policy recommended by the ESRB and link them to specific macroprudential instruments. The adoption of macroprudential instruments has been assisted, in particular, by the implementation of the Capital Requirements Regulation and Directive (CRR/ CRD IV) legislative package at the national level across the EU, fostered by the European Commission. In many cases, the instruments focus on the banking sector owing to the bank-centric nature of most Member States' financial systems and to real estate market developments in some countries, which have induced authorities to consider the introduction of non-harmonised instruments. As a result, further improvements are possible in terms of monitoring potential macroprudential risks arising from the non-banking system and all types of financial infrastructures, including payment systems, deposit guarantee schemes and clearing through central counterparties.

As outlined in this Report, in many cases a comprehensive macroprudential policy strategy has been developed. In most cases, the involvement of the macroprudential authorities in the development and implementation of recovery and resolution plans and of deposit guarantee

schemes is guaranteed. Furthermore, major progress has been made on establishing effective communication between national macroprudential authorities and the ESRB.

Table 3

Addressees' compliance with Recommendation ESRB/2013/1 on intermediate objectives and instruments of macroprudential policy

	Overall grade	Recommendation A	Recommendation B	Recommendation C
Weights		**40%**	**40%**	**20%**
Austria	FC	FC	FC	FC
Belgium	FC	FC	FC	LC
Bulgaria	FC	FC	FC	LC
Croatia	FC	FC	FC	LC
Cyprus	FC	FC	FC	FC
Czech Republic	LC	LC	LC	PC
Denmark	FC	FC	FC	FC
Estonia	FC	FC	FC	FC
Finland	FC	FC	FC	LC
France	FC	FC	FC	FC
Germany	FC	FC	FC	FC
Greece	FC	FC	FC	FC
Hungary	FC	FC	FC	FC
Ireland	FC	FC	FC	FC
Italy	FC	FC	FC	LC
Latvia	FC	FC	FC	FC
Lithuania	FC	FC	FC	FC
Luxembourg	FC	FC	FC	FC
Malta	FC	FC	FC	FC
Netherlands	FC	FC	FC	FC
Poland	FC	FC	FC	FC
Portugal	LC	LC	FC	FC
Romania	FC	FC	FC	FC
Slovakia	FC	FC	FC	FC
Slovenia	FC	FC	FC	FC
Spain	LC	LC	FC	PC
Sweden	FC	FC	FC	LC
United Kingdom	FC	FC	FC	FC

FC	fully compliant
LC	largely compliant
PC	partially compliant

It should be highlighted that Member States have an ongoing responsibility to monitor and adjust their macroprudential framework at this initial stage of development of the national institutional frameworks and in the light of the changing risks faced by the financial system. A large majority of addressees are already in line with the Recommendation in terms of their commitment to periodically review their macroprudential framework in order to ensure its effectiveness and efficiency. This review also involves reassessing the need for additional intermediate objectives and instruments, which, for the moment, are not considered necessary by most addressees.

1.4 Recommendation ESRB/2015/1 on recognising and setting countercyclical buffer rates for exposures to third countries – Compliance Assessment

On 11 December 2015 the ESRB issued the Recommendation on recognising and setting countercyclical buffer (CCyB) rates for exposures to third countries (ESRB/2015/1) to mitigate risks arising from excessive credit growth in third countries. The Recommendation is addressed to the designated authorities.

The Recommendation aims to promote a coherent approach across the EU for recognising and setting CCyB rates for exposures to third countries in order to prevent an uneven playing field and regulatory arbitrage. The Recommendation is intended to ensure that designated authorities recognise CCyB rates set by third-country authorities, set CCyB rates for exposures to third countries and set lower CCyB rates when risks in a particular third country abate or materialise.

The deadline for addressees to provide information on the level of implementation of sub-recommendations B(1), B(2) and D was 31 December 2016. The assessment of compliance with these sub-recommendations across EU Member States started in January 2017 and is projected to be completed by the end of August 2017.

2 Reporting to the European Parliament and other institutional aspects

The ESRB reports regularly to the European Parliament on its activities pursuant to Article 19 of the ESRB Regulation on the discharge of its mandate.[76] In line with this obligation to be accountable, the Chair of the ESRB attends hearings before the Committee on Economic and Monetary Affairs of the European Parliament (ECON). These hearings are public and are transmitted by a webcast accessible via the ESRB's website.

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

At the hearings, the ESRB Chair presents policy initiatives that have been adopted in the course of the year, with a view to providing MEPs with first-hand information on the underlying rationale for them. The main points of the two most recent hearings are summarised below.

At the hearing on 21 June 2016 before ECON, the Chair of the ESRB highlighted the contributions made by the ESRB, including:

- the ESRB's ongoing work on the medium-term implications of low interest rate levels, including the ESRB General Board's discussions on these issues and validation of the technical work;
- the development of a strategy for macroprudential policy beyond the banking sector, namely through the publication of an ESRB strategy paper;

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[76] Regulation (EU) No 1092/2010 of the European Parliament and of the Council of 24 November 2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board (OJ L 331, 15.12.2010, p. 1).

- the ESRB's work on assessing risks to the investment fund and market-making sectors in the EU. The ESRB's data collection exercise covered 274 EU asset management firms and 1,668 fixed-income investment funds;
- ESRB publications, including but not limited to: ESRB reports on financial stability issues related to residential and commercial real estate; a review of macroprudential policy in the EU, which discusses the measures implemented across EU countries in 2015; a report by the ESRB on systemic risks in the insurance sector; and a report by the Advisory Scientific Committee, which contributed significantly to the discussion on financial stability risks stemming from climate change;
- the creation of a working group focusing on financial stability issues related to the introduction of the new international accounting standard IFRS 9.

At the hearing before ECON on 28 November 2016, the Chair of the ESRB outlined the ESRB's main achievements and recent measures, including, among other things, the following activities undertaken by the ESRB:

- the issuance of eight country-specific warnings on medium-term vulnerabilities in the residential real estate sector. The warnings were addressed to the relevant ministers in eight Member States, following an EU-wide assessment of vulnerabilities relating to residential real estate;
- the publication of the ESRB report on the macroprudential policy issues arising from low interest rates and structural changes in the EU financial system. The report was jointly produced by the ESRB's Advisory Scientific Committee and the Advisory Technical Committee and the ECB's Financial Stability Committee, and was considered an excellent example of successful cooperation;
- the publication of ESRB Recommendation 2016/14 on the closing of real estate data gaps, which covers both the residential and commercial real estate sectors. With this recommendation, the ESRB aims to establish a more harmonised framework for monitoring developments in real estate markets in the EU.

Lastly, the Chair of the ESRB observed that the ESRB will continue to exercise its mandate of macroprudential oversight of the financial system in the EU. In particular, its oversight function includes identifying country-specific financial stability vulnerabilities. The ESRB's institutional set-up allows it to exercise peer pressure and work against inaction bias. This includes issuing warnings if a significant systemic risk to financial stability is identified and needs to be notified, and issuing recommendations for remedial action.

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, which was launched in February 2016, is to gather research papers on systemic risks and macroprudential policy to inform the ESRB's policymaking. The views expressed in these publications are those of the authors and do not necessarily reflect the official stance of the ESRB. The number of papers published in the first year of this series reflects the growing interest in the field of macroprudential policy within the academic debate. A list of the ESRB's publications that are available on the website can be found in the Annex.

In 2016 the ESRB organised a number of conferences and workshops as part of its work aimed at fostering discussion on macroprudential policy. The ESRB international conference on the macroprudential use of margins and haircuts aimed to gather the views of policymakers, representatives from academia and market participants from different jurisdictions on the use of margins and haircuts as potential new instruments, and the main benefits and challenges in applying them for macroprudential purposes. At the First ESRB Annual Conference, panellists debated on the current macroprudential policy stance and the most prominent topics in the policy agenda, such as the low interest rate environment, the implications of the central clearing obligation to make safer trading on standardised OTC derivatives and the apparent scarcity of safe assets in the markets (see Box 4). The ESRB also organised the Conference on Systemic Risk Analytics in collaboration with Suomen Pankki – Finlands Bank and RiskLab at the Arcada University of Applied Sciences, with the aim of adopting advanced methods and techniques for systemic risk identification and assessment. The ESRB held a number of workshops, namely the second ESRB annual workshop on shadow banking in September 2016 and an ESRB industry workshop on sovereign bond-backed securities in December 2016.

Box 4
ESRB Annual Conference on 22-23 September 2016

On 22-23 September 2016 the ESRB held its first Annual Conference. The Conference included three keynote speeches, two policy panel discussions and three academic sessions. The proceedings are available to view on the ESRB's website.

In his welcome address, the Chair of the ESRB and President of the ECB, Mario Draghi, stated that the ESRB's strength lies in the diversity of its expertise. As such, the ESRB is uniquely placed to take a holistic view of the European financial system. Since its creation, the ESRB has contributed to building a rich set of macroprudential policy tools for banks, and continues to coordinate the calibration of those policies. The ESRB is also at the forefront of research into new macroprudential instruments beyond the banking sector.

In his capacity as Chair of the Advisory Technical Committee, the Governor of Sveriges Riksbank, Stefan Ingves, emphasised that the ESRB also benefits from its broad composition. The ESRB's inclusive working methods have enabled it to publish an extensive catalogue of work that contributes actively to the general policy debate. In this context, the Vice-President of the European Commission, Valdis Dombrovskis, presented the Commission's consultation document on the Review of the EU Macroprudential Policy Framework. The purpose of the consultation is to clarify the conditions governing when and how macroprudential measures are used. This includes an assessment of whether the existing macroprudential toolkit is sufficient, in both banking and non-banking sectors.

These keynote speeches set the scene for conference discussions, which included policy debates on measurement of the macroprudential policy stance and assessment of its effectiveness. Many participants noted the complexity of macroprudential policy, for which there are multiple instruments to target multiple intermediate objectives. Implementation of this kind of policy is in its formative years, but policymakers should nevertheless be prepared to deploy the novel instruments at their disposal, since greater risk arises from inaction. Moreover, policymakers can gauge the effectiveness of different instruments in mitigating systemic risks through thorough policy assessments and simulations.

At the Conference, paper presentations were given focusing on the implications of three specific systemic phenomena for macroprudential policy: namely low interest rates, derivatives trading and the scarcity of area-wide safe assets. Three main insights emerged. First, policy should allow banks and other financial institutions to adapt their business models to a prolonged low interest rate environment and structural overcapacity. Second, policymakers should complete reforms to derivatives markets – notably by mandating central clearing and trading obligations – in order to enhance their resilience. Third, in the euro area policymakers could consider addressing the scarcity of area-wide low-risk assets by creating sovereign bond-backed securities.

3 The institutional framework

The organisational structure of 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 currently chaired by the President of the ECB, Mario Draghi. The General Board, at its 25th regular meeting on 23 March 2017, appointed Philip R. Lane, Governor of the Central Bank of Ireland, as Chair of the ATC for a three-year term. Stefan Ingves, Governor of Sveriges Riksbank, who has chaired the ATC for the last six years, will remain Chair until the General Board meeting in June 2017. Professor Marco Pagano chaired the ASC until 31 December 2016, and Professor Richard Portes took over this responsibility as of 1 January 2017. The work of the ATC and the ASC is supported by a number of expert groups, which are listed in the organisational chart available on the ESRB's website.[77] In line with past editions, the Ieke van den Burg prize for research on systemic risk attracted a significant number of outstanding papers. The ASC conducts its selection with the support of the ESRB Secretariat. The winning paper will be published on the ESRB's website and presented at the ESRB Annual Conference in the autumn of 2017.

The day-to-day business of the ESRB is carried out by its Secretariat. The Head of the ESRB Secretariat is Francesco Mazzaferro and the Deputy Head is Tuomas Peltonen. In accordance with Council Regulation (EU) No 1096/2010[78] the ECB ensures the functioning of the Secretariat of the ESRB and provides it with analytical, statistical, logistical and administrative support. In 2016 the ECB provided the ESRB with support in the form of 61.8 full-time equivalent staff. Of these, 26.8 persons were employed within the Secretariat and 35 persons provided other forms of support. The direct costs incurred by the ECB amounted to €9.5 million. The indirect costs relating to other support services shared with the ECB (e.g. human resources, IT, general administration) must be added to this sum. Over the same period, other member institutions of the ESRB provided approximately 55 full-time equivalent staff for analytical support within the context of ESRB groups and ESRB chair positions.

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[77] **ESRB Organisational Chart**.

[78] **Council Regulation (EU) No 1096/2010 of 17 November 2010 conferring specific tasks upon the European Central Bank concerning the functioning of the European Systemic Risk Board** (OJ L 331, 15.12.2010, p. 162).

Annex – Publications on the ESRB's website from 1 April 2016 to 31 March 2017

Warnings

28/11/2016
Warning ESRB/2016/07 on medium-term vulnerabilities in the residential real estate sector of Denmark

28/11/2016
Warning ESRB/2016/06 on medium-term vulnerabilities in the residential real estate sector of Belgium

28/11/2016
Warning ESRB/2016/05 on medium-term vulnerabilities in the residential real estate sector of Austria

28/11/2016
Warning ESRB/2016/08 on medium-term vulnerabilities in the residential real estate sector of Finland

28/11/2016
Warning ESRB/2016/09 on medium-term vulnerabilities in the residential real estate sector of Luxembourg

28/11/2016
Warning ESRB/2016/10 on medium-term vulnerabilities in the residential real estate sector of the Netherlands

28/11/2016
Warning ESRB/2016/11 on medium-term vulnerabilities in the residential real estate sector of Sweden

28/11/2016
Warning ESRB/2016/12 on medium-term vulnerabilities in the residential real estate sector of the United Kingdom

Recommendations and Compliance Reports

01/03/2017
ESRB/2012/2 on funding of credit institutions: Follow-up – Summary Compliance Report

09/02/2017
ESRB Recommendation on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1): Follow-up – Summary Compliance Report

28/11/2016
Recommendation of 31 October 2016 on closing real estate data gaps (Recommendation ESRB/2016/14)

08/08/2016
Recommendation of 24 June 2016 amending Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2016/4)

22/04/2016
Recommendation of 24 March 2016 amending Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2016/3)

Commentaries and Occasional Papers

06/12/2016
Macroprudential Commentaries, No 8: "Implementation of the countercyclical capital buffer regime in the European Union"

22/09/2016
Occasional Paper No 11: "Shedding light on dark markets: First insights from the new EU-wide OTC derivatives dataset", by Jorge Abad, Iñaki Aldasoro, Christoph Aymanns, Marco D'Errico, Linda Fache Rousová et al.

27/07/2016
Occasional Paper No 10: "Assessing shadow banking – non-bank financial intermediation in Europe", by Laurent Grillet-Aubert, Jean-Baptiste Haquin, Clive Jackson, Neill Killeen and Christian Weistroffer

ESRB Reports

16/02/2017
The macroprudential use of margins and haircuts

28/11/2016
Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system

28/11/2016
Vulnerabilities in the EU residential real estate sector

06/10/2016
Preliminary investigation into the potential impact of a leverage ratio requirement on market liquidity

06/10/2016
Market liquidity and market-making

27/07/2016
EU Shadow Banking Monitor

13/05/2016
A Review of Macroprudential Policy in the EU in 2015

Working Papers

15/03/2017
Working Paper No 40: "Mapping the interconnectedness between EU banks and shadow banking entities", by Jorge Abad, Marco D'Errico, Neill Killeen, Vera Luz, Tuomas Peltonen, Richard Portes, Teresa Urbano

14/03/2017
Working Paper No 39: "Decomposing financial (in)stability in emerging economies", by Etienne Lepers, Antonio Sánchez Serrano

10/03/2017
Working Paper No 38: "Flight to liquidity and systemic bank runs", by Roberto Robatto

10/03/2017
Working Paper No 37: "SRISK: a conditional capital shortfall measure of systemic risk", by Christian Brownlees, Robert Engle

13/02/2017
Working Paper No 36: "Credit conditions, macroprudential policy and house prices", by Robert Kelly, Fergal McCann, Conor O'Toole

13/02/2017
Working Paper No 35: "Addressing the safety trilemma: a safe sovereign asset for the Eurozone", by Ad van Riet

13/02/2017
Working Paper No 34: "Resolution of international banks: can smaller countries cope?", by Dirk Schoenmaker

22/12/2016
Working Paper No 33: "How does risk flow in the credit default swap market?", by Marco D'Errico, Stefano Battiston, Tuomas Peltonen, Martin Scheicher

21/12/2016
Working Paper No 32: "Financial contagion with spillover effects: a multiplex network approach", by Gustavo Peralta, Ricardo Crisóstomo

21/12/2016
Working Paper No 31: "The (unintended?) consequences of the largest liquidity injection ever", by Matteo Crosignani, Miguel Faria-e-Castro, Luís Fonseca

17/11/2016
Working Paper No 30: "Exposure to international crises: trade vs. financial contagion", by Everett Grant

14/11/2016
Working Paper No 29: "Predicting vulnerabilities in the EU banking sector: the role of global and domestic factors", by Markus Behn, Carsten Detken, Tuomas Peltonen and Willem Schudel

20/10/2016
Working Paper No 28: "Financial intermediation, resource allocation, and macroeconomic interdependence", by Galip Kemal Ozhan

20/10/2016
Working Paper No 27: "(Pro?)-cyclicality of collateral haircuts and systemic illiquidity", by Florian Glaser and Sven Panz

20/10/2016
Working Paper No 26: "Using elasticities to derive optimal bankruptcy exemptions", by Eduardo Dávila

19/09/2016
Working Paper No 25: "Macroeconomic effects of secondary market trading", by Daniel Neuhann

19/09/2016
Working Paper No 24: "Macroprudential policy with liquidity panics", by Daniel Garcia-Macia and Alonso Villacorta

19/09/2016
Working Paper No 23: "Liquidity transformation in asset management: Evidence from the cash holdings of mutual funds", by Sergey Chernenko and Adi Sunderam

19/09/2016
Working Paper No 22: "Arbitraging the Basel securitization framework: Evidence from German ABS investment", by Matthias Efing

19/09/2016
Working Paper No 21: "ESBies: Safety in the tranches", by Markus K. Brunnermeier, Sam Langfield, Marco Pagano, Ricardo Reis, Stijn Van Nieuwerburgh and Dimitri Vayanos

08/08/2016
Working Paper No 20: "Multiplex interbank networks and systemic importance – An application to European data", by Iñaki Aldasoro and Iván Alves

25/07/2016
Working Paper No 19: "Strategic complementarity in banks' funding liquidity choices and financial stability", by André Silva

13/07/2016
Working Paper No 18: "Cyclical investment behavior across financial institutions", by Yannick Timmer

12/07/2016
Working Paper No 17: "Assessing the costs and benefits of capital-based macroprudential policy", by Markus Behn, Marco Gross and Tuomas Peltonen

28/06/2016
Working Paper No 16: "Bank recapitalizations and lending: A little is not enough", by Timotej Homar

28/06/2016
Working Paper No 15: "Credit default swap spreads and systemic financial risk", by Stefano Giglio

28/06/2016
Working Paper No 14: "Catering to investors through product complexity", by Claire Célérier and Boris Vallée

09/06/2016
Working Paper No 13: "Banks' exposure to interest rate risk and the transmission of monetary policy", by Matthieu Gomez, Augustin Landier, David Sraer and David Thesmar

03/06/2016

Working Paper No 12: “Extreme risk interdependence”, by Arnold Polanski and Evarist Stoja

02/05/2016

Working Paper No 11: “Bank exposures and sovereign stress transmission”, by Carlo Altavilla, Marco Pagano and Saverio Simonelli

02/05/2016

Working Paper No 10: “Systemic risk in clearing houses: Evidence from the European repo market”, by Charles Boissel, François Derrien, Evren Örs and David Thesmar

02/05/2016

Working Paper No 9: “Regime-dependent sovereign risk pricing during the euro crisis”, by Anne-Laure Delatte, Julien Fouquau and Richard Portes

20/04/2016

Working Paper No 8: “Double bank runs and liquidity risk management”, by Filippo Ippolito, José-Luis Peydró, Andrea Polo and Enrico Sette

12/04/2016

Working Paper No 7: “Bail-in expectations for European banks: Actions speak louder than words”, by Alexander Schäfer, Isabel Schnabel and Beatrice Weder di Mauro

Other ESRB publications

30/03/2017

ESRB Risk Dashboard, March 2017 (Issue 19)

06/03/2017

ESRB Secretariat staff response to the EIOPA Discussion Paper on the potential harmonisation of recovery and resolution frameworks for insurers

03/02/2017

Adverse scenario for the ESMA EU-wide central counterparty stress test in 2017

22/12/2016

ESRB Risk Dashboard, December 2016 (Issue 18)

24/10/2016

ESRB response to the European Commission’s Consultation Document on the Review of the EU Macro-prudential Policy Framework

04/10/2016

ESRB opinion to ESMA on securities financing transactions and leverage under Article 29 of the SFTR

29/09/2016

ESRB Risk Dashboard, September 2016 (Issue 17)

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Handbook on the assessment of compliance with ESRB recommendations

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