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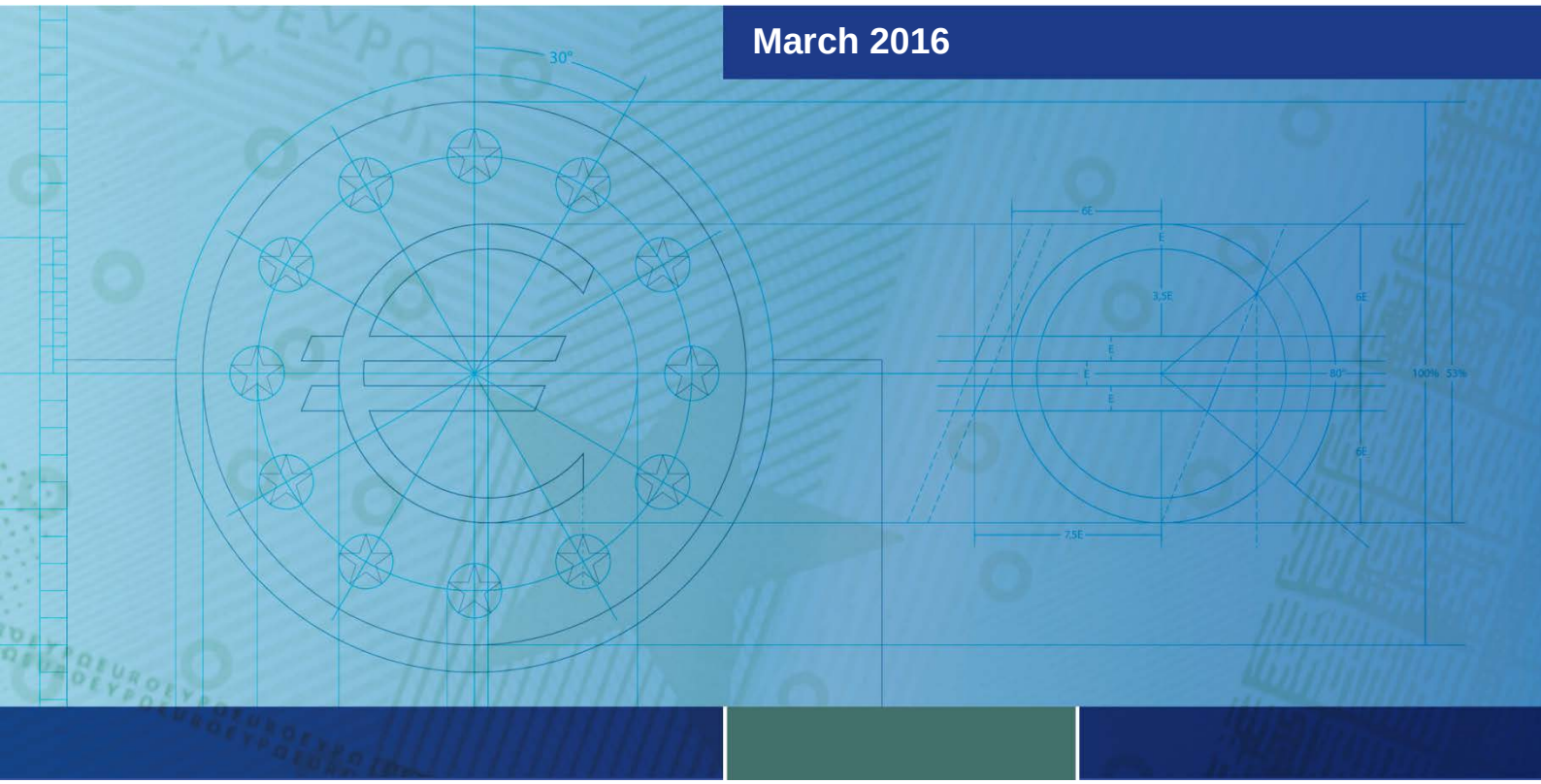

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Foreword

ECB Vice-President
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Since the financial crisis, the concept of macroprudential policy has progressively gained ground. The aim of macroprudential policy is to increase the resilience of individual financial institutions and of the financial system as a whole. It is also used to smooth out the financial cycle, determined by fluctuations in credit, leverage and asset prices, which may otherwise result in a pattern of boom and bust. The ECB has, in co-operation with national authorities, set up a macroprudential policy framework for the euro area, in order to achieve these important objectives. The ECB's responsibilities in the area of macroprudential policy stem from the Single Supervisory Mechanism (SSM) Regulation.

Published biannually, the Bulletin enhances transparency on macroprudential policy in the euro area. In this first edition, we present our framework for macroprudential policy and discuss its objectives and governance structure, as well as the policy instruments available.

The Macroprudential Bulletin is a channel to inform about ongoing research in macroprudential policy areas, and illustrates how it is applied in dedicated policy work at the ECB. This bulletin provides some examples of the analytical tools developed by the ECB and used to form a view on the adequate level of macroprudential capital requirements.

In addition, the Macroprudential Bulletin may also refer to macroprudential regulatory issues under discussion, and give an overview of recent announcements on macroprudential instruments adopted by national authorities in the euro area.

The Macroprudential Bulletin marks the starting point for regular reporting on analytical tools and models used to support macroprudential policy analysis in the euro area.

Vítor Constâncio

Vice-President of the European Central Bank

Chapter 1 – Topical issue
The ECB's macroprudential policy framework

This chapter provides an overview of the new macroprudential responsibilities conferred on the ECB under the Single Supervisory Mechanism (SSM) Regulation. It discusses the objectives being pursued by the ECB through its macroprudential policy and considers how the ECB is aiming to achieve its mandate. It also describes the macroprudential tools available to the ECB and presents the governance structure of the macroprudential policy framework.

1 A framework for macroprudential policy at the ECB

1.1 Introduction

Since the outbreak of the crisis, a broad consensus has emerged on the need for a new type of policy framework, which gives authorities the mandate to contain risk for the financial system as a whole, and provides them with the instruments with which to do so.[1] By adopting a system-wide perspective, macroprudential policy can help to fill the gaps left by traditional supervision. The crisis has shown that sound and rigorous microprudential supervision is an essential component of any policy designed to maintain financial stability, but that it may, on its own, not be sufficient.[2] In other words, ensuring the safety and soundness of individual institutions alone will not necessarily protect the financial system from systemic risk or externalities, which, if ignored, could pose a threat to financial stability.

At the same time, monetary policy, the aim of which is primarily to maintain price stability, cannot alone guarantee financial stability.[3] The financial and business cycles are often not synchronised: a monetary policy trying to stabilise the financial cycle may risk losing control of inflation and inflation expectations. Moreover, the monetary policy stance influences all sectors of the economy: monetary policy rates may be too broad and blunt a tool to address sector-specific imbalances, which may be the root cause of financial instability. To achieve price stability and financial

1 See, e.g., Caruana, J., April 2010, "Macroprudential Policy: Towards a New Consensus", speech given at the high-level meeting on "The Emerging Framework for Financial Regulation and Monetary Policy" jointly organised by the BIS's Financial Stability Institute and the IMF Institute, Washington DC; Hanson, S., Kashayp, A. and Stein, J., 2011, "A Macroprudential Approach to Financial Regulation", Journal of Economic Perspectives 25: 3-28; Bini Smaghi, L., May 2011, "Macroprudential supervision and monetary policy – linkages and demarcation lines", speech given at the OeNB Annual Economic Conference, Vienna; Constâncio, V., June 2014, "Making macroprudential policy work", speech given at high-level seminar organised by De Nederlandsche Bank, Amsterdam.

2 See, e.g., Brunnermeier, M., Crockett, A., Goodhart, C., Persaud, A. and Shin, H., 2009, "The fundamental principles of financial regulation", Geneva Reports on the World Economy 11.

3 See, e.g., Bean, C., August 2010, "Monetary Policy after the Fall", speech given at the Federal Reserve Bank of Kansas City Annual Conference, Jackson Hole.

stability simultaneously, two independent policy frameworks with specific instruments and objectives are therefore needed. Macroprudential policy has therefore gradually taken on an increasingly important role in ensuring financial stability.

In the euro area, the Single Supervisory Mechanism (SSM) Regulation confers specific powers and responsibilities on the ECB and on National Competent Authorities (NCAs) or National Designated Authorities (NDAs) in the field of macroprudential policy.

Embedding macroprudential responsibilities within the ECB and the Eurosystem will help to internalize cross-policy and cross-country spill-overs and ensure the coordination and consistency of macroprudential policies in the euro area.[4]

1.2 Objectives, instruments and general principles of macroprudential policy

1.2.1 Macroprudential objectives

The ultimate objective of macroprudential policy is to ensure financial stability. This includes strengthening the resilience of the financial system and limiting the build-up of vulnerabilities, in order to mitigate systemic risk and ensure the ongoing effective provision of financial services to the real economy.[5]

The sources of systemic risk can be classified in three broad categories: (a) severe macroeconomic shocks; (b) endogenous financial imbalances, resulting from excessive credit growth, excessive leverage and excessive maturity mismatches, and (c) contagion effects resulting from interconnectedness and herd behaviour.

As part of its strategy for containing systemic risks, the ECB's macroprudential policy includes the following operational objectives:

- Avoiding excessive accumulation of risk over time, in order to smoothen the financial cycle. This involves addressing externalities related to strategic complementarities, e.g. externalities resulting from financial institutions' tendency to take on common exposures to credit and liquidity risks, including maturity mismatches, during upturn phases of the financial cycle, or to shrink their balance sheets by selling off similar assets during the downturn phases of the financial cycle.

- Contributing, alongside microprudential supervision, to increasing the resilience of the financial sector and limiting contagion effects. This involves addressing externalities related to interconnectedness, e.g. externalities resulting from

[4] See, e.g., Draghi, M., February 2014, "The path to recovery and the ECB's role", speech given at the Symposium on Financial Stability and the Role of Central Banks organised by the Deutsche Bundesbank, Frankfurt am Main; Constâncio, V., October 2015, "Macroprudential policy in Europe: ensuring financial stability in a banking union", speech given at the Financial Stability Conference, Berlin.

[5] Article 3(1) of CRD defines systemic risk as a "risk of disruption in the financial system with the potential to have serious negative consequences for the financial system and the real economy".

financial institutions' direct and indirect interconnections, such as holdings of each other's assets or mutual liquidity funding.

- Encouraging a system-wide perspective in financial regulation, in order to create the right set of incentives for market participants.

1.2.2 Macroprudential instruments

The set of instruments that can be used as part of macroprudential policy is potentially very large, reflecting the multifaceted nature of the systemic risks being addressed, and can go beyond the banking sector.[6]

Macroprudential policy instruments for the banking sector can be grouped into three categories: (i) capital-based measures, (ii) asset-based measures, and (iii) liquidity-based measures.

The Glossary gives an overview of the macroprudential instruments available to the ECB and national authorities, based on this classification.

In particular, in accordance with Article 5 of the SSM Regulation, the ECB has the power to set higher requirements than those implemented by national authorities for the instruments covered by the Capital Requirements Directive (CRD IV) and the Capital Requirements Regulation (CRR) (see Section 1.3.1 below). These instruments include:

- The countercyclical capital buffer (CCyB, Articles 130 and 135 to 140 of CRD IV): this is designed to increase resilience during periods of excessive credit growth and to counter pro-cyclicality in the financial system. The CCyB ranges from 0% to 2.5% of risk weighted assets, but can be set higher where this is justified by the underlying risk.

- The systemic risk buffer (SRB, Articles 133 to 134 of CRD IV): this is designed to prevent and mitigate structural systemic risks. The SRB is a flexible instrument that can be applied to all or a subset of banks.

- The capital buffers for global systemically important institutions (G-SII) and other systemically important institutions (O-SII) (Article 131 of CRD IV): the G-SII buffer is mandatory for banks identified as having global systemic importance; its level and ranges from 1% to 3.5% of risk-weighted assets. The

[6] For discussions of available instruments, see European Systemic Risk Board, 2014, "The ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector"; International Monetary Fund, 2014, "Staff guidance note on macroprudential policy – Detailed guidance on instruments", IMF Policy Paper; Committee on the Global Financial System, December 2012, "Operationalizing the selection and application of macroprudential instruments", CGFS Papers, No 48; Bank of England, 2011, "Instruments of Macroprudential Policy" discussion paper; Lim, C., Columba, F., Costa, A., Kongsamut, P., Otani, A., Saiyid, M., Wezel, T. and Wu, X., 2011, "Macroprudential policy: what instruments and how to use them? Lessons from country experience", IMF Working Paper; Kok, C., Moccero, D., Martin, R. and Sandström, M., "Recent experience of European countries with macroprudential policy"", special feature in the ECB Financial Stability Review, May 2014.

O-SII buffer allows authorities to require institutions that are systemically important at the national level to maintain a capital buffer up to a level of 2%.

- Various instruments listed under the flexibility package (Article 458 of CRR).

Examples of instruments that are within the exclusive remit of national authorities are caps on loan-to-value (LTV) and loan-to-income (LTI) ratios. These measures affect credit flows directly and are typically used to address risks in a country's real estate market.

1.2.3 Macroprudential, microprudential and monetary policy

Microprudential supervision and macroprudential policy complement each other over a medium-term horizon. While the microprudential and macroprudential perspectives may diverge in some specific situations,[7] they share the ultimate objective of preserving financial stability. Microprudential measures designed to increase the resilience of financial institutions also contribute to moderating the emergence of financial vulnerabilities. Similarly, macroprudential instruments such as the CCyB, by mitigating the accumulation of imbalances, also contribute to making financial institutions more resilient.

Furthermore, there is a significant overlap between the instruments used in microprudential supervision and macroprudential policy. In macroprudential policy, however, the policy instruments are used to address risks of a systemic nature. These instruments include both broad-based instruments, such as the CCyB, which is designed to counteract the build-up of systemic vulnerabilities, and more targeted instruments, designed to reduce contagion risks or the build-up of risk in systemically important institutions. In microprudential supervision, meanwhile, the instruments are applied on individual institutions or limited groups of institutions, to strengthen their resilience and to mitigate their idiosyncratic risks. The commonality in the objectives and instruments of microprudential supervision and macroprudential policy make it essential to share information between the two areas and ensure a high degree of consistency in the action taken.

Macroprudential and monetary policies interact with each other mainly via their respective transmission channels, e.g. they both affect the supply of and demand for credit, incentives for risk-taking iand the funding conditions for financial intermediaries. The two policy areas can complement each other in ensuring both price stability and financial stability. For example, in an economic environment characterised by relatively muted inflation, which does not call for a tight monetary policy, and where financial imbalances are potentially building up, a macroprudential tightening can help to contain the development of such risks, thus complementing monetary policy. The fact that macroprudential instruments can be used in a more

[7] For example, in a severe downturn macroprudential authorities could call for a loosening of capital buffers in order to mitigate a credit crunch, while microprudential supervision may favour tightening measures in order to preserve banks' resilience. On the other hand, during a boom, capital or liquidity requirements might have to be tightened from a financial stability perspective, while from a microprudential supervision perspective, credit institutions might appear sufficiently resilient.

selective and targeted manner means that they can be useful for addressing more localised financial risks that affect specific sectors or countries. This is particularly important within a monetary union. In other words, macroprudential policy can 'unburden' monetary policy, allowing it to focus on its primary objective of maintaining price stability.

The euro area institutional set-up means that monetary policy, macro- and microprudential policy are managed by the same institution, the ECB, within a clear governance structure, under the direction of its decision-making body, the Governing Council. This allows the ECB to benefit from common access to information, to exploit synergies between the policy areas and to work within a consistent analytical framework.[8]

1.3 The governance of macroprudential policy: the institutional set-up

1.3.1 Macroprudential decisions

As mentioned above, the SSM Regulation assigns macroprudential responsibilities[9] to both the national authorities and the ECB, who are thus jointly responsible for macroprudential policy. In particular, the Regulation gives national authorities the power to implement macroprudential measures and gives the ECB the power to tighten the measures set out in EU legislation. The asymmetric nature of the powers assigned to the ECB reflects both the role the ECB is required to play should national authorities not take adequate action to implement macroprudential measures, and the expectation that NCAs and NDAs will be pro-active in reacting to the specific conditions being experienced in their country at any particular time. The ECB can also lead the analysis of cross-border effects, and can support action being taken to promote reciprocation of national macroprudential policies. The ECB and the national authorities engage in broad discussions on the use of macroprudential instruments in the SSM, both at technical and policy level. In this context, the ECB and the national authorities are in 'symmetric' roles, and the discussions serve to assess the adequacy of the macroprudential stance across the SSM and not only in any one individual Member State.

The ultimate decision-making body in the SSM is the Governing Council, which is also in the lead for macroprudential policy.[10] The Governing Council works closely with the Supervisory Board on macroprudential matters and benefits from the Supervisory Board's detailed knowledge of the banking system. The SSM Regulation

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8 See, e.g. Lautenschläger, S., September 2014, "Banking supervision – a challenge", speech given at the annual conference of the Verein für Socialpolitik, Hamburg; Lautenschläger, S., November 2014, "The interplay between macroprudential, microprudential and monetary policies at the ECB", presentation given at the conference "Macroprudential policy: Implementation and Interaction with other Policies" jointly organised by Sveriges Riksbank and the IMF, Stockholm; Darracq Pariès, M., Kok, C. and Rancoita, E., 2015, "Quantifying the policy mix in a monetary union with national macroprudential policies", special feature in the ECB Financial Stability Review, November 2015.

9 For an overview of the allocation of macroprudential powers in the European Union, see "Report of the Advisory Scientific Committee, No 5/November 2014: Allocating macroprudential powers", ESRB 2014.

10 See Decision of the European Central Bank of 22 January 2014 amending Decision ECB/2004/2 adopting the Rules of Procedure of the European Central Bank (ECB/2014/1).

outlines the basis on which macroprudential tasks have been assigned to the ECB, and sets out how the independence of monetary policy is to be preserved.

The Macroprudential Forum, composed of the members of the Governing Council and the Supervisory Board, operates as a platform for regular discussion at the highest level, bringing together the micro- and the macroprudential perspectives across the SSM. The Financial Stability Committee (FSC) is the European System of Central Banks' (ESCB) main technical committee supporting the ECB in the area of macroprudential policy. It includes high-level representatives from the national central banks and supervisory authorities of the SSM Member States. They meet to discuss macroprudential measures and advise the Governing Council on macroprudential concerns and potential policy responses, including the preparation of draft proposals on the activation of macroprudential tools.

The European Systemic Risk Board (ESRB), on which all EU central banks, national supervisory authorities and relevant EU institutions are represented, extends the discussion on systemic risk and the possible ways of mitigating it to EU level. Under the Regulation establishing the ESRB, the ECB provides analytical and technical support to the ESRB, and can therefore exploit synergies with its own analytical framework. Furthermore, the network created by the ESRB, which non-SSM and non-banking/non-central banking authorities are also part of, can promote the sharing of information, methodologies and best practices across its members.

1.4 The implementation of macroprudential policy in the ECB

The ECB's process of macroprudential policymaking consists of four distinct steps and can ultimately lead to the activation of a macroprudential instrument. The steps are as follows: i) identification and analysis of the main risks and vulnerabilities; ii) selection and calibration of instruments and evaluation of their impact; iii) discussion of policy options and decision as to which policy to implement; iv) implementation of this policy and ex post assessment of its effectiveness. The policymaking process can be initiated by the ECB or by national authorities. National authorities and the ECB are obliged to notify one another if they intend to activate a macroprudential policy instrument.[11]

1. The general risks for the euro area and the EU, as identified in the ECB's Financial Stability Review and in the analysis produced by the ECB to support the ESRB, constitute the starting point for the analysis of banking sector vulnerabilities. In addition to considering the risks for the euro area and the EU, the ECB also conducts analysis at country level, with the aim of identifying and monitoring risks that are specific to individual Member States. The ECB works in close cooperation with experts from the national authorities, exchanging data and analysis, and draws on material produced by members of the Eurosystem's

[11] Given the short deadlines set in the EU legislation, the official notification of macroprudential measures is preceded by informal discussion between the ECB and national authorities, starting much further in advance.

Financial Stability Committee, i.e. NCBs and/or national supervisory authorities, and on market intelligence.

Given the recurring features of past financial crises, model-based analysis can provide useful early warning signals (see the example in Section 2.3). While fully recognising the need to complement model-based analysis with expert judgement, the ECB relies on the former to overcome a potential "inaction bias", as it triggers an early discussion of the vulnerabilities identified. The ECB's model-based analysis is based on results from a set of early warning models that include a range of univariate signalling models[12] and country[13] and bank[14] multivariate logit models, in addition to machine learning tools (e.g. a random forest algorithm[15]), a measure of the financial cycle[16] and real estate valuation models. Further models that would improve the identification of early warning signs and macroprudential risks are currently under development. These include network-based measures of systemic risk, visualisation maps[17], and systemic risk indicators that focus on the cross-sectional dimension of macroprudential risk.

The close cooperation between the national authorities responsible for macroprudential policy and the ECB is crucial for identifying risks early. The national authorities contribute with a deep understanding of their national financial sector, while the ECB can offer insight into the relative situation of a country vis-à-vis its peers, and has extensive experience with model-based assessments.

2. When carrying out its financial risk assessment, the ECB relies on a number of different tools and methods to assess whether the macroprudential policy stance proposed by national authorities is appropriate or whether further action should be suggested, in accordance with its mandate in this area. In addition to assessing the new policies proposed (ex ante assessment), the ECB also reviews the country's past policies (ex post evaluation) as part of this assessment. The analytical tools chosen to assess the macroprudential stance range from structural models, such as general equilibrium models that include the banking sector, to reduced form models that capture past statistical patterns

12 See Detken, C., Weeken, O., Alessi, L., Bonfim D., Boucinha, M. M., Castro, C., Frontczak, S., Giordana, G., Giese, J., Jahn, N., Kakes, J., Klaus, B., Lang, J. H., Puzanova, N. and Welz, P., 2014, "Operationalizing the Countercyclical Capital Buffer", ESRB Occasional Paper, No 5.

13 See Behn, M., Detken, C., Peltonen, T. A. and Schudel, W., 2013, "Setting countercyclical capital buffers based on early warning models: Would it work?", ECB Working Paper, No 1604, and Lo Duca, M. and Peltonen, T. A., 2013, "Assessing systemic risks and predicting systemic events", Journal of Banking and Finance 37: 2183-2195.

14 See Betz, F., Oprică, S., Peltonen, T. A. and Sarlin, P., 2013, "Predicting distress in European banks", Journal of Banking & Finance, 45(C): 225-241.

15 See Alessi, L. and Detken, C., 2014, "Identifying excessive credit growth and leverage", ECB Working Paper, No 1723.

16 See Schüler, Y., Hiebert, P. and Peltonen, T. A., 2015, "Characterising the financial cycle: a multivariate and time-varying approach", ECB Working Paper, No 1846.

17 See Sarlin, P. and Peltonen, T. A., 2013, "Mapping the state of financial stability", Journal of International Financial Markets, Institutions and Money 26: 46-76; Hałaj, G. and Kok, C.,, 2014, "Modelling Emergence of the Interbank Networks", ECB Working Paper, No 1646 and Quantitative Finance (DOI:10.1080/14697688.2014.968357); Montagna, M. and Kok, C., 2013, "Multi-layered Interbank Model for Assessing Systemic Risk", Kiel Institute Working Paper, No 1873.

using micro bank-level data together with macro-financial series. One example of an evaluation of the macroeconomic effects of macroprudential capital requirements is given in Section 2.1 of this bulletin.

The ECB also assesses both the impact of risks that could potentially affect the financial sector as a whole (banks and insurance) and the impact of macroprudential measures. This work is mainly carried out using top-down stress tests, which use individual bank balance sheet data, together with macroeconomic and contagion models.[18]

3. Policy discussions on the potential costs and benefits of macroprudential measures take place in the relevant ESCB committees, most notably the Financial Stability Committee (FSC), where the Governing Council's policy decisions are prepared. The broad membership of the FSC means that national perspectives on macroprudential issues are also well represented in the discussion. The role of the ECB in this forum is to coordinate the discussion and to present a cross-country view of the overall macroprudential policy stance in the SSM area.

4. The last step of the macroprudential policy process involves the implementation of the chosen policy instruments, and includes the ex post assessment of their effectiveness. In general, the analytical tools used to evaluate the effectiveness of a policy are similar to those employed to select and calibrate policy instruments. The focus of the policy evaluation is on whether the policies being implemented are having the intended effects, in terms of achieving their objectives, whether further action is needed and whether there have been any unintended consequences (such as cross-border spill-overs).

1.5 The role of financial regulation

The starting point for macroprudential policy is the financial regulation of banks. As the financial crisis has shown, decisions taken by individual financial institutions do not necessarily account for the adverse externalities that their increased risk-taking behaviour may generate. To counter this risk, financial regulation should therefore incorporate these systemic aspects and create an incentive structure that takes sufficient account of the interests of all parties concerned, including in particular taxpayers and society as a whole, and considers longer-term perspectives, which go well beyond the traditional planning horizon of individual market participants. Financial regulation is therefore the first line of defence, in that it provides a sound incentive-compatible framework for all parties involved. Good design of financial regulation is critical for addressing risks and increasing systemic stability throughout the financial cycle.

As mentioned above, EU law (CRD IV/CRR) defines the set of macroprudential instruments to be used in the SSM area. These macroprudential tools were

[18] See Henry, J. and Kok, C. (Eds.), 2013, "A macro stress testing framework for assessing systemic risk in the banking sector", *ECB Occasional Paper No. 152.*

introduced following intensive discussions in various regulatory committees and public consultations at European and international level. The ECB contributes to the development of financial regulation at international and EU level, drawing on its expertise as a central bank and in micro- and macroprudential policy. Its new powers in the micro- and macroprudential area have made the ECB an active participant in discussions at all levels in the main regulatory fora.

Chapter 2
Macroprudential policy analysis and tools

This chapter provides some examples of the analytical tools used by the ECB for its macroprudential policy. It should be noted that the results provided in the Macroprudential Bulletin should not be interpreted as an indication of the final ECB view on national macroprudential measures, as the ECB uses several tools for its assessment.

1 Capital requirements in a model for the SSM area with three layers of default[19]

1.1 Purpose of the analytical tool

As part of its new responsibilities in the area of macroprudential policy, the ECB also determines what it considers to be the adequate level for capital requirements and assesses the costs and benefits of changes in the structural and cyclical capital. In order to provide a quantitative assessment of the role of capital-based macroprudential policies in SSM countries, the ECB is building on the model developed by Clerc et al. (2015)[20] as part of the work undertaken by the European System of Central Banks' Macroprudential Research Network (MaRs). The aim is to develop a decision-support tool that will provide policymakers with an analytical assessment of the quantitative costs and benefits of changes in bank capital requirements.

The dynamic structural model initially developed by Clerc et al. (2015) provides a unified framework and is thus an ideal frame within which to **evaluate the macroeconomic effects of capital requirements, and to assess the costs and benefits both in the short-run and the longer-run**. In this way, it allows the trade-offs between different variables and across time horizons to be assessed. It also offers insight into the incentives for banks to adjust their levels of capital to meet these requirements. In particular, the model shows whether the adjustments take place predominantly through changes in aggregate loan amounts or whether they are due to changes in the relative proportion of mortgage loans to households and loans to non-financial corporations.

This tool is being developed for use at both euro area level and country level. The tool is available to SSM countries and its implementation is being coordinated by a

[19] Section 2.1 was prepared by A. Colciago, S. Fahr, S. Hurtado, C. Mendicino, K. Nikolov and D. Supera.

[20] Clerc, L., Derviz, A., Mendicino, C., Moyen, S., Nikolov, K., Stracca, L., Suarez, J. and Vardoulakis, A. P., 2015, "Capital regulation in a macroeconomic model with three layers of default", International Journal of Central Banking, Vol. 11, No 3, pp. 9–63.

dedicated task force working under the Financial Stability Committee (see Section 1).

1.2 Description of the analytical tool

The model developed by Clerc et al. (2015), on which the ECB's analytical tool is based, introduces financial intermediation and **three layers of default into a dynamic stochastic general equilibrium (DSGE) framework**. Defaults can occur among banks, non-financial corporations and households. In the tradition of Kiyotaki and Moore (1997), households are split into savers and borrowers, and banks act as intermediaries moving funds from savers to final borrowers. Specifically, the model includes: (i) household bank deposits and loans for house purchases; (ii) corporate sector bank borrowing to fund entrepreneurial capital accumulation; (iii) default risk in all classes of borrowing (housing mortgages, non-financial borrowing and bank deposits); (iv) a net worth channel operating at the level of each levered sector; and (v) a cost of funding channel which operates via the premium demanded by depositors who suffer losses if banks default.

A distinctive feature of the model is that it provides a clear rationale for capital regulation. It demonstrates how capital regulation arises as a welfare-improving response to two types of distortion: the limited liability of banks, and the cost externalities of bank funding (which depend on system-wide bank behaviour). Both distortions can lead to excessive risk taking by banks. Higher capital ratios reduce the incentive for banks to take on excessive leverage and can thereby tighten the supply of loans. At the same time, higher capital ratios reduce bank defaults and thus reduce the cost of uninsured funds provided to banks, which in turn reduces the cost of credit. The impact of changes in capital requirements on lending and economic activity therefore depends on which of the two channels dominates.

The interaction between the capital ratios imposed on financial intermediaries and households' heterogeneity means that there is a trade-off between the welfare of savers and borrowers. In the long run, savers benefit from tighter capital regulation due to the reduced likelihood of bank failures which implies safer bank deposits. Borrowers, meanwhile, would lose out were capital ratios to become too large, as this would lead to a reduced supply of bank loans. As a result, in the long run, a positive capital ratio is generally optimal. The model can thus be used to analyse the effects of capital requirements on the level of macroeconomic variables and on the transmission of various types of shocks.

1.3 Illustrative results

In order to provide quantitative results for the euro area, Mendicino et al. (2015)[21] calibrated the model to match the first and second moments of a number of the main

[21] Mendicino, C., Kalin, N., Suarez, J. and Supera, D., 2015, "Welfare Analysis of Implementable Macroprudential Policy Rules: Heterogeneity and Trade-offs", forthcoming ECB Working Paper.

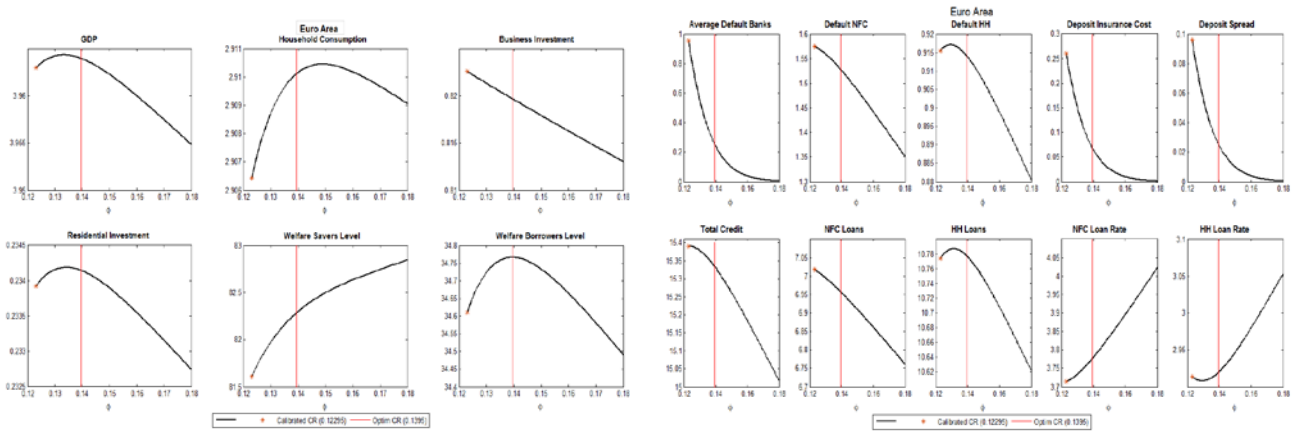
euro area aggregate macroeconomic and financial variables. Particular emphasis was placed on matching the empirical properties of various banking variables, such as bank capital ratios, loan write-offs and bank lending spreads and quantities.

Chart 1 assesses the long-term impact on macroeconomic variables of progressively increasing total capital ratios in the euro area from an initial level of 12.3%.

Chart 1

Long-run macroeconomic effects of varying the total capital ratio

(Changes in variables for given changes in total capital ratios)



Sources: Calculations performed by the DSGE work stream from the task force for operationalising macroprudential research, building on Mendicino et al (2015).

The results show that GDP, household consumption and borrowers' welfare first increase and then decrease as the capital ratio increases.[22] Higher capital requirements reduce bank leverage, bank failure risk and associated distortions. Depositors perceive banks to be safer and the cost of deposit funding declines. Higher bank capital requirements may benefit both savers and borrowers as a result of the consequent increase in capital ratios. Tightening capital requirements, however, also forces banks to use a larger proportion of more expensive equity financing per unit of lending (funding from equity being more expensive than debt financing), which corrects the limited liability distortion and, other things being equal, tightens the supply of loans. Thus, excessively high levels of capital requirements may unduly restrict credit availability.

When bank fragility is high (reflected in low levels of capital), increases in capital requirements can lead to credit expansion by making banks safer (as illustrated by the falling average default rates and deposit insurance costs shown in the charts). But, once the probability of bank failure has been sufficiently reduced and deposit spreads have moved close to zero, tighter capital requirements start to increase the cost of credit and to reduce investment and wages (not shown in the charts), and borrowers no longer benefit from a larger capital requirement. By considering these

22 Welfare is mostly driven by household consumption of goods and housing services. Other significant determinants are hours worked and the volatility of consumption (which both reduce welfare).

trade-offs, the model provides guidance as to an optimal level for capital requirements.

By including two different types of households, the model is also able to illustrate the difficulties of defining an optimal policy given that the policy has redistributive effects. It shows that capital requirements have an asymmetric effect on the welfare of savers and borrowers. If the model were used to derive a measure of the optimal capital ratio for the banking system, different alternative criteria for "optimal results" would lead to different results. A Pareto-type criteria would lead to increases in the capital requirement up until the point at which borrowers started to be hurt by further increases, whereas a criteria that tries to weight up the benefits to one group against the cost to the other (such as, for example, maximising total consumption) would lead to a higher level being chosen for the optimal capital ratio.

This comparative statics exercise highlights the importance of correctly taking into account the starting point when assessing the effects of a policy measure such as an increase in the capital ratio requirements for banks. In the euro area, an increase of one percentage point from the calibrated steady state would have a positive effect on GDP and consumption , but these effects could be negative if the capital ratio were already beyond the level at which the peak occurs in any one of these variables. This can be particularly important when the measure is to be implemented in a group of countries with non-homogeneous banking systems. Assessments are being conducted for each SSM country in order to provide both welfare-based optimal capital requirements and optimal capital requirements based on their effects on observable variables. The aim is to understand how these optimal levels depend on country-specific features and to evaluate the cost, in terms of both output and other variables, of a transition from the currently observed capital ratios to capital requirements that would increase financial stability and mitigate the effects of financial stress on the real economy.

2 A model of the euro area household sector for stress testing and assessing the efficacy of lending standard-related macroprudential policy measures[23]

2.1 Purpose of the analytical tool

The purpose of the integrated dynamic household balance sheet (IDHBS) model is to help assess how macroprudential policy instruments related to lending standards that banks set for borrowers ("borrower-based instruments") would affect households. The effect of imposing loan-to-value (LTV) ratio or debt service to income (DSTI) ratio caps, for example, can be assessed by comparing the results under an unconstrained scenario and under a scenario where an LTV or DSTI ratio cap is being imposed. The response of households, as measured by a number of

[23] Gross, M. and Poblacion, J. (ECB).

risk parameters, allows conclusions to be drawn both in terms of the effect on the households themselves and also the subsequent impact on bank balance sheets.

The model, and the impact assessment that can be conducted alongside it, are designed to offer insight into how borrower-based instruments can exert an influence on the economy. LTV caps shall exert their impact primarily through reducing loss given default (LGD) parameters, as the LTV ratio is directly related to the value of the underlying collateral underlying a mortgage loan. The effect of DSTI caps, on the other hand, stems mainly from the reduction in the probability that households will default on their debt, i.e. it is related to their probability of default (PD). The results from the model clearly confirm this. They also suggest, however, that the PDs and LGDs implied by the model correlate, such that both policies also have the potential to affect the other risk parameter. This is not a necessity in countries, such as many in Europe, where there is known to be little incentive for strategic default, unlike in the US where this incentive is stronger and where LTV caps therefore might have a greater potential to directly affect PDs.

2.2 Description of the analytical tool

The model has two core components – a macro part and a micro part.[24] The macro component uses the GVAR (global vector autoregressive) model structure to capture the dependencies of variables that shape the size and structure of household balance sheets over time: house prices, short- and long-term interest rates (affecting the income that households receive from their deposits and bond holdings, for example, but also the costs they incur when paying off their debts), and stock prices (affecting financial stock holdings). In addition to asset prices, the macro module also contains aggregate, country-level unemployment rates which provide an important input for the micro part of the model. The micro component of the model is built around a household member-level logistic model for their employment status. It is important for the macro and micro components of the model to be fully integrated at a technical level, as the dependency between the evolution of income, asset prices and employment rates over the business cycle needs to be captured accurately. The integrated model can then be used to conduct stochastic forward simulations, either without specifying further conditions, or under predefined macro-financial scenarios, and with or without policy caps.

The basis for the micro component of the model are the accounts of the subset of the 60,000 households (150,000 household members) covered by the Eurosystem Household Finance and Consumption Survey (HFCS) which hold mortgage debt. The survey is decentralised, to which all participating institutions (national central banks or national statistical institutes, depending on the country) which conduct their own wealth survey contribute.[25]

[24] The IDHBS model is composed of a number of integrated modules, details of which can be found in ECB Working Paper, No 1881, “Assessing the efficacy of borrower-based macroprudential policy using an integrated micro-macro model for European households” by Gross, M. and Poblacion, J.

[25] See the Household Finance and Consumption Network webpage for details.

2.3 Illustrative results

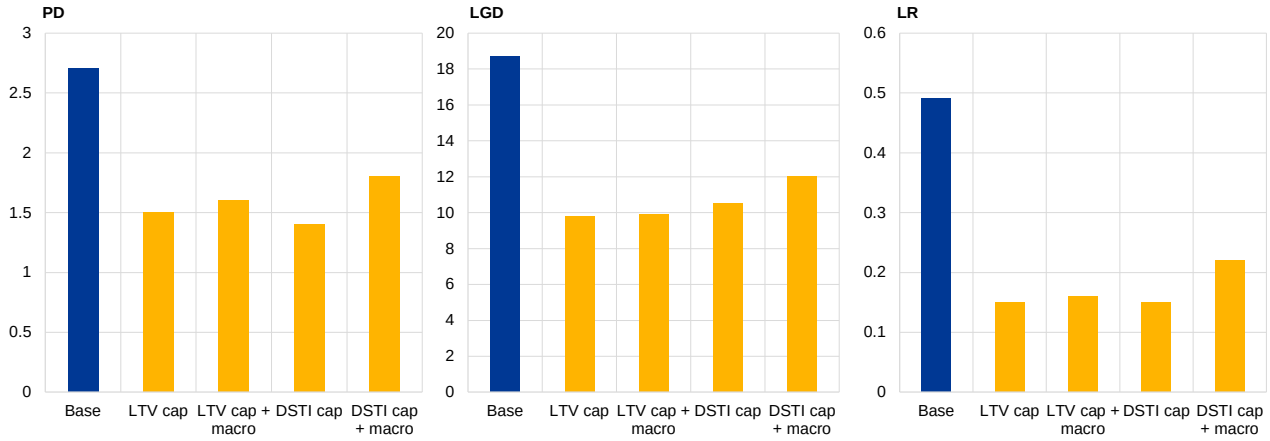
The assessment starts from an assumption about, for example, a retrospective LTV cap, set at a certain percentage for a particular country. In the following, we assume an 80% LTV cap for an anonymous country. It is assumed that, had this cap been introduced at the specified percentage level, a certain amount of mortgage loan volume would have been crowded out, i.e. not granted, in a particular recent reference year. This policy-induced drop in loan demand is used as an input for the macro component of the IDHBS model, which then translates the loan demand shock to macroeconomic responses. There are two main outputs from the model: the aggregate household risk parameters under the baseline scenario (without the LTV or DSTI cap), and under the alternative scenario, where the policy measure is activated. The risk parameters include the individual probabilities of default (aggregated at country level) and the loss given default, and their product, the expected loss rate.[26]

Chart 2 illustrates how the household risk parameters would behave in response to the assumed 80% LTV cap and to a DSTI cap, in the anonymous country, both excluding and including macroeconomic feedback effects.

Chart 2

PDs, LGDs and loss rates, in response to LTV and DSTI caps

(probabilities of default, loss given default, and loss rates are all in per cent; "+macro" denotes the results taking into account macroeconomic feedback effects)



Sources: Calculations based on IDHBS model.

The DSTI cap on which the estimates in Chart 2 are based is derived using a loss-rate-equivalent measure. This means that the DSTI ratio cap is set at a level such that the loss rates predicted by the model after the first-round mechanical impact of the LTV and DSTI caps respectively are equal. The DSTI cap needed for this to be the case (the loss-rate-equivalent DSTI cap) was approximately 0.5 in the example being used.

[26] Note that a "default" is defined as a household not being able to service its debt for at least one quarter (60 business days), i.e. it does not necessarily reflect literal bankruptcy of a household, but rather that its financial margin (the difference between periodic income and expense), has fallen to zero.

The IDHBS model can be used, with the implied loan volume demand shock as described above, to quantify the macroeconomic response. While the first-round mechanic reduction in PDs, LGDs and loss rates for households can be significant, these effects may be counteracted by the short-term macroeconomic response, which might imply for the household risk parameters to increase again to some extent (as can also be seen in Chart 2).[27]

There are a number of channels through which primary and secondary macroeconomic feedback effects may occur. The aggregate probability of default of households in the population may fall if households with a high LTV ratio were no longer granted loans (when under the baseline scenario they would have been), and if the high LTV ratio characteristic of these households correlates with lower financial margins, or possibly a higher propensity to become unemployed (to be assessed empirically). The primary impact on aggregate LGDs would be fairly mechanic. LGDs would be lower, as lower aggregate loan to value ratios mean that more collateral is available to back the household loans. The combined effect on loss rates from a credit provider perspective is likely to be negative (i.e. loss rates would fall), if only the first-round effects are considered.

Secondary effects can be split into short-term and medium-term secondary effects. One sort of short-term secondary effect (which can be assessed using the current version of the IDHBS model) arises as a result of reduced credit demand. This may mean that construction levels are lower, and thus that economic activity may fall by a certain degree. GDP would therefore drop, and unemployment rates may rise to some extent. This would thus create some counteracting upward pressure on PDs for households affected by unemployment. Downward pressure on house prices, or at least slower growth (an aim of the policy), would allow LGDs to rise as the expected value of housing collateral falls.

The model will be further developed along various dimensions. First, population growth will be made dynamic (the current version of the model operates with a static population). Second, the loan supply process will be made endogenous, such that households that do not have a mortgage loan at the outset will be allowed to apply for and be granted a mortgage loan. Third, an explicit distinction between principal and interest payments will be introduced, so that the repayment can be made a function of the change in the interest rate, including where this is caused by second-round effects. This is particularly relevant in countries that are characterised by variable rate regimes. The first two of these developments will allow modelling to be performed for a longer assessment horizon. We would currently advise to set this horizon to no more than two years as over a longer horizon the results might start being dominated by survivor bias, i.e. PDs would fall because high-risk households default on their debt repayment early in the simulation horizon. Careful attention should then, however, be given to finding the right balance between increasing the complexity of the model, by introducing dynamic population or loan origination

[27] The macroeconomic variable responses are not presented here. Please see ECB Working Paper, No 1881 for details.

features, and maintaining a simpler model structure, such as the current one, for the sake of robustness.

In addition to introducing these model refinements, further attention will also be given to determining how capital-based and borrower-based macroprudential measures can be assessed against one another, in order to answer questions as to which of the two is more effective, under specific circumstances (e.g. during particular phases in the business or financial cycle). One comparative assessment of the two borrower-based measures specifically (LTV and DSTI caps) is discussed in detail in the Working Paper that accompanies this bulletin. The analysis suggests that DSTI caps are more effective than LTV caps in reducing household loss rates ("effectiveness" being defined in terms of the implied reduction in loan volume). DSTI caps appear to create a systematically smaller loan demand shock than LTV caps for the same reduction in loss rates.[28]

3 A bank-level early warning model and its uses in macroprudential policy[29]

3.1 Purpose of the analytical tool

The bank early warning model (BEWM) can be used to identify both vulnerabilities in individual systemically important banks and vulnerabilities that build up simultaneously across a number of banks at euro area or country level. Compared to country-level early warning models, the BEWM has the advantage of providing a micro view on the build-up of vulnerabilities, which can be important when there are nonlinearities and bank heterogeneity. This model can therefore provide information about the build-up of systemic risk in the cross-sectional and the time dimension. The decomposition of bank-level distress probabilities into bank-specific, aggregate banking-sector and macro-financial factors can further support the identification of the main drivers of vulnerabilities. This can, in turn, inform macroprudential policy decisions.

3.2 Description of the analytical tool

The BEWM is built around a bank-level logit model that uses bank-specific, aggregate banking-sector and macro-financial indicators as predictive variables to warn of future bank distress. The model is based on the method and dataset described in Lang, Peltonen and Sarlin (2015)[30], applied to euro area banks. The logit model is estimated via the logistic LASSO (least absolute shrinkage and

[28] See ECB Working Paper, No 1881 for details.

[29] Prepared by Jan Hannes Lang.

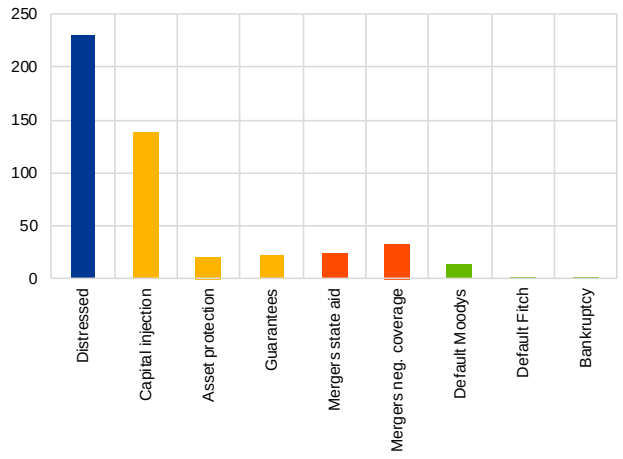
[30] Lang, J. H., Peltonen, T. and Sarlin, P., 2015, "A framework for early-warning modelling with an application to banks", forthcoming ECB Working Paper.

selection operator) method[31], where the shrinkage parameter is chosen by means of cross-validation, in order to obtain a parsimonious model specification that optimises the model's out-of-sample forecasting performance. The optimal signalling threshold for the logit model probabilities is derived by maximising the usefulness of the model for a policymaker who has a loss function that is defined in terms of Type I errors (missed crises) and Type II errors (false alarms), and that also accounts for the unconditional probability of events, as proposed by Sarlin (2013)[32]. The relative weight assigned to Type I errors is set at 0.9, which roughly corresponds to balanced preferences between Type I and II errors in the loss function framework developed by Alessi and Detken (2011)[33], given that the unconditional probability of a bank being in a vulnerable state (experiencing a "pre-distress event") is around 10% in the sample in question.

Chart 3

Most of the distress events used in the BEWM are related to capital injections by the state

(x-axis: distress categories; y-axis: number of distress event quarters)



Source: ECB calculations.
Notes: The results are based on the euro area sample taken from the dataset described in Lang, Peltonen and Sarlin (2015) – "A Framework for Early Warning Modelling with an Application to Banks" (forthcoming ECB Working Paper).

The bank distress events that are used to define the vulnerability indicator of the model comprise bankruptcies, defaults, liquidations, state-aid cases and distressed mergers (see Betz et al. (2014)[34] for details). Vulnerable states are defined as the eight quarters prior to a distress event. The model is estimated for a large number of euro area banks using data from the first quarter of 2000 to the last quarter of 2014. An overview of the distribution of distress events across the various subcategories can be found in Chart 3. Based on the dataset and the optimal penalty parameter obtained through cross-validation, the LASSO method automatically identifies the variables that best predict bank distress events over a two-year horizon. The optimal forecasting model contains 11 risk drivers: five bank-specific variables, four banking-sector variables and two macro-financial variables. In order to account for real-time publication lags, all of the variables are lagged by one or two quarters.

The five bank-specific variables identified as optimal predictors by the LASSO method relate respectively to bank leverage, asset quality, funding costs, profitability and trading activities. The four banking-sector indicators identified as optimal predictors relate to banking sector size, the change in the loan-to-deposit ratio and the level of and change in the share of market-based funding.

31 See Tibshirani, R., 1996, "Regression Shrinkage and Selection via the Lasso", Journal of the Royal Statistical Society, Vol. 58, 267-288.

32 See Sarlin, P., 2013, "On policymakers' loss functions and the evaluation of early warning systems", Economics Letters, 119 (1), 1-7. The loss function is defined as $L(\mu,\tau) = \mu P_1 T_1(\tau) + (1-\mu) P_2 T_2(\tau)$ where μ is the relative weight assigned to Type I errors, τ is a given signalling threshold, T1 and T2 are Type I and Type II error rates and P1 and P2 are the unconditional probabilities of distress events and tranquil periods.

33 Alessi, L. and Detken, C., 2011, "Quasi real time early warning indicators for costly asset price boom/bust cycles: A role for global liquidity", European Journal of Political Economy, 27 (3), 520-533.

34 Betz, F., Oprica, S., Peltonen, T. and Sarlin, P., 2014, "Predicting distress in European banks", Journal of Banking & Finance, Vol. 45, 225-241.

Finally, the two macro-financial variables identified by the LASSO method relate to developments in residential real estate prices and government bond yields.

Table 1 shows a number of in-sample and out-of-sample performance measures, which can be used to assess how well the optimal parsimonious model explains and predicts the data. Starting with the in-sample fit of the model, it can be seen that the parsimonious model seems to explain the data reasonably well. The AUROC, a measure of the global signalling performance of the model independent of policy preferences, is fairly high, at 0.847. In addition, the relative usefulness for a policymaker with a relative preference of 0.9 for Type I errors is around 53%, indicating that the model could offer considerable benefits for a policymaker who is relatively concerned about bank failures. The model only fails to signal less than one third of pre-distress events, while just 14% of calm periods are incorrectly classified as pre-distress events.

Table 1

Summary of the in-sample and out-of-sample performance of the BEWM

Measure	In-sample	Out-of-sample
AUROC	0.847	-
Relative usefulness	0.533	0.312
Missed vulnerable states	0.316	0.274
False distress alarms	0.141	0.260
Conditional distress probability	0.334	0.326
Unconditional distress probability	0.094	0.148
Probability difference	0.241	0.179
Signalling threshold	0.134	-
Observations	4,024	2,517

Source: ECB calculations.
Notes: The results are obtained from the bank early warning model (BEWM). The model is estimated for a large number of euro area banks and builds on the method and dataset described in Lang, Peltonen and Sarlin (2015) – "A Framework for Early Warning Modelling with an Application to Banks" (forthcoming ECB Working Paper). The out-of-sample performance measures are computed for a recursive one-quarter-ahead forecasting exercise between the first quarter of 2006 and the fourth quarter of 2014.

In terms of the out-of-sample performance, the model also attains a fairly high relative usefulness of 31.2%. This reflects the model's accuracy in classifying banks as vulnerable or not, with only 27.4% of pre-distress events not correctly identified and 26.0% of calm periods incorrectly classified as pre-distress events. The conditional out-of-sample distress probability is therefore fairly high, at 32.6% compared to an unconditional distress probability of 14.8%.[35] In summary, the parsimonious optimal early-warning model includes all the relevant categories of risk-drivers and performs well in signalling bank vulnerabilities both in-sample and out-of-sample.

3.3 Illustrative results

The BEWM can be used to identify both vulnerabilities in individual systemically important institutions and vulnerabilities that build up simultaneously across a

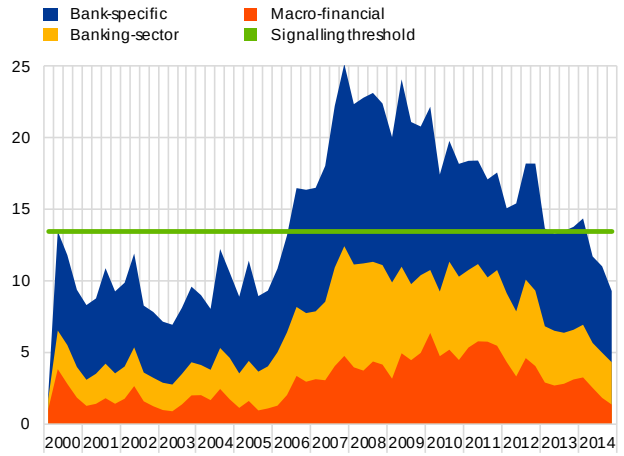
[35] The conditional distress probability is defined as the share of true pre-distress events whenever the model issued a vulnerability signal.

number of banks at euro area or country level. Aggregate euro area and country-level distress probabilities can be calculated as a weighted average of the individual distress probabilities for all the banks (for which data is available) in the country or region. In addition, a decomposition of distress probabilities into contributing factors can support the analysis carried out to guide macroprudential policy. It can help to gauge which factors drive the build-up of vulnerabilities, and can direct attention to relevant areas for further investigation.

Chart 4

The BEWM can be used to identify the build-up of vulnerabilities in the euro area banking sector

(x-axis: quarters; y-axis: weighted average bank-level distress probability in per cent)



Source: ECB calculations.
Notes: The aggregate distress probability is obtained from the bank early warning model (BEWM). The model is estimated for a large number of euro area banks and builds on the method and dataset described in Lang, Peltonen and Sarlin (2015) – "A Framework for Early Warning Modelling with an Application to Banks" (forthcoming ECB Working Paper).

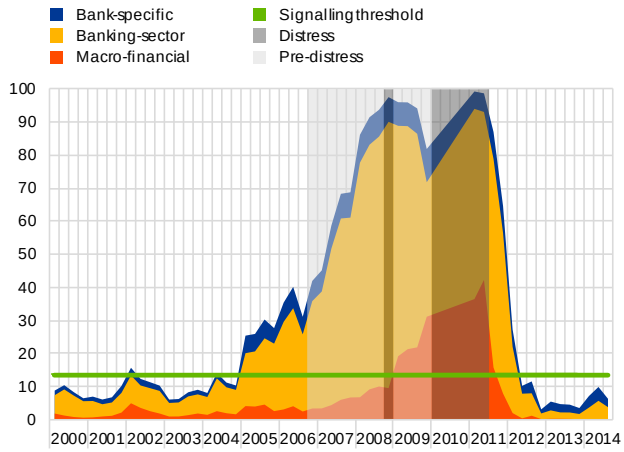
Chart 4 shows the aggregate distress probability for the euro area up to the final quarter of 2014, together with a decomposition of the factors contributing to this probability into bank-specific, aggregate banking-sector and macro-financial factors. As can be seen, the model captures the build-up of vulnerabilities prior to the global financial crisis fairly well. The model starts to issue warning signals for the euro area aggregate at the beginning of 2006. While the aggregated vulnerability for the euro area is currently well below the peaks reached before the financial crisis, it increased somewhat in the second and third quarters of 2015, partly driven by developments in Greece (not shown here). The decomposition of distress probabilities in the first quarter of 2016 into contributing factors suggests that remaining vulnerabilities in the euro area banking sector are mainly linked to bank-specific and country-level banking sector factors, while macro-financial factors, such as residential real estate prices and government bond yields, are currently playing a lesser role in most countries. A further breakdown of distress probabilities reveals that the remaining bank-specific vulnerabilities are, in most cases, strongly linked to weak asset quality, highlighting the need for comprehensive action to be taken to deal with non-performing loans. Similar aggregations and decompositions can also be produced at the country level.

Chart 5 shows an example of how the BEWM can be used to identify the build-up of vulnerabilities over time for individual systemically important banks. The coloured area represents the evolution of the forward looking distress probability for a given bank. Past distress events and pre-distress events for the bank are highlighted by the shaded areas. Further information on what is driving the distress probability is provided by the high-level decomposition of the distress probability into bank-specific, aggregate banking-sector and macro-financial factors. Finally, the signalling threshold provides information as to whether the estimated distress probability should raise warning signals that could lead to further investigation into the vulnerabilities identified in respect of this particular bank. Chart 6 shows another decomposition of the latest estimated distress probability into specific driving factors (within the three main groups of distress factors). This decomposition can help to identify the priority areas that a more detailed follow-up analysis should focus on.

Chart 5

The BEWM can be used to identify the build-up of vulnerabilities in individual banks

(x-axis: quarters; y-axis: bank-level distress probability in per cent)

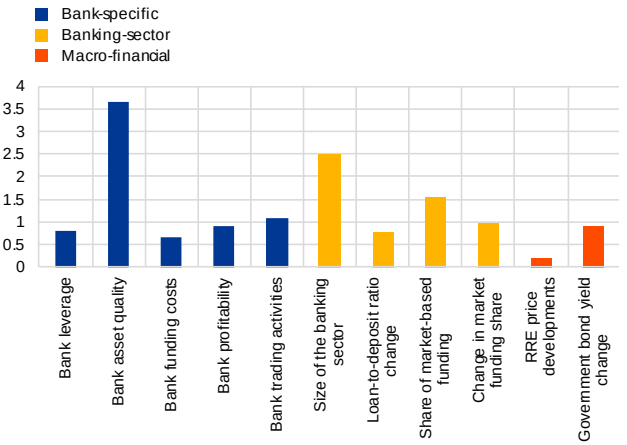


Source: ECB calculations.
Notes: The bank-level distress probability is obtained from the bank early warning model (BEWM). The model is estimated for a large number of euro area banks and builds on the method and dataset described in Lang, Peltonen and Sarlin (2015) – "A Framework for Early Warning Modelling with an Application to Banks" (forthcoming ECB Working Paper).

Chart 6

Distress probability decompositions can help to gauge the importance of different driving factors

(x-axis: risk drivers; y-axis: percentage point contribution to distress probability)



Source: ECB calculations.
Notes: The distress probabilities are decomposed into their different factors using the relative distress probabilities that would prevail if all other factors were set to their mean values. See Lang, Peltonen and Sarlin (2015) – "A Framework for Early Warning Modelling with an Application to Banks" (forthcoming ECB Working Paper) for further details.

Annex 1
Macroprudential policy measures at a glance

This Annex provides on overview of the macroprudential policy measures that have been implemented or announced in euro area countries since the publication of the last ECB Financial Stability Review in November 2015. In each case, a link is given to the announcement of the macroprudential or regulatory measure issued by national authorities, where further information can be found. The cut-off date for reporting macroprudential measure was 29 February 2016. As soon as the information on macroprudential policy measures is made available on the ECB website, the Annex will no longer be included in the Macroprudential Bulletin.

1 Assessment of macroprudential policy measures by the ECB

As mentioned in Chapter 1, the ECB is responsible for assessing the macroprudential policy measures adopted by national authorities in the SSM area and has the right to object these measures. In addition, the ECB has the power to apply more stringent measures designed to address risks to financial stability.

The ECB takes into account the results of many different analytical tools when assessing national measures. Some of these are described in this Macroprudential Bulletin (see Chapter 2) or will be discussed in future bulletins. Moreover, the ECB's assessment is discussed in detail with the respective national authority and with all members of the Financial Stability Committee (FSC), before being presented to the ECB's Macroprudential Forum, composed of the Governing Council and the Supervisory Board of the ECB, for discussion.

The macroprudential policy measures introduced by SSM countries since the publication of the latest Financial Stability Review in November 2015 have focused particularly on implementing the legal framework for the countercyclical capital buffer (CCyB) and on setting the corresponding buffer rates (pursuant to Article 130 of CRD IV and the transitional provisions set out in Article 160 of CRD IV). In accordance with the requirements set out in CRD IV, the national authorities of SSM countries have identified other systemically important institutions (O-SIIs) authorised within their jurisdiction. France, Germany, Italy, Spain and the Netherlands have all identified G-SIIs. Further details on the measures recently introduced by SSM countries are provided in Section 2 of this Annex.

2 Macroprudential policy measures

2.1 Countercyclical capital buffers

As part of the regulatory response to the financial crisis, the Basel Committee on Banking Supervision prepared a new set of global capital standards (Basel III). Two new requirements introduced in these standards were the capital conservation buffer (CCoB) and the countercyclical capital buffer (CCyB). The CCyB is an important instrument in macroprudential policy and has been incorporated into EU law via the Capital Requirements Directive IV (CRD IV).

The aim of the CCyB is to protect banks from periods of excessive credit growth that have often been associated with the build-up of system-wide risk. During an upswing in the credit cycle, banks are required to hold the CCyB in addition to meeting the other capital requirements. This should increase banks' resilience and at the same time make credit more expensive, thus slowing the extension of credit. The CCyB requires not only that banks hold a certain amount of extra capital, but also that this capital is Common Equity Tier 1 (CET1), which is capital of the highest quality. If a bank does not have enough CET1 capital to meet the CCyB requirement, it will be subject to restrictions on the discretionary distributions it can make (e.g. dividends, bonuses and coupon payments on AT1 instruments). In downturns, the CCyB can be partially or fully released. This new requirement should thus help to prevent a breakdown of the supply of credit to the real economy during a crisis, which can occur as a result of high regulatory capital requirements.

In accordance with CRD IV, each Member State will designate a public authority or body (the national designated authority (NDA), which can be also the national competent authority (NCA)) that is responsible for setting the CCyB rate for the relevant exposure in this country.

The CCyB rate can be set in steps of 0.25 percentage points between 0% and 2.5% of total risk exposure amount (risk weighted assets, RWAs). Banks are required to comply within 12 months of the announcement (and in exceptional cases within less than 12 months). If a country decides to lower the CCyB rate, this decision will take effect immediately. The NCA or NDA can set the CCyB rate at a level higher than 2.5% if it considers that the conditions in the Member State justify this course of action. The CCyB is a bank-specific buffer, which means that the CCyB is calculated as the weighted average of the national CCyB rates in effect in the countries to which a particular bank has relevant credit exposures. Jurisdictional reciprocity[36] will be applied in the case of internationally active banks. This ensures that the domestic CCyB in force in one country is also applied by non-domestic EU banks operating in this country.

The NCAs or NDAs will notify the ECB of the rate set for the CCyB each quarter. They are required to provide, as a minimum, the following information: the CCyB rate in force; the credit-to-GDP ratio and its deviation from the long-term trend; the buffer

[36] Reciprocity is mandatory for CCyBs below 2.5%, but voluntary above 2.5%.

guide; a justification for the buffer rate; the date at which the CCyB rate is being increased or decreased; and a description of the exceptional circumstances if the CCyB rate is to be applied sooner than 12 months after its announcement.

These rules apply as of 2016, but CRD IV allows a phasing-in period for the maximum bank-specific CCyB that national authorities can require banks to hold. This period lasts from 1 January 2016 to 31 December 2018. Member States are, however, also allowed to apply a shorter transitional period.

To date, all euro area countries have notified the ECB of CCyB rates of 0% of total risk exposure amount (RWAs). Links to the announcements issued by the NCAs or NDAs are provided in the table below.

Table 1

Links to CCyB decisions for Q1 2016; in % of total risk exposure amount

AT	0%	BE	0%	CY	0%	DE	0%	EE	0%
ES	0%	FI	0%	FR	0%	GR	0%	IE	0%
IT	0%	LT	0%	LU	0%	LV	0%	MT	0%
NL	0%	PT	0%	SI	0%	SK	0%		

Sources: ECB, ESRB and national authorities.

CRD IV allows small and medium-sized investment firms to be exempted from the CCyB requirement, providing such an exemption does not threaten the stability of the financial system of that Member State.

2.2 Other systemically important institutions (O-SIIs)

The failure of a systemically important institution could be severely damaging to the financial system and the real economy. In maximising its private benefits, an institution makes rational decisions, but without taking any negative externalities affecting the financial system into account. Moreover, it is assumed that a systemically important institution may have implicit government guarantees for its existence, which can lead to moral hazard in the form of lower market discipline and excessive risk taking. The O-SII buffer aims to mitigate this behaviour by imposing stricter requirements on systematically important institutions.

Member States' national authorities identify O-SIIs according to the guidelines developed by the EBA (EBA-GL-2014-10). These guidelines propose a scoring system for the degree of systemic importance of an institution. An institution's overall score is obtained by aggregating its scores for a set of 10 indicators, reflecting its size, importance, complexity and degree of interconnectedness. Institutions with scores above a certain threshold (that national authorities can set at a level between 275 and 425 basis points) should be automatically identified as O-SIIs. The guidelines specify the variables to be used to calculate an institution's score. The value of each variable is determined on a consolidated basis, with information from FINREP statements also being taken into account. In cases where the FINREP variables for a particular institution are not available, the most similar available variables should be used. In addition to classifying the institutions automatically

identified by this process as O-SIIs, authorities should also then assess whether any other institutions are sufficiently systemically relevant that they should also be designated as O-SIIs. When making this decision, they should focus on the indicators which they consider to best capture systemic risk in their particular domestic sector or in the EU economy.

The national authority may require O-SIIs to maintain an O-SII buffer of up to 2% of the total risk exposure amount (RWAs). When more than one of the O-SII, the G-SII and the systemic risk buffer (SRB) have been set for one institution, with respect to all its exposures, the highest of the buffer requirements will be applied. This one buffer requirement must then be met with CET1 capital, held by the bank in addition to the CET1 capital it is otherwise required to hold. The O-SII buffer will be phased in in equal steps from 1 January 2016 to 1 January 2019. National authorities are required to review the level of the buffer at least once a year.

Table 2 provides an overview on O-SII buffer capital buffer requirements for 2016, which have publicly been announced. In some countries, the decisions on O-SII designations and O-SII buffers have not been made public yet.

Table 2

Links to O-SIIs buffers in 2016; in % of total risk exposure amount

AT		BE	0.25%-0.5%	CY	0.0%	DE		EE	0.0%
ES	0.0%–0.25%	FI	0.5%-2.0%	FR	0.0625-0.375%	GR	0.0%	IE	0.0%
IT	0.0%	LT	0.0%	LU	0.125%-0.25%	LV	0.0%	MT	0.125%-0.5%
NL	0.25%-0.5%	PT	0.0%	SI	0.0%	SK	1.0%		

Sources: ECB, ESRB and national authorities.

More details on the national O-SII buffer decisions since the publication of the most recent ECB Financial Stability Review in November 2015 are provided below.

Cyprus

O-SII

The Central Bank of Cyprus has designated six banks as O-SIIs (Bank of Cyprus Public Company, Hellenic Bank Public Company, RCB Bank, Central Cooperative Bank, Eurobank Cyprus and Alpha Bank Cyprus). The total O-SII capital buffer requirement will range from 0.5% to 2.0% of the total risk exposure amount (RWAs) as of 2022, after a four year phasing-in period.

Estonia

O-SII

The central bank of Estonia, Eesti Pank, has notified the European Systemic Risk Board (ESRB) of the identification of Swedbank AS and AS SEB Pank as O-SIIs. Eesti Pank will set the O-SII rate during the first half of 2016. Both banks identified as O-SIIs are among the bank significant to the SSM as they each have total assets of above 20 % of GDP.

France

France's prudential supervisory and resolution authority, l'Autorité de contrôle prudential et de résolution (ACPR) has notified the ESRB of six O-SIIs. An O-SII buffer rate of 1.5% of total risk exposure amount (RWAs), to be gradually phased in until 2019, has been set for BNP Paribas. BNP Paribas is also, however, a G-SII, and has a G-SII buffer rate of 2% coming into force in 2019. As only the highest buffer applies, it is the G-SII buffer rate that BNP Paribas is required to comply with. Société Générale, BPCE and Crédit Agricole have also been designated as both G-SIIs and O-SIIs, with buffer rates of 1% from 2019. In addition, ACPR has designated Crédit Mutuel and La Banque Postale as O-SIIs, with 0.5% and 0.25% buffer rates from 2019.

Greece

The Bank of Greece has designated four O-SIIs (National Bank of Greece, Alpha Bank, Piraeus Bank and Eurobank Ergasias) and has decided to phase-in the O-SII buffer rates set for these banks. As of 2019, the buffer rates will increase by 0.25% of total risk exposure amount (RWAs) every year until 2022.

Italy

The Banca d'Italia has designated three institutions as O-SIIs (Unicredit Group, Intesa Sanpaolo and Banca Monte dei Paschi di Siena). The O-SII buffer rate will be set at 0% in 2016. The reasoning behind this decision was as follows. One of the banking groups identified as an O-SII (Unicredit) also has G-SII status and is therefore already subject to a 1% G-SII capital buffer. Moreover, the three banking groups identified as O-SIIs are already adequately capitalised, thanks in part to the Pillar 2 capital buffer requirements, and are required to maintain a CET1 buffer of 1% to offset systemic risk. The Banca d'Italia's decision seeks to avoid an overlap between micro-and macroprudential measures (e.g. the O-SII buffer) designed to offset the same risk. Moreover, the three O-SIIs are subject to closer supervision. Another reason was that the CCoB has been being fully implemented for all banks since 2014. The Banca d'Italia considers that the set of prudential measures already in place adequately addresses the risks of domestically systemic banks. Furthermore, it sees there being a substantial danger of additional buffer requirements hampering Italy's already sluggish economic recovery and thus undermining the country's financial stability.

Latvia

Latvia's financial and capital market commission, Finanšu un kapitāla tirgus komisijahas designated six banks (ABLV Bank, Swedbank, SEB banka, Citadele banka, Rietumu Banka and AS DNB banka) as O-SIIs. An O-SII buffer is not currently being applied.

Lithuania

The central bank of Lithuania, Lietuvos bankas has designated four banks (AB SEB bankas, Swedbank AB, AB DNB bankas and AB Siauliu bankas) as O-SIIs. It has set buffer rates of 2% of total risk exposure amount (RWAs) for the first three banks listed and 0.5% for AB Siauliu bankas, applicable from 31 December 2016.

Luxembourg

Six banks have been designated as O-SIIs. Two of these banks (Deutsche Bank Luxembourg S.A. and Société Générale Bank & Trust S.A.), are subject to an O-SII buffer rate of 1%, which is being phased in gradually until 2019. The other four institutions (Banque et Caisse d'Epargne de l'Etat Luxembourg, BGL BNP Paribas S.A., CACEIS Bank Luxembourg S.A. and Banque Internationale à Luxembourg S.A.) are required to implement a buffer of 0.5% from 2019, also following a phasing-in period.

Malta

Malta has designated three banks as O-SIIs. The O-SII buffer rate has been set at 2% of total risk exposure amount (RWAs) for Bank of Valletta Group, 1.5% for HSBC Bank Malta plc and 0.5% for Medifin Holding Limited, with the buffer rates being gradually phased in over the period to 2019.

The Netherlands

De Nederlandsche Bank has designated five banks as O-SIIs (ING bank, Rabobank, ABN Amro Bank, SNS bank and N.V. Bank Nederlandse Gemeenten). For three of these (ING bank, Rabobank and ABN Amro Bank), it has set a buffer rate of 2% of total risk exposure amount (RWAs), to apply from 2019, and has decided to apply a systemic risk buffer (SRB) at a rate of 3%. The highest of the two buffers will apply (in the case of ING bank, which is a G-SII and also has a G-SII buffer rate of 1%, the highest of the three will apply). The two remaining banks (SNS bank and N.V. Bank Nederlandse Gemeenten) have been set an O-SII buffer rate of 1%. All buffers will be gradually phased in in equal steps.

Portugal

The Banco de Portugal has decided to apply an O-SII buffer of between 0.25% and 1% of total risk exposure amount (RWAs) to six banks (Caixa Geral de Depósitos, Banco Comercial Português, Novo Banco, Santander Totta – SGPS, Banco BPI and Caixa Económica Montepio Geral), with effect from 1 January 2017. The bank Banif (Banco Internacional do Funchal) was also initially identified as an O-SII, but in the aftermath of the resolution measure applied to Banif, the Banco de Portugal decided not to include Banif in the O-SIIs identified. The Banco de Portugal identified these banks using the 10 indicators set out in the mandatory framework, and an optional indicator ("geographical breakdown of banks activities (deposits and loans)"), as

provided for in the EBA guidelines. The O-SII capital buffers to be applied to these institutions were determined using the clusters methodology.

Slovenia

Banka Slovenije has designated eight banks (NLB, SID, Unicredit banka, Abanka, NKBM, SKB, Sberbank and Banka Koper) as O-SIIs. The O-SII buffer rates range from 0.25% to 1% of total risk exposure amount (RWAs). Banks are required to meet their buffer requirements from 1 January 2019 onwards.

Spain

The Banco de España has identified six banks as O-SIIs, and set buffers of between 0% and 1% of total risk exposure amount (RWAs), to apply from 1 January 2016. In addition to Banco Santander and BBVA, which have been identified as G-SIIs, the Banco de España has also designated Caixabank, Bankia, Popular and Sabadell as O-SIIs. For BBVA, the O-SII buffer is lower than the G-SII buffer, and the G-SII buffer of 0.25% of RWAs will therefore be applied.

2.3 Other macroprudential measures

Austria

The Austrian financial market authority, Finanzmarktaufsicht introduced a systemic risk buffer (SRB) at the start of 2016. As recommended by the Austrian Financial Market Stability Board (FMSB), the SRB rate will vary between 0.25% and 1.0% of total risk exposure amount (RWAs) during 2016, and will then increase to up to 2% of total risk exposure amount by 2019. Table 2A and Table 2B provide a list of the institutions identified by the FMA, and the respective SRB rates they are required to comply with in 2016 and 2019.

Belgium

The Nationale Bank van België/Banque Nationale de Belgique has decided to extend for one year the 5-percentage-point add-on applied to the risk weight assigned to mortgage loan exposures by banks using the internal ratings-based models (IRB) approach. This decision was motivated by the bank's observation that exposures to real estate continued to rise in 2014 and the first half of 2015, leading to a further rise in households' indebtedness. The proportion of new loans with a high-risk profile therefore remained high. This extension of this measure introduced in 2013 is conditional on the agreement of the European Commission.

Finland

The board of the financial supervisory authority, Finanssivalvonta issued a statement on the low level of housing loan risk weights applied by banks in capital adequacy calculations, and the need to increase these risk weights. The housing loan risk

weights applied in Finland are low when assessed from a macroprudential perspective, and compared with those applied in other EU and Nordic countries.

Germany

The German supervisory authority BaFin has designated Deutsche Bank AG as a G-SII. Deutsche Bank AG is required to hold additional own funds, increasing by 0.5% each year from 2016, up to a level of 2.0% of total risk exposure amount, to be reached in 2019.

Italy

The Banca d'Italia has designated Unicredit Group as a G-SII and has categorised it as belonging to the set of G-SIIs subject to a G-SII capital buffer of 1% of total risk exposure amount (RWAs). The Banca d'Italia is making use of the phase-in allowed under CRD IV, meaning that the buffer rate will rise by 0.25% of total risk exposure amount each year starting in 2016, to reach the level of 1%.

Spain

The Banco de España has identified Banco Santander and BBVA as G-SIIs. This means they will be subject to a required regulatory capital surcharge of 0.25% total risk exposure amount (RWAs) in 2016. Although the score calculated for BBVA, following the EBA guidelines, was below the benchmark for automatic identification as a G-SII, Banco de España decided to include this institution in the list of G-SIIs on the basis of supervisory judgement.

3 Total minimum capital requirements at country level

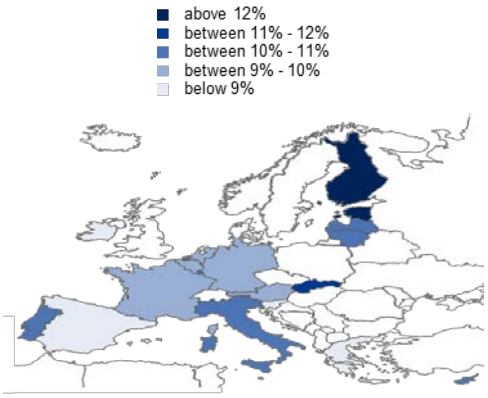
This section provides an overview of the macroprudential policy measures introduced in 2016, and those announced for 2019, in each of the euro area Member States. It should be noted that all tables are based on publicly available data, and that Pillar 2 requirements have not therefore been taken into account.

The charts below show the highest total minimum capital requirements that will be able to be applied at country level in 2016 and 2019.

Chart 1

Highest total minimum capital requirements for G-SIIs, O-SIIs and banks with SRBs as of **2016**

(in % of total risk exposure amount (RWAs))

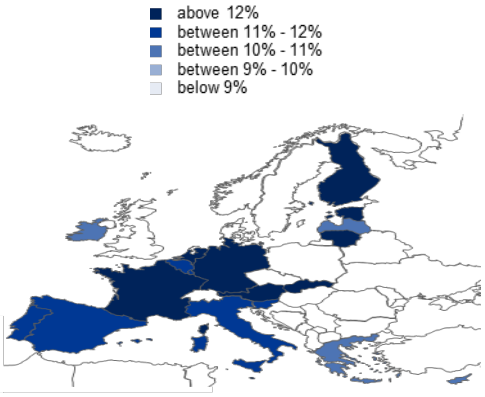


Sources: ECB, ESRB and national authorities.

Chart 2

Highest total minimum capital requirements for G-SIIs, O-SIIs and banks with SRBs as of **2019**

(in % of total risk exposure amount (RWAs))



Sources: ECB, ESRB and national authorities.

Table 1A

Minimum capital requirements at country level, based on publicly announced measures, as of **1 January 2016**

The numbers in light blue include links to either the notification of national measures sent to the ESRB or the official website of the national authority. Pillar 2 measures are not included. The real CCyB requirement may diverge from the national CCyB rate, as it depends on the CCyB rates that apply in the countries where the institution-specific credit exposures are located. The CCyB will be assessed every quarter, and the G-SII buffer, the O-SII buffer and the SRB will be assessed once a year.

% of total risk exposure amount (RWAs)	Minimum total capital a)	Combined buffer requirement						Total min. capital requirements for non-G-SII or -O-SII banks	Total min. capital requirements for G-SII and O-SII banks
				The higher of			Total combined buffer requirement for systemically important banks		
		CCoB rate b)	CCyB rate c)	G-SII buffer b)	O-SII buffer	SRB c)			
Filled with	CET1, AT1, T2	CET1	CET1	CET1	CET1	CET1	CET 1		
Austria	8%	0.625%	0.0%	n/a	n/a	0.25% - 1.0%	0.875% - 1.625%	8.625%	8.875% - 9.625%
Belgium	8%	0.625%	0.0%	n/a	0.25% - 0.5%	n/a	0.875% - 1.125%	8.625%	8.875% - 9.125%
Cyprus	8%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%	10.5%
Estonia	8%	2.5%	0.0%	n/a	0.0%	2.0%	4.5%	12.5%	12.5%
Finland	8%	2.5%	0.0%	n/a	0.5% - 2.0%	n/a	3% - 4.5%	10.5%	11.0% - 12.5%
France	8%	0.625%	0.0%	0.25% - 0.5%	0.0625% - 0.375%	n/a	0.6875% - 1.125%	8.625%	8.6875% - 9.125%
Germany	8%	0.625%	0.0%	0.5%	n/a	n/a	1.125%	8.625%	9.125%
Greece	8%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%	8.625%
Ireland	8%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%	8.625%
Italy	8%	2.5% d)	0.0%	0.25%	0.0%	n/a	2.75%	10.5%	10.75%
Latvia	8%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%	10.5%
Lithuania	8%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%	10.5%
Luxemburg	8%	2.5%	0.0% d)	n/a	0.125% - 0.25%	n/a	2.625% - 2.75%	10.5%	10.625%-10.75%
Malta	8%	0.625% d)	0.0% d)	n/a	0.125% - 0.5%	n/a	0.75% - 1.125%	8.625%	8.75%-9.125%
Netherlands	8%	0.625%	0.0%	0.25%	0.25% - 0.5%	0.75%	0.875% - 1.375%	8.625%	8.875% - 9.375%
Portugal	8%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%	10.5%
Slovakia	8%	2.5% d)	0.0%	n/a	1.0%	0.0%	3.5%	10.5%	11.5%
Slovenia	8%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%	8.625%
Spain	8%	0.625%	0.0%	0.25%	0.0% – 0.25%	n/a	0.8625% - 0.875%	8.625%	8.625% - 8.875%

Sources: ECB, ESRB and national authorities.
Notes:
a) This consists of a minimum 4.5% CET1, a maximum 1.5% Additional Tier 1 and a maximum 2% Tier 2 capital.
b) Phasing-in arrangements are applied; please see CRD IV, Article 160 for the CCoB and Article 162 for the G-SII buffer. The G-SII buffer can range from 1% to 3.5%.
c) The CCyB and the SRB can be set at higher levels in certain cases. For more details, see CRD IV, Article 140 and Article 133(13). The maximum capital requirements could therefore also be higher. If the SRB is applied to domestic exposures only, the SRB will be added to the O-SII or G-SII buffer.
d) Small and medium-sized investment firms are exempted.

Table 1B

Minimum capital requirements at country level, based on publicly announced measures, as of **1 January 2019**

The numbers in light blue include links to either the notification of national measures sent to the ESRB or the official website of the national authority. Pillar 2 measures are not included. The real CCyB requirement may diverge from the national CCyB rate, as it depends on the CCyB rates that apply in the countries where the institution-specific credit exposures are located. The CCyB will be assessed every quarter, and the G-SII buffer, the O-SII buffer and the SRB will be assessed once a year.

% of total risk exposure amount (RWAs)	Minimum total capital a)	Combined buffer requirement						Total min. capital requirements for non-G-SII or -O-SII banks	Total min. capital requirements for G-SII and O-SII banks
				The higher of			Total combined buffer requirement for systemically important banks		
		CCoB rate b)	CCyB rate c)	G-SII buffer b)	O-SII buffer	SRB c)			
Filled with	CET1, AT1, T2	CET1	CET1	CET1	CET1	CET1	CET 1		
Austria	8%	2.5%	n/a	n/a	n/a	1.0% - 2.0%	3.5% - 4.5%	10.5%	11.5% - 12.5%
Belgium	8%	2.5%	n/a	n/a	0.75% - 1.5%	n/a	3.25% - 4.0%	10.5%	11.25% - 12.0%
Cyprus	8%	2.5%	n/a	n/a	0.125% – 0.5%	n/a	2.625% - 3.0%	10.5%	10.625% - 11.0%
Estonia	8%	2.5%	n/a	n/a	0.0%	2.0%	4.5%	12.5%	12.5%
Finland	8%	2.5%	n/a	n/a	0.5% - 2.0%	n/a	3% - 4.5%	10.5%	11.0% - 12.5%
France	8%	2.5%	n/a	1.0% - 2.0%	0.25% - 1.5%	n/a	2.75% - 4.5%	10.5%	10.75% - 12.5%
Germany	8%	2.5%	n/a	2.0%	n/a	n/a	4.5%	10.5%	12.5%
Greece	8%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.5%	10.75%
Ireland	8%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%	10.5%
Italy	8%	2.5% d)	n/a	1.0%	0.0%	n/a	3.5%	10.5%	11.5%
Latvia	8%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%	10.5%
Lithuania	8%	2.5%	n/a	n/a	0.5% - 2.0%	n/a	3.0% - 4.5%	10.5%	11.0% - 12.5%
Luxemburg	8%	2.5%	n/a d)	n/a	0.5% - 1.0%	n/a	3.0% - 3.5%	10.5%	11.0% - 11.5%
Malta	8%	2.5% d)	n/a d)	n/a	0.5% - 2.0%	n/a	3.0% - 4.5%	10.5%	11.0% - 12.5%
Netherlands	8%	2.5%	n/a	1.0%	1.0% - 2.0%	3.0%	3.5% - 5.5%	10.5%	11.5% - 13.5%
Portugal	8%	2.5%	n/a	n/a	0.25% - 1.0%	n/a	2.75% - 3.5%	10.5%	10.75% - 11.5%
Slovakia	8%	2.5% d)	n/a	n/a	1.5% - 2.0%	1.0%	4.0% - 5.5%	10.5%	12.0% - 13.5%
Slovenia	8%	2.5%	n/a	n/a	0.25% - 1.0%	n/a	2.75% - 3.5%	10.5%	10.75% - 11.5%
Spain	8%	2.5%	n/a	1.0%	0.0% – 1.0%	n/a	2.5% - 3.5%	10.5%	10.5% - 11.5%

Sources: ECB, ESRB and national authorities.
Notes:
a) This consists of a minimum 4.5% CET1, a maximum 1.5% Additional Tier 1 and a maximum 2% Tier 2 capital.
b) Phasing-in arrangements are applied; please see CRD IV, Article 160 for the CCoB and Article 162 for the G-SII buffer. The G-SII buffer can range from 1% to 3.5%.
c) The CCyB and the SRB can be set at higher levels in certain cases. For more details, see CRD IV, Article 140 and Article 133(13). The maximum capital requirements could therefore also be higher. If the SRB is applied to domestic exposures only, the SRB will be added to the O-SII or G-SII buffer.
d) Small and medium-sized investment firms are exempted.

4 Total minimum capital requirements for O-SIIs and G-SIIs

Table 2A

Minimum capital requirements for O-SIIs and G-SIIs, based on publicly announced measures, as of **1 January 2016**

The numbers in light blue include links to either the notification of national measures sent to the ESRB or the official website of the national authority. Pillar 2 measures are not included. The real CCyB requirement may diverge from the national CCyB rate, as it depends on the CCyB rates that apply in the countries where the institution-specific credit exposures are located. The CCyB will be assessed every quarter, and the G-SII buffer, the O-SII buffer and the SRB will be assessed once a year.

% of total risk exposure amount (RWAs)	Bank name	Minimum total capital a)	Combined buffer requirement						Total min. capital requirements for G-SII and O-SII banks
					The higher of			Total combined buffer requirement	
			CCoB rate b)	CCyB rate c)	G-SII buffer b)	O-SII buffer	SRB c)		
		CET1, AT1, T2	CET1	CET1	CET1	CET1	CET1	CET 1	
Austria		8.0%	0.625%	0.0%	n/a	n/a	0.25% - 1.0%	0.875% - 1.625%	8.875% - 9.625%
	Erste Group Bank	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
	Raiffeisen Zentralbank	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
	Raiffeisen Bank International	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
	UniCredit Bank Austria	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
	Raiffeisenlandesbank Oberösterreich	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
	Raiffeisen−Holding Niederösterreich	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
	BAWAG P.S.K.	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
	HYPO NOE Gruppe Bank	8.0%	0.625%	0.0%	n/a	n/a	1.00%	1.625%	9.625%
	Vorarlberger Landes− und Hypothekenbank	8.0%	0.625%	0.0%	n/a	n/a	1.00%	1.625%	9.625%
	Hypo Tirol Bank	8.0%	0.625%	0.0%	n/a	n/a	1.00%	1.625%	9.625%
	Landesbank Oberösterreich	8.0%	0.625%	0.0%	n/a	n/a	1.00%	1.625%	9.625%
	Sberbank	8.0%	0.625%	0.0%	n/a	n/a	0.25%	0.875%	8.875%
Belgium		8.0%	0.625%	0.0%	n/a	0.25% - 0.5%	n/a	0.875% - 1.125%	8.875% - 9.125%
	BNP Paribas Fortis	8.0%	0.625%	0.0%	n/a	0.5%	n/a	1.125%	9.125%
	KBC Group	8.0%	0.625%	0.0%	n/a	0.5%	n/a	1.125%	9.125%
	ING Belgium	8.0%	0.625%	0.0%	n/a	0.5%	n/a	1.125%	9.125%
	Belfius Bank	8.0%	0.625%	0.0%	n/a	0.5%	n/a	1.125%	9.125%
	Axa Bank Europe	8.0%	0.625%	0.0%	n/a	0.25%	n/a	0.875%	8.875%
	Argenta	8.0%	0.625%	0.0%	n/a	0.25%	n/a	0.875%	8.875%
	Euroclear	8.0%	0.625%	0.0%	n/a	0.25%	n/a	0.875%	8.875%
	Bank of NY Mellon SA/NV	8.0%	0.625%	0.0%	n/a	0.25%	n/a	0.875%	8.875%
Cyprus		8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Bank of Cyprus Public Company	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Hellenic Bank Public Company	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	RCB Bank	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Central Cooperative Bank	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Eurobank Cyprus	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Alpha Bank Cyprus	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
Estonia		8.0%	2.5%	0.0%	n/a	0.0%	2.0%	4.5%	12.5%
	Swedbank AS	8.0%	2.5%	0.0%	n/a	0.0%	2.0%	4.5%	12.5%
	AS SEB Pank	8.0%	2.5%	0.0%	n/a	0.0%	2.0%	4.5%	12.5%

Finland		8.0%	2.5%	0.0%	n/a	0.5% - 2.0%	n/a	3% - 4.5%	11% - 12.5%
	Nordea Bank Finland	8.0%	2.5%	0.0%	n/a	2.0%	n/a	4.5%	12.5%
	OP Group	8.0%	2.5%	0.0%	n/a	2.0%	n/a	4.5%	12.5%
	Danske Bank	8.0%	2.5%	0.0%	n/a	0.5%	n/a	3.0%	11.0%
	Municipality Finance	8.0%	2.5%	0.0%	n/a	0.5%	n/a	3.0%	11.0%
France		8.0%	0.625%	0.0%	0.25% - 0.5%	0.0625% - 0.375%	n/a	0.6875% - 1.125%	8.6875% - 9.125%
	BNP Paribas	8.0%	0.625%	0.0%	0.5%	0.375%	n/a	1.125%	9.125%
	Société Générale	8.0%	0.625%	0.0%	0.25%	0.25%	n/a	0.875%	8.875%
	Groupe BPCE	8.0%	0.625%	0.0%	0.25%	0.25%	n/a	0.875%	8.875%
	Groupe Crédit Agricole	8.0%	0.625%	0.0%	0.25%	0.25%	n/a	0.875%	8.875%
	Groupe Crédit Mutuel	8.0%	0.625%	0.0%	n/a	0.125%	n/a	0.75%	8.75%
	La Banque Postal	8.0%	0.625%	0.0%	n/a	0.0625%	n/a	0.6875%	8.6875%
Germany		8.0%	0.625%	0.0%	0.5%	n/a	n/a	1.125%	9.125%
	Deutsche Bank	8.0%	0.625%	0.0%	0.5%	n/a	n/a	1.125%	9.125%
Greece		8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	National Bank of Greece	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Alpha Bank	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Piraeus Bank	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Eurobank Ergasias	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
Ireland		8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Allied Irish Banks plc	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	The Governor and Company of the Bank of IE	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
Italy		8.0%	2.5% d)	0.0%	0.25%	0.0%	n/a	2.75%	10.75%
	Unicredit	8.0%	2.5%	0.0%	0.25%	0.0%	n/a	2.75%	10.75%
	Intesa Sanpaolo	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Banca Monte dei Paschi di Siena	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
Latvia		8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	ABLV Bank;	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Swedbank	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	SEB banka	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Citadele banka	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Rietumu Banka	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	AS DNB banka	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
Lithuania		8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	AB SEB bankas	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Swedbank AB	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	AB DNB bankas	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	AB Siauliu bankas	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
Luxemburg		8.0%	2.5%	0.0% d)	n/a	0.125% - 0.25%	n/a	2.625% - 2.75%	10.625%- 10.75%
	Deutsche Bank Luxembourg	8.0%	2.5%	0.0%	n/a	0.25%	n/a	2.75%	10.75%
	Société Générale Bank & Trust	8.0%	2.5%	0.0%	n/a	0.25%	n/a	2.75%	10.75%
	Banque et Caisse d'Epargne de l'Etat Luxembourg	8.0%	2.5%	0.0%	n/a	0.125%	n/a	2.625%	10.625%
	BGL BNP Paribas	8.0%	2.5%	0.0%	n/a	0.125%	n/a	2.625%	10.625%
	CACEIS Bank Luxembourg	8.0%	2.5%	0.0%	n/a	0.125%	n/a	2.625%	10.625%

	Banque Internationale à Luxembourg	8.0%	2.5%	0.0%	n/a	0.125%	n/a	2.625%	10.625%
Malta		8.0%	0.625% d)	0.0% d)	n/a	0.125% - 0.5%	n/a	0.75% - 1.125%	8.75%- 9.125%
	Bank of Valletta Group	8.0%	0.625%	0.0%	n/a	0.5%	n/a	1.125%	9.125%
	HSBC Bank Malta	8.0%	0.625%	0.0%	n/a	0.375%	n/a	1.0%	9.0%
	Medifin Holding Ltd	8.0%	0.625%	0.0%	n/a	0.125%	n/a	0.75%	8.75%
Netherlands		8.0%	0.625%	0.0%	0.25%	0.25% - 0.5%	0.75%	0.875% - 1.375%	8.875% - 9.375%
	ING Bank N.V.	8.0%	0.625%	0.0%	0.25%	0.5%	0.75%	1.375%	9.375%
	Coöperative Centrale Raiffeisen Boerenleenbank	8.0%	0.625%	0.0%	n/a	0.5%	0.75%	1.375%	9.375%
	ABN Amro Bank	8.0%	0.625%	0.0%	n/a	0.5%	0.75%	1.375%	9.375%
	SNS Bank N.V.	8.0%	0.625%	0.0%	n/a	0.25%	n/a	0.875%	8.875%
	N.V. Bank Nederlandse Gemeenten	8.0%	0.625%	0.0%	n/a	0.25%	n/a	0.875%	8.875%
Portugal		8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5
	Caixa Geral de Depósitos	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Banco Comercial Português	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Novo Banco	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Santander Totta – SGPS	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Banco BPI	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
	Caixa Económica Montepio Geral	8.0%	2.5%	0.0%	n/a	0.0%	n/a	2.5%	10.5%
Slovakia		8.0%	2.5% d)	0.0%	n/a	1.0%	0.0%	3.5%	11.5%
	Československá obchodná banka	8.0%	2.5%	0.0%	n/a	1.0%	0.0%	3.5%	11.5%
	Poštová banka	8.0%	2.5%	0.0%	n/a	1.0%	0.0%	3.5%	11.5%
	Slovenská sporiteľňa	8.0%	2.5%	0.0%	n/a	1.0%	0.0%	3.5%	11.5%
	Tatra banka	8.0%	2.5%	0.0%	n/a	1.0%	0.0%	3.5%	11.5%
	Všeobecná úverová banka	8.0%	2.5%	0.0%	n/a	1.0%	0.0%	3.5%	11.5%
Slovenia		8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	NLB	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	SID	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Unicredit banka	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Abanka	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	NKBM	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	SKB	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Sberbank	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Banka Koper	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
Spain		8.0%	0.625%	0.0%	0.25%	0.0% – 0.25%	n/a	0.875%	8.875%
	Banco Santander	8.0%	0.625%	0.0%	0.25%	0.25%	n/a	0.875%	8.875%
	BBVA	8.0%	0.625%	0.0%	0.25%	0.125%	n/a	0.875%	8.875%
	Caixabank	8.0%	0.625%	0.0%	n/a	0.0625%	n/a	0.6875%	8.6875%
	Bankia	8.0%	0.625%	0.0%	n/a	0.0625%	n/a	0.6875%	8.6875%
	Popular	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%
	Sabadell	8.0%	0.625%	0.0%	n/a	0.0%	n/a	0.625%	8.625%

Sources: ECB, ESRB and national authorities.
Notes:
a) This consists of a minimum 4.5% CET1, a maximum 1.5% Additional Tier 1 and a maximum 2% Tier 2 capital.
b) Phasing-in arrangements are applied; please see CRD IV, Article 160 for the CCoB and Article 162 for the G-SII buffer. The G-SII buffer can range from 1% to 3.5%.
c) The CCyB and the SRB can be set at higher levels in certain cases. For more details, see CRD IV, Article 140 and Article 133(13). The maximum capital requirements could therefore also be higher. If the SRB is applied to domestic exposures only, the SRB will be added to the O-SII or G-SII buffer.
d) Small and medium-sized investment firms are exempted.

Table 2B

Minimum capital requirements for O-SIIs and G-SIIs, based on publicly announced measures, as of **1 January 2019**

The numbers in light blue include links to either the notification of national measures sent to the ESRB or the official website of the national authority. Pillar 2 measures are not included. The real CCyB requirement may diverge from the national CCyB rate, as it depends on the CCyB rates that apply in the countries where the institution-specific credit exposures are located. The CCyB will be assessed every quarter, and the G-SII buffer, the O-SII buffer and the SRB will be assessed once a year.

% of total risk exposure amount (RWAs)	Bank name	Minimum total capital a)	Combined buffer requirement						Total min. capital requirements for G-SII and O-SII banks
					The higher of			Total combined buffer requirement	
			CCoB rate b)	CCyB rate c)	G-SII buffer b)	O-SII buffer e)	SRB c)		
		CET1, AT1, T2	CET1	CET1	CET1	CET1	CET1	CET 1	
Austria		8.0%	2.5%	n/a	n/a	n/a	1.0% - 2.0%	3.5% - 4.5%	11.5% - 12.5%
	Erste Group Bank	8.0%	2.5%	n/a	n/a	n/a	2.0%	4.5%	12.5%
	Raiffeisen Zentralbank	8.0%	2.5%	n/a	n/a	n/a	2.0%	4.5%	12.5%
	Raiffeisen Bank International	8.0%	2.5%	n/a	n/a	n/a	2.0%	4.5%	12.5%
	UniCredit Bank Austria	8.0%	2.5%	n/a	n/a	n/a	2.0%	4.5%	12.5%
	Raiffeisenlandesbank Oberösterreich	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
	Raiffeisen−Holding Niederösterreich	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
	BAWAG P.S.K.	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
	HYPO NOE Gruppe Bank	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
	Vorarlberger Landes− und Hypothekenbank	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
	Hypo Tirol Bank	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
	Landesbank Oberösterreich	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
	Sberbank	8.0%	2.5%	n/a	n/a	n/a	1.0%	3.5%	11.5%
Belgium		8.0%	2.5%	n/a	n/a	0.75% - 1.5%	n/a	3.25% - 4.0%	11.25% - 12.0%
	BNP Paribas Fortis	8.0%	2.5%	n/a	n/a	1.5%	n/a	4.0%	12.0%
	KBC Group	8.0%	2.5%	n/a	n/a	1.5%	n/a	4.0%	12.0%
	ING Belgium	8.0%	2.5%	n/a	n/a	1.5%	n/a	4.0%	12.0%
	Belfius Bank	8.0%	2.5%	n/a	n/a	1.5%	n/a	4.0%	12.0%
	Axa Bank Europe	8.0%	2.5%	n/a	n/a	0.75%	n/a	3.25%	11.25%
	Argenta	8.0%	2.5%	n/a	n/a	0.75%	n/a	3.25%	11.25%
	Euroclear	8.0%	2.5%	n/a	n/a	0.75%	n/a	3.25%	11.25%
	Bank of NY Mellon SA/NV	8.0%	2.5%	n/a	n/a	0.75%	n/a	3.25%	11.25%
Cyprus		8.0%	2.5%	n/a	n/a	0.125% - 0.5%	n/a	2.625% - 3.0%	10.625% - 11.0%
	Bank of Cyprus Public Company	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	Hellenic Bank Public Company	8.0%	2.5%	n/a	n/a	0.375%	n/a	2.875%	10.875%
	RCB Bank	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Central Cooperative Bank	8.0%	2.5%	n/a	n/a	0.125%	n/a	2.625%	10.625%
	Eurobank Cyprus	8.0%	2.5%	n/a	n/a	0.125%	n/a	2.625%	10.625%
	Alpha Bank Cyprus	8.0%	2.5%	n/a	n/a	0.125%	n/a	2.625%	10.625%
Estonia		8.0%	2.5%	n/a	n/a	0.0%	2.0%	4.5%	12.5%
	Swedbank AS	8.0%	2.5%	n/a	n/a	0.0%	2.0%	4.5%	12.5%
	AS SEB Pank	8.0%	2.5%	n/a	n/a	0.0%	2.0%	4.5%	12.5%
Finland		8.0%	2.5%	n/a	n/a	0.5% - 2.0%	n/a	3% - 4.5%	11% - 12.5%

	Nordea Bank Finland	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	OP Group	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	Danske Bank	8.0%	2.5%	n/a	n/a	0.5%	n/a	3%	11%
	Municipality Finance	8.0%	2.5%	n/a	n/a	0.5%	n/a	3%	11%
France		8.0%	2.5%	n/a	1.0% - 2.0%	0.25% - 1.5%	n/a	2.75% - 4.5%	10.75% - 12.5%
	BNP Paribas	8.0%	2.5%	n/a	2.0%	1.5%	n/a	4.5%	12.5%
	Société Générale	8.0%	2.5%	n/a	1.0%	1.0%	n/a	3.5%	11.5%
	Groupe BPCE	8.0%	2.5%	n/a	1.0%	1.0%	n/a	3.5%	11.5%
	Groupe Crédit Agricole	8.0%	2.5%	n/a	1.0%	1.0%	n/a	3.5%	11.5%
	Groupe Crédit Mutuel	8.0%	2.5%	n/a	n/a	0.5%	n/a	0.75%	8.75%
	La Banque Postal	8.0%	2.5%	n/a	n/a	0.25%	n/a	0.6875%	8.6875%
Germany		8.0%	2.5%	n/a	2.0%	n/a	n/a	4.5%	12.5%
	Deutsche Bank	8.0%	2.5%	n/a	2.0%	n/a	n/a	4,5%	12.5%
Greece		8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75
	National Bank of Greece	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Alpha Bank	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Piraeus Bank	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Eurobank Ergasias	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
Ireland		8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	Allied Irish Banks plc	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	The Governor and Company of the Bank of IE	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
Italy		8.0%	2.5% d)	n/a	1.0%	0.0%	n/a	3.5%	11.5%
	Unicredit	8.0%	2.5%	n/a	1.0%	0.0%	n/a	3.5%	11.5%
	Intesa Sanpaolo	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	Banca Monte dei Paschi di Siena	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
Latvia		8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	ABLV Bank;	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	Swedbank	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	SEB banka	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	Citadele banka	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	Rietumu Banka	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	AS DNB banka	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
Lithuania		8.0%	2.5%	n/a	n/a	0.5% - 2.0%	n/a	3.0% - 4.5%	11.0% - 12.5%
	AB SEB bankas	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	Swedbank AB	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	AB DNB bankas	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	AB Siauliu bankas	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
Luxemburg		8.0%	2.5%	n/a	n/a	0.5% - 1.0%	n/a	3.0% - 3.5%	11.0% - 11.5%
	Deutsche Bank Luxembourg	8.0%	2.5%	n/a	n/a	1.0%	n/a	3.5%	11.5%
	Société Générale Bank & Trust	8.0%	2.5%	n/a	n/a	1.0%	n/a	3.5%	11.5%
	Banque et Caisse d'Epargne de l'Etat Luxembourg	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	BGL BNP Paribas	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	CACEIS Bank Luxembourg	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	Banque Internationale à	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%

	Luxembourg								
Malta		8.0%	2.5% d)	n/a	n/a	0.5% - 2.0%	n/a	3.0% - 4.5%	11.0% - 12.5%
	Bank of Valletta Group	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	HSBC Bank Malta	8.0%	2.5%	n/a	n/a	1.5%	n/a	4.0%	12.0%
	Medifin Holding Ltd	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
Netherlands		8.0%	2.5%	n/a	1.0%	1.0% - 2.0%	3.0%	3.5% - 5.5%	11.5% - 13.5%
	ING Bank N.V.	8.0%	2.5%	n/a	1.0%	2.0%	3.0%	5.5%	13.5%
	Coöperative Centrale Raiffeisen Boerenleenbank	8.0%	2.5%	n/a	n/a	2.0%	3.0%	5.5%	13.5%
	ABN Amro Bank	8.0%	2.5%	n/a	n/a	2.0%	3.0%	5.5%	13.5%
	SNS Bank N.V.	8.0%	2.5%	n/a	n/a	1.0%	n/a	3.5%	11.5%
	N.V. Bank Nederlandse Gemeenten	8.0%	2.5%	n/a	n/a	1.0%	n/a	3.5%	11.5%
Portugal		8.0%	2.5%	n/a	n/a	0.25% - 1.0%	n/a	2.75% - 3.5%	10.75% - 11.5%
	Caixa Geral de Depósitos	8.0%	2.5%	n/a	n/a	1.0%	n/a	3.5%	11.5%
	Banco Comercial Português	8.0%	2.5%	n/a	n/a	0.75%	n/a	3.25%	11.25%
	Novo Banco	8.0%	2.5%	n/a	n/a	0.75%	n/a	3.25%	11.25%
	Santander Totta – SGPS	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	Banco BPI	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	Caixa Económica Montepio Geral	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
Slovakia		8.0%	2.5% d)	n/a	n/a	1.5% - 2.0%	1.0%	4.5%	12.5%
	Československá obchodná banka	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	Poštová banka	8.0%	2.5%	n/a	n/a	2.0%	n/a	4.5%	12.5%
	Slovenská sporiteľňa	8.0%	2.5%	n/a	n/a	2.0%	1.0%	5.5%	13.5%
	Tatra banka	8.0%	2.5%	n/a	n/a	1.5%	1.0%	5.0%	13.0%
	Všeobecná úverová banka	8.0%	2.5%	n/a	n/a	2.0%	1.0%	5.5%	13.5%
Slovenia		8.0%	2.5%	n/a	n/a	0.25% - 1.0%	n/a	2.75% - 3.5%	10.75% - 11.5%
	NLB	8.0%	2.5%	n/a	n/a	1.0%	n/a	3.5%	11.5%
	SID	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	Unicredit banka	8.0%	2.5%	n/a	n/a	0.5%	n/a	3.0%	11.0%
	Abanka	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	NKBM	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	SKB	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Sberbank	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Banka Koper	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
Spain		8.0%	2.5%	n/a	1.0%	0.0% – 1.0%	n/a	2.5% - 3.5%	10.5% - 11.5%
	Banco Santander	8.0%	2.5%	n/a	1.0%	1.0%	n/a	3.5%	11.5%
	BBVA	8.0%	2.5%	n/a	1.0%	0.5%	n/a	3.5%	11.5%
	Caixabank	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Bankia	8.0%	2.5%	n/a	n/a	0.25%	n/a	2.75%	10.75%
	Popular	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%
	Sabadell	8.0%	2.5%	n/a	n/a	0.0%	n/a	2.5%	10.5%

Sources: ECB, ESRB and national authorities.
Notes:
a) This consists of a minimum 4.5% CET1, a maximum 1.5% Additional Tier 1 and a maximum 2% Tier 2 capital.
b) Phasing-in arrangements are applied; please see CRD IV, Article 160 for the CCoB and Article 162 for the G-SII buffer. The G-SII buffer can range from 1% to 3.5%.
c) The CCyB and the SRB can be set at higher levels in certain cases. For more details, see CRD IV, Article 140 and Article 133(13). The maximum capital requirements could therefore also be higher. If the SRB is applied to domestic exposures only, the SRB will be added to the O-SII or G-SII buffer.
d) Small and medium-sized investment firms are exempted.
e) It is assumed that O-SII buffer decisions made before 2019 are maintained in 2019.

5 Real estate measures

Table 3

Real estate measures

	Maximum regulatory LTV ratio	Maximum regulatory LTI ratio	Maximum regulatory DSTI ratio	Maximum maturity of housing loans	Adjustment to risk weights	Comments
Austria						
Belgium					5 p.p.	**RWA add-on:** to be applied to the risk weight of Belgian mortgage loan exposures by banks using the IRB approach. Reciprocity in the Netherlands.
Cyprus	70% or 80%		35% or 60%			**Cap on LTV ratio:** 80% where the credit facility is granted for financing the primary permanent residence of the borrower; 70% for all other property financing. **Cap on DSTI ratio:** the debt servicing amount is limited to the lower of: (a) 35% of the borrower's "total monthly income"; and (b) the difference between the "total monthly income" and the "total monthly expenditure". For high income borrowers, the same rules apply, but the limit determined on the basis of the borrower's total monthly income is higher (60%).
Estonia	85% or 90%		min. 50%	30 years		**Cap on LTV ratio:** 90% if guaranteed by KredEx, otherwise 85% for new housing loans. **Cap on DSTI ratio:** this has been calculated taking into account the proportionate approach under which 85% of new loans granted during one period must have a DSTI of maximum 50% of the borrower's income, while the limit can be higher for the remaining 15% of new loans. **Cap on maturity:** for 85% of new loans granted during a particular period.
Finland						
France						
Germany						
Greece						
Ireland	80% or 90%	>3.5; 20%				**Cap on LTV ratio:** 80% for non-first-time buyers (non-FTBs); 90% for first-time buyers (FTBs) of properties up to €220,000; a sliding LTV limit based on property value for FTBs of properties over €220,000. To be exceed by no more than 15% of the value of new lending for primary homes. Buy-to-let (BTL) loans with LTV greater than 70% should make up no more than 10% of the total value of new BTL loans. **Cap on LTI ratio:** new housing loans with LTI greater than 3.5 should not make up more than 20% of the total value of new housing loans.
Italy						
Latvia	90% or 95%					**Cap on LTV ratios:** 90% for residential mortgage lending; 95% for loans supported by a government guarantee.
Lithuania	85%		60%	30 years		**Cap on LTV ratios:** on new housing loans. **Cap on DSTI ratio:** the effective regulatory DSTI limit has been determined on the basis of a proportionate approach under which a DSTI limit of 40% is applied to 95% of new loans granted during the calendar year, while the limit can be higher for the remaining 5% of new loans, but is capped at 60% overall.
Luxemburg						
Malta	70%					**Cap on LTV ratio:** continuation of the practice applied since 2008: exposures secured by mortgages on residential property and attracting a risk weight of 35% are not to exceed 70% of the market value of that property.
Netherlands	102%					**Cap on LTV ratio:** the LTV limit was reduced by 1 percentage point in 2016. It will be further reduced by 1 percentage point each year until it reaches 90% in 2028.
Portugal						
Slovakia	90% / 100%			30 years		**Cap on LTV ratio:** not more than 100% on new loans. The proportion of total new loans with LTV ratios between 90% and100% should not exceed 20% (until March 2016), 15% (until end 2016) and 10% after 2016. Loan maturity recommendation: 10% of new loans may exceed this limit. Maximum maturity for other new loans is 8 years.
Slovenia						
Spain						

Source: ECB, ESRB and national authorities.

Annex 2
Glossary

Table 1

Regulatory framework

Name	Link	Description
SSM Regulation	Council Regulation (EU) No 1024/2013	This Regulation gives the ECB responsibility for specific tasks related to policies on the prudential supervision of credit institutions. This includes macroprudential policy (Article 5).
SSM Framework Regulation	Regulation (EU) No 468/2014 of the ECB	This ECB Regulation established the framework for cooperation between the ECB and national authorities within the Single Supervisory Mechanism (SSM).
Capital Requirements Directive (CRD IV) Capital Requirements Regulation (CRR)	Directive 2013/36/EU of the European Parliament and of the Council Regulation (EU) No 575/2013 of the European Parliament and of the Council	The CRD IV package (CRR/CRD IV) transposes the global standards on bank capital (the Basel III agreement) into EU law. Since 1 January 2014, stronger prudential requirements have been introduced for credit institutions and investment firms, requiring them to keep higher capital reserves and sufficient liquidity. The benefits of robust capital requirements include: reducing bank moral hazard and thereby improving the quality of lending decisions; increasing banks' ability to lend throughout the financial cycle; and protecting taxpayers and society from having to bear banks' unexpected losses. Some of the new provisions are being phased-in between 2014 and 2019.
Bank Recovery and Resolution Directive (BRRD)	Directive 2014/59/EU of the European Parliament and of the Council	The BRRD established a framework for the resolution of credit institutions and investment firms. It introduced harmonised tools and powers relating to prevention, early intervention and resolution for all EU Member States.
Deposit Guarantee Schemes (DGS) Directive	Directive 2014/49/EU of the European Parliament and of the Council	The main measures introduced by the DGS Directive related to: the harmonisation and simplification of rules and criteria applicable to deposit guarantees; a shorter time limit for repayment; and improvements to the financing of deposit guarantee schemes in all EU Member States. In November 2015, the European Commission proposed a euro area wide deposit insurance scheme (EDIS) for bank deposits.

Table 2

Capital-based macroprudential policy instruments

Name	Legal basis for ECB action	Size	Description
Capital conservation buffer (CCoB)	CRD Article 129, CRR Article 458	The CCoB is a capital buffer of up to 2.5% of a bank's total exposures. The capital used to meet this required level must be the highest quality of capital (i.e. CET1 capital). Phasing-in arrangements: 2016: 0.625%, 2017: 1.25%, 2018: 1.875%, 2019: 2.5% of RWAs, but earlier introduction is possible. If a credit institution's capital buffer is below the minimum level required, it will be subject to restrictions on its discretionary distributions.	The CCoB was introduced by the Basel III framework and has been implemented via CRD IV. The CCoB requirement is in addition to the minimum 4.5% CET1 capital requirement. The aim is to avoid breaches of minimum capital requirements during periods of stress when losses are incurred.
Countercyclical capital buffer (CCyB)	CRD Articles 130 and 135 to140	0–2.5% of total risk exposure amount (RWAs), but this can be set at a higher level if certain procedures have been followed. The buffer is institution specific and is calculated as a weighted average of the countercyclical buffer rates that apply in the countries where an institution's credit exposures are located.	The CCyB ensures that credit institutions accumulate a sufficient capital base during periods of excessive credit growth to be able to absorb losses during periods of stress.
Global systemically important institutions (G-SII) buffer	CRD Article 131	1-3.5% of total risk exposure amount (RWAs), depending on the degree of systemic importance of an institution. Phasing-in arrangements: 2016: 25%; 2017: 50%; 2018: 75%; 2019: 100%.	The G-SII buffer aims to reduce the moral hazard created by the implicit state support and guarantee of bail-out using taxpayer money that such institutions enjoy due to their size, cross border activities and interconnectedness. The FSB publishes a list of G-SIIs on an annual basis. The buffer is a mandatory requirement and must be met with CET1 capital.
Other systemically important institutions (O-SII) buffer	CRD Article 131	0–2% of total risk exposure amount (RWAs).	CRD IV allows this buffer to be applied to domestically important institutions and to institutions important at EU level. The O-SII buffer aims to reduce the moral hazard created by implicit support.
Systemic risk buffer (SRB)	CRD Articles 133 to 134	1–5% of total risk exposure amount (RWAs), but this can be set at a higher level if certain procedures have been followed or can be applied only to domestic exposure. As of 2015, a special authorisation procedure must be followed in order to set the buffer at rates between 3% and 5%. Buffer rates above 5% are possible, but also require special authorisation (e.g. a Commission implementing act).	CRD IV allows this buffer to be applied to the financial sector or to one or more subsets of the sector, in order to prevent and mitigate long term non-cyclical systemic or macroprudential risks.
Leverage ratio	Basel III leverage ratio framework	The Basel III leverage ratio is defined as Tier 1 capital divided by the bank's total exposure, expressed as a percentage. The BCBS is currently testing a minimum level of 3% until 1 January 2017, with a view to migrating to a Pillar 1 requirement on 1 January 2018. At European level, the EBA is preparing a report on the impact and calibration of the leverage ratio. Based on the results of this report, the European Commission will submit a report on the impact and effectiveness of the leverage ratio to the European Parliament and the Council by the end of 2016.	The leverage ratio is intended to restrict the build-up of leverage in the banking sector and to strengthen the risk-based requirements by adding a simple, non-risk based backstop.
Sectoral capital requirements	CRR Articles 124 and 164	Stricter requirements for loss given default (LGD); higher real estate risk weights.	The prudential rules for the EU banking system provide for the use of more targeted capital based tools designed to address vulnerabilities that can appear at sectoral level.

Table 3

Liquidity-based instruments

Name	Legal base for ECB action	Size	Description
Liquidity coverage ratio (LCR)	CRR Part VI, Article 458	Institutions are required to hold sufficient liquid assets to be able to accommodate any possible imbalance between liquidity inflows and outflows that may occur under severely stressed conditions, over a period of thirty days. The LCR entered into force in October 2015, with a starting level of 60%, and will be increased gradually to reach 100% in 2018. Under the Basel III agreement, the LCR would need to reach 100% by 1 January 2019. The European Commission may, however, delay full implementation by one year, subject to a report by the EBA in June 2016 (Article 461 of CRR).	The main purpose of the liquidity-based instruments is to increase banks' resilience to liquidity shocks. Provisions requiring a steady funding level to be maintained can weaken banks' dependence on short-term funding sources and consequently lessen the risk of unexpected funding losses. Buffers of this type also improve banks' capacity to deal with such outflows, should they occur. At the same time, liquidity-based instruments may influence credit provision, as they may cause banks to shift from illiquid to liquid asset holdings. In addition, they can restrict the excessive credit growth typically driven by less stable funding sources.
Net stable funding ratio (NSFR)	Basel NSFR CRR Article 458	The NSFR will require banks to maintain a stable funding profile in relation to the composition of their assets and off-balance sheet activities. This ratio should be at least 100% on an ongoing basis. The Basel minimum standard will be introduced in 2018. The EBA conducted a comprehensive impact and calibration assessment of the NSFR for the EU. The European Commission will decide in 2016 if and how the NSFR will be implemented in the EU.	

Table 4

Asset-based measures

Name	Legal base	Size	Description
Limits on loan-to-value (LTV) ratio; loan-to-income (LTI) ratio; debt service-to-income (DSTI) ratio	National legal framework		Lending limits impose direct restrictions on the quantity of credit banks can issue and have the potential to affect the credit cycle. They mainly increase borrowers' resilience by lowering their probability of default and/or increase banks' resilience by lowering the loss given counterparty default.
Large exposure limits	CRR Article 458	A large exposure value is an exposure value equal to or exceeding 10% of a bank's eligible capital	

Table 5

Supervisory measures and powers

Name	Legal base for ECB action	Size	Description
Pillar 2 measures	CRD Articles 102 to 106	Higher requirements for capital, liquidity and disclosure are possible.	National competent authorities may apply similar or identical supervisory measures to institutions with a similar risk profile, e.g. having a similar business model or similar geographical location of exposures, or which might be exposed to similar risks or pose similar risks to the financial system.

National law can provide for additional macroprudential measures.

Abbreviations

Countries

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

Others

ABS	Asset-backed security
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCyB	Countercyclical capital buffer
CCoB	Capital conservation buffer
CDS	Credit default swap
CET1	Common Equity Tier 1
CMU	Capital Markets Union
EAA	Euro area accounts
EBA	European Banking Authority
ECB	European Central Bank
Ecofin Council	Council of Economic and Finance Ministers
EEA	European Economic Area
EFSF	European Financial Stability Facility
EIOPA	European Insurance and Occupational Pensions Authority
EMIR	European Market Infrastructure Regulation
EMU	Economic and Monetary Union
ERF	European Resolution Fund
ESA	European Supervisory Authorities
ESCB	European System of Central Banks
ESM	European Stability Mechanism
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
EU	European Union
FSB	Financial Stability Board
ICPF	Insurance corporations and pension funds
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
ISDA	International Swaps and Derivatives Association, Inc.
MFI	Monetary financial institution
MiFID	Markets in Financial Instruments Directive
MMF	Money market fund
NCA	National competent authority
NCB	National central bank
NDA	National designated authority
OECD	Organisation for Economic Cooperation and Development
OJ	Official Journal of the European Union
SRA	Single Resolution Authority
SRM	Single Resolution Mechanism
SSM	Single Supervisory Mechanism
SSMR	Single Supervisory Mechanism Regulation

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