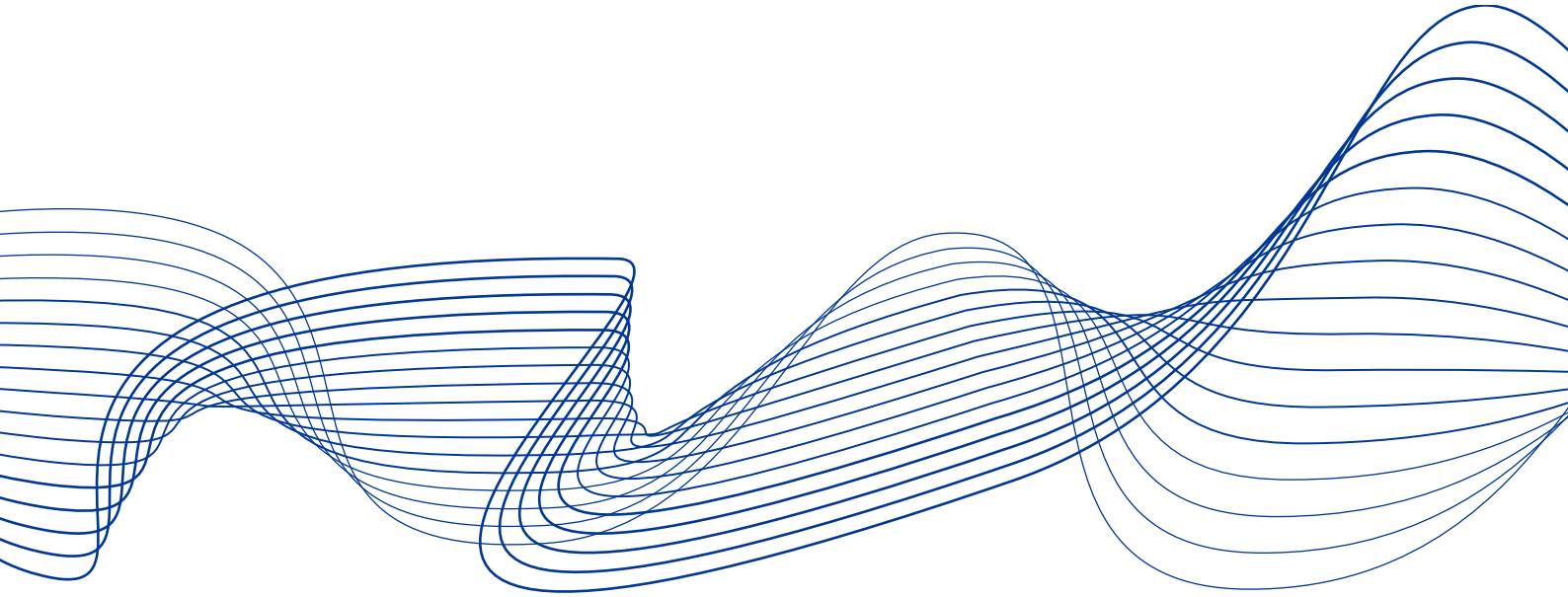
The ESRB handbook on operationalising macroprudential policy in the banking sector



ESRB
European Systemic Risk Board
European System of Financial Supervision

Contents[1]

[1] This is a report by the ESRB Instruments Working Group chaired by Aerdt Houben (De Nederlandsche Bank). It builds on contributions from all of its members (Annex A). It was edited under the leadership of Andrea Maechler and benefited from comments by members of the ESRB Advisory Technical Committee, members of the ESRB Advisory Scientific Committee, notably Dirk Schoenmaker, and IMF staff, particularly Jan Brockmeijer and Erlend Nier. The ESRB is grateful to staff from member institutions who chaired the various work streams, namely, Carsten Detken (ECB) for the countercyclical capital buffer, Ola Melander (Sveriges Riksbank) for real estate instruments, Olivier Jaudoin (Banque de France) for tools addressing systemic banks and structural systemic risks and Pillar 2 and its macroprudential use, Jouni Timonen (Suomen Pankki – Finlands Bank) for liquidity instruments, and Silvia Pezzini (Bank of England) for national flexibility measures under Article 458 of the CRR. The ESRB also thanks member institutions which kindly seconded staff temporarily to the ESRB Secretariat to finalise the work in a timely manner, namely Maciej Brzozowski (Narodowy Bank Polski), Sorin Dumitrescu (CNVMR – Romanian Supervisory Authority), Stijn Ferrari (Nationale Bank van België/Banque Nationale de Belgique), Karsten Gerdrup (Norges Bank), Matilda Gjirja (Finansinspektionen), Katrine Graabæk Mogensen (Danmarks Nationalbank), Andreas Strohm (European Commission), Alexander Trachta (Österreichische Nationalbank), and Peter Wierts (De Nederlandsche Bank). On the ESRB Secretariat side, key contributors include Elias Bengtsson, Jeroen Brinkhoff, Frank Dierick, Chiara Fogo, Sebastian Frontczak, Leonor Dormido Jordá, Timo Kosenko, Sam Langfield, Asen Lefterov, Adam Pawlikowski, Evangelia Rentzou, Carmelo Salleo, Marcel-Eric Terret and Olaf Weeken.

Section I: Introduction
Motivation

Macroprudential policy is today a reality in the European Union.

This Handbook aims to assist macroprudential authorities in the European Union (EU) to operationalise instruments set out in the prudential rules for the EU banking sector. While some of the rules – commonly referred to as the Capital Requirements Directive (CRD IV) and the Capital Requirements Regulation (CRR)[2] – have been phased in, Member States can already use all of the macroprudential instruments.

The global financial crisis highlighted fault lines in the existing institutional arrangements, including the lack of a macroprudential policy framework. The crisis revealed that authorities responsible for overseeing the financial system usually lacked appropriate mandates, analytical tools and/or instruments to address systemic risk. In the EU, a number of important steps have been taken to address these shortcomings. One such step was the establishment of the ESRB, with responsibility for macroprudential oversight of the EU financial system. Since it was set up in 2010, the ESRB has actively promoted the development of macroprudential policy frameworks.[3]

The coming into force of the CRD IV/CRR on 1 January 2014 was a new milestone in the development of a macroprudential policy framework in the EU. The new rules provided Member States with a common legal framework and a set of macroprudential instruments to mitigate systemic risk in the banking sector. Ultimately, this framework will need to be extended beyond the banking sector (for example, to cover e.g. the insurance sector, financial infrastructures, or shadow banking). For now, the CRD IV/CRR is an important step towards increasing the ability of authorities to conduct macroprudential policy.

This Handbook and the companion Flagship Report are the ESRB's main contributions to an EU macroprudential policy framework. This Handbook is targeted at macroprudential authorities and offers detailed instrument-specific advice on how to design and implement macroprudential policy for the banking sector. The companion ESRB Flagship Report is targeted at high-level policy-makers and provides an overview of the new macroprudential policy framework.[4]

This Handbook was updated in 2015 and 2017 on the basis of the growing experience with the use of macroprudential instruments. Nonetheless, further revisions will be needed, given additional experience gained and to reflect future regulatory changes. In 2015 an addendum to the ESRB Handbook on the macroprudential leverage ratios was published.[5] During 2017,

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2 "CRD IV" refers to Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms and "CRR" refers to Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.

3 In 2011 the ESRB recommended that Member States should establish national macroprudential authorities (ESRB/2011/3) and in 2013 it recommended that they should identify clear intermediate macroprudential objectives and assign concrete tools to achieve those objectives (ESRB/2013/1).

4 ESRB (2014).

5 ESRB (2015).

Chapter 4 of the Handbook was revised on the basis of the country comparison when using the structural macroprudential instruments. Further changes to the Handbook will be required once more experience with the use of macroprudential instruments has been gained and to reflect future regulatory developments.

The Handbook is structured in three sections.

The first section presents the overall macroprudential policy framework and key findings (Chapter 1). By way of synthesis, it provides a roadmap outlining which macroprudential instruments can be used to achieve specific financial stability objectives. It also discusses the role of indicators in assessing the build-up of vulnerabilities and the possible need for policy action. Finally, it offers general advice on the different phases of the macroprudential policy cycle – from risk assessment to policy design, implementation and evaluation.

Key features and the role of individual macroprudential instruments are presented in the second section (Chapters 2 to 7). These chapters describe how specific instruments address intermediate objectives, as well as their respective benefits and shortcomings. They also elucidate on the instruments' operational, legal and institutional features. The instruments covered in this part of the Handbook are: the countercyclical capital buffer (Chapter 2), real estate instruments (Chapter 3), instruments for systemic banks[6] and structural risks (Chapter 4), liquidity instruments (Chapter 5), instruments available through Pillar 2 (Chapter 6) and national flexibility measures, also referred to as Article 458 instruments (Chapter 7).

Cross-cutting issues are presented in the final section (Chapters 8 to 11). This covers four topics of particular importance when designing and implementing macroprudential policy: Selecting instruments (Chapter 8); the decision-making process, notably the role of guided discretion (Chapter 9); communication (Chapter 10); and cross-border issues (Chapter 11). For each of these topics, the Handbook highlights core issues and provides practical advice.

[6] Throughout the report, the general term "bank" is used for simplicity, without referring to a particular type of credit institution.

Chapter 1
Key findings: instruments and policy framework[7]

[7] The chapter was prepared by a team led by Andrea Maechler (ESRB Secretariat) and comprising Stijn Ferrari (Nationale Bank van België/Banque Nationale de Belgique), Elias Bengtsson, Timo Kosenko, and Olaf Weeken (all ESRB Secretariat).

1 Instruments

1.1 Objectives

The ultimate objective of macroprudential policy is to contribute to the safeguarding of the stability of the financial system as a whole. This includes strengthening the resilience of the financial system and decreasing the build-up of vulnerabilities, thereby ensuring a sustainable contribution of the financial sector to economic growth.

The ESRB has identified four intermediate objectives relevant for safeguarding the stability of the banking sector.[8] These are aimed at preventing and mitigating systemic risks that may arise from:

- **excessive credit growth and leverage.** *Excessive credit growth has been identified as a key driver of financial crises, with leverage acting as an amplifying channel;*
- **excessive maturity mismatch and market illiquidity.** *Reliance on short-term and unstable funding may lead to fire sales, market illiquidity and contagion;*
- **direct and indirect exposure concentrations.** *Exposure concentrations make a financial system vulnerable to common shocks, either directly through balance sheet effects or indirectly through asset fire sales and contagion;*
- **misaligned incentives with a view to reducing moral hazard.** *This involves strengthening the resilience of systemically important institutions, while counterbalancing the negative effects of (implicit) government guarantees.*

1.2 Instruments by objective

For each intermediate objective, several instruments may be available.[9] For each intermediate objective, Column 1 in Tables 1.1-1.4 provides a non-exhaustive list of suitable instruments. Column 2 gives an overview of the transmission channels associated with the introduction or tightening of the instruments. It separates how the instruments transmit into increased resilience of banks and how they reduce the build-up of vulnerabilities in the upswing. In the financial downswing, lifting or loosening the measures would have the opposite effects as the ones described in Column 2.

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8 The ESRB Recommendation on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1) also included a fifth objective to strengthen the resilience of financial infrastructures. This objective has been omitted from the Handbook, because it does not fall within the scope of the macroprudential framework for the banking sector, as provided under the CRD IV/CRR.

9 The ESRB has also recommended that a macroprudential authority should have at least one instrument to address each intermediate objective. In this context, the ESRB provided an indicative list of 17 instruments (Recommendation ESRB/2013/1).

Authorities may need to pursue more than one intermediate objective to address systemic risk. Prior to the global financial crisis, excessive credit growth and increasing maturity mismatch went hand in hand. Excessive risk-taking was fuelled by the perception of the existence of implicit government safety nets. When the financial cycle turned, shocks transmitted through the financial system, through direct and indirect exposure concentrations. Since systemic risk often appears in several guises, authorities may need to use combinations of instruments to address it.[10] Conversely, some instruments can be used to address several intermediate objectives (and hence appear in several of the Tables 1.1-1.4).

The macroprudential instruments discussed in the Handbook have different legal bases. Instruments under the Directive (CRD IV) are to be transposed into national law, while those provided for in the Regulation (CRR) become EU law with immediate effect. Some instruments are exclusively based on national law (e.g. loan-to-value ratios). Column 3 in Tables 1.1-1.4 provides an overview of the legal basis of the instruments.

The nature and scope for application differs across instruments. Some instruments are new macroprudential instruments, which have been introduced for the first time by the CRD IV (e.g. the systemic risk buffer). Others are microprudential instruments, which under certain conditions can be topped up for macroprudential purposes. This includes using instruments through Pillar 2, when the supervisory review and evaluation process (SREP) shows that a specific bank or groups of banks contribute to systemic risks. It also includes so-called "national flexibility measures" in Article 458 of the CRR. These national flexibility measures can be used only if other measures cannot adequately address systemic risk, and are subject to specific notification and authorisation procedures.

Public disclosure requirements play an important role across all intermediate objectives. They increase transparency and thus strengthen market discipline. They have not been included explicitly in Tables 1.1-1.4, as they strengthen the transmission mechanism of all the instruments.

1.2.1 Instruments to address excessive credit growth and leverage

Periods of excessive credit growth are a key predictor of financial crises. This is particularly the case when excessive credit growth coincides with unsustainable developments in real estate markets that lead to a build-up of leverage in the private sector.[11] Table 1.1 highlights six broad groups of macroprudential instruments available to mitigate and prevent excessive credit growth and leverage.

- *The countercyclical capital buffer (CCyB).* This instrument is designed to counter pro-cyclicality in the financial system. It is aimed at building up a capital buffer during periods of excessive credit growth that is released when systemic risks materialise or abate. By increasing resilience during the upturn, the CCyB supports the sustainable provision of credit to the economy in the downturn. The CCyB can also help dampen the credit cycle during the upturn. The buffer will be between 0% and 2.5% of risk-weighted assets, but can be set higher

[10] See Chapter 8 for further details.

[11] See, for example, Borio and Drehmann (2009), Enoch and Ötker-Robe (2007) and Reinhart and Rogoff (2009).

when justified by the underlying risk. In line with the internationally agreed Basel III framework, national authorities should follow a set of principles and calculate a reference rate as a benchmark to guide their judgement. Much work is being done by the ESRB to help guide EU macroprudential authorities in exercising their judgment when activating and calibrating the CCyB (see Chapter 2).

- *Loan-to-value (LTV), loan-to-income (LTI) and debt service-to-income (DSTI) caps.* These instruments are exclusively based on national law. They include caps that restrict credit in relation to the value of the underlying real estate (LTV cap) or the income of the borrower (LTI/DSTI cap). In contrast to capital-based instruments, they target the borrowers who take credit, rather than the banks that provide the credit. Macroprudential authorities should be able to assess LTV and LTI/DSTI ratios.

- *Sectoral requirements.* Sectoral requirements enable stricter regulatory requirements to be imposed, for example by increasing risk weights for specific exposures or minimum loss given default (LGD) values. Sectoral requirements improve the resilience of banks to risk in the sectors concerned. They can also have a dampening effect on credit growth.

- *Macroprudential use of Pillar 2.* Pillar 2 allows competent authorities to tighten prudential requirements when the SREP shows that a specific bank (or group of banks) is contributing to systemic risk. In the case of excessive credit growth and leverage, instruments include sectoral requirements, raising own funds and capital conservation buffer requirements. To ensure a holistic approach to mitigating systemic risk, close collaboration is needed between microprudential and macroprudential authorities, since the systemic risks that would be considered in the SREP would typically have been identified by macroprudential authorities.

- *The systemic risk buffer (SRB).* The SRB is designed to prevent and mitigate structural systemic risks, including excessive leverage. It is a flexible instrument that can be applied to all or to a subset of banks, and is subject to a notification requirement for buffer rates up to 3%. Above that rate, the need to obtain authorisation from the European Commission after the delivery of an opinion by the EBA and ESRB is differentiated depending on the scope, geographic exposure and level of the SRB (the procedure is described in more detail in Chapter 4).

- *Additional own funds requirements and capital conservation buffer.* When the above-mentioned instruments are not adequate to address excessive credit growth, macroprudential authorities can use national flexibility measures to apply add-ons to own funds requirements and the capital conservation buffer, subject to specific procedures and authorisation.

- *A leverage ratio.* The leverage ratio hinders excessive on-balance sheet and off-balance sheet leverage by limiting a bank's total assets (including off-balance sheet) in relation to its equity. Since it is not based on risk-adjusted assets, it also provides a simple and transparent back-stop to safeguard against model and measurement error in the risk-based capital requirements.

Table 1.1

Key instruments to address excessive credit growth and leverage

Instrument	Transmission		Legal basis	Chapter in Handbook
	Increasing resilience	Reducing build-up of vulnerabilities		
CCyB	Increase banks' loss absorption capacity	Possibly slowing down credit growth through higher funding cost	Articles 130 and 135-140 of the CRD IV	2
LTV cap **LTI/DSTI cap**	Decrease banks' LGD, decrease borrower s' PD	Direct restriction of lending	National law	3
Sectoral requirements	Increase banks' loss absorption capacity, lowers potential losses and shifts lending away from sector	Possible impact on financial cycle through higher funding cost	Article 124 of the CRR, Article 164 of the CRR, Pillar 2 Article 458 of the CRR	3 & 7
SRB	Increase banks' loss absorption capacity		Articles 133-134 of the CRD IV	4
Own funds conservation buffer	Increase banks' loss absorption capacity		Pillar 2 Article 458 of the CRR	7
Leverage ratio	Limit leverage: safeguards against error in risk-based capital buffers		National law	8

1.2.2 Instruments to address excessive maturity mismatch and market illiquidity

The global financial crisis has shown that prudential rules aimed solely at strengthening capital buffers do not sufficiently address liquidity risk. Both sides of banks' balance sheets are subject to liquidity risk: market illiquidity on the asset side and funding risk on the liability side. The materialisation of these risks could lead, among other things, to fire sales and contagion. Hence, there is a need for dedicated liquidity instruments, including at the macroprudential level that can address these risks (see Table 1.2).

The CRD IV/CRR offers the possibility of implementing macroprudential liquidity instruments through two procedures. First, under Pillar 2 as a firm specific measure (when the SREP shows that a specific bank or group of banks contributes to systemic risk); and second, to a lesser extent, under the national flexibility measures (provided other instruments cannot adequately address the identified risks).

- *Net stable funding ratio (NSFR).* The NSFR is a microprudential measure which will enter into force in 2018. Developing a sound NSFR that is aimed at limiting banks' one-year maturity and liquidity mismatches will go a long way towards increasing the stability of banks' funding bases to sudden outflows. A macroprudential use of the NSFR could impose a (fixed or time-varying) add-on over the prudential minimum requirement.

- *Liquidity buffer ratios.* Liquidity ratios, such as the liquidity coverage ratio (LCR), are microprudential measures. They may also increase resilience to liquidity shocks by increasing the stock of liquid assets available to cover sudden outflows. A macroprudential use of the LCR could impose a (fixed or time-varying) add-on over the prudential minimum requirement.
- *Liquidity charges.* Liquidity charges could complement the above quantity-based ratios. They could be a Pigouvian levy reflecting banks' contributions to systemic liquidity risk (e.g. the duration of their funding profile or their reliance on wholesale funding).
- *Other stable funding requirements.* These can be introduced at a national level, for instance through loan-to-deposit (LTD) limits.

Table 1.2
Key instruments to address excessive maturity mismatch and market illiquidity

Instrument	Transmission		Legal basis	Chapter in Handbook
	Increasing resilience	Reducing build-up of vulnerabilities		
NSFR	Increase stability of funding base to limit sudden outflows	Possible dampening effect on financial cycle if requirements are binding (e.g. shift to liquid assets and/or higher liquidity premia)	Pillar 2, Article 458 of the CRR3)	5
Other stable funding requirements (e.g. LTD limits)			National law	
LCR	Increase stock of liquid assets to cover sudden outflows		Pillar 2, Article 458 of the CRR3)	
Other liquidity buffer			National law	
Liquidity charge	Increase banks' loss absorption capacity		Pillar 2 Article 458 of the CRR	

The LCR and NSFR are conditional on the adoption of their respective prudential regulations (by 2015 for the LCR and 2018 for the NSFR). The ESRB's work on the use of these instruments remains at the exploratory level. It is important to support the finalisation of the prudential rules so that macroprudential authorities can start designing adequate instruments to address liquidity risks.

Authorities may also consider simpler liquidity ratios. These include stable funding ratios, such as the long-term stable funding (LTSF) ratio, a cap on the LTD ratio and a ratio of highly liquid assets over total assets. These simple variants could also serve as a backstop to the NSFR and LCR, akin to the way the leverage ratio serves as a backstop for risk-weighted capital requirements.

By targeting banks' funding structures, liquidity instruments could also help to address excessive credit growth and leverage. The LTD ratio, for example, has been applied to reduce reliance on wholesale funding for domestic lending in Portugal. Other liquidity ratios could also be used.

1.2.3 Instruments to address direct and indirect exposure concentration

Excessive exposure concentrations make large parts of the financial sector vulnerable to common shocks. Direct concentration risks arise from large exposures to specific sectors (e.g. the real estate, interbank or economic sectors) or asset classes (e.g. asset-backed securities). They are direct in the sense that a shock to a particular sector or asset class would affect all banks' balance sheets with common exposures to this sector or asset class. Indirect concentration risks arise when a shock weakens banks through contagion channels, such as interconnectedness, asset fire sales and a general dry-up of liquidity. These risks are indirect in the sense that they may stem from fragilities in other parts of the financial sector with repercussions on the pricing or quality of bank assets.

Four broad categories of macroprudential instruments help address risks related to common exposures, contagion or interconnectedness (see Table 1.3). Except for the SRB, these instruments can also be implemented under Pillar 2 (when the SREP shows that a specific bank or group of banks are contributing to systemic risks) or under the national flexibility measures provided other instruments cannot adequately address the identified risks.

- *Large exposures restrictions.* These restrictions are microprudential measures which can be further restricted for a macroprudential purpose. They can be applied via Pillar 2 on a sectoral basis to reduce banks' exposures to a particular sector and/or asset class (restrictions on intra-financial exposures can be imposed through Article 458 of the CRR). They may target both direct exposures and excessive (indirect) interconnectedness among financial institutions, thereby reducing contagion risk.

- *Capital-based instruments* (e.g. sectoral capital requirements, SRB, own funds requirements and capital conservation buffer). In the context of exposure concentration, the main focus of capital-based instruments is to address contagion risks arising from banks' common exposures and interconnectedness. These instruments are aimed at enhancing bank resilience to shocks, by raising capital buffers and by reducing banks exposures. When applied on a sectoral basis, they may also affect the asset composition of banks.

Table 1.3

Key instruments for addressing exposure concentration

Instrument	Transmission channel		Legal basis	Chapter in Handbook
	Increasing resilience	Reducing build-up of vulnerabilities		
Sectoral capital requirements (including intra-financial)	Increase banks' loss absorption capacity	Possible impact on financial cycle through higher funding cost	Article 124 of the CRR, Article 164 of the CRR, Pillar 2 Article 458 of the CRR	3 & 7
SRB	Increase banks' loss absorption capacity	Possible impact on financial cycle through higher funding cost	Articles 133-134 of the CRD IV	4
Large exposures restrictions (including intra-financial)	Limit counterparty, concentration and contagion risk	Direct restriction of credit quantity	Pillar 2 Article 458 of the CRR	7
Own funds Conservation buffer	Increase banks' loss absorption capacity	Possible impact on financial cycle through higher funding cost	Pillar 2 Article 458 of the CRR	7

1.2.4 Instruments to address misaligned incentives and moral hazard

The perception that certain financial institutions are too systemically important to fail leads to misaligned incentives and magnifies moral hazard. Shocks to these systemically important institutions (SIIs) may give rise to losses and liquidity shortages in the rest of the financial system, both through direct and indirect channels. Financial institutions are thus categorised as SIIs when they give rise to systemic risk and may lead to serious negative consequences for the financial system and the real economy.

Table 1.4

Key instruments for addressing misaligned incentives and moral hazard

Instrument	Transmission channel		Legal basis	Chapter in Handbook
	Increasing resilience	Reducing build-up of vulnerabilities		
G-SII buffer	Increase banks' loss absorption capacity	Possible impact on financial cycle through of increased funding cost	Article 131 of the CRD IV	4
O-SII buffer			Article 131 of the CRD IV	
SRB			Articles 133-134 of the CRD IV	
Own funds Conservation buffer			Pillar 2, Article 458 of the CRR	7
Additional liquidity requirements for SIIs	Increase stability of funding base and/or stock of liquid assets	Pass through of increased funding cost	National law, Pillar 2, Article 458 of the CRR	5

Four broad categories of instruments help address the risks associated with misaligned incentives and moral hazard. They cover both capital-based and liquidity-based instruments:

- *The globally systemically important institutions (G-SII) buffer* is a macroprudential instrument. It imposes a mandatory capital buffer on banks identified as globally systemically important. The surcharge ranges from 1% to 3.5% and is being phased in gradually between 1 January 2016 and 1 January 2019.
- *The other systemically important institutions (O-SII) buffer* is another macroprudential instrument. It enables authorities to impose capital charges on domestically important institutions. A notification procedure and a 2% upper limit are imposed. The O-SII buffer became applicable in all EU Member States on 1 January 2016.
- *The SRB* is a flexible residual instrument that can be targeted at a broad range of structural (non-cyclical) risks. The SRB is an optional instrument, which could have been applied, if transposed into national law, as early as 1 January 2014.
- *Additional own funds or conservation buffer requirements* can be implemented either under Pillar 2 (when the SREP shows that a specific bank or group of banks are contributing to systemic risks) or under the national flexibility measures (provided other instruments cannot adequately address the identified risks).
- *Additional liquidity requirements*. The resilience of SIIs may also be increased through additional liquidity requirements or charges. These requirements may also be applied under Pillar 2 (when the SREP shows that a specific bank or groups of banks contribute to systemic risks) or under the national flexibility measures (provided other instruments cannot adequately address the identified risks).

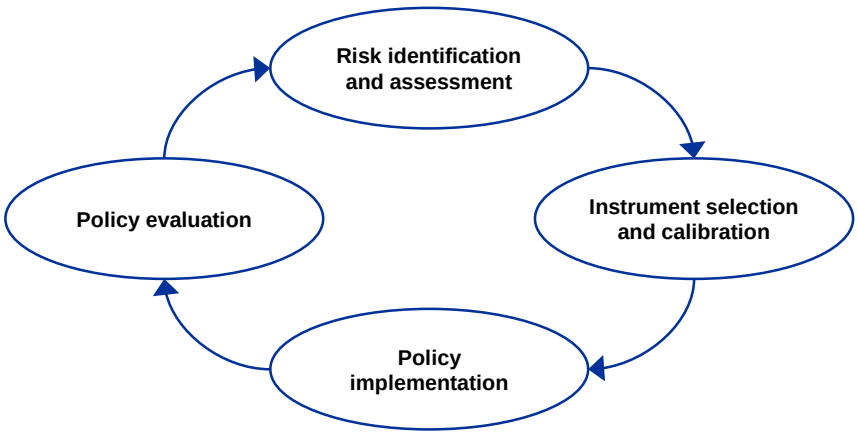
2 Policy framework[12]

To operationalise macroprudential instruments, authorities need to develop a macroprudential strategy. The companion Flagship Report highlights that macroprudential instruments and intermediate objectives cannot be considered in isolation. This section picks up on this theme and describes how objectives and instruments are part of a wider macroprudential policy strategy. It aims to help Member States better understand and operationalise each stage of the macroprudential policy cycle.

A macroprudential policy strategy relates objectives to indicators and instruments. Indicators help to identify the risks and assess their severity, while instruments help to prevent and mitigate the materialisation of these risks. Narrowing down the list of possible indicators, and identifying indicative thresholds beyond which there would be a presumption to activate an instrument are important areas of ongoing work. The ultimate decision to activate an instrument should also take other factors into account.

A macroprudential policy strategy follows four stages. These stages make up the policy cycle (see Figure 1.1) and include: (i) the risk identification stage, where relevant indicators help detect and assess vulnerabilities (relative to the intermediate objectives) and where indicative thresholds are defined; (ii) the instrument selection and calibration stage; (iii) the implementation and communication stage, where instruments are activated; and (iv) the evaluation phase, when the impact of instruments is assessed in view of possible adjustment/de-activation. In practice, the four stages are interlinked and cannot be considered in isolation.

Figure 1.1
Macroprudential policy cycle



[12] A more detailed description of the macroprudential policy strategy can be found in the companion ESRB Flagship Report on Macro-prudential Policy in the Banking Sector (ESRB, 2014).

2.1 Risk identification and assessment

"Key indicator books" help monitor and assess sources of systemic risk. Macroprudential authorities must assess whether a threat to financial stability might emerge and whether there is a case for macroprudential intervention. Selecting a targeted set of key indicators that capture the identified sources of systemic risk helps monitor and assess the build-up of these risks. Authorities may find it helpful to compile "key indicator books" that map the intermediate objectives into a well-defined set of key indicators.

Significant progress has been made, but work on indicators is ongoing. Most progress has been on the CCyB, where the ESRB has employed an innovative technique that allows for the power of indicators to signal crises across a wide range of indicator thresholds to be evaluated. This technique, which helps model the trade-off between missing crises (type I errors) and false alarms (type II errors), has been used to evaluate a large set of indicators across the EU. Preliminary results show that the credit-to-GDP gap and real estate price-based indicators can signal the types of crisis that the CCyB is meant to mitigate as early as five years ahead. Moreover, it has been found that combining indicators that performed well in isolation into a model improves signalling performance (see Chapter 2). It will be important to apply similar techniques to select indicators that signal other sources of systemic risks. Table 1.5 provides a non-exhaustive list of select leading and coincident indicators for each intermediate objective. Box 1.1 presents key findings relating to indicators.

Table 1.5:
Examples on how to link intermediate objectives with indicators

Sources of systemic risk	Select indicators	Chapter in Handbook
Mitigate and prevent excessive credit growth and leverage		
Excessive credit growth	Credit-to-GDP gap, real estate price-based indicators, leverage, private sector indebtedness	2
Risks arising from sectoral developments (e.g. real estate boom)	Sectoral credit growth, residential and commercial real estate price-based indicators, LTV/LTI indicators, investment in real estate and value added of construction, sectoral indebtedness	3
Mitigate and prevent excessive maturity mismatch and market illiquidity		
Liquidity risk	Bank funding ratios (e.g. LTD ratio), reliance on central bank funding, maturity structure, net open foreign currency position Liquid asset ratios, asset encumbrance and market liquidity indicators	5
Limit direct and indirect exposure concentration		
Large exposures and interconnectedness	Concentration indicators (e.g. geography, currency, maturity and sectoral), large exposures indicators (ten largest exposures), financial network indicators	4&7
Limit the systemic impact of misaligned incentives with a view to reducing moral hazard		
Distress or failure of an SII	SII indicators related to size, interconnectedness, substitutability, complexity, banking sector size and concentration, and cross-border activities.	4

Macroprudential authorities should consider identifying indicator thresholds beyond which they may consider taking action. Such thresholds could be public or private, and would depend on a range of factors. An important factor is policy-makers' preferences about the inherent trade-off between missing crises (when a high threshold is set) and receiving false alarms (when a low threshold is set). Country-specific considerations may also influence the selection of thresholds. Macroprudential stress tests can identify stress points in the banking sector and thereby help assess banks' resilience when indicators breach their thresholds.

Box 1.1
Indicators – key findings

1. **Indicators for the build-up and the release of instruments can differ.** This has been backed up by empirical evidence relating to the CCyB, real estate instruments and liquidity instruments.

2. **Combining information received from multiple indicators is likely to provide better and stronger signals of vulnerabilities building up.** A combination of strong credit developments (credit-to-GDP gap for the CCyB, mortgage credit evolutions for real estate instruments) and high real estate price growth is likely to be a cause of concern in the context of excessive credit growth and leverage.

3. **Information from single indicators is nevertheless important.** For example, an institution may be identified as an SII even when it is important along only one of the dimensions of systemic importance.

4. **Simple structural liquidity ratios seem to be promising leading indicators of systemic liquidity risk.** A simple LTD or core funding ratio seems to provide some signalling power regarding the build-up of systemic liquidity risk.

5. **Market-based indicators play a larger role in the release phase.** Market-based indicators have been found important in the release phase of the CCyB. Given the way in which liquidity risk typically crystallises in periods of stress, the role of market-based indicators could play an even larger role in the release phase of liquidity instruments.

6. **The assessment of structural systemic risks is likely to require a broad set of indicators.** Such indicators could capture the probability and size of shocks to the financial system, commonality of institutions' exposures and risk of intra-financial contagion, and the size and concentration of the financial sector.

In order to identify thresholds, it is necessary to understand the relationship between indicators and particular systemic events. Relevant systemic events include banking crises, including those relating to real estate and liquidity crises, losses incurred in such crises and losses related to the distress or failure of SIIs. For example, preliminary work on the CCyB has shown that a credit-to-GDP gap in excess of 2 percentage points signals the risk of a banking crisis arising from excessive credit growth.

Important data gaps that hamper the development of key indicators have been identified. Large differences with respect to availability, coverage and definitions of data persist across the

EU. Efforts to fill data gaps would allow macroprudential authorities to make better informed decisions. Specific areas for progress are the following:

- *improving the availability, quality and comparability of data related to the real estate sector, particularly in the context of commercial real estate, for which data is particularly weak.* Given the importance of regional developments in the real estate sector, policy-makers should also be able to monitor such developments and consider measures to prevent them from developing into a systemic risk;

- *improving the availability, quality and comparability of data on key indicators, such as LTV and LTI/DSTI ratios*. This is important in terms of cross-border comparability of data for systemic risk assessments and indicator selection. It would also facilitate cross-country comparisons of lending standards in the real estate sector;

- *having a better overview of funding flows across the financial system as a whole*. Liquidity risk was at the heart of the global financial crisis. But many data gaps prevent monitoring financial flows across the financial system. International and European efforts are underway to address such gaps, but much remains to be done.

2.2 Instrument selection and calibration

The selection and calibration of macroprudential instruments must reflect the underlying sources of risk. When selecting instruments, macroprudential authorities should consider economic, legal and cross-border aspects.

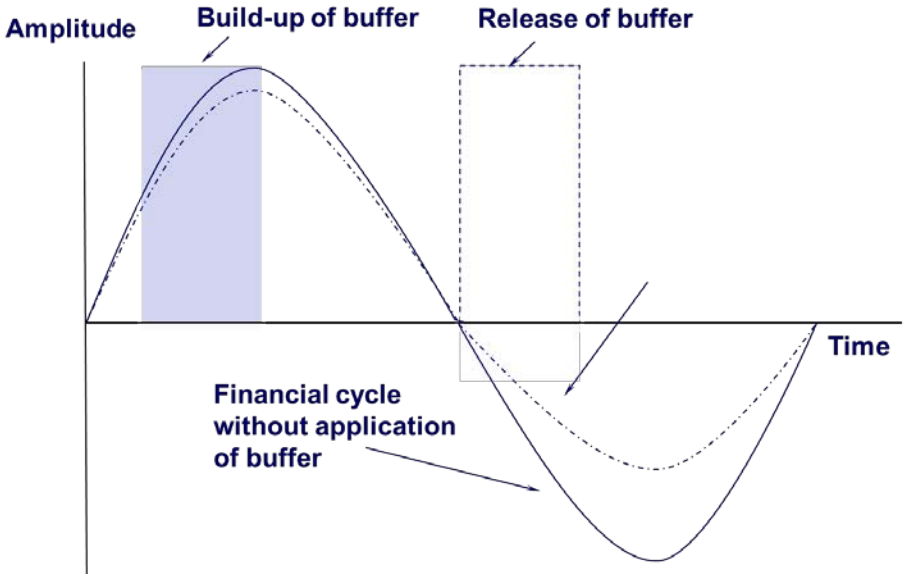
2.2.1 Economic considerations

Macroprudential policy must account for the financial cycle, as systemic risks are magnified by pro-cyclicality. Macroprudential authorities must be able to assess their broad position in the financial cycle to calibrate their policy stance.

Macroprudential instruments can dampen both the upswing and the downswing of the financial cycle. They can dampen the upswing of the financial cycle by reducing the build-up of vulnerabilities and can dampen the downswing of the financial cycle by increasing the resilience of the banking system. Figure 1.2 uses the example of a capital buffer to illustrate these channels of this transmission mechanism. For example, by increasing banks' cost of capital, the build-up of the buffer (shaded rectangle) tends to slow credit growth and thus, dampen the upswing of the cycle. Releasing the buffer in the downswing (dashed rectangle) helps dampen the downswing of the cycle, as banks' greater resilience allows them to smooth the provision of credit to the economy. These transmission channels are reflected in Tables 1.1-1.4.

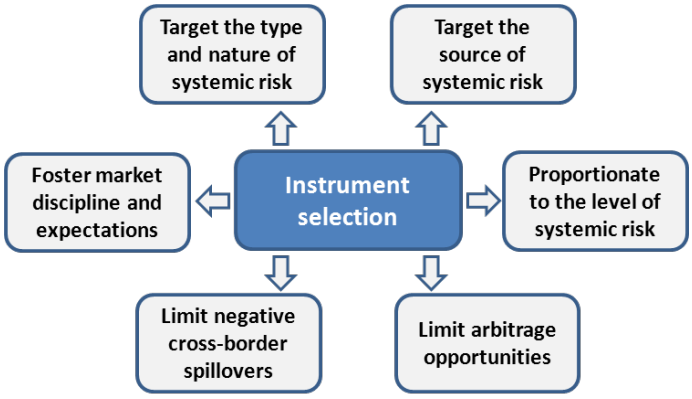
Calibrating macroprudential instruments to dampen the upswing of the financial cycle will be challenging. An increase in resilience is often easier to quantify and assess. For example, other things being equal, a banking system with €1 more capital will be able to absorb an extra €1 of losses. In contrast, the impact of €1 more capital on credit growth is difficult to assess. This makes it difficult to calibrate and assess the effectiveness of policy measures aimed at reducing the build-up of vulnerabilities.

Figure 1.2
Stylised transmission of buffers over the financial cycle



Macroprudential authorities should strive to use those instruments which lead to the highest net benefits to society. A practicable approach to this cost-benefit analysis involves assessing the instruments' effectiveness in relation to the desired objective, and the social costs they may give rise to by imposing restrictions on entities and activities. In general, this means favouring instruments that display a number of desirable characteristics, presented in Figure 1.3 and discussed in detail in Chapter 8.

Figure 1.3
Desirable characteristics in instrument selection



Using a combination of instruments may be more effective than using a single instrument. This may be the case when systemic risk has both structural and cyclical dimensions, and when it needs to be addressed by pursuing several intermediate objectives. It may also be the case in situations in which one instrument on its own cannot sufficiently address the level of systemic risk. Combining instruments can also increase effectiveness by limiting arbitrage opportunities.

2.2.2 Legal considerations

The CRD IV/CRR is aimed at ensuring that the use of macroprudential instruments does not harm the functioning of the internal market. Some instruments can only be used when others are not adequate and under a set of restrictions and requirements. In particular:

- the SRB should only be considered when other CRD IV measures (including Pillar 2) are not sufficient to address the identified systemic risk;
- similarly, national flexibility measures should only be considered when other measures cannot adequately address the macroprudential or systemic risk identified.[13]

Some instruments are subject to specific notification and approval procedures (see Table 1.6).[14] It remains important that macroprudential authorities have adequate instruments to address the emergence of systemic risk. Thus, the legal procedures should not discourage authorities from using these instruments when appropriate.

Table 1.6
Key notification and approval procedures

	O-SII buffer (Article 131 of the CRD IV)	SRB (Articles 133-134 of the CRD IV)	National flexibility measures (Article 458 of the CRR)
Addressee	COM, ESRB, EBA	COM, ESRB, EBA, CADA of Member States concerned	European Parliament, Council, COM, ESRB, EBA
Justification of effectiveness and proportionality	Yes	Yes	Yes
Assessment of likely positive or negative impact on the internal market	Yes	Yes	Yes
Justification of why other particular instruments in the CRD IV/CRR alone or in combination cannot adequately address the systemic risk	No	Yes	Yes
Approval of addressees required?	No	Under certain conditions (Chapter 4 Table 4.7)	Council may reject measure

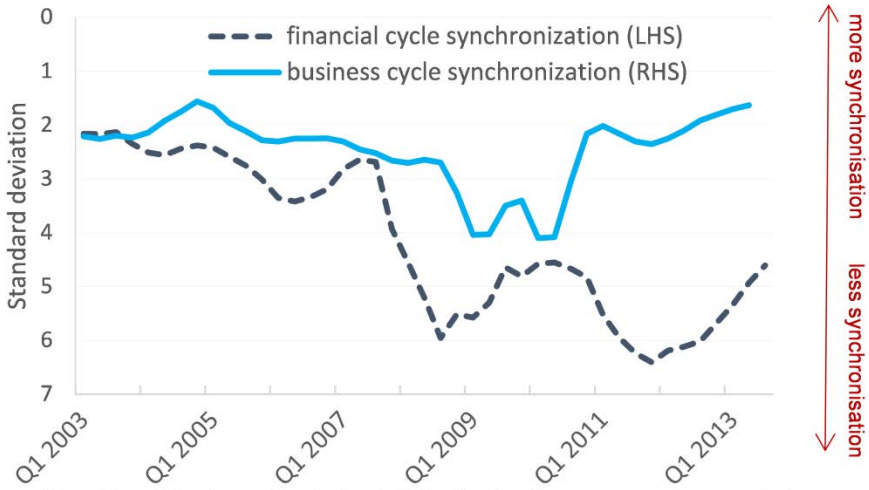
2.2.3 Cross-border considerations

Macroprudential instruments are likely to have positive net effects outside the jurisdiction in question. They might reduce the risk of negative financial or macroeconomic spillovers to other countries. However, spillovers can also be negative. As a general rule, this is more likely when financial cycles are out of sync: some countries will require a "tight"' policy stance; others a "loose" stance. Empirical evidence shows that there is substantial variation across financial cycles in the EU (see Figure 1.4).

[13] Other measures include Articles 124 and 164 of the CRR and Articles 101, 103, 104, 105, 133 and 136 of the CRD IV.

[14] Section 2.3c) elaborates on the role of the ESRB in these notification and approval procedures.

Figure 1.4
Divergence of financial cycles in the EU



Notes: Financial cycle synchronization is defined as the 1-year cross-country standard deviation in the credit-to-GDP gap (source: Alessi and Detken (2011, *EJPE*)). Business cycle synchronization is defined as the 1-year cross-country 2-year standard deviation in the YoY GDP growth rate (source: national accounts). Sample includes the EU28.

Macroprudential authorities should favour instruments for which negative cross-border spillovers are limited.[15] Reflecting this, for the instruments already noted in Table 1.6 (i.e. the O-SII buffer, the SRB and national flexibility measures), the CRD IV/CRR impose specific notification and approval procedures to ensure that their use does not harm the functioning of the internal market.

The ability to assess cross-border spillovers must improve. Authorities should build the analytical capacity to assess cross-border spillovers. Such analysis must cover both spillovers to other jurisdictions from activating macroprudential instruments domestically and the domestic impact from measures activated in other countries.

2.2.4 Calibration

Authorities should calibrate instruments to reflect the level of systemic risk. Calibration depends on what purpose the instrument serves; the calibration of an instrument aimed at increasing resilience is likely to differ from the calibration required when it is aimed at smoothing the financial cycle.

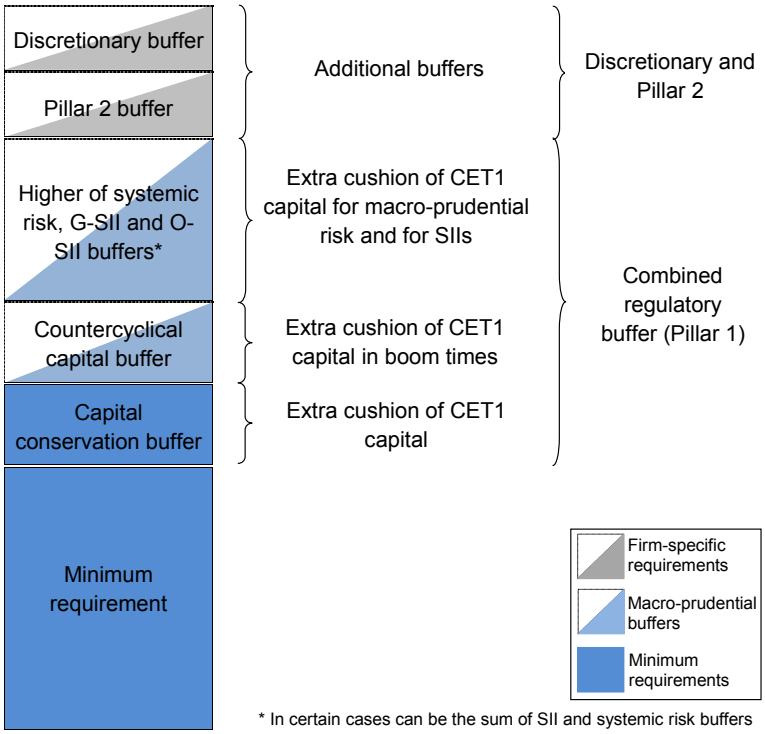
The calibration of instruments should account for potential stressed losses, obtained either from historical data or stress tests. For example, in the context of the CCyB, decisions on the appropriate buffer rate should be guided by the objective to protect the banking system

[15] For an extended discussion on cross-border issues, see Chapter 11.

against potential losses when the financial cycle turns. The calibration should therefore cover stressed losses and take into account that banks should be able to keep lending to the real economy even in periods of financial stress.

If instruments are applied in combination, they should be calibrated together. Instrument calibration should at least account for the levels of instruments that are already activated. This is particularly obvious in the case of the activation of multiple capital instruments (see Figure 1.5). However, this rule also applies in the case where different types of instruments (e.g. capital and liquidity, capital and LTV/LTI caps) are combined.

Figure 1.5
Capital requirements in the CRD IV/CRR



Source: ESRB staff based on European Commission (2013)

2.3 Policy implementation

When implementing macroprudential policy, a number of cross-cutting issues arise. These include the role of guided discretion, policy coordination, and communication.

2.3.1 Guided discretion

Policy-makers need to overcome the "inaction bias" (see Chapter 8). This is because the costs of activating macroprudential instruments are felt in the short term and are immediately visible, while the benefits are long-term and less obvious. For example, increasing the CCyB rate imposes costs on banks, while the lack of a counter-factual makes it difficult to demonstrate that the CCyB will successfully mitigate the risk and impact of a systemic crisis. As a result, authorities may be too slow to activate instruments. In a downturn, when losses materialise, policy-makers may be concerned about losses rising further. This can result in instruments being deactivated too late, with excessive negative effects on credit supply.

In theory, a strictly rules-based approach would mitigate the risk of inaction bias. Such an approach would trigger an automatic policy action if a single indicator or a set of indicators breached identified thresholds. It would require authorities to identify indicators that encompass a broad range of risks and thus reliably signal financial crises in a timely manner. Since indicator thresholds reflect policy-makers' preferences between missing crises and false alarms, it would also require these preferences to be relatively stable over time.

In practice, there is recognition that judgment needs to be exercised, as indicators and thresholds cannot fully capture identified risks. The analytical work underpinning this Handbook identified a number of indicators that performed well in signalling financial crises for the EU as a whole (see Chapter 2). However, such analysis is necessarily backward-looking and cannot fully take account of the fact that financial systems between Member States differ and evolve over time. This means, for example, that policy-makers should be willing to act based on qualitative assessments of the level of systemic risks, even if statistical indicators are not sending clear signals. More generally, because macroprudential policy is a relatively new tool and its analytical foundations are still in their infancy, it will be necessary to exercise judgment in order to cover new and evolving types of risk.

The new prudential rules for the EU banking sector combine elements of the rules-based approaches and the need for judgement into a principle of "guided discretion". In particular, Article 136 of the CRD IV stipulates that, while authorities are free to exercise their judgement when setting the CCyB, they should follow a set of principles and publish a benchmark reference rate to guide their judgement. This promotes sound and transparent decision-making, while the ultimate use and design of the instrument would remain under the responsibility of the macroprudential authority.

The principle of "guided discretion" could serve as a model for other instruments. Some of the other instruments introduced by the new prudential rules include elements of guided discretion. For example, while the CRD IV sets out an identification methodology for G-SIIs that produces a score, authorities can use supervisory judgement and allocate an institution to a higher G-SII sub-category than its score would imply.

2.3.2 Coordination

In order to arrive at a holistic view on how to address systemic risks, cooperation between relevant authorities is needed (see Chapter 9 for details). This is particularly the case when different authorities are responsible for macroprudential and microprudential policy. Both of these policy areas have a role in building a more robust and sustainable financial system. They also reinforce each other in terms of risk monitoring and policy design. Cooperation will be particularly beneficial when incorporating macroprudential elements into the SREP and when using Pillar 2 tools.[16]

The presence of potential cross-border spillovers also necessitates EU-wide coordination of national macroprudential policy. National authorities are recommended to engage in ex ante coordination when considering a macroprudential measure with potential significant cross-border effects. This will facilitate the assessment of possible cross-border spillovers and may lead to adjustments of measures. The ESRB will contribute to such coordination by developing a coherent and consistent macroprudential policy framework in the EU and promoting best practices.

Coordination across borders can ensure that macroprudential measures apply to both domestic and foreign banks. To hinder leakages and to promote a level playing field, authorities should seek to ensure that both domestic and foreign banks face the same requirements for their exposures in a particular country. This implies that foreign authorities voluntarily reciprocate macroprudential measures imposed by the domestic macroprudential authority.[17]

Before activating certain measures laid down in the CRD IV/CRR, authorities must notify the ESRB (see Box 1.2). For specific instruments, authorities are required to notify the ESRB before activating the measure.[18] Such notifications include an explanation of why a measure is justified and other information on the measures themselves.[19] The ESRB will assess the proposed measures and, if necessary, recommend amendments. For certain instruments, the ESRB is required to provide an opinion (see Table 1.6). The assessment will both cover the benefits of the macroprudential measures from a financial stability perspective and potential negative spillover effects in the context of the EU internal market.

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16 See Chapter 6 for more details.

17 For the CCyB, reciprocity arrangements are already included in the legal requirements up to certain levels (see Chapter 2).

18 This includes applying an O-SII buffer and using national flexibility measures under Article 458 of the CRR and SRB rates exceeding 3% (until 2015) and 5% (from 2015).

19 The detailed requirements on the content of these notifications differ somewhat depending on the instruments. See, for instance, Article 458(2) of the CRR and Article 133(12) of the CRD IV.

Box 1.2
Support for the issuing of ESRB opinions

Under the CRD IV/CRR, the ESRB is charged with issuing opinions and recommendations regarding the proper use of certain measures. This applies to the use of systemic risk buffer rates exceeding 5% (from 2015), as well as the use of national flexibility measures:

- **recommendations:** the ESRB must issue a "recommendation" when a Member State imposes a systemic risk buffer between 3% and 5%, provided there is at least one EU-owned foreign subsidiary in that Member State, When doing so, the ESRB must assess whether the measure is necessary, effective and proportionate, and whether the systemic risk cannot be adequately addressed by other measure(s);
- **opinion:** the ESRB must issue an opinion when authorities wish to use national flexibility measures. This opinion should cover the justification of effectiveness and proportionality of the measure, why other instruments in the CRD IV/CRR (alone or in combination) cannot adequately address the systemic risk and the likely impact on the internal market.

In order to ensure an efficient and timely process, standard notification templates for these macroprudential instruments have been published on the ESRB's website. The templates, agreed by the ESRB, the European Commission and the EBA, help to harmonise the notification process for Member States and assist the ESRB in assessing the appropriateness of the intended measures. Furthermore, the notifying authorities are asked to inform the Secretariat of an imminent notification in an informal manner, whenever possible five ECB working days prior to submitting the notification.

An ESRB Assessment Team has been created to assess and prepare ESRB opinions on macroprudential policy measures notified to the ESRB. The Assessment Team is composed of 13 permanent members (two representatives of the ESRB's Secretariat, one representative of the ECB, one of the SSM and nine representatives of different EU national central banks) and two permanent observers (one representative of the European Commission and one representative of the EBA). Jurisdictions which have notified a macroprudential policy measure will be represented by two non-permanent observers. Institutions with a member in the General Board can also have one non-permanent observer, if they have material concerns regarding possible negative cross-border externalities of the notified measure.

2.3.3 Communication

Authorities should promptly communicate macroprudential measures (see Chapter 11). Such communication needs to include more than purely operational features (e.g. design of the instrument(s), scope of application, timing and likely duration) of the measures. In particular, authorities should provide a simple narrative that links identified systemic risks to the intermediate objectives that are threatened by these risks and explains how measures taken are expected to mitigate these risks.

In some cases, communication should be coordinated between authorities (domestic and foreign) before publicly announcing the activation of a measure. Particularly in stressed circumstances, speaking with one single voice will provide clarity to target audiences and reduce the risk of conflicting and inconsistent messages.

2.4 Policy evaluation

Once a macroprudential instrument has been activated, authorities should monitor and evaluate its effects. Such evaluations should include to what extent the intermediate objective is sufficiently addressed (e.g. has systemic risk been mitigated?), and whether there are any substantial undesirable spillovers domestically or cross-border. Such evaluations should allow sufficient time for the effects of an instrument to play out.

If the instrument seems to be successful in achieving its objective with few undesirable spillovers, the authority should maintain its policy stance. If the risk recedes over time, authorities should plan for a relaxation of macroprudential policy. Just as when an instrument is activated, any deactivation should be designed with appropriate timing and phasing arrangements.

Macroprudential policy should be re-considered if the instrument seems insufficient to effectively address the intermediate objective. This should also be the case if it leads to material unintended spillovers. Reconsiderations could include tightening policy by increasing the requirements of the activated instrument. Other options include complementing or substituting it with other instruments. Any alteration to policy should be carefully designed, taking into account the advice provided in this Handbook.

Policy evaluation also has a role to play in refining the other stages of the policy cycle, including risk assessment, instrument selection and policy implementation more generally. International organisations can provide a useful complement to authorities' internal evaluations. They are at more of a distance from the actual decision-making process, and can bring international best practices and specialised skills to evaluate macroprudential policy.

Section II: Macroprudential instruments
Chapter 2
The countercyclical capital buffer[20]

[20] This chapter was prepared by Karsten Gerdrup (Norges Bank) and Olaf Weeken (ESRB Secretariat). It draws heavily on analytical work by the ESRB Expert Group on guidance on setting countercyclical buffer rates chaired by Carsten Detken (European Central Bank). The Expert Group comprised Diana Bonfim/Miguel Medonca Boucinha (Banco de Portugal), Peter Brun (Danmarks Nationalbank), Maciej Brzozowski (Narodowy Bank Polski), Christian E. Castro (Banco de España), Saša Cerovac (Hrvatska narodna banka), (Conn Creedon/Eoin O'brien), Stijn Ferrari (Nationale Bank van België/Banque Nationale de Belgique), Julia Giese (Bank of England), Gaston Andres Giordana (Banque centrale du Luxembourg), Karsten Gerdrup (Norges Bank), Matilda Gjirja (Finansinspektionen), Philipp Hochreiter (Austrian Financial Market Authority), Anna Jernova (Bank of England, PRA), Jan Kakes (De Nederlandsche Bank), Karlo Kauko (Suomen Pankki – Finlands Bank), Anna Kelber/Benjamin Klaus (Banque de France), Claire Labonne (Autorité de Contrôle Prudentiel), Massimo Libertucci (Banca d'Italia), Stan Maes (European Commission), Ola Melander (Sveriges Riksbank), Florian Neagu (Banca Naţională a României), Benjamin Neudorfer (Oesterreichische Nationalbank), Peer Osthoff (BaFin), Evangelia Rentzou (ESRB Secretariat), Štefan Rychtárik (Národná banka Slovenska), Sofia Savvidou (Bank of Greece), Jakub Seidler/Miroslav Plašil (Česká národní banka), Ingrid Stein/Natalia Puzanova (Deutsche Bundesbank), Wolfgang Strohbach (European Banking Authority), Balázs Világi (Magyar Nemzeti Bank), Ianna Yordanova (Finanstilsynet), Balázs Zsamboki (European Central Bank).

Executive summary

The countercyclical capital buffer (CCyB) is a key macroprudential instrument introduced by the new EU capital rules. Countries may implement the CCyB from 1 January 2014. It will become operational for all Member States from 2016. This chapter aims to help macroprudential authorities use the CCyB.

The CCyB is designed to help counter some of the pro-cyclicality in the financial system. Such pro-cyclicality contributed both to the origin of the global financial crisis and aggravated it: in the economic upswing, credit grew excessively as banks had easy access to debt funding, whereas credit contracted during the economic downswing as this funding dried up, leading to boom and bust.

The CCyB increases the resilience of the banking system during periods of excessive credit growth. In addition, during a boom phase, the CCyB may help dampen excessive credit growth through a price and/or quantity effect. The CCyB will tend to raise the cost of credit since capital is deemed to be more costly than debt, thereby reducing credit demand (price effect). Banks can also meet higher CCyB requirements by reducing risk-weighted assets, which may reduce credit supply (quantity effect).

To work as intended, the CCyB must be allowed to swing over the financial cycle. Macroprudential authorities should reduce the CCyB during periods of stress or when systemic risks abate. By reducing or fully releasing the CCyB, banks are able to absorb losses without constraining the flow of credit to the economy.

The operation of the CCyB is outlined in the EU capital rules. Reflecting the principle of "guided discretion" in the internationally agreed Basel III framework, authorities are obliged to calculate a buffer guide as a reference rate to guide their judgement. Macroprudential authorities are also asked to regularly monitor a range of economic and financial variables that have been associated in the past with excessive credit growth and ensuing financial crisis. Together with qualitative assessments, this should guide authorities in setting the CCyB. The CCyB rate should be higher than zero when credit growth is excessive and poses systemic risks.

The EU capital rules give the ESRB a mandate to provide guidance to macroprudential authorities on setting CCyB rates. The purpose of this guidance is to ensure that authorities adopt a sound approach to relevant financial cycles and to promote sound and consistent decision-making across Member States.

An ESRB expert group has been set up to conduct the necessary analysis and to develop this guidance. The expert group has collected data on relevant crisis episodes and economic/financial variables that may indicate such crises covering EU Member States. It has also developed a methodology to evaluate the signalling properties of these indicators and built the associated computational infrastructure to implement this evaluation procedure. It is envisaged that eventually this infrastructure will be made available to macroprudential authorities across the EU, and can also be adapted to operationalise other macroprudential instruments. Given the substantial amount of analytical work that needs to be undertaken, it is expected that the ESRB will provide guidance on the CCyB in the course of 2014. The analysis presented in this chapter, while preliminary, draws on the results from the expert group. It does not, however, prejudge this guidance.

This chapter has the following **key findings and policy messages**:

- Decisions on the appropriate CCyB rate should be guided by the objective to protect the banking system against potential losses when excessive credit growth is associated with a build-up of system-wide risk, thereby supporting the sustainable provision of credit.

- When evaluating the indicators that suggest activating/increasing or releasing the buffer, macroprudential authorities should develop a sound empirical methodology. Such a methodology would typically involve the following steps, although authorities may wish to explore alternatives to reflect national specificities:

    1. identify periods of financial crisis associated with excessive credit growth;

    2. identify and collect relevant economic/financial explanatory variables;

    3. employ a suitable approach to estimate the relationship between the explanatory variables and the crisis episodes. The expert group has found the following three approaches particularly useful: The signalling approach, which uses the raw data of the indicator; the discrete-choice approach, which transforms the data into the probability of a crisis occurring; and the decision tree approach;

    4. use a comprehensive measure to evaluate the signalling properties of indicators. The area under the receiver operating characteristic (AUROC) curve, which enables policy-makers to evaluate indicators over a wide range of thresholds, is one such measure. Optimal thresholds can be identified for specific preferences. A choice needs to be made between setting high thresholds and thus missing many crises and setting low thresholds and obtaining many false alarms.

- To indicate the build-up of risks, the deviation of the ratio of credit aggregates to GDP from its long-term trend and indicators based on real estate prices have performed well for the EU *as a whole* and in many individual Member States. Macroprudential authorities may wish to publish such measures as a matter of course. They may also wish to monitor a broader set of indicators, including accounting for national specificities.

- Financial market prices have performed well during the global financial crisis in indicating turning points in the financial cycle that are associated with periods of stress. Lack of data, however, means that these indicators cannot be tested over earlier crises. Determining when to launch the release phase of the CCyB may thus require greater exercising of judgment than during the build-up phase.

- Existing methods of mechanically mapping different levels of indicators into different buffer rates – a “buffer guide” – tend to be ad hoc. Further analysis is needed to determine the optimal size of CCyBs. Stress tests may also help to calibrate buffer settings.

- Since the CCyB is time-varying, it is likely that expectations of future rates will be important for its effectiveness. Macroprudential authorities should be transparent about how they decide on buffer settings. Therefore, a communication strategy that is consistent with the EU capital rules is needed in order to manage public expectations, foster coordination between macroprudential authorities and maintain accountability and credibility.

1 Macroprudential objectives

The CCyB is designed to counter some of the pro-cyclicality in the financial system. This pro-cyclicality contributed both to the origin of the global financial crisis and aggravated it: in the economic upswing, credit grew excessively as banks were able to fund themselves easily and cheaply through debt, whereas credit contracted during the economic downswing as funding dried up, leading to boom and bust.

The Basel Committee on Banking Supervision (BCBS, 2010) specified the objective of the CCyB in more detail:

"…to achieve the broader macro-prudential goal of protecting the banking sector from periods of excess aggregate credit growth that have often been associated with the build-up of system-wide risk. Protecting the banking sector in this context is not simply ensuring that individual banks remain solvent through a period of stress, as the minimum capital requirement and capital conservation buffer are together designed to fulfil this objective. Rather, the aim is to ensure that the banking sector in aggregate has the capital on hand to help maintain the flow of credit in the economy without its solvency being questioned, when the broader financial system experiences stress after a period of excess credit growth. This should help to reduce the risk of the supply of credit being constrained by regulatory capital requirements that could undermine the performance of the real economy and result in additional credit losses in the banking system."

This objective is also reflected in the EU capital rules (Recital 80 of the CRD IV):

"*It is therefore appropriate to require credit institutions and relevant investment firms to hold, in addition to other own fund requirements, a capital conservation buffer and a countercyclical capital buffer to ensure that they accumulate, during periods of economic growth, a sufficient capital base to absorb losses in stressed periods. The countercyclical capital buffer should be built up when aggregate growth in credit and other asset classes with a significant impact on the risk profile of such credit institutions and investment firms are judged to be associated with a build-up of system-wide risk, and drawn down during stressed periods.*"

Appropriately pursued, the CCyB can contribute to safeguarding the stability of the financial system as a whole, thereby achieving the ultimate objective of macroprudential policy.

2 Transmission mechanism and effects of the CCyB

2.1 Description of the CCyB

The CCyB is a Common Equity Tier 1 (CET1) buffer requirement on domestic exposures. It shall be set between 0% and 2.5%, but can be set higher when system-wide risks associated with excessive credit growth or other cyclical systemic risks are judged to be high.

Mandatory reciprocity (up to 2.5%)[21] ensures that the CCyB applies to all exposures in a certain jurisdiction irrespective of the country of origin of the creditor. This contributes to a level playing field between domestic and foreign banks (see also Section 5.3). The risk of regulatory arbitrage and cross-border spillover may be greater in cases where the CCyB is set higher than 2.5% and that rate is not fully recognised by other national authorities (see Section 2.4).

Each Member State shall designate a public authority or body (a "designated authority") that is responsible for the quarterly setting of the CCyB rate. There is typically a 12-month lead time from when an increase in the CCyB is announced until banks must apply the new buffer rate. A reduction in the buffer can be made effective immediately. If a designated authority reduces the CCyB rate, it shall also decide on an indicative period during which no increase in the buffer is expected.

Sections 2.2-2.5 provide an overview of transmission mechanisms of the CCyB, possible unintended consequences and cross-border spillovers. Interaction between the CCyB and other policy areas is also discussed. Table 2.1 provides an overview of the CCyB, including its objective, pros and cons, as well as relevant operational and legal issues.

[21] Mandatory reciprocity up to a buffer rate of 2.5% applies from 2019.

Table 2.1

Overview of the CCyB

Description: The CCyB is a CET1 buffer requirement on domestic exposures. It is calibrated in steps of 0.25 percentage point or multiples of 0.25 percentage point and cannot fall below zero (Article 136(4) of the CRD IV).

Objective: Decisions on the appropriate CCyB rate should be guided by the objective to protect the banking system against potential losses when excessive credit growth or other cyclical systemic risks are associated with a build-up of system-wide risk, thereby supporting the sustainable provision of credit to the economy.

Pros:

It is a broad-based measure that affects banks' resilience.
Banks may be allowed to draw down the buffer in periods of stress to help maintain the flow of credit in the economy without their solvency being questioned.
It is time-varying.
Reciprocity allows for the creation of a level playing field between banks regardless of their jurisdiction.

Cons:

Leakage/arbitrage may occur to less regulated and non-regulated domestic or foreign entities.
Possibility of cross-border spillovers to all of the countries in which a bank operates.
Excessive increase in exposures with low risk weights may be at the expense of exposures with high risk weights.
The impact on credit growth and economic growth is uncertain.
The expectation channel is uncertain and will possibly be affected by authorities' communication and practice over time.
The authorities can reduce or fully release the buffer, but banks can react by increasing their voluntary buffers, so the CCyB may not work as intended

Relevant operational issues:

It is difficult to assess when the financial cycle has turned.
Mapping credit-to-GDP gaps and possibly other indicators to benchmark buffer rates.
Sequencing of the CCyB and other policy instruments that may have cyclical effects in the implementation or adjustment phase.
Macroprudential authorities must balance mechanical rules and judgment/discretion within limits set by ESRB guidance and communicate the rationale for buffer settings.
Macroprudential authorities may put a different emphasis on missing crises and false alarms. An authority that judges financial crises to be extremely costly and/or is highly risk averse will tend to activate the CCyB more often than other authorities.

Relevant legal/institutional issues:

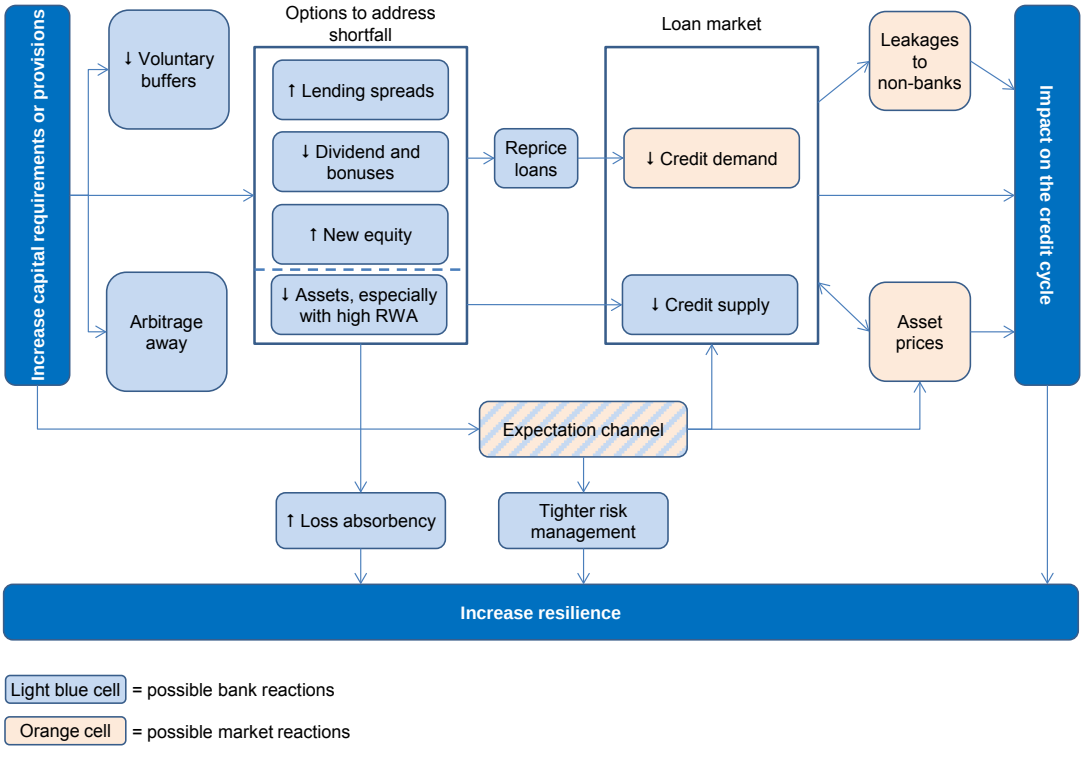
Member States are required to maintain a CCyB (Article 130(1) of the CRD IV).
Each Member State shall designate a public authority or body that is responsible for setting the CCyB rate (Article 136(1) of the CRD IV).
Each designated authority shall calculate for every quarter a buffer guide as a reference to guide its judgment in setting the CCyB rate. It shall be based on the deviation of the ratio of credit to GDP from its long-term trend (Article 136(2) of the CRD IV).
Each designated authority shall assess and set the appropriate CCyB on a quarterly basis, taking into account the buffer guide, any ESRB guidance/recommendations, and other variables relevant for addressing cyclical systemic risk (Article 136(3) of the CRD IV).
There is typically a 12-month lead time from when an increase in the CCyB is announced until when banks must apply the new buffer rate (Article 136(5) of the CRD IV). A shorter lead time is possible in exceptional circumstances. A reduction in the buffer can be made effective immediately after its announcement.
If a designated authority reduces the CCyB rate, it shall also decide on an indicative period during which no increase in the buffer is expected (Article 136(6) of the CRD IV).
Designated authorities shall notify each quarterly setting of the CCyB and specified information to the ESRB. The ESRB shall publish on its website all such notified buffer rates and related information (Article 136(7) of the CRD IV).
The ESRB has a mandate to provide guidance to designated authorities on setting CCyB rates (Article 135(1) of the CRD IV).
The ESRB may issue a recommendation to designated authorities on the appropriate CCyB rate for exposures to third countries (Article 138 of the CRD IV).

2.2 Transmission mechanism and channels

The CCyB works through the same channels as other capital requirements as well as banks' own funds (Figure 2.1).[22] An increase in the CCyB rate will have an impact on banks' resilience unless they reduce any voluntary buffers they may hold by an equal amount. However, not all banks have high enough voluntary buffers to enable them to do so, and they would typically want to hold a voluntary buffer on top of the regulatory capital as a safeguard. An increase in the CCyB is thus expected to increase banks' overall capital positions. Concerning the potential impact on the financial cycle, a separation can be made between a quantity and a price channel.

Unless banks increase their capital position through retained earnings, reduced dividend payments to shareholders or issuance of new capital, they must reduce their risk-weighted assets (RWA). To the extent that they choose to do so by cutting back on lending, credit conditions will become tighter and economic growth may be reduced. This effect may be warranted from the point of view of policy-makers since it may curb excessive credit growth.

Figure 2.1
Transmission mechanism of raising capital requirements



Source: Adapted from CGFS (2012).

A higher CCyB rate may entail higher overall funding costs because equity capital is deemed more costly than debt. This effect is not obvious. A well-known theorem in the finance literature is that the total value of a firm's assets should be independent of how these assets are funded (Modigliani and

[22] See also CGFS (2012) for a description of transmission mechanisms.

Miller, 1958). This also means that the total cost of funding should be independent of the composition of the firm's funding. When banks are required to hold more capital, shareholders' return on equity will be reduced for a given cost of debt. However, as banks' leverage falls, the risk of their debt also declines. This should offset the cost of having to finance the bank with a greater share of equity. The strict conditions underlying the Modigliani-Miller theorem would typically not hold, owing to, for example, taxes and asymmetric information.

A special feature of banking is that parts of banks' liabilities are subject to explicit (e.g. deposit insurance) and implicit (e.g. "too-big-to-fail" banks) guarantees. The price of bank debt may therefore not properly reflect its risks, and banks may have an incentive to operate with high leverage in order to maximise shareholders' return on equity. Banks may pass on the actual or perceived costs of higher capital resulting from a higher CCyB rate to their customers in the form of higher lending rates, possibly leading to reduced demand for credit and lower overall growth in the economy. When the CCyB rate is reduced – and provided that banks use the freed up capital – the above-mentioned mechanisms are largely expected to work in reverse.

Since the CCyB is time-varying, it is likely that expectations of future CCyB rates will become important for the effectiveness of this instrument. These expectations will be formed by authorities' communication, practice and credibility. During a build-up phase, clear and credible communication of the reasons for a higher CCyB rate may help in terms of leaning against the cycle as well as building resilience.

The expectation channel may be particularly important in periods of stress or crisis, since market requirements for banks' capital often increase at such times. This could reduce the effectiveness of lowering CCyB requirements. This effect is likely to be smaller if banks have built large enough buffers during the upswing of the cycle. To improve the effectiveness of the CCyB and increase the predictability of buffer decisions, macroprudential authorities are required to "*decide an indicative period during which no increase in the buffer is expected*" when the CCyB rate is reduced (whether or not it is reduced to zero), see Article 136(6) of the CRD IV.

2.3 Unintended domestic consequences of the CCyB

The effectiveness of the CCyB can be reduced by regulatory arbitrage and leakages to entities outside the scope of this instrument. Non-financial companies may substitute credit from banks that face a higher CCyB with credit from shadow banks or by issuing bonds or using other instruments to raise funds. Banks may exacerbate such a development by using techniques to transfer exposures to non-regulated entities. A higher CCyB may also give banks incentives to increase exposures with low risk weights at the expense of exposures with high risk weights.

While the aim of the CCyB is to improve resilience, it is expected to have an impact on the build-up phase of system-wide risk. The latter may be intended or can be a desired side-effect. Unintended domestic consequences can arise if an increase in the CCyB reduces the flow of credit growth to the economy by more than is warranted.

Inappropriate timing in releasing/reducing the CCyB can also have unintended domestic consequences. Releasing the CCyB reduces the risk of the supply of credit being constrained by regulatory capital requirements when the financial cycle turns. However, if macroprudential

authorities reduce the CCyB too late, its countercyclical effect will become less effective. The same applies if banks are being constrained from other sources, for example if they are unable to use the freed-up capital owing to high market requirements for banks' capital.

Unintended consequences can also arise if macroprudential authorities release the CCyB too early, i.e. before systemic risks have abated/no financial stress has occurred. In this case banks' loss absorbing capacity would be reduced if they used the new leeway accordingly. For example, credit growth could be fuelled more than desired, eventually causing banks to become exposed in the event that systemic risks materialise.

2.4 Cross-border spillovers of the CCyB

The CCyB increases banks' resilience, which contributes to reducing the incidence and severity of financial crises. Given the international nature of financial markets, this should also reduce contagion of financial stresses across countries, giving rise to potentially substantial positive cross-border spillovers.

This international aspect also implies, however, that differences in capital requirements across jurisdictions will create incentives for regulatory arbitrage and contribute to leakages. The EU capital rules on the CCyB address some of the challenges arising from arbitrage and leakages through the required reciprocity of buffer decisions (see Section 5.3), but negative cross-border spillovers may still arise in specific cases.

A change in the CCyB rate on exposures in a certain country may have spillover effects on all countries where a bank operates. For example, banks may choose to scale down all of their exposures regardless of the jurisdiction of their borrowers in order to meet a higher buffer rate in a country. This may adversely affect credit conditions and economic activity in these countries. Banks may also seek to move more of their business to specific countries, possibly to those which have not increased the CCyB. These countries could therefore experience increased supply of credit, which might be desirable if they are in a downturn and systemic risks are low.

Banks may also try to transfer activities to shadow banks as a response to a higher CCyB rate. This will have cross-border spillovers to the extent that activities are transferred to entities in other Member States or entities outside the EU.

2.5 Interaction with other policy areas

The CCyB may have side effects on the objectives of microprudential, monetary and fiscal policy, and vice versa. The use of each policy tool may need to take into account such side effects.

The CCyB may interact with monetary policy in many ways. Provided that the CCyB affects the price of credit, it may influence the transmission of interest rate changes in both the build-up and the release phase. The CCyB and monetary policy often work in the same direction, for example when excessive credit growth goes hand in hand with rising aggregate demand and inflation, or during financial crises, which typically coincide with weak economic growth. At other times, the policy stance in these two areas may be different. Low interest rates over extended periods owing

to low inflation may contribute to higher levels of risk-taking and excessive credit growth. The CCyB may also increase the effectiveness of monetary policy. To the extent that the CCyB is successful in reducing the incidence and severity of crises, the risk of monetary policy running into constraints such as the zero lower bound may be reduced as a result.

Important interactions may also arise between the CCyB and microprudential policy. The instruments available under Pillar 2 are numerous and their use is particularly flexible. Regulators in charge of microprudential policy may want measures to strengthen the resilience of individual institutions by requiring them to hold higher levels of capital during stressed periods when losses typically increase and perceived risks are elevated. By contrast, regulators in charge of the CCyB may prefer to let banks use the freed up capital to support the provision of credit to the economy. To the extent that such situations are not coordinated, policy-makers could end up in a "push-me, pull-you" situation in which microprudential policy instruments and the CCyB are used more aggressively in opposing directions.[23]

Furthermore, there may be a need for coordination or exchange of information/analysis in the implementation phase of other requirements applying to banks in order to reduce the risk of the CCyB having unintended domestic or cross-border spillover effects. This applies to both microprudential and macroprudential requirements. In particular, the CCyB may interact with real estate-related instruments (e.g. loan-to-value, loan-to-income and sectoral risk weights), since periods of stress or crisis in the financial system are often associated with problems in the real estate sector, implying that the objectives of these instruments partly overlap.

[23] This type of mechanism has also been used to justify the need tof coordinate monetary and macroprudential policy, see Ingves (2011).

3 Possible indicators for the CCyB

3.1 Motivation

In applying the CCyB framework, macroprudential authorities should take as a starting point risks to financial stability at the national level. These risks may differ from Member State to Member State, given that the characteristics of financial systems and financial cycles vary across the EU.

The CCyB should be built up when aggregate growth in credit and other asset classes with a significant impact on the risk profile of banks are judged to be associated with a build-up of system-wide risk. Macroprudential authorities may follow a range of early warning indicators to signal when system-wide risks are building up to a degree that suggests the need to activate or raise the CCyB. Different measures of developments in credit and real estate have been found to be particularly useful. This may reflect the fact that they can reinforce each other.

The deviation of the ratio of credit to GDP from its long-term trend (credit-to-GDP gap) has been recognised as a useful indicator by the BCBS (2010) and incorporated into EU capital rules (Article 136(2) of the CRD IV). Other variables than the credit-to-GDP gap could also have good signalling qualities and should be investigated by macroprudential authorities. The ESRB is tasked with providing guidance on the measurement and calculation of the credit-to-GDP gap, on the calculation of buffer guide(s), and on other relevant indictors for setting the CCyB (see Box 2.1).

First, two main approaches used in the literature to assess the performance of different early warning indicators are described below. Second, preliminary results for the credit-to-GDP gap consistent with Article 135(1)(b) of the CRD IV are reported and possible calculations of the buffer guide are described. Third, other variables indicating the build-up of system-wide risk are considered. Finally, variables that may be more relevant for reducing or fully releasing the buffer are presented. The results are preliminary and reflect work in progress.

Box 2.1
Formulating ESRB guidance

The EU capital rules (Article 135(1) of the CRD IV) give a mandate to the ESRB to provide guidance to designated authorities on setting CCyB rates. This guidance – which will take the form of a recommendation – consists of four items:

1. *Principles to guide judgment as to the appropriate CCyB rate.*
2. *General guidance* on the measurement and calculation of the credit-to-GDP gap and the calculation of buffer guides.
3. *Guidance* on variables indicating the build-up of system-wide risks associated with periods of excessive credit growth.
4. *Guidance* on variables that indicate that the buffer should be maintained, reduced or fully released.

To this end, a group of experts has been drawn from the Member States of the EU. Given the substantial amount of nalytical work that needs to be undertaken, the guidance is expected to be issued in the course of 2014 following the conclusions drawn by this group. This is well in advance of the regular transition period for the CCyB, which is due to start in January 2016.

Since Member States are allowed to implement the CCyB from 1 January 2014 (Article 160(6) of the CRD IV), i.e. prior to the transition period, this chapter of the Handbook draws on preliminary results of the analytical work carried out by the expert group. However, any findings presented here do not prejudice the forthcoming ESRB guidance under Article 135(1) of the CRD IV.

3.2 Approaches for evaluating indicators to guide decisions on the CCyB

The first step in an empirical analysis is to define the type of crisis that the instrument is meant to mitigate (left-hand side variable). For the CCyB, the crisis variable should capture periods of systemic-wide crisis associated with excessive credit growth. The next step is to determine the explanatory variables that ought to be tested and to collect the appropriate data (right-hand side variables). The third step is to employ a suitable empirical approach to estimate the relationship between the explanatory variables and the crisis episodes. The final step is to use a measure to evaluate the signalling properties of the indicators/models.

Two traditional methods have been used to assess the performance of early warning indicators in predicting crises. The first approach uses the raw data series of the indicator in question – henceforth the signalling approach. The second approach transforms the raw series into crisis probabilities using a logit or probit model – henceforth the discrete choice approach.[24]

The signalling approach is one of the most common approaches for the statistical evaluation of early warning indicators.[25] The signal is extracted directly from the data series when the indicator under consideration breaches a pre-determined or optimised threshold.

Under the discrete choice model, a binary classification set-up first maps various explanatory variables into the probability of there being a systemic banking crisis, i.e. either a probit or a logit mapping function transforms the data into a continuous variable between “0” and “1”, which indicates the probability of there being a crisis. If the probability exceeds a specified threshold, a signal is issued.

There are few studies to guide the choice between these two approaches. An advantage of the discrete choice approach over the signalling approach is that the logit or probit model gives an immediate understanding of whether a variable is statistically significant in relation to crisis

[24] It became standard following the seminal papers by Hardy and Pararbazioglu (1998) and Demirguc-Kunt and Detragiache (1999). Recent contributions in this field include Davis and Karim (2008), Barrell et al. (2010) and Lund-Jensen (2012).

[25] Following Kaminsky and Reinhart (1999), a number of policy papers utilise this method for an ex post examination of how well various indicators signal approaching crises: see Borio and Lowe (2002), Borio and Drehmann (2009), Drehmann et al. (2010), Alessi and Detken (2011), Drehmann et al. (2011) and CGFS (2012) among other things.

observations, even before a threshold for the crisis probability is set.[26] This is because the procedure estimates the marginal contribution of each explanatory variable. The signalling approach is more transparent as the link between indicators and warning signals is not mediated by the estimation of a crisis probability. However, it does not offer a multivariate setting for the assessment of the interplay of several indicators.[27]

A third approach, which is still largely unexplored in the literature on early warning models, is decision tree learning. It is based on numerical algorithms that allocate a set of indicators with larger discriminatory power in a "decision tree" format and calculate optimal decision thresholds at each node of the tree. Decision trees retain the advantages of both of the approaches described above as, on the one hand, they are very easy to explain and use and, on the other hand, they are able to provide an early warning where the relevant indicators are considered in a unitary framework.[28]

The empirical properties of different indicators/models can be evaluated by means of suitable metrics. One evaluation method that is of interest to policy-makers in evaluating crisis indicators is the AUROC curve.[29] The idea behind this approach is that there will always be a trade-off between missed crises (type-I errors) and false alarms (type-II errors). For example, using a higher threshold for indicators to signal crises will result in more type-I errors and fewer type-II errors, whereas a using a lower threshold will result in the reverse. Typically, policy-makers' preferences with regards to type-I and type-II errors, and thus their preferred thresholds, are unknown. If a national authority judges that financial crises are extremely costly and/or if the authority is highly risk averse, then it will choose a low threshold for activating the CCyB and consequently have it activated for longer periods of time.

The information is summarised in a measure called the AUROC curve.[30] This is the area under the receiver operating characteristic curve that plots the noise ratio (false positive rate)[31] against the signal ratio (true positive rate)[32] across a range of thresholds. This approach enables policy-makers to first identify indicators that perform well over a wide range of thresholds, and then to identify thresholds for these indicators which best reflect policy-makers' preferences with regard to type-I and type-II errors.

3.3 Credit-to-GDP gap

The credit-to-GDP gap has been found useful in signalling crises in many countries, most notably across the 27 member countries of the Basel Committee on Banking Supervision (BCBS). In its

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26 See Barrell et al. (2010).

27 Within the signalling approach, it is possible to test the performance of joint indicators which would issue warning signals only if at least two individual indicators breach their respective threshold (see Alessi and Detken (2011)).

28 See Alessi and Detken (2013).

29 See, for example Berge and Jordà (2011), Candelon et al. (2012), Drehmann and Juselius (2013) and Jordà (2012) for a description and more recent application.

30 See, for example, Hanley and McNeil (1982, 1983).

31 Which is equal to the type-II error rate.

32 Which is equal to one minus type-I error rate.

"Guidance for national authorities operating the CCyB" issued in 2010, the BCBS (calculated the credit-to-GDP gap as follows:

- the ratio of broad credit[33] to nominal GDP is calculated for each quarter, where GDP in each quarter is taken as the sum of the four most recent quarterly observations;
- the credit-to-GDP gap is the difference between the ratio of credit to GDP and its long-term trend, resulting in a gap in percentage points;
- the long-term trend is calculated with a one-sided Hodrick-Prescott filter, where the smoothing parameter, *lambda* (λ) is set at 400,000.

The credit-to-GDP gap calculated in this manner may not necessarily be appropriate across the EU since only seven[34] EU Member States are also members of the BCBS. Experiences at the national level have also shown that this gap would not always have given the best signal for activating a buffer.

Authorities can analyse and evaluate the sensitivity of the credit-to-GDP gap along different dimensions, for example using different smoothing parameters for the trend, calculating the trend over different sub-samples, using forecasts to reduce end-point problems in the filter and improve signalling qualities[35], and using different specifications of credit (e.g. narrow versus broad). Preliminary results of empirical analysis of various measures of the gap performed by the Expert Group on Countercyclical Capital Buffers are reported in Box 2.2.[36]

The results of this work suggest that the BCBS (2010) definition performs sufficiently well such that, for the purposes of international comparison and consistency, there is merit in countries calculating and publishing a credit-to-GDP gap according to this definition. However, given that the BCBS (2010) definition does not work well for all EU countries, Member States should also investigate alternative calculations of the credit-to-GDP gap in order to reduce the incidence of misleading signals.

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[33] All credit extended to households and other non-financial private entities in an economy independent of its form and the identity of the supplier of funds. This means that it should include credit extended by domestic and international banks as well as non-bank financial institutions either domestically or directly from abroad, and should also include all debt securities issued domestically or internationally to fund households and other non-financial private entities (including securitisations), regardless of who holds the securities. Available credit data varies across jurisdictions, see BCBS (2010).

[34] These are Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Spain, Sweden and the United Kingdom.

[35] Norges Bank uses forecasts in its application of the CCyB, see Norges Bank (2013).

[36] In principle, buffer decisions need to be based on real-time available data. In practice, however, it may take several months before preliminary data on credit and GDP are published and, in some cases, the correction of initial estimates has been found to be in the same order of magnitude as the gap itself (Edge and Meisenzahl (2011). However there is little evidence to suggest that the ex post measure consistently outperforms the real-time estimates of the gap as an indicator for the CCyB (van Norden, 2011) or in predicting periods of increased systemic risk Drehmann et al. (2011).

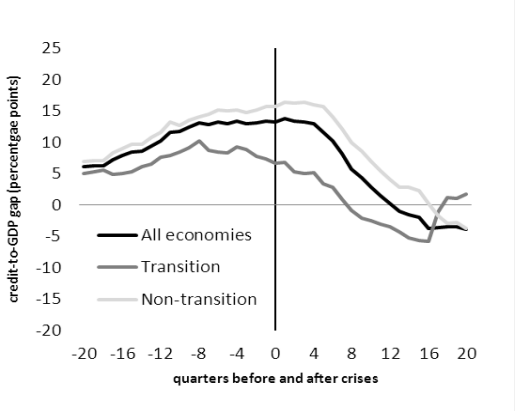
Box 2.2
Preliminary empirical analysis of the credit-to-GDP gap

The expert group has performed empirical analysis of various measure of the gap. First, a data set was constructed by defining a crisis variable that identified the type of financial crises the CCyB is meant to mitigate, and collecting nominal credit and GDP data from which the ratio of credit to GDP could be calculated. Different specifications of the credit-to-GDP gap were then constructed and evaluated using the AUROC-approach mentioned in Section 3.2. The AUROC is larger than 0.5 if an indicator is informative.

Figure 2.2 shows that the credit-to-GDP gap based on the BCBS (2010) method has tended to be relatively high (i.e. above the 2% threshold suggested by the BCBS) as early as 20 quarters ahead of financial crises. The indicator shows good signalling properties, with an AUROC of 0.77. These preliminary findings do not mean that the calculation of the credit-to-GDP gap following BCBS (2010) performs equally well for each Member State. In particular, the estimate of the trend tends to be slow to adjust following structural breaks leading to credit-to-GDP gaps that can be implausibly persistent. More generally, Figure 2.3 shows a markedly different level and pattern for transition and non-transition economies.

Figure 2.2
Average gap and ranges for the EU28

Figure 2.3
Average gaps by country grouping



Notes: The lines represent the average credit gap (in percentage points) from 20 quarters prior to a crisis to 20 quarters after the start of a crisis. Averages are based on all crisis episodes in the set of countries considered. The dashed lines represent the 25th and 75th percentiles.

For the EU28 as a whole, the signalling qualities of different calculations of the gap are robust across a range of specifications. In particular, few calculations of the gap displayed significantly better signalling qualities for future crises than the calculation suggested in the BCBS guidance. The empirical results indicate that it may be useful to use forecasts to reduce end-point problems and improve the signalling qualities of the credit-to-GDP gap. The measures of the gap that perform significantly better than the BCBS (2010) calculation tend to be based on bank credit rather than total credit as in the BCBS (2010). A narrow measure of credit would, however, not be robust to increased credit provision through the non-bank sector as a possible response to the use of CCyBs. The household credit-to-GDP gap also performed well.

3.4 Other early warning indicators

Early warning indicators that signal a build-up of risk can be divided into two broad categories. First, macroeconomic and macro-financial indicators, which signal developments in system-wide risk at the aggregate level. Second, aggregate bank balance sheet indicators, which signal a build-up of risks in banks and potential spillovers to the wider economy.[37] In general, combining information from several indicators is likely to provide more precise and robust signals of system-wide risks building up. The remainder of this Section describes which types of variable to consider and provides a qualitative summary of empirical results obtained by the expert group.

Macroeconomic and macro-financial aggregates, such as high broad credit and property price growth, can signal a domestic build-up of systemic risk. The emergence of easy credit in anticipation of collateral appreciation could create a self-fulfilling cycle of higher asset prices and indebtedness, further fuelling a credit boom.[38] When an adverse shock occurs, the value of the collateral adjusts, leaving banks overexposed.

Sectoral measures can offer additional useful information, as the exuberance may be concentrated in a particular sector of the economy, in particular residential and commercial real estate. Excessive credit growth makes non-financial sector balance sheets more vulnerable. This vulnerability can be measured directly by looking at measures of household and non-financial companies' leverage and debt service stretch. A cyclically high household debt-to-income ratio and high debt servicing costs mean that the household sector is vulnerable to any changes in lending conditions (such as interest rates) or in the valuations of collateral.[39]

Aggregate bank balance sheet-based indicators can be grouped according to the different types of risk that financial institutions face: solvency risk (including shocks to capital and profitability) and liquidity risk. Macroprudential authorities may look at system-wide, aggregate measures as well as at measures of systemically important banks. The macroprudential relevance of such indicators also relates to the funding of accelerating credit growth. Since it is difficult to support rapid growth by means of core funding sources, banks tend to turn to less stable non-core funding sources, which increase the vulnerability of the financial system.

Bank capital-based indicators could potentially be used to signal solvency concerns at the level of the financial system, or levels of excessive leverage and credit more generally. Bank profitability measures track the state of the banking system. For example, periods of high profitability may be related to an increase in banks' risk-taking at a time when capital buffers could be built organically at relatively low cost.[40]

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37 Behn et al. (2013) analyse the effects of macroeconomic, macro-financial and banking sector variables in predicting financial vulnerabilities in the financial system in EU Member States.

38 See Kiyotaki and Moore (1997). Irving Fisher noted as early as 1933 that: "…over-indebtedness may lend importance to over-investment or to over-speculation."

39 For example, a study by Drehmann and Juselius (2012) has found that the debt service ratio tends to peak just before systemic banking crises materialise and that, at horizons of around one year before a crisis, the quality of the early warning signal issued by the debt service ratio seems to be more accurate than that provided by the credit-to-GDP gap.

40 See Behn et al. (2013).

While the credit-to-GDP gap remains the single best performing indicator, the expert group has identified other single indicators that display reasonable forecasting performance. The most promising of these indicators are measures of overvaluation of commercial and residential real estate markets, the current account-to-GDP ratio and the (household) debt service to income ratio.

Multivariate results using the three different methodologies mentioned above (i.e. multivariate signalling, discrete choice and decision trees) deliver a consistent picture. Models that perform best tend to combine the credit-to-GDP gap with the other single indicators that perform well in isolation. On average, statistics summarising the performance of such models improve by 10-15%.[41] Typically, the multivariate analysis does not improve much on the rate of true predicted crises (in the range of 70-87% for thresholds calibrated for balanced preferences for both univariate and multivariate models), but it can significantly reduce the rate of false alarms (from about 30% for univariate models to 25-10% for multivariate models).

The main conclusion from the empirical results that are currently available suggests that macroprudential authorities should take into account warning signals from indicators other than credit-to-GDP gaps when setting the CCyB and should publish these indicators accordingly. In particular, looking beyond credit variables seems to reduce the probability of false alarms, as it conditions the credit growth on other developments in the economy. On the other hand, it should also be highlighted that the past performance of several other indicators is focused on the last financial crisis owing to a lack of long enough time series. The last crisis had specific characteristics, which makes it easier to explain (ex post) and might thus artificially boost the performance of some of these indicators, for which only shorter time series were available. There is thus a trade-off between broadening the set of indicators including those for which only less reliable empirical results regarding their performance in past crises exists, and the likely improvement of the overall assessment potentially obtainable by scrutinising a broader universe of facts. National authorities should also take into account national specificities in their selection of indicators and analysis.

3.5 Variables indicating the need to reduce or fully release the CCyB

The buffer may be reduced when: (i) threats to resilience have receded and the financial cycle is turning, or (ii) during periods of financial stress. In the first case, the buffer can be released gradually, for example when the financial cycle turns and risks decrease gradually, without materialising acutely. In the second case, a prompt release of the buffer may be necessary in periods of stress and rapidly weakening credit conditions. In such situations, the prompt release may avoid constraints in credit supply motivated by uncertainty about the timing of the release of the buffer.

[41] For example, AUROC curves for multivariate models are in the range of 0.86-0.90, up from the best single indicator AUROC in the range of 0.75 – 0.84. Usefulness measures for balanced preferences between type-I and type-II errors tend to increase by about 30%, but at least half of which is owing to the fact that multivariate models can often only use a shorter sample and are estimated mainly for the recent financial crisis, for which single indicator credit gap models would also perform better.

The choice of indicators will depend on the reason for releasing the CCyB. In the first case, in which threats are receding, the indicators used for the build-up phase, such as the credit-to-GDP gap, real estate-related indicators and other variables deemed relevant, could be informative. However, the credit-to-GDP gap may decline only slowly after a financial cycle has turned. For example, during a crisis GDP might fall faster than credit, and credit itself might be slow to fall if credit lines are still being drawn. Measures such as growth in credit and asset prices may be more helpful in identifying turning points in the financial cycle.

In the second scenario, i.e. during periods of financial stress, the release of the buffer could be guided by high-frequency and readily available indicators reflecting rapidly weakening credit conditions and stress in the financial sector. Market-based indicators reflecting the situation in money and credit markets (like CDS premia, covered bond spreads, credit spreads, etc.) are available in a timely manner and reflect coincident conditions in relevant markets, while credit growth and credit conditions surveys are crucial to assess the tightness of credit conditions. Such variables have been found useful in empirical studies[42], including the preliminary analysis conducted by the expert group. These variables will also be useful in helping authorities to decide how to ensure that the capital released by the CCyB is used for loss-absorbency or to maintain lending, for example whether to limit the distribution of the capital surplus created by the release of the buffer or rule that any reduction in capital ratios should be achieved only by absorbing losses or increasing risk-weighted assets.

Even though such indicators can be useful, authorities should be mindful of possible caveats. First, such indicators tend to noisy, signalling many false crises. Second, results may be specific to the global financial crisis, as most of the series tested are only available for a few countries and only from the late 1990s. As a result, even more than in the build-up phase, judgment may need to play an even greater role in identifying the appropriate timing for releasing the buffer. This applies especially to countries in which the markets for the respective financial instruments are not deep and liquid.

[42] Drehmann et al. (2011) analyse credit spreads, LIBOR-OIS spreads and CDS spreads. They find that credit spreads display the best signalling properties for potential release during stress.

4 Setting the appropriate level of the CCyB

4.1 Principles to guide judgment

The EU capital rules give macroprudential authorities flexibility in setting the CCyB subject to, for example ESRB guidance on principles. The BCBS "*Guidance for national authorities operating the countercyclical capital buffer*" (BCBS, 2010) complemented with guidance laid down in the CRD IV form a natural starting point for ESRB guidance. A preliminary list of possible principles considered by the expert group is shown in Box 2.3. The first five principles are largely based on the guidance issued by the BCBS. Given the importance of communication and reciprocity for the effectiveness of the CCyB, the list of principles has been extended to cover these two areas.

Box 2.3
Preliminary list of ESRB principles

Principle 1: (Objective) *Decisions on the appropriate CCyB rate should be guided by the objective to protect the banking system against potential losses when excessive credit growth is associated with a build-up of system-wide risk, thereby supporting the sustainable provision of credit to the economy.*

Principle 2: (Buffer guide) *The deviation of the ratio of credit to GDP from its long-term trend – the credit-to-GDP gap – should serve as a common starting point in guiding decisions on buffer rates, most notably in the build-up phase. However, this is not the only input in assessing and setting the appropriate countercyclical buffer rate. Designated authorities should explain the quantitative and qualitative information used, and how it is taken into account in the setting of the relevant buffer rate.*

Principle 3: (Risk of misleading signals) *Designated authorities should assess the information contained in the credit-to-GDP gap and any other variables, being mindful of their potential to give misleading signals. In addition, the usefulness of these variables should be periodically reassessed.*

Principle 4: (Prompt release of the buffer) *Prompt partial or full release of the buffer in times of stress or when threats to resilience recede can help reduce the risk that the supply of credit will be constrained by regulatory capital requirements. Designated authorities should take into account all relevant factors when releasing the buffer and determining an indicative period during which no increase in the buffer rate is expected.*

Principle 5: (Other macroprudential tools) *The CCyB forms part of a suite of macroprudential instruments at the disposal of the authorities in the EU. As part of their macroprudential policy strategy, authorities should consider when to use the buffer and when to use other instruments at their disposal.*

Principle 6: (Communication) *A good communication strategy for the buffer decisions contributes to managing public expectations plays an important role in the coordination mechanism between designated authorities and is essential for the credibility, accountability and effectiveness of*

macroprudential policy. Transparent, stable processes and well defined channels of communication between authorities and key stakeholders constitute the basis of a good communication strategy.

Principle 7: (Reciprocity) *Designated authorities should recognise the buffer rates applied in other jurisdictions, where appropriate. Designated authorities should consider potential cross-border implications when not recognising a buffer rate for exposures to another Member State and when setting or not recognising a buffer rate for exposures to a third country. The relevant designated authorities and the ESRB should be notified of these decisions.*

4.2 The buffer guide

The buffer guide as calculated in the BCBS guidelines (2010) contains two elements: a measure of the credit-to-GDP gap and an operationalisation to calculate a benchmark buffer rate. To preserve comparability across EU and non-EU countries, national authorities could follow the measurement and calculation of the gap as set out in the BCBS guidelines (2010). In addition, to account for national specificities, EU Member States may calculate a second measure of the credit-to-GDP gap based on an empirical analysis of data for that Member State.[43]

The BCBS guidelines (2010) map different levels of the gap into different buffer guides using a linear rule when the credit-to-GDP gap is within a range defined by a lower (L) to trigger the CCyB and a higher (H) threshold associated with a CCyB of 2.5%. The thresholds were both derived from an empirical analysis:

- *"L should be low enough, so that banks are able to build up capital in a gradual fashion before a potential crisis. As banks are given one year to raise capital, this means that the indicator should breach its threshold at least two to three years prior to a crisis."*
- *"L should be high enough, so that no additional capital is required during normal times."*
- *"H should be low enough, so that the buffer would be at its maximum prior to a major banking crisis…"*

Based on these criteria and the noise-to-signal ratio at different thresholds, the BCBS guidelines (2010) suggest a lower threshold of a two percentage point gap (L=2) and an upper threshold of a ten percentage point gap (H=10).

Although the BCBS guidelines (2010) provide a useful benchmark, mechanistically linking different levels of the credit-to-GDP gap to different buffer rates is an ad hoc approach. Macroprudential authorities should therefore investigate other rules for mapping the gap into a benchmark buffer rate. Furthermore, authorities may also investigate mapping indicators other than the credit-to-GDP gap into a benchmark buffer rate, since the credit-to-GDP gap may not be sufficient to capture the build-up of system-wide risk associated with excessive credit growth.

[43] When issuing its recommendation, the ESRB must account for the differences between Member States (Article 135(2) of the CRD IV).

4.3 Guided discretion

Article 136(3) of the EU capital rules requires that the designated authority shall assess and set the appropriate CCyB rate for its Member State on a quarterly basis, taking into account:

(a) the buffer guide calculated;

(b) any current guidance maintained by the ESRB and any recommendations issued by the ESRB on the setting of a buffer rate;

(c) other variables that the designated authority considers relevant for addressing cyclical systemic risk.

On this basis, CCyB rate decisions could emphasise rules or discretion. A rules-based approach would mean that authorities should place substantial weight on a buffer guide when setting the CCyB. A discretion-based approach means that authorities would place greater weight on judgment when setting the CCyB.

In general, macroprudential authorities should base their CCyB decisions on a robust set of principles, indicators and buffer guide(s). When macroprudential authorities follow a clear objective (i.e. to protect the banking sector from periods of excess aggregate credit growth that have often been associated with the build-up of system-wide risk), they can adjust their approach to accommodate different circumstances within the limits set by EU capital rules and guidance from the ESRB. For instance, while the buffer guide may serve as a common benchmark across the EU, setting the CCyB rate according to the buffer guide may not achieve the desired objective of the buffer in all country-specific situations.

The degree to which macroprudential authorities should adhere to a rules-based approach depends on the accuracy and robustness of the identified indicators. Furthermore, it depends on the extent to which authorities' preferences can be summarised in simple rules.

Macroprudential authorities may need to rely more on discretion in the release phase than in the build-up phase owing to indicators being less robust (see also Section 3.5). Timing in the release phase will be important. If the buffer is released too early, the released capital might continue to fuel a boom. This supports the argument that authorities should be careful not to release the buffer too early, in particular in the situation when the financial cycle is turning gradually without any systemic risks having materialised.

On the other hand, if the buffer is released too late, stress that have not been identified might have magnified to such an extent that markets question whether capital levels in the system are sufficient. CGFS (2012) notes that policy measures that boost the level of bank capital might in some situations be required to restore confidence. However, when macroprudential authorities have managed to increase the level of capital sufficiently prior to the crisis, such a situation may be less likely to arise. Stress-testing could allow for estimates of losses under different scenarios.

Box 2.4
Examples of frameworks for setting the CCyB

Norway and Switzerland have already introduced a framework for setting the CCyB. They have both chosen a small set of key indicators to guide their decisions. The Swiss National Bank can make proposals on setting the CCyB based on residential real estate exposures in Switzerland. The Swiss National Bank employs a guided discretion approach whereby a set of key indicators based on mortgage volume and real estate prices are used (Swiss National Bank, 2013). Additional indicators may be used to ensure that the decision is based on a comprehensive view of the developments in the Swiss mortgage market and, in particular, if the key indicators do not depict a homogenous image of the imbalances.

Norges Bank is responsible for giving advice to the Ministry of Finance on the CCyB. It has announced that this advice primary will be based on four key indicators: the credit-to-GDP gap, the wholesale funding ratio of Norwegian credit institutions, the ratio of house prices to household disposable income and commercial property prices (Norges Bank, 2013). However, there will not be a mechanical relationship between changes in the indicators or gaps and Norges Bank's advice, in particular when fully releasing the buffer.

The Financial Policy Committee (FPC), which is tasked with setting macroprudential policy in the United Kingdom, published a draft policy statement (FPC, 2013) on the CCyB and also sectoral capital requirements. This includes a list of 17 indicators that will be evaluated regularly comprising 1) indicators of bank balance sheet stretch, 2) indicators of non-bank balance sheet stretch, and 3) indicators that reflect conditions and terms in financial markets. The credit-to-GDP gap is included in the second category.

While there will be ample room for judgment given the complexities of national financial systems and the way in which they evolve over time, this increases the need for clear communication on the decision basis used and trade-offs applied by macroprudential authorities (see Section 5.4). Box 2.4 illustrates how the trade-offs between rules and discretion have been reflected in the frameworks for setting the CCyB in three selected countries.

5 Decision-making, coordination and communication

5.1 Responsible authorities

Each Member State shall designate a public authority or body (a “designated authority”) that is responsible for setting the CCyB rate (Article 136(1) of the CRD IV). When the Single Supervisory Mechanism becomes operational, the ECB will assume the asymmetric responsibility for imposing higher CCyBs for member countries of the banking union (Article 5(2) of Council Regulation (EU) No 1024/2013).

5.2 Coordination issues with other authorities

Different macroprudential instruments help achieve the same overarching objective – financial stability – and, in some cases, several intermediate objectives. The CCyB is one of several broad-based instruments included in the CRD IV/CRR that can contribute to mitigating and preventing excessive credit growth and leverage. The others consist of the systemic risk buffer, own funds under Pillar 1 and 2 respectively, and the capital conservation buffer. Several sectoral instruments can also contribute to the same intermediate objective. These include measures targeting developments in the real estate sector and measures for intra-financial sector exposures.

Institutional arrangements differ among EU Member States, meaning that different coordinating devices are required to achieve the overall objectives in macroprudential policy. Instruments need to address as much as possible the underlying sources of risk, whether they are due to a build-up of vulnerabilities or to market failures. A distinctive feature of the CCyB is that it is designed to help counter some of the pro-cyclicality in the financial system associated with credit growth. The other instruments tackle non-cyclical systemic risks (e.g. the SRB), more institution-specific risks (e.g. Pillar 2 measures) or sector-specific risks (RWs in real estate, LTV limits, LTI limits, etc.). Furthermore, the CCyB applies to all banks in a certain jurisdiction, benefits from mandatory reciprocity (see Section 5.3), is transparent and can be a powerful communication tool (see also Section 5.4). It also has low procedural requirements for its activation.

The CCyB would thus be the preferred instrument to mitigate a broad-based build-up of systemic risk associated with excessive credit growth. Other instruments targeted at strengthening debtors’ resilience and restricting access to credit (like the LTV and LTI limits) could be used in tandem with the CCyB if the aim is to reduce credit growth. To the extent that the CCyB and other relevant tools are under the control of different authorities, there is clearly scope for policy coordination. In particular, authorities should be aware of, and resolve, possible conflicts of interest in the conduct of CCyB and microprudential policy to avoid situations in which such instruments are used aggressively in opposing direction.

There may be a need for coordination or exchange of information and analysis in the implementation or adjustment phase of other capital and liquidity requirements, in order to reduce

the risk of the CCyB having unintended domestic or cross-border spillover effects. This applies to both microprudential and macroprudential requirements.

A strong institutional framework for the CCyB to pursue its objective can reduce conflict and create more room for manoeuvre for monetary and fiscal policy to pursue their own objectives. Exchange of information, analysis and decisions may furthermore improve economic decisions across the different policy areas.

5.3 Reciprocity agreements

Mandatory reciprocity (up to 2.5%) means that banks with exposures in several countries will face the CCyB as a weighted average of the CCyBs in all countries where they have exposures. This ensures that the application of the CCyB in a given jurisdiction does not distort the level playing field between domestic and foreign bank lending to counterparties in that jurisdiction. Reciprocity also reduces the risk of leakages and ensures the buffer's effectiveness in protecting banks from potential losses from abroad.

The designated authority in a country sets the CCyB rate that would apply to credit exposures held by banks located in their jurisdiction. Institutions established in a Member State different from the one setting the CCyB rate have to apply the same CCyB rate on exposures towards clients located in the country setting the CCyB rate. A Member State can also recognise a CCyB rate in excess of 2.5%, and shall in such circumstances announce that recognition by publication on its website (Article 137 of the CRD IV).

The CRD IV also contains rules regarding third countries. Member States are to refrain from applying to branches of banks headquartered outside the EU regulatory provisions more favourable than those applicable to branches of EU banks (Article 47 of the CRD IV). Furthermore, a Member State can choose to recognise or set buffer rates for third countries. Article 139(3) of the CRD IV states that a designated authority in a EU Member State may set a different CCyB rate for a third country for the purposes of the calculation by domestically authorised institutions of their institution-specific CCyB if they reasonably consider that the buffer rate set by the relevant third-country authority is not sufficient to protect those institutions appropriately from the risks of excessive credit growth in that country.

The EU capital rules (Article 138 of the CRD IV) give the ESRB an explicit mandate to issue a recommendation to designated authorities on the appropriate CCyB rate for exposures to a third country, for example when a CCyB rate has not been set and published or the CCyB is judged to not sufficiently protect EU institutions from the risk of excessive credit growth in that country.

In the EU/EEA, the reciprocity becomes fully effective only after the end of the transitional period on 31 December 2018 (Article 160 of the CRD IV). Moreover, if some Member States impose a shorter transitional period and decide to activate the buffer prior to 1 January 2016, the CCyB rates for the exposures located in these Member States will not necessarily apply to the exposures of institutions authorised in other Member States. National authorities should consider recognising CCyB rates also for countries that choose to implement it early in order to reduce the risk of regulatory arbitrage and leakage.

5.4 Communication

The EU capital rules (Article 136(7) of the CRD IV) require national authorities to announce the quarterly setting of the CCyB by publication on their websites from 1 January 2016, or earlier for authorities that begin to use it sooner. The information that shall be announced is:

(a) the applicable countercyclical buffer rate;

(b) the relevant credit-to-GDP ratio and its deviation from the long-term trend;

(c) the buffer guide;

(d) a justification for that buffer rate;

(e) where the buffer rate has been increased, the date from which the institutions must apply that increased buffer rate for the purposes of calculating their institution-specific countercyclical capital buffer;

(f) where the date referred to in point (e) is less than 12 months after the date of the announcement under this paragraph, a reference to the exceptional circumstances that justify that shorter deadline for application;

(g) where the buffer rate has been decreased, the indicative period during which no increase in the buffer rate is expected, together with a justification for that period.

Macroprudential authorities need to devise a strategy to communicate CCyB decisions consistent with these rules. This can act as a coordination mechanism between authorities to prevent/mitigate systemic risk effectively and to manage expectations (see Chapter 10). Regular information from macroprudential authorities about the indicators, buffer guide(s) and the rationale for their decisions may assist the market in changing its expectations for banks' capital levels accordingly, and may foster accountability and credibility. Over time, banks might be able to anticipate future actions and thus may even act before measures have to be taken.

Clear communication may be particularly important for the successful operation of the CCyB during the release period, which relies on the willingness of banks to put the capital released to good use. By providing assurance that the authorities do not plan to increase the buffer again in the near future, banks' willingness to reduce their capital ratios in times of stress may be enhanced.

In order to enhance the CCyB's effectiveness, it is important to ensure that authorities can credibly inform markets of banks' resilience when taking decisions on the release of the buffer. This can be done by publishing stress-test results, so as to ensure that the market does not question the adequacy of banks' level of capital.

Given the importance of clearly communicating buffer decisions to all stakeholders, a separate principle dealing specifically with communication may be appropriate, see Section 4.1.

Chapter 3
Real estate instruments[44]

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Executive summary

This chapter provides operational guidance to the member organisations of the ESRB regarding the use of real estate instruments for macroprudential purposes, in particular under the CRD IV/CRR.

Credit booms in real estate markets can create substantial risks to financial stability and the real economy. Unfavourable developments in the real estate sector have played a significant role in major financial crises. Macroprudential policy continues to be an area that is very much under development. Nevertheless, some practical country experience is already available on how to address systemic concerns originating from the real estate sector, including in EU Member States. Recent developments in the real estate sectors of a number of Member States make it more likely that such instruments will be used in the near future. Against this backdrop, developing and operating macroprudential instruments that target real estate markets is a key issue for European authorities.

This chapter is structured in four main parts. First, it discusses the transmission mechanism for the real estate instruments, as well as potential unintended effects. Where possible, policy options to mitigate such unintended effects are highlighted. Second, it reviews in detail the individual instruments, which can be grouped into instruments that target banks (sectoral capital requirements) and instruments that target borrowers (loan- to-value or LTV, loan-to-income or LTI, and debt service-to-income or DSTI limits). Third, it lists potential indicators that authorities can employ to inform policy decisions on the (de)activation and adjustment of macroprudential real estate instruments. These include price-based indicators, volume-based indicators, as well as indicators on the terms and conditions of loans. Finally, the last part discusses relevant legal and institutional issues related to the use of these instruments.

The main analytical findings and policy messages of the chapter are as follows.

- **Macroprudential real estate instruments contribute to strengthening banks' as well as borrowers' resilience and to dampening credit growth during the upswing of the credit cycle.** Instruments targeting banks (sectoral capital requirements) increase their resilience and may also help in moderating the credit cycle. Instruments targeting borrowers (LTV, LTI and DSTI limits) increase the resilience of both banks and borrowers, and restrict the quantity of credit relative to the value of the collateral or the borrower's income, thereby also dampening the credit cycle. Given the differences in their transmission channels and impact, the two types of instrument complement each other and there can be merit in having both types of instruments in place at the same time.

- **Real estate instruments can be used to address both time-varying and structural systemic risks.** Some instruments may be better suited for including a time-variant element. For example, varying the instruments targeting banks may be relatively easier than changing LTV limits, which may risk destabilising the market by creating incentives to frontload lending in anticipation of tightening measures. Other instruments do not need a time-varying element to smooth the cycle, such as LTI limits. However, macroprudential policy should not aim to fine-tune the credit cycle, and frequent changes in instrument settings should in general be avoided. It is also important for communication on macroprudential policy not to create unrealistic expectations regarding the ability to manage the credit cycle.

- **When using a macroprudential instrument in a time-varying way, in principle, the instrument should be loosened in a downturn.** Macroprudential tightening during the upswing of the cycle would provide room for such loosening in downturns, which would support credit growth and potentially help avoid a credit crunch.

- **The systemic risk buffer can also be used as a sectoral capital instrument to address structural risks originating from the real estate sector.** However, cyclical risks related to the real estate sector should be addressed with other instruments.

- **National regulation should allow authorities in Member States to implement LTV and LTI/DSTI limits if they deem this to be appropriate.** Given the large cross-country variation in regulation between Member States, the identification of current best practices by the ESRB could provide guidance as to the design of such regulation. The monitoring of actual LTV and LTI/DSTI ratios should be improved, as they convey important information on mortgage lending practices and provide invaluable guidance to policy-makers when considering implementation of limits or changes to existing limits.

- **High volumes of real estate credit and strong price growth are good leading indicators of banking crises associated with problems in the real estate sector;** a combination of both is of particular cause for concern. Based on empirical performance as well as data availability, macroprudential policy-makers in Europe should therefore consider both volume-based indicators (real estate credit) and price-based indicators (real estate prices). In addition, there are also promising results for indicators capturing real estate investment. During the release phase, market-based indicators such as spreads are useful, and the exercising of judgment is likely to be more important than in the build-up phase. Bank balance sheet indicators are generally valuable for policy-makers' understanding of banks' resilience, in particular during the release phase.

- **Other indicators are also useful, including LTV and LTI/DSTI ratios, but constraints on data availability can hinder a reliable analysis.** Further work to improve data availability, quality and comparability is therefore needed, especially for LTV and LTI/DSTI ratios and data on commercial real estate. Member States should consider collecting relevant data for LTV and LTI/DSTI, if not yet available. The ESRB could explore ways forward to improve the availability and comparability of data on actual LTV and LTI/DSTI ratios, as well as for data on other indicators related to terms and conditions for loans and data on commercial real estate developments.

- **Given the heterogeneity of national real estate markets, policy-makers should also consider measures to address regional developments that may result in systemic risk.** Because of the regional heterogeneity of real estate markets, it would be desirable to improve the availability of reliable regional data.

1 Macroprudential objectives

The ultimate objective of macroprudential policy is to contribute to safeguarding the stability of the financial system as a whole, including by strengthening its resilience and containing the build-up of systemic risks, thereby ensuring a sustainable contribution of the financial system to economic growth. In its Recommendation of 4 April 2013 on the intermediate objectives and instruments of macroprudential policy, the ESRB identified a number of intermediate objectives as operational specifications of this final objective. These intermediate objectives include, among other things, mitigating and preventing excessive credit growth and leverage as well as limiting exposure concentration.

Excessive real estate booms are particularly undesirable from a systemic risk perspective as they are often associated with financial and economic busts that are deeper, costlier and longer lasting than average downturns. This is because such booms often go hand in hand with high leverage in the household and financial sectors. In addition, real estate constitutes a large store of household wealth and the construction sector has major supply-side effects on growth. Therefore, the indirect effects of a real estate bust on the broader economy are large enough to justify policy action during a boom.[45]

Real estate instruments for macroprudential purposes can mitigate and prevent systemic risks in two ways:

- by **increasing the resilience of banks and households** against losses during periods of financial stress, thereby helping to maintain lending. This can be done by decreasing the riskiness of real estate loans, increasing the amount of capital held by lenders to withstand shocks stemming from the real estate sector or both.
- by **dampening credit growth** in the expansive phase of the credit cycle. Note, however, that actively managing the business cycle is beyond the scope of macroprudential policy.[46]

The effects on credit supply differ between types of instrument. Provided sufficient buffers have been accumulated during the upswing of the credit cycle, the instruments could be relaxed such that they return to their regulatory minimum during a downturn in order to support credit growth, potentially preventing a credit crunch.

[45] For a survey on the effects of real estate booms on the financial system, see for example Davis et al. (2011).

[46] See Chapter 1, which provides more detail on the role of macroprudential policy in addressing pro-cyclicality.

2 The instruments, their transmission and effects

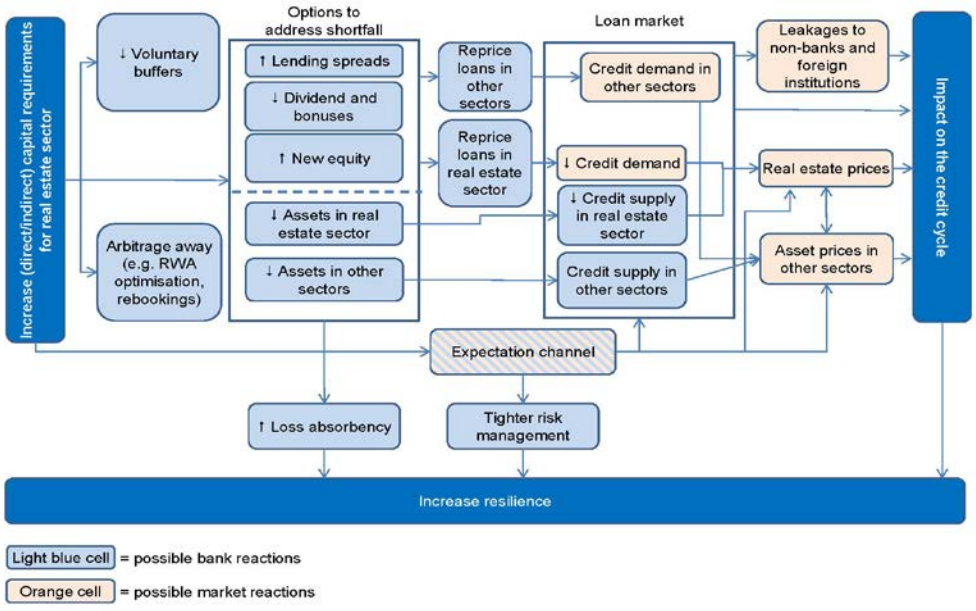
Real estate instruments that are used for macroprudential purposes can be broadly grouped into instruments that target banks and instruments that target borrowers. **Instruments that target banks** work on banks' balance sheets via regulatory capital requirements, either directly (by imposing higher capital requirements for exposures on the real estate sector) or indirectly (by working on variables that affect these capital requirements such as risk weights (RWs) and loss given default (LGD) parameters). **Instruments that target borrowers** work directly on the terms and conditions of the loans by making the volume of credit granted dependent on the value of the underlying real estate (LTV limit) or on the debt servicing capacity of the borrower (LTI and DSTI limits).[47] In practice, these classifications may overlap (for example, the use of higher RWs for loans that exceed certain LTV, LTI or DSTI limits).

2.1 Transmission mechanism

2.1.1 Instruments targeting banks

Increased capital requirements have a direct impact on banks' resilience and may also help in preventing excessive credit growth and leverage.

Figure 3.1
Transmission channels of an increase in sectoral capital requirements



Source: Adapted from CGFS (2012).

[47] Other instruments may also be available, such as sectoral concentration limits or loan amortisation requirements.

Impact on resilience. Any additional capital held to meet the higher requirements increases banks' capacity to absorb losses stemming from real estate loans. The additional capital can result from the issuance of new equity or from the non-distribution of profit.

Impact on the credit cycle. Banks may choose to restrict their real estate (or other) lending or to increase the cost of credit for borrowers (higher spreads), and these measures may reduce the likelihood of a credit-fuelled real estate boom. However, lending opportunities might be too attractive in a boom period for increased capital requirements to have any significant impact on credit availability for the real estate sector. In a downturn, the additional capital can be released and made available to absorb losses and help to maintain lending. However, reduced regulatory capital requirements can be offset by higher requirements imposed by the market, in particular in crisis situations (See Box 3.1 for country experiences).

Box 3.1
Empirical evidence on the effect of changes in capital requirements

Higher capital requirements increase banks' resilience, and experience shows that they may also help in moderating the credit cycle. However, the effect on credit is not easy to disentangle from other policy actions or developments.

In **Australia**, an increase of RWs on uninsured "low-doc'" mortgages in 2004 has been effective in limiting growth of the low-doc market.

In **Estonia**, RWs on mortgages were raised from 50% to 100% in March 2006. A decline in housing loan growth followed, but Eesti Pank noted in its May 2006 FSR that banks also increased own funds, mitigating some of the impact on credit growth.

The Reserve Bank of **India** increased RWs on commercial real estate (CRE) lending in 2005 and again in 2006. Credit growth to the sector declined – and stayed low – after these actions.

In **Ireland**, RWs on mortgages, particularly high LTV mortgages, were raised in 2006 (and in 2007 for CRE loans). Loan growth started to decline following the increase in RWs, but it is unclear whether this was due to the policy action or to other reasons. Policy-makers now describe the move as "too timid, too late".

In **Norway**, RWs were raised from 50% to 100% on loans with an LTV greater than 75% in 1998 (discontinued in 2001). While Borio and Shim (2007) note that credit growth decreased from above 10% at the end of 1997 to below 7% in mid-1999, it is difficult to distinguish whether this deceleration was the result of the real estate measures or owing to the economic downturn following the Asian crisis.

In **Portugal**, more capital was required for housing loans with LTVs above 75% from July 2000 onwards. There is some evidence that loan growth declined, but Borio and Shim (2007) note that it is difficult to disentangle this from the effects of higher interest rates.

Recently, **Hong Kong and Sweden** have introduced residential mortgage risk weight floors of 15%. There is some tentative evidence, at least for Hong Kong, that this may have resulted in higher mortgage rates, but it is too early to reach firm conclusions on the impact and effectiveness of these measures.

Expectation channel. Expectations of future policy measures may already have an impact on banks' lending policies before any measures are actually implemented.

Leakage and arbitrage. The effect of the instruments can be reduced through various types of leakages and arbitrage. Banks' ability to draw down their voluntary capital buffers to meet higher requirements could mitigate the impact. Subject to supervisory scrutiny and/or approval, banks using the internal ratings based approach (IRB) for credit risk may re-optimise their risk-weighted assets (RWAs) by adjusting the parameters of their internal models. Banks may also shift lending to riskier real estate exposures to compensate for higher costs or transfer risks off-balance sheet. If measures are not applied to all transactions, loans can be shifted to other financial institutions in less regulated sectors, or, in the case of local subsidiaries, loans can be rebooked to foreign parent banks not subject to the local capital requirements. The risk of cross-border leakages depends on existing reciprocity rules.

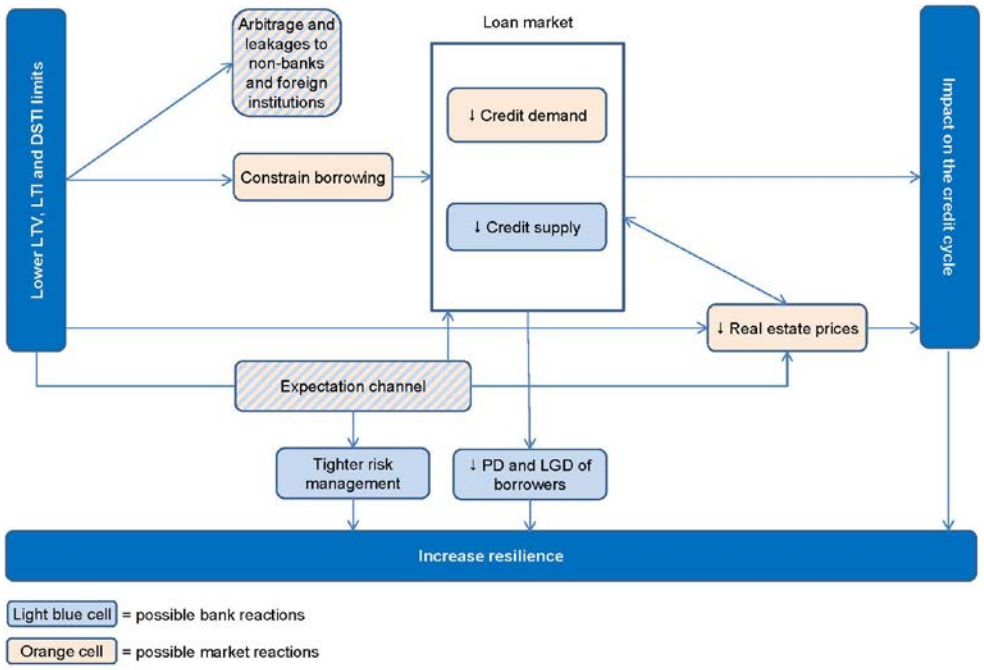
Cross-border effects. In building up the resilience of the domestic financial system, macroprudential policy measures are likely to have significant positive effects on other countries as financial crises are prevented or mitigated. Measures aimed at banks' balance sheets may in certain circumstances also have negative effects, for example if countries are in different stages of the credit cycle and banks affected by a measure in one country cut back lending in other countries as well (see Chapter 11 of the Handbook).

Mitigation of unintended domestic and cross-border effects. The incentives for re-optimising RWAs can be reduced if tighter capital restrictions are implemented through or accompanied by limitations concerning parameter adjustments in IRB models In general, the scope for arbitrage can be reduced by increasing the regulatory perimeter and through greater regulatory reciprocity. Active monitoring of the financial sector by macroprudential authorities is instrumental to prevent risks shifting to other institutions inside or outside the regulatory perimeter. Arbitrage and leakages can also be reduced by exploring the complementarities between instruments (for example by combining capital requirements with LTV, LTI and/or DSTI caps). On-site assessments conducted by the microprudential authority could also play a role in supporting policy enforcement.

2.1.2 Instruments targeting borrowers

Instruments that target borrowers restrict the amount that can be borrowed relative to the value of the collateral or income of the borrower and thereby curb credit growth in the real estate sector. In addition, they enhance the resilience of both the banks and their borrowers. The discussion below focuses on LTV, LTI and DSTI caps. These instruments are distinct from the other the instruments used for macroprudential purposes in that they are directed towards the contract between the bank and the borrower.

Figure 3.2
Transmission channels of a tightening of the LTV, LTI and DSTI limits



Source: Adapted from CGFS (2012).

Impact on resilience. LTV, LTI, and DSTI caps increase the resilience of both borrowers and banks (see Box 3.2 for country experiences). Broadly speaking, LTV limits reduce the potential loss of the bank in case the borrower defaults (lower LGD), while LTI and DSTI limits reduce the probability that the borrower will default (lower probability of default or PD).

Impact on the credit cycle. LTV, LTI and DSTI caps are intended to curb excessive credit growth and leverage, thus smoothing the credit cycle. They reduce the funding available to borrowers by imposing a limit on the loan, either in relation to the value of the underlying collateral (LTV) or the disposable income of the borrower (LTI, DSTI). Since these instruments are aimed directly at restricting the quantity of credit, they are likely to contribute to a decrease in the credit-driven demand for real estate and to potentially lower or decelerating real estate prices. The tightening could be reversed as systemic risks recede. In fact, lowering LTV, LTI and DSTI caps during a downturn of the real estate cycle might increase credit availability to the sector and reduce the likelihood of a credit crunch.

Box 3.2
Empirical evidence on the effect of LTV, LTI and DSTI limits

Evidence from European countries on the effectiveness of LTV, LTI and DSTI caps is relatively scarce, as in most cases they have been implemented only recently. For example, Swedish authorities report that the residential LTV cap in force since October 2010 has made lending standards more conservative, thus contributing to the resilience of the banking sector (Finansinspektionen, 2013).

Some Asian economies have a somewhat longer history of operating such caps. In almost all instances, these are used for residential (and not CRE) lending. The results of several studies suggest that the caps have been effective in moderating the credit cycle and increasing resilience.

Evidence from **Korea** finds that tightening of residential DSTI and especially LTV criteria significantly lowers transaction activity and price appreciation in the housing market owing to a decrease in expected house price growth and lower speculative activity (Igan and Kang, 2011). During the release phase, little evidence has been found that relaxing lending standards stimulates credit growth. In **Hong Kong**, a tighter residential LTV may have helped reduce household leverage and sensitivity of defaults to changes in property prices (Craig and Hua, 2011, Wong, Fong, Li and Choi, 2011). In September 1998 the mortgage delinquency ratio remained relatively low and Hong Kong banks remained well-capitalised, despite a 40% year-on-year fall in property prices. **China** has varied LTV caps extensively with policy tightening in response to the growth in house prices and house sales. For example, house price growth fell from 90% to around 0% after the central bank tightened the LTV cap to 70% in June 2006.

Cross-country studies find that lower residential LTV and DSTI caps have contributed to restraining credit growth during the past decade. Furthermore, the use of LTV caps tends to have a decelerating effect on real estate price growth and appears to strengthen bank capital buffers and bank performance (Wong, Fong, Li and Choi, (2011), Ahuja and Nabar (2011), Maddalonia and Peydró (2013)). Based on a panel of 57 countries, Kuttner and Shim (2013) conclude that out of LTV, LTI and DSTI caps, only the latter has had a significant and robust impact on housing credit growth, with no discernible effect on housing price growth.

A larger body of literature provides evidence for the supposed transmission mechanism for LTV, LTI and DSTI caps. IMF (2012) finds that LTV ratios have potent effects on credit growth, house prices and economic output. Residential house prices are typically found to be more sensitive to income shocks when households are highly leveraged (Lamont and Stein (1999), Almeida, Campello and Liu (2006), Benito (2006)) and household consumption is found to be more volatile when household debt levels are high (Isaksen et al. (2011)). Such volatility in house prices and consumption, which can magnify boom-bust cycles, suggests a role for LTV and LTI caps. Similarly, U.S. house prices were found to be influenced by the loosening and subsequent tightening of banks' residential mortgage lending standards during the boom-bust cycle of the past decade, suggesting that a binding LTV or LTI cap could have moderated the credit boom ((Duca, Muellbauer and Murphy (2011), Mian and Sufi (2009), Mian and Sufi (2011)).

Expectation channel. Expectations might reinforce the impact of the limits since banks may step up their risk management practices in anticipation of policy tightening. At the same time, expectations may also play a destabilising role by providing incentives to frontload credit activity, thereby further fuelling real estate prices and credit growth. This risk seems greater for instruments that target borrowers (for example, LTV, LTI and DSTI) that are typically applied to flows of new loans rather than stocks. In practice, however, it is likely that LTV, LTI and DSTI limits will be changed only infrequently. The risk of frontloading seems lower for sectoral capital requirements, such as RWs and LGDs, which can be effective from their announcement and are typically applied to stocks rather than flows.

Leakage and arbitrage. Leakage may occur as borrowers take out mortgage loans in parts or when additional unsecured (consumer) financing is used and the limits do not account for this. Banks may also become more lax in the valuation of the collateral or the determination of the borrower's income. If the caps are not applied to all domestic transactions, other financial institutions, the less regulated sector or institutions from abroad might take the place of the banks that have reduced their lending. Loans originated by local subsidiaries could also be rebooked to foreign parent banks. In such cases, the absence of reciprocity requirements might increase the risk of cross-border leakages.

Cross-border effects. In building the resilience of the domestic financial system, macroprudential policy measures are likely to have positive effects on other countries as the risk of financial crises is reduced. Measures that target the terms and conditions of domestic lending are unlikely to have any negative effects on other countries.

Mitigation of unintended domestic and cross-border effects. Leakages and arbitrage can be reduced if limits apply to all domestic transactions rather than a specific group of institutions or through voluntary reciprocity arrangements. This minimises the potential for households to circumvent the limits through other financial institutions, such as non-banks or branches of foreign banks. A clear and comprehensive definition of both the numerator and the denominator of the ratios can further mitigate unintended effects. Clear criteria for the valuation of the collateral and the assessment of the borrowers' income are required to enhance the effectiveness of the instruments.

2.2 Interaction with other policy areas

The effectiveness of the instruments also depends on their interaction with other areas of economic policy-making, in particular monetary, fiscal or microprudential policy, highlighting the need for coordination.

Monetary policy. Monetary policy decisions have a bearing on developments in credit and real estate markets, thereby affecting financial conditions. The use of macroprudential real estate instruments affects credit growth, leverage and real estate prices, variables that are also relevant for monetary policy.[48] Although real estate instruments and monetary policy can reinforce each other, conflicts may arise when there are diverging developments in the economic and financial cycles. For example, this would be the case when the risk of a real estate-related credit boom

[48] House prices as such are not part of the HICP used by the ECB to assess price stability for monetary policy purposes.

occurs in a setting of low inflation and subdued economic activity. In this scenario, macroprudential authorities would want to restrict credit growth and leverage to safeguard financial stability, while monetary authorities may want to take an accommodative stance to bolster the economy and maintain price stability.

Fiscal policy. Real estate-related taxes, such as stamp duties, transaction taxes, capital gains or property taxes can discourage speculative transactions when implemented during a boom. Kuttner and Shim (2013) find that housing-related taxes are the only policy tool with a discernible impact on real estate price appreciation. Conversely, tax relief and subsidies can support real estate prices during a bust, thus supporting macroprudential objectives. A potential conflict of interest may arise from a favourable tax treatment of debt-financed home ownership through the (partial) tax-deductibility of interest payments on mortgage loans. This creates a debt bias and may fuel credit and real estate booms. Macroprudential authorities may want to counter such biases in order to mitigate financial stability risks.

Microprudential policy. The activation and calibration of real estate instruments for macroprudential purposes should be based on an assessment of risks to the financial system as a whole, rather than on the risk profile of individual institutions. That said, in some countries, the instruments are available primarily for microprudential or consumer protection objectives.

The use of macroprudential real estate instruments and microprudential policy are usually aligned in the upswing of the credit cycle, where there is a need to strengthen the resilience of individual institutions and the system as a whole. Tensions are most likely to arise in the downswing. In the face of increasing losses and expectations of further credit quality deterioration, a strict microprudential perspective would be to tighten the capital requirements for individual institutions. At the system-wide level, however, this may lead to deleveraging, asset fire sales and a credit crunch, further exacerbating adverse macro-financial feedback loops. To prevent such a scenario, macroprudential policy should aim to relax measures that unnecessarily tighten credit supply.

3 Features of the instruments

This section looks at each of the instruments in greater detail based on the following standard set of key features (see Sections 3.1 – 3.3): (i) description of the instrument; (ii) its objective, nature and impact; (iii) pros and cons related to its use; (iv) any relevant operational issues; and (v) any relevant legal or institutional issues (e.g. whether measures are subject to maximum harmonisation and the extent of national discretion). Comparing the instruments according to these standard features allows the following general conclusions to be drawn.

Different balance of objectives. Both strengthening resilience and smoothing the credit cycle are relevant goals, but the appropriate balance between the two goals differs between instruments. Sectoral capital requirements increase banks' resilience and may also help in moderating the credit cycle. Instruments that primarily target the terms and conditions of loans (such as LTV, LTI and DSTI limits) impact more directly on the availability of credit and would therefore be more effective in dampening the credit cycle. At the same time, they also increase the resilience of both borrowers and banks. It should be noted that these latter instruments fall outside the scope of the CRD IV/CRR and are therefore implemented according to national discretion.

Time-varying use of instruments. The instruments can be used to address both structural and time-varying risks. However, there are differences between the instruments in terms of the drawbacks associated with frequent changes in the use of the instrument. While it may be easier in practical terms to make time-varying use of instruments targeting banks, frequent changes to LTV, LTI or DSTI limits may risk destabilising the market by creating incentives to frontload loans in anticipation of tightening measures. Such frontloading is less of a concern for measures like changing RWs and LGDs, which typically apply to the stock of outstanding loans. In addition, LTI and DSTI limits would contribute to smoothing the credit cycle even without any time-varying element, since they become more binding during credit booms when real estate prices and credit tend to grow at a faster pace than income. For a fixed or time-invariant LTV limit, the required equity down-payment would increase in booming real estate markets, but there would still be scope for more lending as real estate prices increase.

Combining instruments. Given the differences in objectives and impact, the instruments complement each other, so that there may be merit in having both types of instrument in place. Combining instruments also reduces the risk of leakage and arbitrage. Even within the class of instruments targeting borrowers, the different instruments can be seen as complementary. LTI/DSTI caps complement LTV caps in the sense that they help to address procyclicality, given their properties as automatic stabilisers during credit booms, as well as to address potential leakages, given their coverage of unsecured loans that are not covered by LTV caps. These instruments are also complementary in the way they increase resilience. Broadly speaking, LTV caps lower the potential LGD for borrowers and banks, while LTI/DSTI caps lower the PD.

Leakages and arbitrage. The risk of leakage and arbitrage exists for each instrument, but this can be addressed at the domestic level through close cooperation between macroprudential and microprudential supervisors (e.g. on-site inspections to check bank behaviour in response to the measures). At the cross-border level, the risk calls for as much reciprocity as possible, even where it is not required legally. Cooperation on reciprocity might also be relevant for the instruments

targeting borrowers. An alternative to reciprocity for the latter instruments would be to apply measures to all domestic transactions.

Commercial versus residential real estate. For both economic and legal reasons, it may be more challenging to implement policy measures targeting the commercial real estate (CRE) sector than to implement those targeting the residential real estate (RRE) sector. For instruments targeting borrowers, calculations of income and collateral valuation would typically be more complex for CRE than for RRE transactions. Furthermore, where new construction of CRE is financed, no current income streams can be assessed and future income streams are hypothetical. By contrast, LTI/DSTI limits for households would typically be assessed on existing stable household income streams. As policy measures targeting borrowers directed towards the CRE sector are relatively complex to implement, it would be more difficult to affect sectoral credit developments.

Regarding instruments targeting banks, indirect sectoral capital requirements can be implemented for RRE and CRE retail exposures of IRB banks through LGD floors under Article 164 of the CRR. Since the large majority of CRE exposures are not classified as retail exposures, this measure may not be very helpful for this segment, making it necessary to take measures under Pillar II or Article 458 of the CRR (known as "national flexibility measures") instead.[49] Such measures could also be effective, but there are also potential disadvantages in terms of less transparency and more complex procedural requirements, respectively.

National versus regional measures. Given the heterogeneity of national real estate markets, policy-makers should consider measures to address regional developments in real estate markets that may develop into systemic risk concerns. Also in the light of the costs associated with macroprudential instruments, regulators might consider applying measures on a regional basis before a local real estate bubble (for example one occurring only in major cities) spreads to the rest of the country. In this spirit, Article 124 of the CRR allows for the regionally-curbed application of RWs for RRE and CRE under the standard approach. A similar regional application is not provided for the IRB banks' minimum LGD under Article 164 of the CRR. Finally, Article 458 of the CRR can also be used, subject to the conditions that apply for this article.

[49] See Chapter 7 of the Handbook for more details.

3.1 Sectoral capital requirements

Description: Additional capital requirements for bank exposures to the real estate sector. Can be imposed either directly or indirectly (through parameters that influence the capital requirements, in particular RWs and LGD floors).

Objective, nature and impact: Increasing banks' resilience by means of additional buffers for credit losses in the real estate sector. Possibly affecting the credit cycle through the price of real estate credit.

Advantages

Instrument specifically targeted at (certain segments of) the real estate sector (in contrast to the CCyB).
Clear effect on banks' resilience.
RWs can be applied to regional real estate markets.

Disadvantages

Reduced effect if banks choose to meet the requirements through existing capital surplus by reducing their voluntary buffers.
Can lead to unintended "crowding out" effects, as the bank might reduce its other assets in order to release capital for real estate loans.
Possibility of some circumvention by IRB banks via optimisation of RWAs (for direct sectoral capital requirements and LGDs).
Uncertain effect on credit growth.
OFIs or less regulated sectors or institutions from abroad to which the requirement may not apply, might step in and take the place of the banks that have reduced their lending; loans originated by local subsidiaries can be rebooked to foreign parent banks.

Relevant operational issues

Can be applied to both the stock of existing loans and flow of new loans.
Possibility of significant transmission lag.
Less effective when the boom is already well developed and profit opportunities outweigh capital considerations.
Limited to regulated domestic credit institutions (but reciprocity is possible).

Setting higher RWs for exposures secured by mortgages on real estate in accordance with Article 124(2) of the CRR has an impact on the calculation of the large exposure limit under Article 395 of the CRR: for the large exposures calculation, the market or mortgage lending value of the property concerned can no longer be deducted.

Relevant legal/institutional issues

a) Direct sectoral capital requirements

Legally, there are three possible ways for national authorities to implement such direct capital requirements:

Pillar I – systemic risk buffer (Article 133 of the CRD IV): applied by the competent or designated authority to a set of SA (standardised approach) and IRB banks in case of long-term non-cyclical systemic or macroprudential risks otherwise not covered by the CRR. Can potentially be motivated by real estate risks, but the CRD IV does not specify whether the SRB can have only the real estate exposures as its basis for calculation (as is the case for RWs or LGDs). It requires a notification to the European Commission, ESRB, EBA and competent/designated authorities of the Member States/third countries concerned. An opinion, implementing act or recommendation from the European Commission (together with a Recommendation by the ESRB) is required for buffers exceeding a certain threshold. The ESRB and EBA issue opinions for buffers exceeding a certain threshold. Reciprocity is allowed.
Pillar I – higher own funds requirement – national flexibility measures (Articles 458 and 92 of the CRR): applied by the competent or designated authority to (a set of) SA and IRB banks. Can potentially be motivated by real estate risks, but the instrument does not have only real estate exposures as its basis for calculation (in contrast to RWs or LGDs). It can only be applied in a very restricted set of cases (subsidiarity requirement) and, as a rule, following a procedure with an implementing act by the European Commission/Council. Reciprocity is allowed.
Pillar II (Article 103 of the CRD IV): applied by the competent authority to SA and IRB banks with a similar risk profile. Requires a notification to the EBA. The EBA is tasked with monitoring supervisory practices and issuing guidelines. Development of a common view of risks in supervisory colleges is strongly encouraged.

b) Indirect sectoral capital requirements: the case of RWs

Legally, there are three possible ways to implement higher RWs:

Pillar I (Article 124(2) of the CRR): the competent authority may require SA banks to apply higher RWs (or stricter criteria) for exposures on particular property segments that are fully and completely secured by mortgages on residential or commercial property. This has to be on the basis of financial stability considerations, taking into account an assessment regarding the loss experience and forward-looking markets developments. It further requires a consultation of the EBA. The EBA shall publish the higher RWs (or stricter criteria). The EBA has been given a mandate to develop regulatory technical standards (RTS) to specify the conditions applying for such higher RWs. It should be noted that since Article 124 of the CRR only applies to SA banks, the instrument would only affect a small part of the market in many Member States and may therefore not have the intended effect. Reciprocity is compulsory.
Pillar I – national flexibility measures (Article 458 of the CRR): the competent or designated authority can temporarily

increase RWs to target asset bubbles in the residential and commercial real estate sector. In principle, the general conditions/procedure under Article 458 of the CRR need to be followed, but when the increase is below a certain threshold, it is sufficient to meet the notification requirements set out in the said article. Reciprocity is allowed.
Pillar II (Article 103 of the CRD IV): the competent authority requires banks with a similar risk profile to apply higher RWs. Requires a notification to the EBA. The EBA is required to monitor supervisory practices and issue guidelines. Development of a common view of risks in supervisory colleges is encouraged.

c) Indirect sectoral capital requirements: the case of LGDs

Legally, there are two possible ways to implement higher LGDs:

Pillar I (Article 164(5) of the CRR): the competent authority may require IRB banks to apply a higher exposures-weighted LGD floor for retail exposures secured by residential or commercial property than is normally allowed under the CRR. This has to be on the basis of financial stability considerations, taking into account an assessment regarding the loss experience and forward-looking market developments. This measure would not be very helpful for addressing the CRE sector since the large majority of CRE exposures are not classified in the retail exposures class. It requires notification to the EBA. The EBA is to publish the LGD values. The EBA has a mandate to develop RTS to specify the conditions to be taken into account when determining such higher LGD floors. Reciprocity is compulsory.
Pillar I – national flexibility measures (Article 458 of the CRR): see the case of RWs. RWs can be changed, for instance, by putting a floor on the LGDs in the RW formula, subject to the procedure set out in that article.
Pillar II (Article 103 of the CRD IV): applied by the competent authority to banks with a similar risk profile. Requires a notification to the EBA. The EBA is tasked with monitoring supervisory practices and issuing guidelines. Development of a common view of risks in supervisory colleges is encouraged

3.2 LTV limit

Description: Cap on the ratio of the value of the loan relative to the value of the underlying (real estate) collateral. As a rule, this cap applies at the time of origination of the loan.

Objective, nature and impact: It affects the credit cycle by restricting the borrower's share of debt-financing using real estate as collateral. It increases the resilience of both banks and their borrowers by lowering LGDs and possibly also PDs.

Advantages

Effect on both the credit cycle and banks' resilience.
Easy to explain in public communication.
Can be applied to all domestic transactions (including by foreign banks, insurance firms and shadow banks), depending on the way the cap is introduced (e.g. through consumer protection rules or rules of general conduct, reciprocity arrangements).
There is some existing experience with instrument.
Lower risk of "crowding out" of other bank assets compared with the use of sectoral capital requirements.

Disadvantages

Lack of data hinders its use in a number of countries.
No common definition, which is less of a problem for applying the measure at the national level, but complicates a cross-country evaluation of early-warning properties of LTV as an indicator as well as any reciprocity arrangements.
Banks might have an incentive to overvalue property.
A time-invariant limit still allows for more lending in booming real estate markets; however, when the down-payment accounts for a fixed percentage of the house price the equity down-payment also increases.
Possibility of perverse incentive (frontloading of loans in anticipation of the measure).
Politically sensitive, as it may prevent certain borrowers from entering the housing market and have an effect on the rental versus ownership relationship (this concern can be addressed by applying the limit to only a part instead of all newly originated loans or by differentiating the cap according to the type of borrower).
Possible leakage in the form of unsecured financing if not combined with LTI limit.
Possible leakage to other financial institutions if the limit is not applied to all domestic transactions. The less regulated sector or institutions from abroad might then step in to take the place of the banks that have reduced their lending; loans originated by local subsidiaries can be rebooked to foreign parent banks.

Relevant operational issues:

Typically applied to (a segment of) the flow of RRE loans, but also possibly to CRE.
Can be time-invariant (constant through the credit cycle) or time-varying (according to financial stability conditions). A time-invariant limit implies that the maximum allowed loan is a linear function of housing prices, making the measure less effective in addressing a boom. A time-varying limit could instead limit procyclicality, i.e. increase the LTV's effectiveness, but at the cost of greater operational complexity, including the risk of perverse incentives. It might also be more effective to (additionally) implement LTI/DSTI limits as income does not usually increase as fast as prices.

The numerator needs to be comprehensively defined to avoid circumvention (e.g. splitting up loans, or topping up with non-secured loans).
Valuation issues related to the denominator (e.g. reference price, reliability, incentives for overvaluation).
Complements LTI/DTSI limits in addressing procyclicality.
Observed forms of implementation include caps for all or a share (e.g. 80%) of newly originated loans, comply or explain measures, or measures targeting RWs (differentiate RWs according to LTV level).
More intrusive instrument than additional capital requirements as it restricts lending directly.

Relevant legal/institutional issues:

Instrument not harmonised under the CRD IV/CRR, and is therefore implemented at national discretion.
LTV can be used for different purposes (e.g. as a macroprudential instrument, in capital requirement rules, covered bonds legislation or consumer protection legislation) and the definition may change accordingly.
Can be used as a Pillar II measure (Article 104(1)(f) of the CRD IV), also applied in a similar or identical way to banks with a similar risk profile (Article 103 of the CRD IV).
Article 125 of the CRR (mortgages on residential property) and Article 126 of the CRR (mortgages on commercial immovable property) refer to the LTV in the context of the use of a favourable RW under SA.
Article 129(1)(d)(f) of the CRR refers to LTV in the context of covered bonds.
Less prone to leakages by non-banks and foreign banks if applicable to all regulated products (e.g. if applied through consumer protection rules or rules of general conduct), although it may not capture all products.
Recital 24 of the proposed Mortgage Credit Directive refers to LTV (European Commission, 2011).
EBA Opinion on good practices for responsible mortgage lending refers to LTV (EBA, 2013c).
Reference to LTV in the ESRB's Recommendation on intermediate objectives and instruments of macroprudential policy.
Reference to LTV in the ESRB's Recommendation on foreign currency lending.
Liikanen report (2012) advises that an LTV cap be introduced.

3.3 LTI and DSTI limits

Description:

LTI limit: Cap on the value of the loan (or a set of a borrower's loans) relative to the disposable income of the borrower (usually measured on a yearly basis).
DSTI limit: Cap on the debt servicing cost relative to the disposable income of the borrower (usually measured on a monthly or yearly basis).
Sometimes the concepts are used in different ways. LTI might be understood as referring to a loan servicing cost (instead of loan size) or total debt (instead of an individual loan).

Objective, nature and impact: It affects the credit cycle by restricting the real estate loans available to borrowers and increases the resilience of both banks and borrowers. It lowers the PDs of borrowers.

Advantages

Effect on both the credit cycle and banks' resilience.
Simple to explain in public communication.
Can be applied to all domestic transactions (including by foreign banks, insurance firms and shadow banks), depending on the way the cap is introduced.
It acts as an automatic stabiliser in the sense that it becomes more binding during credit booms, when real estate prices grow faster than incomes.
May encompass unsecured credit, thereby restricting overall indebtedness.
(Some) existing experience with the instrument.

Disadvantages

Lack of data hinders its use in a number of countries.
No common definition, which is less of a problem for applying the measure at the national level, but which complicates a cross-country evaluation of the early-warning properties of LTI and DSTI as indicators as well as any reciprocity arrangements.
Income data may not be regularly updated; the sustainability of the income is relevant.
Possibility of destabilising expectations (frontloading of loans in anticipation of measure).
Possible leakage by increasing the maturity of the loans (for the DSTI cap).
It is politically sensitive, as it may prevent certain borrowers from entering the housing market and has an effect on the rental versus ownership relationship (this concern can be addressed by applying the limit to only a part instead of to all new loans or by differentiating the cap according to the type of borrower).
If it is not applied to all transactions, other financial institutions, the less regulated sector or institutions from abroad might

step in and take the place of the banks that have reduced their lending; loans originated by local subsidiaries can be rebooked to foreign parent banks.

Relevant operational issues:

Typically applied to the flow of RRE loans.
A time-invariant limit improves the resilience of banks and borrowers on a structural basis and contributes to smoothing the credit cycle.
Numerator: need for a comprehensive view of the debt service cost, including all the borrower's loans, and potentially under different interest rate scenarios.
Denominator: difficulty in determining the income for certain borrowers (e.g. self-employed); assessment concerns (incentive for overstatement).
It complements LTV in addressing procyclicality (given its properties as an automatic stabiliser during credit booms; as a rule, income does not grow as fast as real estate prices) and potential leakages (given the coverage of unsecured loans not covered by the LTV cap).
It can be combined with RWs (different RWs depending on LTI/DSTI level).
More intrusive instrument than additional capital requirements as it restricts lending directly.

Relevant legal/institutional issues:

Instrument not harmonised under the CRD IV/CRR, and is therefore at national discretion.
Article 125(2)(b) of the CRR refers to LTI in the context of exposures fully and completely secured by mortgages on residential property.
Article 129(1)(e) of the CRR refers to LTI in the context of covered bonds.
It can be used as a Pillar II measure (Article 104(1)(f) of the CRD IV), also in a similar or identical way to banks with a similar risk profile (Article 103 of the CRD IV).
Less prone to leakages by non-banks and foreign banks if applicable to all regulated products (e.g. if applied through consumer protection rules or rules of general conduct), although it may not capture all products.
Recital 24 of proposed Mortgage Credit Directive refers to LTI (European Commission, 2011).
The EBA Opinion on good practices for responsible mortgage lending refers to LTI.
Reference to LTI in the ESRB's Recommendation on intermediate objectives and instruments of macroprudential policy.
Reference to DSTI in the ESRB's Recommendation on foreign currency lending.
Liikanen report (2012) advises the introduction of an LTI cap.

4 Possible indicators for the use of the instruments

4.1 Selecting the indicators

Potential indicators for the use of real estate instruments can be identified drawing on the relevant literature (see Box 3.3) and country experiences. A distinction can be made between volume-based indicators, price-based indicators and other indicators (e.g. terms and conditions of lending). Furthermore, it is useful to look into a number of regional indicators, if available, as real estate developments may differ substantially across a country's regions (for example developments in urban as compared with rural areas). As a result of data limitations, such regional data were not considered in the analysis below. Indicators from national accounts can also be useful (for example, investments in the real estate sector). Finally, bank balance sheet indicators should also be taken into consideration, particularly those specific to the real estate instruments (such as average RWs for RRE/CRE mortgage loans).

Considerations regarding the release phase of real estate-specific instruments are similar to those for general instruments such as the CCyB. The stance of sectoral instruments might be eased back to their regulatory minimum when threats to the resilience in that particular sector have receded, for example when sectoral credit growth or asset prices have normalised or during a downturn. However, different indicators may be needed for the tightening and loosening phases and market-based indicators such as spreads are likely to be especially useful when capital has to be released (Drehmann et al. (2011)). It is likely that judgment will play a more important role during the loosening phase. In circumstances where threats are receding, it is also important to look at market-based indicators to understand to what extent stress has already materialised. Releasing capital buffers when the solvency of the banking system is in question is unlikely to be effective. Information on the development of banks' non-performing loans (NPLs) and losses on real estate exposures would also be useful in assessing banks' resilience and the phase of the credit cycle.

The ESRB collected available time series for many of these indicators across Member States and investigated them using a graphical analysis ("butterfly analysis"). The analysis compared the behavior of indicators 20 quarters before and after the start of banking crises related to RRE and/or CRE to that in countries that did not experience similar RE-related banking crises. The analysis is based on the "mean" or "median" of indicators across the sample of crisis and non-crisis Member States.

Annex 3.1 shows the butterfly analysis for six indicators, three for RRE and three for CRE: household credit-to-GDP gap, nominal house price gap, year-on year percentage change in house price-to-income growth, non-financial credit-to-GDP gap, CRE property price gap (deviation from long-term trend) and investment in other buildings (as a percentage of GDP). The figures shown in the annex are for illustrative purposes.

The results of this graphical analysis suggest that many indicators show material changes ahead of and during such banking crises and may therefore be helpful in signaling emerging vulnerabilities. However, developments are not always markedly different from those in Member States that did not

experience such a crisis, suggesting a common component in house price and credit cycles. Indicators where the difference between crisis and non-crisis Member States is widest before the crises have the strongest signaling power and would therefore be preferred for activating the instruments (see Annex 3.1(c) for Ireland and Spain).

Box 3.3
Review of the literature on potential real estate indicators

Starting with **volume-based indicators**, Beck et al (2012) and Büyükkarabacak et al (2010) study the impact of the sectoral allocation of credit on financial stability and growth using a cross-country panel. The former study finds that, while lending to companies is positively associated with economic growth, lending to households is not. Büyükkarabacak et al. find that lending to households grew more rapidly than to corporates ahead of most crises in their sample. Logit estimations confirm this finding and suggest that the marginal impact of an increase in the household credit-to-GDP ratio is both larger and more robustly estimated than an increase in the business credit-to-GDP ratio.

Mian and Sufi (2009, 2011) highlight the importance of household debt in the US financial crisis, finding that areas in the United States with a high share of sub-prime borrowers experienced very rapid house price appreciation and growth in mortgage debt before the crisis and very high default rates during the crisis. Drehmann and Juselius (2012) find that the debt service ratio tends to peak just before systemic banking crises occur and that, around one year before the start of a crisis, the quality of the debt service ratio as an early warning signal seems to be more accurate than that provided by the credit-to-GDP gap.

As regards **price-based indicators**, typically house prices have been good indicators of forthcoming financial crises (Barrell et al. (2010), Borio and Drehmann (2009), Drehmann et al. (2010), Claessens et al. (2011a), Mendoza and Terrones (2008) and Riiser (2005)). They tend to signal emerging vulnerabilities well in advance and turn somewhat before quantity-based measures such as the credit-to-GDP gap. However defining the equilibrium level of house prices may be difficult. Measures used in the literature include statistically derived residential and commercial property price gaps, affordability indices, such as house price-to-income ratios, and simple asset pricing frameworks, such as a house price-to-rent ratio. Claessens et al. (2011a) find that there is a strong link between credit and housing cycles: when credit cycles are accompanied by housing cycles, the crisis typically lasts longer and is more pronounced.

Regarding the **conditions and terms** of lending, a combination of high LTV ratios and increasing asset prices can be a sign of a credit-driven asset price boom. A higher LTV ratio for residential mortgage borrowers signals a higher level of indebtedness, making them more vulnerable to changes in interest rates, collateral valuations and loan refinancing conditions. Easy credit in anticipation of collateral appreciation could create a self-fulfilling cycle of higher asset prices and indebtedness, fuelling a credit boom (Kyotaki and Moore (1997), Honohan (1997)). When the shock occurs, the value of the collateral adjusts, leaving banks overexposed. Almeida et al (2006) find that, in countries where households can obtain loans with higher LTV ratios, housing prices and new mortgage credit are more sensitive to income shocks. The IMF (2011) shows that the LTV ratio has an effect on the severity of house price busts: where ratios are high, busts are deeper on

average. Crowe et al (2011) confirm the positive relationship between LTV at origination and the subsequent price appreciation using state level data in the United States.

Lending spreads on mortgages or corporate loans (for example, CRE) can provide further information on the build-up of systemic risk. During a credit boom, high spreads may indicate demand-driven credit expansion, whereas low credit spreads indicate greater credit supply. Rising lending spreads during a downturn may highlight the need to release the capital buffer to maintain lending. Surveys of credit conditions may be a useful complement to empirical measures.

Any cross-country analysis has several caveats and should therefore be taken as preliminary guidance and as being complementary to country-specific analysis. Definitions and data availability of indicators may differ between Member States. Furthermore, an indicator may have desirable properties in a cross-country analysis, but break down at the level of individual Member States. In addition, former transition economies may have special features related to financial deepening.

Table 3.1 identifies a list of promising indicators that can be monitored by national authorities. These indicators were selected on the basis of the following criteria: (i) their signalling and discriminatory power between crisis and non-crisis Member States well before the start of the crisis; (ii) a sufficiently high coverage of Member States; and (iii) sufficiently long time series.

Table 3.1
List of promising indicators

General	
	Aggregate credit: as a percentage of GDP
	Value added construction (normalised): as a percentage of GDP
Residential real estate	
	Household credit: as a percentage of GDP, in terms of level and/or as a gap
	Household debt-to-income (only a short history is available)
	Nominal house prices: as a percentage of growth or as a gap
	House price to income : as a percentage of growth
	House price-to-rent: as a percentage of growth
	Investment in dwellings (normalised): as a percentage of GDP
Commercial real estate	
	Credit to non-financial corporations: as a percentage of GDP, in terms of level, growth rate and/or as a gap
	CRE prices: as a gap or as apercentage of growth
	Investment in other buildings (normalised): as a percentage of GDP

Preliminary findings from a more formal statistical analysis broadly support the conclusions from the graphical analysis. In particular, RRE and CRE volume and price-based indicators are found to be useful as early-warning indicators, both individually and in combination, even controlling for other macro-financial variables. This is in line with previous empirical studies (for example by Dell'Ariccia

et al. (2012)). Possible follow-up work by the ESRB could also derive thresholds, signalling a possible need for policy action based on assumptions about policy-makers' preferences.

Finally, there are also some other indicators that are potentially promising, but for which there are more concerns related to data coverage and quality (see below). Based on the preliminary analysis of indicators with weaker data coverage and quality, the set of real estate-related indicators from Table 3.1 should be complemented with the following indicators to the extent that data are available.

Spreads on new lending. This data might be useful in determining when to loosen the instruments, since spreads increase in a timely manner during a downturn. When used in combination with other indicators, spreads might be useful during upswings in understanding whether a boom is driven by supply or demand, with spreads likely to be low when supply of credit is ample.

Fixed versus floating rate mortgage loans. The share of floating rates in new mortgages increases before real estate crises relative to non-crisis cases. The time series of the data is short and this may also reflect structural differences between housing markets. Nevertheless, there appears to be a case for monitoring this series.

LTV and LTI ratios. These ratios can be used both as instruments in the form of caps, as well as indicators in the form of realised values for actual loans. When used as indicators, they should in principle capture a lot of information on the risk associated with real estate crises. However, a lack of data makes it difficult to assess their capacity for signalling real estate crises (see Box 4). Cross-country comparisons are also hampered by different definitions and methodologies. This highlights an important data gap that should be filled as soon as possible – ideally data on the distribution of both original and current LTV and LTI ratios should also be collected on a regular basis. It is unclear how LTV or LTI ratios used as instruments could be appropriately calibrated let alone enforced when data on distributions or even averages are not available. The ratios should also be useful in setting capital requirements for real estate exposures, for example if this is targeted, in particular, at high LTV or LTI mortgages.

Debt service ratio. Drehmann and Juselius (2012) find that a private sector debt-service ratio is a good predictor of banking sector distress. A visual analysis of this indicator for European countries as well as its discriminatory power suggest that a rapid increase in the indicator increases the likelihood of a subsequent real estate-related crisis. For example, the indicator increases sharply ahead of the crises in the Nordic countries and in the United Kingdom in the early 1990s, as well as for numerous countries ahead of the current crisis. Possible follow-up work under the auspices of the ESRB could include a more thorough analysis of this type of indicator.

RRE and CRE risk weights. Analysing RWs will be important, either because they can be directly used as an instrument or because other instruments (LTV, LTI and DSTI limits) have an indirect impact on them. Moreover, a time series of banks' RWs for RRE and CRE exposures might show patterns over time: a decrease, for example, could be suggestive of lower risk-taking or of model changes and should therefore be investigated. Data availability is, however, an issue, as is a consistent definition of RRE and CRE exposures. EBA data show considerable variation in RWs both within and across Member States.

Box 3.4
Considerations regarding LTV ratio data availability

Recent surveys by the Banca d'Italia[50] and a dedicated data collection for the purposes of this chapter, suggest a substantial degree of dispersion of average LTV ratios for new residential mortgage loans among EU Member States (see table). Moreover, according to an earlier survey by the ESRB on the LTV levels in the outstanding national mortgage book, Ireland, Poland[51] and the Netherlands have the largest share of high LTVs (above 100%).

Table A
LTV ratio for residential mortgage loans

(percentages)

		LTV ratio for residential mortgage loans (per cent) (1)						
		2006	2007	2008	2009	2010	2011	2012
euro area	NL	101	101	101	101	101	101	
	FI		81					87
	AT		84					84
	FR	78	77	75	77	79	81	79
	IE	81	77	83	89	81	75	74
	CY		80				80	
	MT	76	73	73	74	73	73	70
	GR		73				73	
	SK					67	70	71
	PT	72	73	71	72	69	64	67
	BE	71	67	65	65	64	63	63
	IT	69	64	65	62	61	60	59
	EE						60	
	ES	64	64	61	57	58	58	58
	SL				54	58	70	69
	LU		87					
	DE		70					
non-euro area	BG				62	63	62	62
	CZ				56	56	57	57
	HU	61	59	67	70	63	49	51
	LV						76	77
	PL	63	70	78	63	63	63	66
	RO		73	68	66	71	78	82
	UK	83	78	73	74	74	75	75

(1) Average LTV ratio on new loans for first time home buyers or alternatively on new residential mortgage loans.
Source: based on surveys by the Banca d'Italia and the ESRB.

50 For more details, see Banca d'Italia, Financial Stability Report, No.5, 2013.

51 The main factor behind the high share of loans with LTV>100% is the sharp depreciation of the Zloty against the Swiss franc in the period 2008-2011.

Cross-country comparisons are difficult owing to data heterogeneity since definitions and aggregation methods differ substantially across Member States. In particular, three different definitions of LTV ratio can be identified ("stock" LTV ratio, original LTV ratio based on new mortgage loans and LTV ratio based on new loans for first-time home owners). Moreover, there are differences in how the collateral is valued (at original cost; at actual current market value; at estimated market value according to a real estate price index; or on the basis of the bank's own appraisals). A further element of heterogeneity is the treatment of additional (personal) guarantees. Differences among Member States exist also in the aggregation methodology. The most common method of aggregation is a weighted average by market share, although some countries include only loans disbursed by the main banks or use an average weighted by classes of LTV ratio.

Finally, the analysis of LTV ratios is constrained by the difficulty in obtaining data. A preliminary information collection shows that some countries collect regular data (such as the United Kingdom), while others rely on surveys (for instance Belgium, Italy, Finland, France and Romania); some Member States have no reporting on LTV ratios (Austria and Germany).

4.2 Using the indicators

The indicators can be used in accordance with a rules-based or discretionary approach, with various options inbetween (see Chapter 9 of the Handbook for a general discussion on guided discretion). Given differences in housing markets across Member States, it appears unfeasible to establish binding thresholds based on cross-country analysis. A discretionary element is important because some drivers of housing and mortgage markets are probably difficult to embed in a rule (such as fiscal policies). In addition, several indicators may need to be interpreted in a state-dependent manner (for example debt service ratios in a low interest rate environment) or in a holistic way (for example there may be trade-offs between debt service ratios and loan maturities at origination in loans with constant annuities). However, if more than one indicator breaches its threshold, the signal to act might be considered stronger.

5 Legal and institutional framework

5.1 Overview

For the decision-making process and procedures related to the use of the instrument, it is useful to start with a broad orientation. For the instruments targeting banks, the applicable decision-making process and procedures are set out in the CRD IV/CRR. Despite the CRD IV being a directive, room for national discretion is restricted, since generally speaking the CRD IV pursues maximum harmonisation, especially as regards Pillar I measures. By contrast, procedures for instruments targeting borrowers are dependent on genuine national regulations which vary substantially across Member States.

When the use of an instrument falls under the CRD IV/CRR, it can be either a Pillar I or a Pillar II measure. This distinction determines, among other things, the authority responsible for the use of the instrument. Furthermore, for Pillar I measures, a distinction has to be made between cases that are explicitly accounted for in the CRD IV/CRR, such as the permitted increase in RWs and LGDs in a number of prescribed cases, and the application of stricter national measures under the regime of Article 458 of the CRR ("national flexibility measures"); the latter implies a more restrictive and procedurally heavier process.[52]

The authority responsible for the use of instruments that fall under the CRD IV/CRR will be either the national competent authority or the designated authority to be appointed by the Member State, or both. The **national competent authority** is the authority in charge of banking supervision under the CRD IV/CRR. For a number of well-defined areas (for example the application of stricter national measures under Article 458 of the CRR), the Member State can make the **designated authority** responsible. In most Member States, the designated authority will be the central bank, but in a significant minority of cases, it will be a separate macroprudential authority (as per the. ESRB's Recommendation of 22 December 2011 on the macro-prudential mandate of national authorities). In some Member States, the designated authority will be the banking supervisor or a government ministry. For the instruments that do not fall under the CRD IV/CRR, Member States are free to determine the responsible authority.

It should be noted that the Member States of the **Single Supervisory Mechanism** (SSM) are subject to additional rules ensuring an ex ante and ex post coordination with the European Central Bank (ECB).

First, the SSM Regulation[53] provides that the national authorities of participating Member States need to notify the ECB of their intention to implement measures aimed at addressing systemic or macroprudential risks (Article 5.1). The ECB can object to these measures; this objection is not legally binding, but there is a general duty of cooperation that applies to the national authorities and the ECB (Article 6.2).

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52 See Chapter 7 for a more detailed discussion on the conditions regarding the use of Article 458 of the CRR.

53 Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions.

Second, the ECB may, if deemed necessary, apply higher requirements for capital buffers and apply more stringent measures aimed at addressing systemic or macroprudential risks than the ones established by the national competent or designated authorities ("topping-up power" under Article 5.2). The SSM Regulation specifies that the ECB shall apply all relevant EU legislation, and where this EU law is composed of directives, the national legislation transposing those directives (Article 4.3). Such an obligation to notify the ECB or topping-up power would not apply to instruments implemented at national discretion, such as LTV, LTI and DSTI caps.

Annex 3.2 summarises the key elements of the decision-making process and procedure for each of the real estate instruments identified in Section 3 and which are discussed in greater detail below.

5.2 Direct sectoral capital requirements

Direct sectoral capital requirements take the form of an increase in own funds ratios through additional capital buffers. Imposing higher direct capital requirements on banks with high real estate exposures can be pursued as a Pillar I or a Pillar II measure. As a **Pillar I** measure, there is the possibility in certain cases of imposing a systemic risk buffer (SRB) under Article 133 of the CRD IV, or of applying stricter national measures under the residual case of Article 458 of the CRR. Since both measures are covered in other chapters of the Handbook, they are not discussed in detail here.

The **SRB** aims at addressing long-term, non-cyclical systemic or macroprudential risks otherwise not covered by the CRR. The SRB can be implemented in a differentiated manner for single banks or sets of banks. Its introduction can potentially be motivated by real estate risks and therefore not only real estate exposures. To the extent that real estate risks are cyclically-related, the SRB would not be an appropriate instrument. However, real estate risks can also result from large, common exposures of the banking sector concentrated on the real estate sector. Common exposures are not addressed by the microprudential rules. Given that historically many banking crises are associated with problems in the real estate sector, it can be argued that a banking sector with structurally high exposure on the real estate sector may pose higher systemic risk and is not adequately covered by the CRR.

The application of **Article 458 of the CRR** requires the case where a number of microprudential and macroprudential measures available under the CRD IV/CRR are assessed to be not adequate to address the systemic risk identified. Given the large scope of Article 458 of the CRR, the Member State setting these measures is subject to a higher burden of proof and to a heavier procedure involving the notification and opinions of EU institutions and bodies (including the ESRB) and possible recommendations. It should further be noted that Article 458 of the CRR explicitly provides for the case of indirectly imposing capital requirements via RWs higher than in the case of Section 5.3 (i.e. higher than 150%).

Under **Pillar II**, the national competent authority can apply the Supervisory Review and Evaluation Process (SREP) in a similar or identical manner to institutions that are, or might be, exposed to similar risks or pose similar risks to the financial system (Article 103 of the CRD IV). This may include high common exposures on the real estate sector.

Under the SREP, the competent authority may require such institutions to take certain measures, including additional capital requirements when the risks are not sufficiently covered by available capital (Article 104(1)(a) of the CRD IV). When taking Pillar II measures, the competent authority is subject to a lighter procedure that consists of notifying the EBA.

The EBA is required to monitor such Pillar II practices and issue guidelines in order to ensure consistency across the EU. On a general note, Pillar II measures are part of the institution-specific SREP, on which there are no explicit reciprocity provisions in the CRD IV/CRR. However, under the SREP, the college of supervisors is strongly encouraged to develop a common understanding of a banking group's risks so, in that sense, there are clear possibilities for reciprocity.

5.3 Indirect sectoral capital requirements: the case of RWs

Indirect sectoral capital requirements take the form of an increase of own funds ratios through one of the components used in the calculation of the ratio, such as RWs or LGDs.

Article 124(2) of the CRR explicitly provides for the case under **Pillar I** where the national competent authority for financial stability reasons can set RWs up to 150% or apply stricter criteria for certain real estate exposures of SA banks than normally provided for in the CRD IV/CRR. This has to be on the basis of financial stability considerations, taking into account an assessment regarding the loss experience and forward-looking market developments. It concerns exposures fully secured by mortgages on residential or commercial property and one or more property segments of such exposures, for instance based on geographical area, which are preferentially risk-weighted at 35% (RRE) or 50% (CRE). The stricter criteria mentioned can, for example, concern stricter LTV limits for the preferential RWs than prescribed by the CRD IV/CRR (see Section 0).

The EBA should be consulted before applying the higher RWs and there must be a six month transition period before the higher RWs apply to the banks. The EBA shall publish the RWs and criteria. The EBA is further requested to develop RTS in this area. One advantage of following this particular procedure is that other Member States need to reciprocate the measure, which increases its effectiveness.

While using Article 124.2 of the CRR should in principle be the preferred route to increase RWs under the SA, when the measure cannot adequately address the systemic risk identified, the national competent authority or designated authority may also apply RWs above 150% under the requirements and procedure of **Article 458 of the CRR** (see Section 5.2). In case the route of Article 458 of the CRR is taken, reciprocity by other Member States is voluntary. Article 458.10 of the CRR provides also for the possibility to bypass the usual opinion and recommendation procedure in case of RW increases that are moderately higher (by 25%) than the standard RWs provided that this does not last more than two years.

Finally, it is also possible under **Pillar II** to indirectly require that banks with a higher exposure on the real estate sector to hold more capital via higher RWs (see 5.2 above).

5.4 Indirect sectoral capital requirements: case of LGDs

Article 164.5 of the CRR explicitly provides for the case under **Pillar I**, where the national competent authority can, within certain limits and for financial stability reasons, set higher minimum exposures-weighted average LGDs for exposures of IRB banks secured by property in their territory. This has to be on the basis of financial stability considerations, taking into account an assessment regarding the loss experience and forward-looking markets developments. In contrast to the RWs mentioned under 5.3 above, no upper limit is imposed. EBA must be notified of any changes to the minimum LGDs and to publish their values. EBA is further requested to develop regulatory technical standards in this area. One advantage of following the avenue of Article 164(5) of the CRR is that other EU Member States need to reciprocate the measure, which increases its effectiveness. The drawback, however, is that the article applies only to retail exposures and might not therefore be of much of help in addressing concerns related to CRE lending.

In case Article 164(5) of the CRR cannot adequately address the systemic risk identified, the national competent authority or designated authority may also use the earlier discussed **Article 458 of the CRR** (see Section 5.2 and Section 5.3) to increase RWs. This can be done, for instance, by putting a floor on the LGDs used in the RW formula for retail exposures (Article 154 of the CRR). The implementation is subject to the procedure of Article 458 of the CRR.

Finally, in principle, it is also possible under **Pillar II** to indirectly require banks with a higher exposure on the real estate sector to hold more capital via higher LGDs (see Section 5.2).

5.5 LTV, LTI and DSTI limits

As a rule, LTV, LTI and DSTI limits are exclusively subject to **national rules and procedures**. The limits are currently operational in a number of EU Member States, but implementation differs substantially across Member States (see Annex 3.3 for LTV limits). LTV limits may be imposed as a binding or “comply or explain” constraint on all borrowers or a specific group of credit institutions. The level of the limit also varies, from 45% in Hungary for loans denominated in currencies other than Hungarian forint and euro to 105% in the Netherlands. Alternatively, limitations on the LTV for mortgages used as collateral in widely used funding instruments (e.g. covered bonds) may indirectly constrain lending practices, but do not necessarily limit the total amount of the loan relative to the value of the property. Annex 3.3 provides a more detailed overview of the different ways in which LTV limits are implemented.

The value of LTV and LTI limits as macroprudential instruments is confirmed by the High-level Expert Group on reforming the structure of the EU banking sector (2012). In its report, the Group states that national regulation to allow authorities to set up LTV and LTI limits should be a priority in the further development of an effective set of macroprudential instruments. In addition, EU-level harmonisation of the actual definition and use of such restrictions should also be pursued.

Two factors are of central importance to facilitate the effective implementation and operation of LTV and LTI limits in EU Member States. First, national regulation should allow authorities to implement such limits if they deem this to be appropriate. Given the large current cross-country variation in regulation between Member States, the identification of current best practices by the ESRB could provide guidance as to the potential design of such regulation.

Second, the monitoring of actual LTV and LTI ratios should be harmonised and improved. These indicators convey important information on mortgage lending practices and provide invaluable guidance to policy-makers when considering implementation of limits or changes to existing limits. The current availability and comparability of data is insufficient for macroprudential policy purposes (see Box 4.1 in Section 4.1). This data gap should be addressed in all Member States as a matter of priority. The ESRB could explore ways to improve the availability and comparability of data on actual LTV and LTI ratios, as well as the data on other indicators related to the terms and conditions for loans and the data on commercial real estate developments.

Regarding governance issues, some Member States have granted these instruments directly to the competent or designated authority or are considering doing so. Others have decided to give a specific macroprudential authority guiding powers for these instruments over the competent or designated authority in case they are different authorities.

Following the ESRB's Recommendation of 4 April 2013 on intermediate objectives and instruments of macroprudential policy, the ESRB should be informed in advance of the application of any instrument in case significant cross-border effects on other EU Member States or the single market are expected. This applies not only to instruments under EU legislation, but also to national instruments such as LTV, LTI and DSTI limits although significant cross-border effects are less likely for those instruments.

There is one case, where the CRD IV/CRR explicitly refers to LTV limits, namely to obtain a favourable risk weighting under the SA for exposures fully and completely secured by mortgages on CRE and RRE (**Articles 125 and 126 of the CRR**):

- 35% RW for RRE exposures: LTV condition of max (80% market value of the property, or 80% mortgage value of the property);
- 50% RW for CRE exposures: LTV condition of max (50% market value of the property, or 60% mortgage value of the property)

In Section 5.3, it was mentioned that national competent authorities can apply stricter criteria for banks to benefit from these beneficial RWs, which can include the use of higher LTVs than those mentioned.

Finally, LTV, LTI and DSTI limits can also be used as **Pillar II** measures (see also Section 5.2 above). Indeed, under the SREP, the national competent authority has the power to require the bank to reduce the risk inherent in its activities, products and systems (Article 104(1)(f) of the CRD IV). This is not restricted to instruments covered by the CRD IV/CRR and therefore applies potentially also to the use of national instruments such as LTV, LTI and DSTI limits. Again, the use of Pillar II can be combined with Article 103 of the CRD IV (i.e. the application of the SREP in a similar or identical way to institutions with similar risk profiles).

5.6 Coordination issues

General issues of coordination between different authorities, both domestically and across borders, are discussed in greater detail in the Handbook's horizontal note on securing financial stability

domestically and across the EU. As regards real estate instruments, the following specific points need to be flagged:

- **Interaction with microprudential authorities.** Microprudential decisions concerning banks' real estate exposures can reinforce the macroprudential measures or run counter to them. For example, on-site inspections by the microprudential supervisor could be a strong deterrent against elusive behaviour on the part of banks. There are also potential tensions between the microprudential and macroprudential perspectives, especially in the downswing of the cycle. Independent of the fact of whether the same authority has both the macroprudential and microprudential mandate, coordination between the two areas is therefore of the essence. When the mandates are split between different authorities, a framework needs to be in place to ensure coordination.

- **Interaction with fiscal authorities.** Coordination with the ministry of finance is needed to check for other possible changes in conditions on the real estate markets concerning fiscal and structural policies (e.g. tax treatment of mortgage interest payments, housing subsidies). Any policy measures in place or planned in these areas could potentially distort the impact of the macroprudential policy action. LTV, LTI and DSTI limits could also be implemented for consumer protection purposes, which would require consultation with the competent government bodies and consumer representatives.

- **Interaction with foreign authorities.** With regard to the use of real estate instruments for macroprudential purposes, cross-border coordination is warranted if home supervisors do not only target domestic operations, but also: (i) the banks' consolidated position (e.g. RWs at the consolidated level); or (ii) the banks' cross-border capital flows (e.g. LTV, LTI or DSTI limits on cross-border loans); or (iii) if host supervisors target the subsidiaries of foreign banks. One of the main incentives for such coordination is to reduce the scope for international arbitrage that may otherwise undermine the effectiveness of national policies. Cross-border links and the resulting need for coordination are likely to be more important for sectoral capital requirements than for instruments targeting borrowers.

Chapter 4
Tools addressing systemic banks and structural systemic risks[54]

[54] This chapter was prepared by a team led by Susanne Korbmacher (Deutsche Bundesbank) and comprising Christoph Erkunt, Christiane Westhoff (Deutsche Bundesbank), Eddie Gerba (Banco de España), Sergio Masciantonio (European Commission), Giuseppe Cappelletti, Barbara Meller, Sofia Melo, Balazs Zsamboki (European Central Bank), Jukka Vauhkonen (Suomen Pankki – Finlands Bank), Silvia Gabrieli (Banque de France), Denis Marionnet (Banque de France/Autorité de contrôle prudentiel et de résolution), Marianna Caccavaio (Banca d'Italia), Evangelia Kadara (Bank of Greece), Algirdas Prapiestis (Lietuvos bankas), Arnis Jankovskis (Finanšu un kapitāla tirgus komisija), Márton Zsigó (Magyar Nemzeti Bank), Krzysztof Gajewski (Narodowy Bank Polski), Dina Batista, Diana Lima (Banco de Portugal), Matei Kubinschi, Mihai Toma (Banca Naţională a României), David Lindfield (Finansinspektionen), Teresa Cascino, Anna Jernova, Samuel McPhilemy (Bank of England) and Ľuboš Šesták (ESRB Secretariat). Support was provided by Lucia Országhova from the ESRB Secretariat in the function of Secretary.

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Executive summary

The CRD IV contains a broad set of capital buffers to address systemic bank and structural systemic risks by raising banks' loss-absorbing capacity. Buffers for global systemically important institutions (G-SIIs) and other systemically important institutions (O-SIIs) are aimed at banks which pose systemic risks because they are perceived to be "too big to fail". The systemic risk buffer (SRB) is a flexible residual instrument to target structural systemic risks not covered by the CRR.[55] The SRB can be used to limit direct and indirect concentration of exposures and mitigate and prevent excessive leverage.

The Pillar 2 additional own funds requirements, which are described in more detail in Chapter 6 of this Handbook, address systemic risks related to specific banks. As such they can be used as an "add-on" to the other buffers.

For the application of the buffers for systemically important institutions, the CRD IV prescribes to a great extent the indicators and the size of the buffers, consistent with the global framework.

For the application of the SRB and the Pillar 2 additional own funds requirements, the CRD IV provides authorities with more flexibility. This chapter of the Handbook suggests using a variety of indicators for triggering the SRB, including indicators reflecting the potential for the propagation and amplification of shocks within the financial system, structural characteristics of the banking sector, and indicators of risks to the banking sector stemming from the real economy.

Careful implementation of these capital buffers is warranted, both in terms of timing and phasing in and out. These capital-based instruments also affect leverage levels, asset prices and the price of credit and thereby the financial cycle. This can be intended and unintended. In addition, any potential unintended impact, both domestic and cross-border, should be taken into consideration when deciding on the application of these buffers, including risk and capital shifts, leakages to shadow banks and, in the case of inaction, cross-border contagion of crises. Strong cross-border coordination and reciprocity agreements can minimise these effects.

The key policy messages of the chapter are the following.

- **The CRD IV capital buffers targeting systemically important banks and structural systemic risks are essential to increase the resilience of the banking sector.** They reduce the losses to society arising from financial crises.
- **The O-SII buffer is capped at 2%, with an additional cap for subsidiaries.** The O-SII buffer rate is expected to vary according to country-specific circumstances. However, some Member States consider the O-SII buffers restricted by these caps not to be sufficient to mitigate the risks posed by O-SIIs. In such cases, the use of the SRB instead of or to top-up the O-SII buffer, while not ideal, is possible under the CRD IV. In such cases, it would be appropriate to

[55] Article 133(1) of the CRD IV. In addition, when notifying the measure pursuant to Article 133(11) it is necessary to justify why none of the existing CRD IV/CRR measures (excluding the national flexibility measures under Articles 458 and 459 of the CRR) are sufficient to address the identified risk.

use the same methodology as for the O-SII buffer. Therefore no further guidance is given in this respect in the SRB section of this chapter.

- **The SRB may be used to address a broad set of structural risks, such as those related to amplification of shocks within the financial system, common exposures, and the structure of the banking sector, or the risks to the banking sector stemming from the real economy (those which are not covered by Pillar 1 requirements).** Moreover, the procedural requirements are not onerous for a capital buffer of up to 3% (notification).
- **When applying these capital buffers, there is a need for cross-border coordination to avoid unintended consequences (e.g. pro-cyclicality, regulatory arbitrage and leakages).** Here the ESRB has a key role to play.

1 Introduction

This chapter provides guidance on the use of a range of capital buffers to address systemic risks – buffers for G-SIIs, buffers for O-SIIs and the SRB. Moreover, competent authorities can increase capital charges for specific banks under Pillar 2 (additional own funds requirements, see Chapter 6). These capital-based instruments provide a broad toolbox which authorities can use to address structural systemic risks. They complement the other capital requirements and (macroprudential) buffers (see Figure 1.5).

The first section briefly describes the instruments. The second discusses the objectives, transmission mechanism and potential unintended domestic and cross-border effects. The third section focuses on the relevant indicators and the fourth on how to use these indicators for (de)activating the instruments, both in terms of calibration as well as ex ante and ex post evaluation. Finally, the fifth section gives details on the relevant procedures to follow when (de)activating the instruments. Annex 4.1 provides instrument overviews in tabular form for ease of reference.

1.1 Buffers for global systemically important institutions and other systemically important institutions

As of 1 January 2016 G-SIIs and, subject to national discretion, O-SIIs are subject to supplementary requirements concerning CET1 capital that they must hold. The G-SII buffer is mandatory and addresses the potential negative impacts that G-SIIs may have on the international financial system, i.e. in order to compensate for the higher risk that G-SIIs represent and the potential impact of their failure on society. The (optional) O-SII buffer is aimed at banks which are considered “too big to fail” from a domestic perspective.

For identifying G-SIIs, allocating them to the appropriate sub-category and determining the required buffers the CRD IV is consistent with the BCBS global framework.[56] The identification criteria are size, interconnectedness, complexity, lack of substitutability of services or financial infrastructure provided by the group, and cross-border activity. From 2016 the rates are stepped up annually and will be implemented in full in 2019, varying from 1% to 3.5% of RWAs. The G-SII surcharge entails an element of discretion, however, as competent or designated authorities may re-allocate a G-SII from a lower to a higher sub-category, or allocate G-SII status to an institution which is not identified as a G-SII on the basis of the quantitative criteria alone. The EBA has drafted technical standards on the identification and assignment of G-SIIs to sub-categories.

The O-SII buffer follows a more principle-based approach, allowing greater scope for national discretion. This should accommodate the different structural characteristics of individual countries. According to Article 131(3) of the CRD IV, the identification of O-SIIs should be based on at least the following criteria: size, importance for the economy of the Union or of the relevant Member

[56] BCBS (2013a). Note that the BCBS identifies global systemically important banks and domestic systemically important banks, whereas the CRD IV focuses on global systemically important institutions and other systemically important institutions. The CRD IV also applies to investment firms.

State, significance of cross-border activities and interconnectedness of the institution or group with the financial system. In 2014 the EBA issued precise guidelines for identifying O-SIIs.[57] The rates for the O-SII buffer can vary between 0% and 2% of the total risk exposure amount.

1.2 Systemic risk buffer

The SRB is a flexible residual macroprudential instrument that aims to address systemic risks of a "long-term, non-cyclical" nature, which are not covered by the CRR.[58] The SRB translates into an additional CET1 capital requirement for all banks or a subset of them. The SRB can be used to address situations in which the entire financial sector or a specific part thereof is prone to specific risks causing vulnerability to large losses (due to large shocks or the potential for significant amplification of shocks in the system) that could severely impair the financial system's ability to lend and/or provide other critical financial services to the real economy.

The SRB level may vary across institutions or sets of institutions (depending on their respective contribution to the specific structural systemic risk and on the geographical location of their exposures). The CRD IV specifies that the SRB can be applied to all domestic exposures, to all exposures in another Member State, to all exposures in a third country, or to any combination of these.[59] However, it does not specify whether the SRB can be applied to a sectoral subset of exposures.

Unlike for the SII buffers, the CRD IV does not provide specific criteria (size, cross-border activities, etc.) for determining the SRB level applicable. However, it is specified that the application of the buffer must not entail disproportionate adverse effects on the whole or parts of the financial system of other Member States or of the EU as a whole forming or creating an obstacle to the functioning of the internal market. Furthermore, the competent or designated authority must review the SRB at least every second year. There is no maximum limit for the SRB level. However, depending on the level of the buffer and the impact on other Member States, authorisation from the European Commission may be required.

1.3 Macroprudential leverage ratio

As pointed out in academic literature and in the addendum to this Handbook concerning macroprudential leverage ratios,[60] risk-weighted capital requirements should be complemented by a backstop leverage ratio add-on. The latter helps to tackle i) fundamental uncertainty, which is not measurable and not possible to calculate, ii) model risk, especially regarding tail events, and iii) aggregate financial system risks linked to the overall balance sheet size or the correlation of losses due to common exposures. These risks cannot be sufficiently accounted for by risk-weighted capital requirements alone.

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57 EBA Guidelines on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD IV) in relation to the assessment of other systemically important institutions (O-SIIs) (EBA/GL/2014/10).

58 Article 133(1) of the CRD IV.

59 Article 133(8) of the CRD IV.

60 See ESRB (2015).

In addition to the addendum to this Handbook covering both structural and cyclical systemic risks, the possible usefulness of a macroprudential leverage ratio as a complement to risk-weighted capital buffers and as part of the overall toolkit has been highlighted on several occasions, including by the ESRB in its Recommendation on intermediate objectives and instruments of macroprudential policy (ESRB 2013), by the EBA in its report on the leverage ratio (EBA 2016), by the BCBS in its work on simplicity and comparability (BCBS 2013b)[61] and by the Group of Central Bank Governors and Heads of Supervision, which discussed additional requirements for G-SIIs.[62] The ECB and the ESRB also highlighted the advantages of a macroprudential leverage ratio in their respective responses to the European Commission's consultation document on the "Review of the EU Macro-prudential Policy Framework". Authorities in several countries have already implemented a leverage ratio from a macroprudential perspective, especially for systemically important institutions (SIIs), but also to counter cyclical systemic risk (United Kingdom).[63]

When talking about structural systemic risk, such a leverage ratio add-on ought to be designed to take into account the systemic importance of institutions and differences in structural risks to make SIIs more resilient to excessive leverage, model risk and uncertainty and as an instrument for these institutions to internalise negative externalities. Without it, SIIs could operate with the same leverage as their non-systemic competitors and face leverage ratio requirements that are less stringent than their risk-weighted requirements. Also with regard to structural risk covered by the SRB, a leverage add-on would provide protection against the risk of potentially miscalibrated risk-weights by restricting exposure in terms of the balance sheet for a given level of capital. To ensure that the leverage ratio add-on acts as an effective complement to risk-weighted requirements, a rules-based approach could be considered, as described in the addendum to this Handbook. Once a minimum leverage ratio requirement is introduced, as envisaged by the CRD IV/CRR review, the ESRB will update its guidance, incorporating new insights from analytical work, including net benefit analyses on a leverage ratio add-on linked to the risk-weighted buffers as part of the same overall framework. In the meantime, however, Member States should consider how the detailed guidance in the ESRB Handbook could be used to enhance the stability of national financial systems with regard to structural systemic risk.[64]

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61 See BCBS (2013b), which states: "Beyond the current proposals, other ideas to further strengthen the benefits of the leverage ratio within the regulatory framework could include: adjustments to the design and calibration of the leverage ratio, such as adopting a similar 'buffer' structure for the leverage ratio as has been done for the risk-based capital requirements under Basel III; and/or the inclusion of stronger leverage ratio requirements for G-SIBs, so that the leverage ratio maintains its relative strength as a backstop for the most systemically important banks."

62 See BCBS (2016).

63 In the United States, the biggest deposit-taking bank holding companies have to comply with a 6% leverage ratio; in Switzerland, systemically important financial institutions are subject to a 4.5% ratio and G-SIBs to a 5% ratio; and in the Netherlands there is a supervisory expectation that the biggest banks have a leverage ratio of at least 4%. In the United Kingdom, banks subject to risk-weighted macroprudential buffers will also have to comply with a complementary leverage ratio add-on set at 35% of risk-weighted buffers.

64 The addendum to this Handbook provides detailed guidance on key considerations and design issues of a macroprudential leverage ratio add-on. Currently, this can be implemented at national discretion, and Member States should thoroughly consider whether it is needed in order to address systemic risk in a comprehensive manner. In other jurisdictions, both inside the EU (United Kingdom) and outside (United States, Switzerland), authorities have already imposed such an add-on to safeguard financial stability. As this Handbook points out, a rules-based approach that links the leverage add-on to macroprudential risk-weighted buffers represents a simple and coherent approach and preserves the relative stringency of risk-weighted and unweighted capital requirements.

2 Objectives, transmission mechanisms and effects

2.1 Macroprudential objectives

The main objective of using capital-based instruments is to strengthen the resilience of institutions.[65] By increasing their loss-absorption capacity, the resilience of the financial system as a whole is strengthened. The financial system is better able to withstand both institution-specific and sector-wide shocks.

Different capital tools pursue different intermediate objectives. Capital tools directed at systemic banks, in particular the SII buffers, are aimed primarily at fulfilling the intermediate objective of limiting the systemic impact of misaligned incentives with a view to reducing moral hazard (ESRB Recommendation on intermediate objectives and instruments of macro-prudential policy). The other capital tools targeting structural systemic risks, namely the SRB and Pillar 2 additional own funds requirements, can also fulfil the intermediate objectives of limiting direct and indirect concentration of exposures and mitigating and preventing excessive leverage.[66] The market failures targeted include externalities related to interconnectedness (intra-financial contagion) and fire sales, as well as excessive risk-taking owing to bailout expectations when institutions are perceived as systemically important (moral hazard and “too big to fail”).

2.2 Transmission mechanism

Capital-based instruments prompt the institution to (i) raise equity (e.g. by issuing new stocks or retaining earnings), and/or (ii) reduce its RWAs, thereby raising its loss-absorbing capacity.[67] There is also an impact on the credit cycle, in particular during the phase-in period, as the implementation of the capital requirements limits the credit supply and lowers asset prices, both through capital constraints and the expectations channel.

The effects depend on the size of voluntary buffers and the banks’ decision on what to do with them. Often institutions hold voluntary buffers, for instance, as an additional safeguard against breaching their capital requirements. Institutions may choose to meet any increased capital buffer requirements by reducing voluntary capital buffers instead of raising/retaining capital or decreasing risk-weighted assets. In this case, a higher requirement locks more capital in the system but the overall capital level remains the same. The decrease in voluntary buffers may be partly a consequence of an intended effect: when higher capital buffers increase the resilience of the

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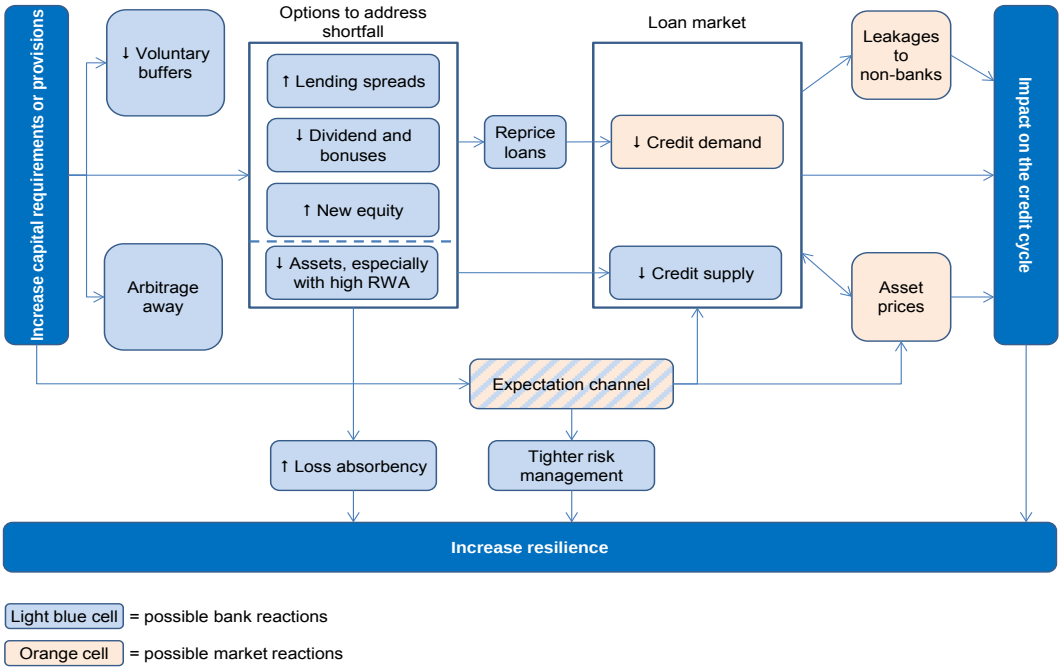
65 Article 1 of the CRD IV defines institutions collectively as “credit institutions and investment firms”, irrespective of their position in a group.

66 Capital-based instruments may also be used to mitigate and prevent excessive maturity mismatch and market illiquidity (e.g. higher capital requirements for less liquid assets may provide incentives to hold more liquid asset types). However, these risks may be addressed more efficiently using other more specific instruments. The use of the capital-based instruments to achieve this intermediate objective is, therefore, outside the scope of this chapter.

67 When using capital-based instruments, the institutions concerned are required to increase the ratio of capital to risk-weighted assets. Banks may react by changing the numerator (capital) and/or the denominator (RWA). In addition, Pillar 2 allows competent authorities to require institutions to decrease their holdings of certain assets.

banking sector overall, voluntary buffers may be released because of increased market tolerance in a more resilient banking sector environment. Figure 4.1 depicts the transmission channels of an increase in capital requirements.

Figure 4.1
Transmission map of raising capital or provisioning requirements



Source: Adapted from CGFS (2012).

When lowering capital requirements, the transmission mechanism works, to an extent, the other way around. This is not without its difficulties, however, as a decrease in capital requirements may lead institutions to reduce their capital buffers (e.g. by a debt-funded increase in assets) or increase their voluntary buffers. Their choice is largely driven by institution-specific considerations, taking account of market perception of their resilience and shareholder interests (return on equity). Thus, while imposing a buffer rise is feasible, at least for some institutions, it is harder to compel institutions to release a buffer, if market forces prompt them to maintain their capital levels.

Releasing the buffers may decrease resilience or reflect a lower level of risk. In general, resilience decreases with a decrease in capital buffers. However, when specific risks targeted by the buffers disappear, releasing the buffers may not necessarily reduce resilience. Capital-based instruments aimed at structural systemic risks can also influence the credit cycle. Scarce capital can be an active constraint on balance sheet expansion. This secondary effect can be intended or unintended.

The importance of resilient banking sectors has been underlined by the latest financial crisis, despite the ongoing improvement in financial integration internationally. An important conclusion of debates among academics and professionals was that banking sectors were, in several cases, undercapitalised. Therefore, increases in capital requirements could have positive indirect effects on overall economic growth in the long run by reducing the probability and magnitude of banking crises and by reducing the overall volatility of output fluctuations. Nonetheless, in the short term,

capital constraints on banks may lead to higher funding costs for them and a potential tightening of credit conditions for both households and companies, with a possible negative impact on GDP growth.

Lastly, structural capital buffers should change less often than cyclical buffers. The SII buffers, the SRB and additional capital requirements under Pillar 2, when constraining, have both short and long-term impacts. As mentioned above, in the short term, i.e. the adjustment stage, it is important to consider not only any structural impact but also the impact on the business cycle. For instance, the impact on the price of capital will depend in part on the timing and phasing-in of the buffers' implementation. Structural capital buffers may therefore "interfere" with the countercyclical capital buffer and indeed the transmission of monetary policy. In the long term the structural impact dominates.

2.3 The impact of structural capital buffers

The assessment of the effectiveness of structural buffers should be related to the main economic objectives of their introduction. Ideally, authorities should be able to document (quantitatively as well as qualitatively) the impact of the instrument on the targeted systemic risk. The long-term impact on the economy should also be investigated whenever possible, including the potential circumvention of the buffer. Moreover, international spillover effects and regulatory practices should also be assessed through, for example, international peer comparisons and following Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures. Nonetheless, it is recognised that valid quantification of the potential impact may be limited to a significant extent by the insufficient empirical experience accumulated so far.[68] Quantifying the effects on the economy is not straightforward and inevitably requires some judgment on how banks will respond to changes in capital requirements. Such challenges have been acknowledged and assessments have been performed using various methodologies and with a wide range of results. It should be noted that all analyses of such impacts should be treated with caution, given the considerable uncertainty surrounding their empirical conclusions and the hypotheses upon which the models are built. Consequently, more weight is still given to qualitative assessments of the effectiveness of the structural buffers.

Various approaches could be used to promote a quantitative evaluation of the effectiveness of structural buffers.

One approach is to monitor relevant indicators (e.g. indicators for setting the O-SII buffer) or other bank-level statistics, such as risk-taking indicators or the evolution of specific exposures for two different groups of institutions (SIIs as the treatment group and non-SIIs as the control group) to identify whether the buffers have changed bank behaviour and how. The same approach could be

[68] The benefits of structural buffers lie predominantly in reducing the frequency and/or severity of crises. As crises are rare events by nature, it might take a very long time to accummulate enough evidence to observe these benefits empirically. The empirical analysis is further complicated by continuous changes in financial and regulatory conditions, which makes distinguishing the positive effects of the capital buffers particulary challenging. On the other hand, unintended consequences, such as higher funding costs, typically manifest themselves more quickly and evidence of them takes less time to accummulate.

used to detect the reaction of other market participants (depositors, bond and equity holders, etc.) to the regulatory measure.[69]

For the O-SII buffer, one possible approach is to look at the evolution of the funding cost advantage around relevant events (i.e. announcement, introduction, calibration of the buffer). This may shed light on how market participants gauge the probability of bank failure (e.g. by looking at CDSs), the magnitude of the buffer and the credibility of the resolution regime. It may be useful to look at market perception and adjustment of bank behaviour separately and try to develop indicators for both categories.

Another approach is to conduct an event study, which might be applicable when banks across the board are affected by the requirements (e.g. application of the SRB to certain common exposures). A further option would be to develop models that explicitly model the probability of bank failure. In the case of sectoral SRBs, if loan-level data are available, these can be used to analyse possible sectoral shifts in banks' credit exposures.[70]

2.4 Unintended effects of capital-based instruments

Unintended consequences can follow both from the activation of capital buffers and release. The section below discusses some potential unintended consequences of increases in capital requirements.

Excessive deleveraging and higher lending costs: To meet higher capital requirements, banks may excessively reduce their balance sheet instead of raising new capital or retaining profits. This behaviour is especially likely when the banking system is facing adverse financial conditions. Banks are also likely to pass at least some of the increased cost of funding on to their customers and raise lending costs. These effects could contribute to lower levels of aggregate credit.

These unintended effects on credit supply can also have an impact across borders. Banks may deleverage more in foreign countries than at home. Countries in which the banking sector is dominated by foreign banks are particularly vulnerable to this unintended cross-border effect, especially if domestic credit sources are not able to offset reductions in credit supply from foreign banks.

Appropriate timing and phasing-in of implementation should mitigate these possible unintended effects on the credit cycle. First, deleveraging pressures can be minimised by introducing the buffers in the "benign" phase of the financial cycle, when raising new capital is relatively cheap and deleveraging pressure is low. Second, in a downturn, a sufficiently long phasing-in period of the buffers can help to avoid such unintended consequences.

Search for yield-related risk-taking: Higher capital requirements may lead credit institutions to invest in riskier assets to improve profitability and ensure that returns on equity remain acceptable to stockholders. This search for yield may ultimately reduce banks' resilience. Such risk shifting may be prevented by applying general capital requirements to all RWAs instead of taking a sectoral

[69] Potential methods include difference in differences (DID) and regression discontinuity design (RDD).

[70] For an overview, see Siegert and Willison (2015).

approach. The leverage ratio should also serve as a safeguard against an increase in exposures to risky assets.

Intragroup risk shifting and capital flight: Cross-border banks may evade capital buffers by shifting risks or capital across borders instead of raising new capital or retaining profits. Recent research[71] shows that cross-border banks have increased their risk-taking in host countries to compensate for the reduced ability to take risks in their home country. Alternatively, cross-border operating banks may meet their increased capital requirements at home by repatriating voluntary buffers from their foreign subsidiaries, thereby decreasing the resilience of the latter. National authorities should pay attention to the cross-border aspects of regulatory arbitrage.

Cross-border coordination, when setting capital buffers, is crucial to prevent such unintended effects. This coordination is in part mandatory, e.g. when a supervisory college takes a joint decision to require additional own funds under Pillar 2 to address systemic risks. In many cases, however, coordination is limited to notification (see Section 5). In those cases the ESRB has an important role to play in fostering further coordination.

Leakages and shadow banking: Leakages take different forms, both within countries and across borders. The capital buffers addressing systemic risks may be partly avoided by leakages (migration) to financial sectors which are less prudentially regulated (so-called shadow banking). This leakage may occur, for example, via securitisation or the creation of special purpose vehicles.

Because shadow banking is closely linked to the banking sector, disruptions in the shadow banking sector are expected to have spillover effects and transmit risk to the banking sector. This issue is of particular importance for SIIs, which carry out most of the operations between the banking industry and shadow-banking entities (investment and commercial banks active in securitisation, banks acting as dealers and prime brokers, etc.).

Adjustments of internal ratings-based models: In order to compensate for the higher capital requirements, banks may "optimise" their internal ratings-based models to artificially reduce their risk exposures. Floors on risk weights, increased supervisory scrutiny and strengthened disclosure requirements can help to prevent this. Moreover, the leverage ratio serves as an ultimate backstop against unduly low risk weights.

Perception of SIIs as "too big to fail": Identification of an institution as systemically important may reinforce market perception that authorities consider the institution to be "too big to fail", leading to expectations of a bailout. As a result, SIIs may enjoy an implicit subsidy in the form of a lower cost of funding. However, it is likely that the recent regulatory and institutional reforms in the area of bank recovery and resolution have reduced the size of these implicit subsidies.

[71] Ongena, Popov and Udell (2012).

3 Indicators

3.1 G-SII buffer

The CRD IV provides the identification methodology for G-SIIs on the basis of a number of categories and indicators. In accordance with Article 131(18) of the CRD IV, the EBA has developed regulatory and implementing technical standards specifying the methodology to be used for identifying G-SIIs, defining sub-categories and allocating G-SIIs to them on the basis of their systemic significance.[72] These standards take the methodology developed by the BCBS and used by the FSB into account and rely on the following categories and indicators (Table 4.1).[73]

Table 4.1

Categories and indicators suggested by the BCBS to identify global systemically important banks (G-SIBs)

Category (and weighting)	Individual indicator	Indicator weighting
Cross-jurisdictional activity (20%)	Cross-jurisdictional claims	10%
	Cross-jurisdictional liabilities	10%
Size (20%)	Total exposure as defined for use in the Basel III leverage ratio	20%
Interconectedness (20%)	Intra-financial system assets	6.67%
	Intra-financial system liabilities	6.67%
	Securities outstanding	6.67%
Substitutability/financial institutions infrastructure (20%)	Assets under custody	6.67%
	Payments activity	6.67%
	Underwritten transactions in debt and equity markets	6.67%
Complexity (20%)	Notional amount of OTC derivatives	6.67%
	Level 3 assets	6.67%
	Trading and available-for-sale securities	6.67%

3.2 O-SII buffer

In line with the provisions of Article 131(3) of the CRD IV, the EBA issued guidelines on the identification of O-SIIs in December 2014.[74] The aim of these guidelines is to promote convergence in the O-SII identification process across Member States and to make the whole process comparable, transparent and comprehensible. The guidelines were prepared on the basis of the

[72] The regulatory and implementing technical standards are available on the EBA's website at **https://www.eba.europa.eu/regulation-and-policy/own-funds/global-systemically-important-institutions-g-sii-**

[73] See BCBS (2013a).

[74] Guidelines on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD IV) in relation to the assessment of other systemically important institutions (O-SIIs) (EBA/GL/2014/10). The guidelines are currently (second half of 2017) subject to an ongoing review.

"comply or explain" principle which means, that authorities are not legally obliged to follow them and may choose their national methodologies, provided that they "explain" the reasons for not complying with the guidelines.

The procedure to identify the O-SIIs in line with the EBA guidelines comprises two steps. In the first step, authorities calculate the systemic importance score of each institution using nine mandatory indicators covering four categories (see Table 4.2) as follows:

1. the value of each indicator for each institution is divided by the aggregate amount of the respective indicator values summed across all institutions in the Member State;[75]
2. the resulting percentage figure is multiplied by 10,000 (to obtain basis points);
3. scores for each category (see Table 4.2) are calculated by taking a simple average of the indicator scores in that category;
4. the overall score for each relevant entity is calculated by taking a simple average of its four category scores.

Table 4.2
EBA mandatory indicators

Category	Indicators	Weight
Size	Total assets	25%
Importance (including substitutability/financial system infrastructure)	Value of domestic payment transactions	8.33%
	Private sector deposits from depositors in the EU	8.33%
	Private sector loans to recipients in the EU	8.33%
Complexity/cross-border activity	Value of over-the-counter (OTC) derivatives (notional)	8.33%
	Cross-jurisdictional liabilities	8.33%
	Cross-jurisdictional claims	8.33%
Interconnectedness	Intra-financial system liabilities	8.33%
	Intra-financial system assets	8.33%
	Debt securities outstanding	8.33%

Source: EBA, Guidelines on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD IV) in relation to the assessment of other systemically important institutions (O-SIIs) (EBA/GL/2014/10).

To foster harmonisation, authorities are encouraged to use common definitions of these mandatory indicators across Member States, using the implementing technical standards on an EU-wide common supervisory reporting framework.[76] The score should be calculated at least at the highest consolidation level that falls under the jurisdiction of the authority conducting the assessment, including subsidiaries in other Member States and third countries. Authorities may, in addition, apply the methodology at other appropriate levels of consolidation to inform their decision on how the O-SII buffer should be calibrated and at which consolidation level it should apply.

[75] Where the Member State's banking system contains a large number of small institutions, relevant authorities may opt to exclude a relevant entity from the identification process if the relative size of this relevant entity measured by its total assets does not exceed 0.02%.

[76] References to the FINREP templates are provided in Annex 1 to the guidelines.

Authorities should designate as O-SII the banks with a total score equal to or exceeding 350 basis points. In order to take into account the specific feature of banking sectors in each Member State and ensure the homogeneity of the group of O-SIIs, authorities may raise this threshold to as high as 425 basis points or decrease it to as low as 275 basis points (this choice has to be disclosed and explained by the supervisory authority).[77]

In the second step, authorities may extend the list of O-SIIs and designate further institutions (but cannot remove any bank identified as an O-SII in the first step) on the basis of the indicator scores in any of the categories and/or additional qualitative and/or quantitative indicators of systemic importance. The authorities can choose the most relevant indicators from the list of 49 optional indicators provided in Annex 2 of the EBA guidelines.

As the EBA guidelines are not legally binding, it is possible to use national methodology instead. Such an approach has been taken by Malta and Denmark. The Maltese authorities have confirmed that the use of the EBA methodology would have given the same results. The designation of O-SIIs in Denmark is conducted according to three criteria and threshold values determined in a political agreement reached in the Danish Parliament in 2013. These criteria are listed as optional indicators in the EBA guidelines.

3.3 SRB

Compared with the SII buffers, the CRD IV is less prescriptive regarding the indicators to be used for activating or releasing the SRB. It is therefore important to identify the scope of the SRB first.

3.3.1 The scope of the SRB

There are three limitations as regards the scope of the SRB:

- the SRB is intended “to prevent and mitigate long term non-cyclical systemic or macroprudential risks ...;
- … in the meaning of a risk of disruption in the financial system with the potential to have serious negative consequences to the financial system and the real economy in a specific Member State”;
- the risk addressed by the SRB is not already covered by the CRR.[78]

The application of the SRB is complicated by the inherent uncertainty about what constitutes a *non-cyclical systemic risk*. Cyclical risk factors should, in principle, be dealt with by the CCyB (see Section 3.3.2). Nevertheless, authorities should have sufficient flexibility to adjust the rate of the SRB if they observe a change in the level of the sectoral risk. The absence of a clear definition and

[77] Several Member States have excercised the option to adjust the threshold for the identification of O-SIIs, justifying this with reference to the number of O-SIIs in countries with concentrated banking markets (e.g. the Czech Republic, Slovakia) or the need to increase the number of O-SIIs in more diversified banking markets (e.g. Austria, Germany).

[78] Article 133(1) of the CRD IV. In addition, when notifying the measure pursuant to Article 133(11), it is necessary to justify why none of the existing CRD IV/CRR measures (excluding the national flexibility measures and Article 459 of the CRR) are sufficient to address the identified risk.

robust indicators of structural systemic risk may lead to divergent practices among national macroprudential authorities with regard to the SRB thereby increasing the risk of regulatory arbitrage and policy uncertainty in the banking sector.[79] Furthermore, exposures to a common shock and potential channels of intra-financial contagion are likely to vary over the cycle. Because pro-cyclicality tends to magnify systemic risks, the structural and cyclical dimensions of systemic risk may not be easily distinguishable.

Serious negative consequences to the financial system are caused by large exogenous shocks, but also by normal-sized shocks when their impact on the system is amplified.

The following three broad and non-restrictive categories of risks can be potentially addressed with an SRB:

1. **Risks stemming from the propagation and amplification of shocks within the financial system:** financial crises become systemic in nature through the propagation and amplification of the initial shock. Some of these contagion channels are established through direct links between financial agents or through other financial intermediaries. Other amplification channels do not require significant linkages between financial institutions, but can arise from common exposures or similar business models.

2. **Risks stemming from structural characteristics of the banking sector:** certain structural characteristics of the banking system may not necessarily induce direct losses, but they may have the potential to become amplification channels in the event of a crisis. This warrants the introduction of measures aimed at reducing the overall impact of systemic events on the financial sector and, consequently, on the real economy. Such structural aspects are related to market-specific developments and the institutional set-up of the domestic financial system.

3. **Structural risks to the banking sector stemming from the real economy (those not covered by Pillar 1 requirements):** as the recent financial crisis has shown, shocks originating from the real economy can impair the functioning of the financial sector, which in turn has the potential to create an economic downturn through a reduction in lending to the real economy. Such risks can arise from specific economic sectors which are in distress or from an aggregate demand shock which could have come from a separate economic crisis in another country. This scenario is especially relevant for countries with small and open economies.

Finally, the SRB should address long-term structural systemic risks not covered by the CRR. This means that the SRB should only be used to address risks that are not already captured in Pillar 1 own funds requirements (i.e. relating to “entirely quantifiable, uniform and standardised elements of credit risk, market risk, operational risk and settlement risk”).[80] As most macroprudential risks are difficult to standardise and quantify, this limitation will not restrict the use of the SRB, provided that macroprudential authorities can explain why none of the existing CRD IV/CRR measures (excluding “national flexibility measures”[81] and Article 459 of the CRR) are sufficient to address the identified risks.

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[79] For example, there is a considerable difference if the external debt of a country is mostly composed of short-term foreign deposits and “hot money” flowing into the stock exchange rather than long-term government debt.

[80] Article 1 of the CRR.

[81] Article 458 of the CRR.

The risks in the real estate sector serve as an example of the interplay between the CRR requirements and the SRB. Some credit and market risks in the real estate sector are quantifiable, uniform and standardised and are, therefore, intended to be captured by the CRR, which provides instruments to address them. Other real estate risks, however, in particular the macroprudential risk of large common exposures to the real estate sector, are not covered by the CRR. The SRB can therefore contribute to addressing this macroprudential risk in the real estate sector.

Under the current legal set-up, the targeting of multiple structural systemic risks or risks stemming from a particular sector within the economy (e.g. households, non-financial corporations, governments, credit or financial institutions) is unclear. It was clarified in 2017 that since the SRB is an exposure (not risk) targeting measure, there cannot be two SRBs simultaneously applied to the same set of exposures.[82] In addition, the current regime only allows the SRB either to target all exposures or to discriminate according to their geographical origin. Therefore, where multiple risks or specific sectors are targeted, the national competent authority (NCA) or the national designated authority (NDA) is constrained to applying a single SRB calibrated on the total risk exposure amount, which cumulates all relevant risk sources.

Such a non-risk-sensitive approach might reduce the transparency of the SRB and does not promote effective risk management or effectively align incentives. The NCA or NDA needs to properly address these caveats. First, it needs to calibrate the SRB rate individually for each institution (or group of institutions) subject to the SRB, as the exposures of each institution to the targeted risk differ. Second, although structural systemic risks are not expected to change significantly over time, the NCA or NDA still needs to regularly re-calibrate such an “aggregate” measure in order to ensure that it remains correctly aligned with incentives and to avoid regulatory arbitrage. While this may be more effective for some authorities and in some jurisdictions, this process might not be the most appropriate one for all jurisdictions. If an entity subject to such an SRB were to decrease (or increase) its exposure to the source of the targeted systemic risk, the SRB rate it is required to maintain would not fall (or rise) until a re-calculation of the SRB requirement by the designated authority had occurred. Moreover, the actual capital required to be held to meet the SRB also depends on other exposures of the institution and not only on the targeted exposures. Such a blunt SRB could thus have negative spillovers to other (non-targeted) exposures of institutions. Third, the authority should properly communicate details of the SRB application to avoid perverse incentives and ensure proper reciprocation by foreign authorities.

The use of multiple SRBs would also increase transparency and thereby help national authorities to reciprocate SRBs from other Member States (see Section 4.3). Although potentially useful in addressing financial stability risks, possible drawbacks of sectoral and multiple SRBs are that they could significantly increase the complexity of the system, hamper the comparability of capital requirements across Member States, and ultimately jeopardise the smooth functioning of the internal market in the European Union.

[82] See Single Rulebook Q&A question 2017_3229, available on the EBA’s website at **http://www.eba.europa.eu/single-rule-book-qa**

3.3.2 Indicators for activating or deactivating the SRB

Three types of indicators may be considered to capture the scope of the SRB, in line with the categorisation of risks detailed in the previous section.

1. **Indicators reflecting structural characteristics of the banking sector.** The focus should be on structural risk factors, as cyclical risk factors should, in principle, be dealt with by the CCyB. The main indicators monitored in this risk category relate to (i) size and importance for the financing of the economy and concentration of the domestic banking sector, (ii) foreign ownership, and (iii) other specific structural risks, such as high system-wide and persistent levels of NPLs or significant exposures to level 2 and level 3 assets.

2. **Indicators of propagation and amplification of shocks within the financial system** which increase the financial system's ultimate losses owing to these shocks.[83] The significance of these amplification channels depends on structural characteristics of the financial system, in particular (i) exposure concentration and asset commonality, (ii) financial interconnections and contagion, and (iii) commonality in bank business models. At the same time, the financial conditions of other relevant parts of the financial system, such as insurance companies, pension funds and asset management companies (the shadow banking system), should be closely monitored.

3. **Indicators of risks to the banking sector stemming from the real economy.** Macroeconomic shocks can lead to significant losses for the banking sector. Therefore macroeconomic indicators, such as (i) economic openness and (ii) sectoral risks from the private non-financial sector, households and the public sector, should be monitored.

In general, data at the financial sector or macroeconomic level should be used, but institution-level data may also be required when macroprudential authorities seek to apply the SRB to a subset of institutions that are the most exposed to particular assets, that are highly interconnected or that contribute substantially to the financial sector's impact on the real economy.

3.3.2.1 Indicators reflecting structural characteristics of the banking sector

Structural risk factors that determine the probability and size of shocks to the financial system relate to structural vulnerabilities of economies. While it is difficult to separate the structural and cyclical dimensions of systemic risk, the focus should be on structural vulnerabilities rather than cyclical changes.

Risks that are included in the category related to the size and importance for the financing of the economy and concentration of the domestic banking sector can be measured both with aggregate banking indicators, such as the size of assets and retail deposits, and specific indicators, such as the share of bank credit to the private non-financial sector.[84] Regarding foreign ownership of banks in

[83] For the conceptualisation of financial instability owing to amplification by the financial system, see Borio and Drehmann (2009).

[84] The indicators used for the identification of O-SIIs are not listed here, as this risk should primarily be addressed through the O-SII buffer.

developed countries, there are no general conclusions as to whether foreign banks contribute to systemic risk or not. It is rather the substitutability of banks which is at the core of this risk factor. This dimension can, however, go beyond individual institutions and become more pronounced if the combination of certain factors – including the ownership structure of the banking sector – increases the risk of a strong balance sheet reduction and hence of the need for substitution of banking activities.

Table 4.3
Metrics for measuring risks stemming from structural characteristics of the banking sector

Specific risk factor	Metrics	Possible data sources
Size and importance for the financing of the economy, and concentration of the domestic banking sector	Total (consolidated) assets as % of GDP	FINREP / BSI + Eurostat / ECB
	Total retail deposits as % of GDP	FINREP / BSI, Eurostat / ECB
	Share of bank credit to the private non-financial sector out of broad credit	
	Share of top five banks as % of total assets	BSI
	Herfindahl Index of banks assets	BSI
Foreign ownership	Share of foreign ownership (non-domestic assets as % of total bank assets)	
	Structure of foreign bank ownership - Number of foreign subsidiaries and foreign branches - Assets held by foreign subsidiaries and foreign branches (as % of total assets) - Foreign-owned equity as % of total equity of the domestic banking sector	
	Share of lending to the PNFS by foreign branches and subsidiaries (as % of total lending)	
	Share of lending to the PNFS by foreign non-banks (as % of total lending)	
	Contribution of host country deposits to the financing of the entire banking group	
	Share of contribution of host countries' subsidiaries to profit of parent bank	
Other potentially structural risks	Aggregate banks' non-performing loans (RRE and all loans) In EUR billions As % of banks' total assets	
	Aggregate banks' coverage ratio – RRE and all loans (as % of NPLs)	
	Aggregate securities (sum of trading assets and liabilities net of derivatives)	BSI
	Aggregate leverage ratio (Tier 1 capital/Total assets)	BSI

Source: ESRB (2017).
Notes: The following data sources are referred to in the last column of this table and subsequent tables in this section: Eurostat/ECB refers to data based on financial accounts and monetary statistics (non-consolidated balance sheets of the respective entities); BSI refers to publicly available balance sheet items; FINREP refers to financial reporting (consolidated balance sheets of the reporting entities, scope of group consolidation as defined in the IFRS).

It is obviously not possible to provide a set of "universal" indicators with a view to determining the timing of application, scope and size of the SRB. Specific structural risk indicators should stem from the structure and current state of the particular economy and financial sector in question.

3.3.2.2 Indicators of amplification channels

a) Exposure concentration and asset commonality

The degree of exposure to particular assets can be measured either in levels (relative to total assets, credit or capital) or in terms of asset class concentration. High levels of asset class concentration may indicate a risk of large losses to the financial system.

Table 4.4

Metrics for measuring structural systemic risks stemming from the propagation and amplification of shocks within the financial system

Specific risk factor	Metrics	Possible data sources
Exposure concentration / asset commonality	Banks' CRE/RRE loans as % of total assets	COREP / FINREP + BSI
	Domestic and foreign general government debt as % of total assets	
	Contingent claims, guarantees extended and other off-balance sheet items as % of total assets	
	Herfindahl Index of asset classes	
	Herfindahl Index of banks' turnover in particular markets	Bloomberg / Reuters
	Banks' international claims as % of total assets	BIS-CBS + SNL Financials
	Banks' international claims against top ten debtor countries (incl. off-balance sheet claims) - Country breakdown - Counterparty sector breakdown	BIS-CBS
	Banks' securities holdings as % of CET1 - Country breakdown - Counterparty sector breakdown	SHS-G + BSI
	Share of forex loans as % of total loans	
	Share of households' loans in foreign currency as % of total loans	
	Share of foreign currency deposits	
	Herfindahl Index of currency exposures	
Commonality in bank business models	Structure of banks' liabilities – equity, deposits (other than interbank), interbank deposits, other non-core liabilities[85]	FINREP
	Non-core liabilities ratio[86]	BSI

[85] Relying on a statistical clustering technique and using balance sheet characteristics of 222 international banks, Roengpitya, Tarashev and Tsatsaronis (2014) identify three bank business models: a retail-funded commercial bank, a wholesale-funded commercial bank, and a capital markets-oriented bank. According to the authors, the banks' funding mix is a key distinguishing feature of their business model. In particular, they identify the share of non-deposit debt and the share of interbank liabilities to total assets (net of derivatives exposures) as the relevant ratios helping to differentiate bank business models. The share of gross loans and the size of the trading book are the only variables in their work relating to the composition of banks' assets.

[86] Hahm, Shin and Shin (2012) present a model of credit supply in which they identify banks' non-core liabilities as an indicator of financial vulnerability. The authors provide evidence that a lending boom is reflected in the composition of bank liabilities when traditional retail deposits (core liabilities) cannot keep pace with asset growth and banks turn to other funding sources (non-core liabilities) to finance their lending.

Specific risk factor	Metrics	Possible data sources
	Share of gross loans as % of total assets	BSI
	Size of trading book (sum of trading securities and fair value through income book)	BSI
	Securities (sum of trading assets and liabilities net of derivatives)	BSI
	Maturity mismatch indicators	
	Leverage ratio (Tier 1 capital/Total assets)	BSI
Financial interconnections and contagion[87]	Banks' intra-financial sector linkages Intra-financial assets (as % of total assets) Intra-financial liabilities (as % of total liabilities)	FINREP + BSI
	Banks' cross-holdings of securities (as % of CET1)	SHS-G + BSI
	Banks' ranking in terms of network centrality metrics (e.g. degree of closeness centrality) Comparison with ranking based on banks' Core Tier 1 ratio	Network analysis depending on available bank-to-bank data + BSI
	Mean geodesic distance (shortest path) between banks in the network	Network analysis depending on available bank-to-bank data
	Model-based estimates of financial contagion - Number of banks failing due to contagion following the default of a network counterparty - Bank-level losses due to contagion following the default of a network counterparty, as % of CET1 - System-wide losses due to contagion following the default of a network counterparty, as % of banking system capital	Network-based simulations depending on available bank-to-bank data + BSI

Source: ESRB (2017).
Notes: The following data sources are referred to in the last column of this table and subsequent tables in this section: BSI refers to publicly available balance sheet items; COREP refers to supervisory reporting (consolidated balance sheets of the reporting entities, scope of group consolidation as defined by the CRD IV); FINREP refers to financial reporting (consolidated balance sheets of the reporting entities, scope of group consolidation as defined in the IFRS); EBA refers to data collected by the European Banking Authority; SHS-G refers to the Securities Holdings Statistics – Group database providing data on 26 European systemically important financial institutions' holdings of equity and short and long-term debt; BIS-CBS refers to the international consolidated banking statistics of the BIS.

b) Financial interconnections and contagion

Although they allow for better diversification of financial institutions and contribute to well-functioning financial markets, interconnections can also be channels that propagate tail risks, spreading financial weaknesses across institutions and across countries. Information on how institutions are interconnected and how shocks may propagate from one institution to the rest of the

[87] It is important to note that the network-based indicators proposed in this section rely on good quality bilateral exposure data. Furthermore, model-based estimates of financial contagion depend on the specific assumptions about the contagion channels taken into account in the underlying network model. Thorough robustness checks of the model(s) used for simulations should be undertaken before using the results for policy purposes.

system can be based on various sources and methods: sector-level balance sheet data may provide an overall picture and assessment of direct channels of interbank contagion, while firm-specific data on interbank exposures give further detail and enable network analysis or bank default simulations to be performed to assess the resilience of the interbank networks. Indirect interconnectedness within the financial system arises on the assets side, given common exposures, and can be accentuated if financial institutions have astrong influence on that exposure's market, inasmuch as banks cannot buy or sell without influencing the price.

c) Commonality in bank business models

Risks may materialise if several banks display some common structural risks, e.g. in their funding structure, maturity mismatch or their sources of income. This is a particular concern for institutions with a strong reliance on potentially volatile market funding as opposed to comparatively more stable secured deposits. Another possible channel for simultaneous distress can arise in a situation where long-term invested assets have a lower return than funding costs, which could significantly increase due to an interest rate shock, despite a stable funding structure based on secured deposits. A lack of diversity in sources of income in the banking sector due to herding behaviour can also introduce stress into the system. Analysing the evolution of bank business model metrics over time would also be important, allowing the assessment of how risks have changed over time.

3.3.2.3 Indicators for measuring risks to the banking sector stemming from the real economy

The vulnerability of the financial sector to macroeconomic shocks may be measured by considering indicators on trade openness and export and import concentration. In this context it is important to measure the capacity of the financial system to withstand the aftermath of such a shock. A broader perspective could also include the capability of fiscal policy to cushion an aggregate demand shock and of the central bank to absorb a foreign exchange shock. However, as such shocks can be amplified through structural characteristics of the banking sector and its contagion channels, macroprudential policies may be necessary to absorb the entire effect of such a shock to the real economy – including second round effects.

Table 4.5

Metrics for measuring risks to the banking sector stemming from the real economy

Specific risk factor	Metrics	Possible data sources
Economic openness	Trade openness ((Export+Import) as % of GDP)	Eurostat / ECB
	Concentration of exports/imports of specific sectors and concentration to/from individual countries	Eurostat + national statistics bureau
	Current account balance-to-GDP ratio	
	Indicators of financial soundness of the sovereign - Debt to GDP-ratio - Interest rates on sovereign debt - Government deficit/surplus	Eurostat / ECB
	Foreign currency reserves of the financial system - Reserves of the banks - Reserves of the central bank	
Sectoral risks to the private non-financial sector (PNFS) (breakdown by NACE code), to households and to the public sector	Identification of relevant sectors Size of each sector Total credit extended to each sector Total debt of the sector (debt as % of value added) Share of exposures to each sector	FINREP + Eurostat / ECB
	Identification of bank exposure concentration for each sector Share of exposures to each sector Herfindahl index of exposures to each sector Number of banks exposed to each sector	FINREP + BSI
	Identification of high-risk sectors Average PD (estimated by banks or rating) of borrowing non-financials for each sector NPLs/amount of provisions for claims by sector Insolvency rates for each sector	FINREP + Eurostat / ECB
	Share of credit risk originating from each sector compared to the overall credit portfolio risk of banks Sectoral credit portfolio models	

Source: ESRB (2017).
Notes: The following data sources are referred to in the last column of this table: Eurostat/ECB refers to data based on financial accounts and monetary statistics (non-consolidated balance sheets of the respective entities); BSI refers to publicly available balance sheet items; FINREP refers to financial reporting (consolidated balance sheets of the reporting entities, scope of group consolidation as defined in the IFRS);

It is emphasised that this list is not exhaustive. Other structural risks may also need to be considered within the above-mentioned categories. In addition, qualitative judgement and financial sector evolutions, such as financial innovation and changes in (financial) regulation, should be taken into account when setting the SRB. Annex 4.2 provides empirical evidence on the relevance of the concentration and the size of the financial sector as indicators.

4 Activating/deactivating instruments

This chapter discusses the application of the O-SII buffer and the SRB in the EU. It does not discuss how to operationalise the G-SII buffer, as this is based on Regulation (EU) No 1222/2014[88] and EBA guidance on the identification of G-SIIs[89]. The EBA methodology closely follows the approach of the BCBS for identifying G-SIBs and is accompanied by detailed (binding) implementing and regulatory technical standards on the identification of G-SIIs, the definition of the G-SII sub-categories and allocation of institutions to them, and the respective buffer rates.[90]

4.1 O-SII buffer

4.1.1 General principles

The buffer size should reflect the risk posed by the systemically important institution. This means that, if a financial institution is identified as systemically important, it poses a systemic risk which should be addressed with a buffer. Therefore, setting the O-SII buffer at zero should be avoided. However, a zero buffer might be justified in specific and exceptional circumstances in which the domestic systemic footprint of the bank is already covered by other measures.[91] The final assessment should always be made by the authorities on a case-by-case basis and be properly explained.

The calibration of the buffer should provide an incentive to the bank not to increase its systemic importance. A rise in the systemic importance of a bank should be reflected in a higher buffer rate, although the relationship need not be linear. If large differences in systemic importance exist among banks, the application of a flat buffer rate is not warranted. If a bucketing approach is used to set buffer rates, the last bucket should, ideally, be left empty to give institutions in the highest occupied bucket an incentive not to increase their systemic importance. However, at present, owing to the existence of O-SII caps, this option might not be available in every Member State.

The calibration of buffer levels should only depend on aspects directly related to the systemic importance of the O-SII. A clear-cut scope of application for the O-SII buffer helps to avoid overlaps between instruments, increases the effectiveness of the instrument and makes evaluation of the measure possible. In order to effectively address the risk of misaligned incentives, no other (e.g. microprudential) aspects should be considered. In particular, the time dimension of systemic risk should

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88 Commission Delegated Regulation (EU) No 1222/2014 of 8 October 2014 supplementing Directive 2013/36/EU of the European Parliament and of the Council with regard to regulatory technical standards for the specification of the methodology for the identification of global systemically important institutions and for the definition of subcategories of global systemically important institutions (OJ L 330, 15.11.2014, p. 27).

89 Revised guidelines on the further specification of the indicators of global systemic importance and their disclosure (EBA/GL/2016/01), available on the EBA's website at **https://www.eba.europa.eu/regulation-and-policy/own-funds/guidelines-for-the-identification-of-global-systemically-important-institutions-g-siis-**

90 The regulatory and implementing technical standards are available on the EBA's website at **https://www.eba.europa.eu/regulation-and-policy/own-funds/global-systemically-important-institutions-g-sii-**

91 E.g. bank subsidiaries with globally integrated business models that are themselves parts of wider international banking groups for which the systemic risks are already properly mitigated through the G-SII buffer and whose domestic activities do not pose significant systemic risk at a non-global level. Other cases may include banks that are being wound down, banks with large non-bank subsidiaries, and cases where there are other risk-mitigating policies.

not be taken into account, meaning that the buffer rate should not be dependent on the financial cycle, as other macroprudential instruments are available in the CRD IV to deal with cyclical risk.

The G-SII buffer rate applied to an institution should not act as an upper bound on the potential O-SII buffer that could be applied to that institution. The O-SII framework is best understood as providing a complementary perspective to the G-SII regime by focusing on the impact that the distress or failure of banks (including international banks) would have on the domestic economy. As institutions may be more significant to their domestic economy than to the global economy, the O-SII buffer rate applied to such an institution may be higher than its G-SII buffer rate.

Whenever the calibration method requires the choice of a reference institution, the use of an external reference point[92] is advised. Such an approach can help to ensure that not only relative changes in the benchmark, but also a general increase in the systemic importance scores of all O-SIIs in a country are reflected in higher capital buffer levels.

The calibration of the O-SII buffers gains in robustness (insofar as possible) if several approaches are used simultaneously. A number of different calibration methods can be used to set the buffer size. Each method has its strengths and weaknesses, each relies heavily on different assumptions, and no methodology is theoretically superior to others. The choice of approach depends, inter alia, on economic reasoning, the specific features of the banking sectors in each EU Member State (e.g. number of O-SIIs, level of concentration), and data availability (e.g. loss history). Different methods might lead to (slightly) different results. Cross-checking with several methods can therefore guide the decision about the final calibration of buffer levels. Furthermore, to improve transparency and understanding, the process leading to the decision should be made public (e.g. via disclosure measures).

A more detailed disclosure of calibration methods would be helpful, since the calibration of the O-SII buffer requires the designated authority to make a significant number of discretionary choices. Public communication would benefit from a full description of the methodology used, including the justification for the choice of method (if possible, with an explanation of why other methods were not chosen). How much should be disclosed depends on the method chosen to calibrate the O-SII buffer.

The greater scope for national discretion that exists in setting the O-SII buffer (compared to, for example, the G-SII buffer) should be maintained in order to accommodate the different structural characteristics of individual countries. The calibration of the buffer can vary according to the specificities of each Member State's economy and banking sector. For instance, small open economies in which the banking sector is highly concentrated with a few large banking institutions may require higher buffer rates than other countries. Therefore, a balance ought to be found between a sufficient level of harmonisation and the ability to effectively target domestic risks.

The assessment of the effectiveness of the O-SII buffer should be related to the main economic objectives of introducing such a policy instrument. Ideally, authorities should be able to document (quantitatively as well as qualitatively) both the impact of the buffer on the

[92] An "external reference point" is a hypothetical institution with a systemic importance score equal to the threshold for the identification of O-SIIs. An alternative to this would be to use the actual score of a selected bank (e.g. a bank with the lowest systemic importance). This does not mean, however, that a national authority is obliged to base its calibration on the practice of another national authority, e.g. by using a bank in another Member State as a reference point.

probability of distress and funding advantages and related increased risk-taking incentives under the implicit state guarantee. The evaluation should encompass both of these objectives, while their relative importance should be decided on a case-by-case basis, as the costs stemming from the distress of an institution and the costs induced by funding cost advantages, excessive risk-taking and distorted market competition are expected to vary from institution to institution. The long-term impact on the economy should also be investigated whenever possible, including the potential circumvention of the buffer. Moreover, international spillover effects and regulatory practices should also be assessed through, for example, international peer comparisons and following Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures. Nonetheless, it is recognised that valid quantification of the potential impact on these accounts may be limited to a significant extent by the insufficient empirical experience accumulated so far and the continuous evolution of financial and regulatory conditions. It is also worth noting that evidence of the O-SII buffer's effectiveness manifests itself only in periods of distress, which, however, are rare.

4.1.2 Calibration

In line with the mandate received under Article 131(3) of the CRD IV, the EBA guidelines described in Section 3.2 offer precise instructions regarding the identification of systemically important banks. However, neither the CRD IV nor the EBA guidelines offer guidance on the calibration of O-SII buffers (how to set the buffer rates). Based on the experience gained so far, two general types of approach to calibrating the O-SII buffer can be identified – with and without direct mapping between buffer levels and systemic importance scores.

(A) Methods with direct mapping between buffer levels and systemic importance scores

(A.1) The proportional approach

In the fully proportional calibration, the O-SII buffer levels are set by defining a linear function of the systemic importance score of each O-SII, while in the adjusted proportional calibration, O-SII buffers are adjusted to (higher) round figures by supervisory judgment. Thus, the two main parameters of the methodology are the slope of the linear function linking the O-SII buffer levels to O-SII scores and the intercept (point of intersection with the axis). Their setting depends on, among other things, the choice of reference institution. The BCBS (2013a) defines this as "(…) a bank whose failure does not pose negative externalities on the system that the supervisor cannot accept". A range of options is possible in this area – it could be, for example, the O-SII with the lowest or highest systemic importance score, but such a choice would directly link the buffers of the other O-SIIs to the score of the chosen reference bank, and hence would deliver relative differences in systemic importance, rather than exhibiting the importance of the individual bank only. Thus, an "external reference point", such as the threshold for the identification of O-SIIs (e.g. 350 basis points for countries using the EBA methodology) should be preferred.

While the proportional methodology is easy to understand and communicate, it has some disadvantages. First, in the case of the fully proportional method, it implies setting continuous buffer levels which are difficult to apply in practice. Second, particulary in the fully proportional case, the buffer rate changes in response to all, even small, changes in the systemic importance score of an O-SII, even though the systemic importance of the bank de facto remains the same. This introduces undesirable volatility and uncertainty in setting the buffer rates, and also makes communication of the buffer framework to the public more challenging (although, the variability can be reduced marginally through supervisory judgment or by the application of a rounding convention). Third, from an economic perspective, it remains unsettled whether the relationship between the capital surcharge and the systemic importance score should be linear or allow some degree of convexity. Fourth, full proportionality may require the authorities to be able to assign buffer levels without limit (i.e. without being constrained by any cap) in order to ensure that the linear mapping between the systemic importance score and the buffer rates is preserved at both ends (low and high scores). Otherwise, the mapping might be non-linear (if, for example, the linear function provides a buffer level higher than the O-SII cap), leaving room for discretionary decisions.

(A.2) The bucketing approach

This approach groups O-SIIs into different groups or "buckets" which are characterised by a similar level of systemic importance. This method is the most commonly used approach in practice as it is intuitive, easy to apply and communicate, and at the same time overcomes some of the problems of full proportionality, e.g. it avoids continuous buffer levels and is therefore more stable over time. However, the number of buckets, their size and corresponding buffer rates often need to be set in a discretionary way by the national authorities.

The appropriate number and size of the buckets can be set in various ways. A simple approach is to design buckets that are equally-sized in terms of systemic importance scores (similar to the G-SIIs approach), but where the size of the bucket is discretionary. Alternatively, a cluster analysis can be used – a statistical technique which groups the institutions in such a way that banks in one group (cluster) are more similar to each other in terms of their systemic importance than those in other clusters.[93] However, cluster analysis also has certain disadvantages.[94]

An adequate number and/or size of buckets in a particular country can also be derived by supervisory judgment. As the motivation for O-SII buffers is to reduce negative externalities and as such externalities increase with rising systemic importance of institutions, assigned capital buffers should rise with the systemic importance of an O-SII. From this it also follows that O-SIIs with widely differing scores need to be allocated to different buckets. The bucket thresholds can be calibrated from the total systemic importance score or from the category scores to link the buffer to

[93] To enhance the robustness of the results, a combination of clustering approaches could be used (as in, e.g., the ECB floor methodology).

[94] First, as clustering is a purely statistical approach without any theoretical or economic basis, there may be concerns about the reliability and economic meaningfulness of the results. Second, the results may crucially depend on the specific clustering methodology chosen (methodological instability), and, as the clustering process is statistical, the meaningfulness of the groupings cannot be assured. Third, cluster analysis requires a sufficiently large group of banks to be available for the analysis and is therefore less feasible (or not feasible at all) for countries that have only a small number of O-SIIs. Fourth, the consistency of the clustering based on a single variable may depend on the underlying sample scores and may not be robust (Alessandri et al., 2015). Fifth, banks with scores close to the selected threshold may fall inside or outside it just because of marginal changes in their scores but not in their ranking positions.

the specific aspects of the bank's systemic relevance. To provide stability over time, the number of buckets should not be too high in order to avoid banks switching between buckets frequently. Stability can also be enhanced if the bucket thresholds are calculated by using average O-SII scores over several years (e.g. three-year averages) instead of only the current year (although this could mean that recent increases in systemic importance are not adequatly reflected in the O-SII buffer) or by using a rounding convention.

Finally, the decision on assigning a buffer rate to each bucket has to be made. Again, no precise rules are available here, so the decision has to be made on the basis of expert judgment, taking into account existing restrictions related to the size of the buffer.

(B) Methods without direct mapping between buffer levels and systemic importance scores (or without use of systemic importance scores)

(B.1) The equal expected impact method

The main idea behind the equal expected impact (EEI) approach is that the expected impact on the economy of the failure of a systemically important institution and a non-systemically important institution should be the same. The expected systemic impact concept is similar to the expected loss concept, but is applied on a wider macro-financial scale where the probability of distress plays a similar role to the probability of default (PD) and the measurement of individual systemic importance has a similar function to loss given default (LGD) estimates. The O-SII buffer lowers the systemic impact by reducing the PD of an O-SII. Thus, if the systemic impact of the failure of an O-SII is X times greater than that of the failure of a non-SII, the capital ratio of an O-SII needs to be increased to make it X times less likely to fail than the non-SII. The "equal expected impact" principle can be written in the form of the following equation:

$$P(OSII)C(OSII) = P(NonOSII^R)C(NonOSII^R) \quad (1)$$

where $P(OSII)$ and $P(NonOSII^R)$ are the probability of failure or near-failure of an O-SII and a reference (R) non-SII, respectively; and $C(OSII)$ and $C(NonOSII^R)$ are the economic/social costs underlying a situation of distress of an O-SII and a non-SII, respectively.

The estimation of the O-SII buffer using the EEI approach consists of the following steps:

1. **Determine the relative economic impact of an O-SII in distress compared with that of a (reference) non-SII in distress.** This is done in two steps. First, a reference bank is chosen. The most natural reference point for countries using scoring methodology to identify SIIs (e.g. EBA guidelines) is the systemic importance threshold (see also the discussion related to the proportional calibration approach, A1). Other approaches are also possible, such as the actual score of an institution falling just under the SII qualification threshold, or the use of a "virtual" institution. Second, the relative economic impact is calculated. As the future cost of crises is not known to authorities, it has to be proxied by looking at historical failures. However, the availability of empirical research related to the distress of individual banks or O-SIIs is very

limited. Thus, the systemic loss given default of an O-SII is usually approximated with the systemic importance.

2. **Determine the probability of distress of a (reference) non-SII.** In this method, the estimation of the PD is the element that has the greatest impact on the final results. The most popular approach is to use a historical distribution of the return on RWA (RORWA) defined as the ratio of net income to RWA. Among the main advantages of this approach are: i) relatively good availability of data (including for non-publicly traded institutions), and ii) the clear relationship between the losses represented by RORWA and capital levels. Nonetheless, there are also certain drawbacks. First, a limited number of extreme loss episodes may result in seriously biased estimates and the results are highly dependent on the time span and institutional coverage of the sample. Ideally the estimates of the buffer should be based on the sample of banks that are similar in their business models and for which long and consistent RORWA time-series are available (see Annex 4.3 for more details). Second, historical loss analyses are sensitive to a number of uncertainties, including the interpretation of historical loss data given the extent of regulatory reform since the crisis, survivorship biases in historical data, the point of non-viability for institutions in the future and the impact of past public-sector interventions.

3. **Determine the required probability of distress of an O-SII,** based on the information obtained in steps 1 and 2 and the EEI principle.

4. **Determine the amount of additional capital needed by the O-SII to reduce its probability of distress to the required level, based on the information obtained in step 3.** The higher the economic impact of the O-SII in distress (as determined in step 1), the larger the O-SII buffer the O-SII needs to hold.

The main advantage of the EEI method is that, unlike the methods described previously, it is linked to the economic rationale of the O-SII buffer. It also relaxes the assumption of a linear relationship between systemic importance and the buffer. However, it assumes that policy-makers are risk-neutral (because it is based on the premise that reducing the expected impact of the O-SIIs is consistent with the objective of reducing negative externalities), but if the regulators are risk-averse, the expected impact approach would underestimate the higher loss absorbency required. Second, the buffer rates suggested by the EEI may not be related to the O-SII scores of the institutions as an increasing function (see, for instance, the results of the Irish calibration using EEI).[95]

(B.2) Funding advantages of systemically important banks

Since “too-big-to-fail” institutions benefit from implicit government guarantees, which might be associated with substantial funding cost advantages,[96] the O-SII buffer could be calculated with the aim of reducing them. However, robust estimations of such advantages are very hard to obtain (for a review of the literature on the existence and extent of funding cost differentials between banks,

[95] See the completed notification template for Ireland, available at **https://www.esrb.europa.eu/pub/pdf/other/20161012_notification_bank_ireland.en.pdf**

[96] Above 100 basis points relative to payable interest during the financial crisis, according to some estimates (see IMF, 2014; or Schich and Aydin, 2014).

see, for example, Kroszner, 2016). Important empirical approaches to estimating the funding advantages (e.g. bond spread differential and ratings-based approach, contingent claims analysis approach, and difference-in-differences approach) are highly dependent on market data (e.g. bank bonds and CDSs) and/or credit ratings.[97] For this reason, the BCBS recommends the use of funding advantages only as a cross-check for other methods. While no EU country has applied such an approach, even as a cross-check, it was used in Australia as one of the methods to calibrate the level of higher loss absorbency requirement for domestic systematically important banks (see APRA (2013)).

(B.3) Network analysis

This approach can be used to analyse the implications of financial linkages of systemically important banks for the emergence of systemic risks. One example is the analysis of the banking system loss (BSL), a model-based analysis of potential system losses caused by the default of a single bank which can be used to determine the amount by which the regulatory Tier 1 capital of the banking system is reduced as a result of the default of an O-SII and its contagion effects within the banking network. This deduction may be interpreted as the contribution to risk costs resulting from the interconnectedness between banks. As well as the first-round effect (write-downs on defaulted exposures), knock-on effects resulting from contagion effects in the interbank market are also taken into account (see Fink et al. (2016)). Analysis of the relative contribution of the failure of an O-SII to the systemic credit risk (e.g. the risk of high failures of correlated credit portfolios of banks) which considers the creditworthiness of borrowers and correlations between them can also inform the supervisory decision about the calibration of capital buffers.

Some authorities set the O-SII buffer rate by also taking into account a **peer review** of buffer rates set by other authorities for similar institutions in similar Member States. This approach can lead to a higher degree of harmonisation, enhance the level playing field and help avoid competitive disadvantages across O-SIIs in the EU. However, it is not a feasible option in countries where peers are not clearly identifiable. Moreover, peer comparison requires relevant authorities to use other approaches first in order to be able to compare buffer levels. Thus, the benefit of this method comes when it is used in addition to other methods.

4.1.3 Ex ante evaluation

An assessment of the likely effectiveness and proportionality of the O-SII buffer implementation is required by Article 131(7) of the CRD IV and recommended in prudential principles of international and European fora. Article 131(7) primarily refers to an ex ante evaluation which is carried out in order to underpin any eventual (re-)setting of the O-SII buffer. Nonetheless the ex post evaluation of past experiences could be utilised for the ex ante investigation, provided that additional forward-looking considerations are supplemented for the ex ante evaluation (see Section 4.1.4 for the ex post evaluation). Moreover Recommendation D of ESRB/2013/1 asks for a periodical review of the effectiveness and efficiency of the implemented macroprudential instruments. Further

[97] For example, Ueda and Weder di Mauro (2012) estimated the value of the structural subsidy by using expectations of government support embedded in Fitch credit ratings as the difference between the overall rating and the unsupported rating.

implementation criteria, such as the avoidance of regulatory arbitrage and the principle of proportionality, are to be applied as well. Accordingly, relevant authorities should have a clear understanding of these concepts.

The assessment of the effectiveness could be interpreted as the evaluation of the past benefits to the financial system and the economy balanced by the negative effects arising from its implementation, compared to alternative instruments. Proportionality requires that regulatory measures impose obligations on individual institutions in proportion to their contribution to systemic risk. Such an analysis should be based on past empirical experience with comparable regulatory measures, although further expected benefits or unfavourable consequences not yet realised prior to the ex post evaluation should also be considered. Effectiveness and proportionality are discussed as interrelated subjects in multiple impact assessments, as different approaches show. Indeed, efficiency and proportionality enhance and intensify each other's effects.

Ex ante evaluation of the O-SII buffer is aimed at gauging the costs and benefits of the additional capital requirement and informs its calibration. Generally, two types of approach are recommended. As practical experience is still limited, econometric modelling can be employed as is done in the examination of potential impacts of other regulatory measures aimed at individual banks with similar effects, such as Pillar 2 capital requirements. Another approach is to use models to examine whether the shock-absorbing capacity in certain scenarios will be increased sufficiently by the measure.

On the benefit side, the application of the O-SII buffer could be evaluated from the perspective of at least two related market failures. First, the O-SII buffer is intended to reduce the probability of the realisation of the systemic impact, i.e. the loss externalities caused by a failure or serious distress of an O-SII. Second, the pricing of an implicit state subsidy into the funding costs of O-SIIs distorts competition and burdens the state budget, as bailing out systemically important institutions usually results in a bill for taxpayers.

Approaches to corroborating the cost of the failure and the impact of the distress of an O-SII could rely on additional indicators. The supplemental indicators specifically displaying the level of systemic risk in a given country could be based on individual or sectoral exposures relative to GDP, sectoral concentration or other types of aggregated measurement (e.g. aggregate share in domestic private deposits and loans or in payment transactions or OTC derivatives). The analysis could distinguish between institutions with similar systemic importance measurements but distinct sources of systemic importance and different corresponding external costs of imposing the O-SII buffer on them.[98]

Several studies confirm that too-big-to-fail institutions benefit from implicit government guarantees. The International Monetary Fund (IMF, 2014) discusses several approaches to estimating implicit funding subsidies,[99] but whether and how much the introduction of the O-SII capital buffer or credible resolution regimes has reduced implicit government guarantees by virtue of the size and importance of such institutions is an ongoing subject of discussion, impeded, on one hand, by the

[98] For example, institutions with a domestic focus could be distinguished from those with a more international focus (see, for example, the approach taken by the Central Bank of Ireland in relation to Allied Irish Bank, available at **https://www.esrb.europa.eu/pub/pdf/other/20151109_Notification_IE_O_SII.pdf**).

[99] See also Siegert and Willison (2015).

limited regulatory experience accumulated so far and, on the other hand, by the limited access to market price and rating data for various national authorities.

The ex ante assessment of the cost side of introducing the O-SII buffer often starts by examining whether the buffer will only lock down own funds already accumulated. First, the assumption that tying down voluntary capital would not lead to significant balance sheet adjustments should be carefully examined from a forward-looking perspective. Second, the assumption that there are no relevant long-run costs of the buffer requirement, i.e. the own funds which are not tied down by the buffer are structural in the sense that they would not impose a binding constraint with the uplift of the lending cycle, should be justified insofar as possible.

An important aspect in the analysis of the cost effects of O-SII buffers are the economic consequences of phasing in the buffer. A forward-looking analysis of the adjustment strategies during the transitional period may be warranted. This could take account of changing access to capital markets, other changes in capital requirements in the near future, the expected trajectory of economic performance and potential balance sheet adjustments (e.g. deleveraging, changes in leverage, in the voluntary buffer or in the market segments affected most by these adjustment needs).

4.1.4 Ex post evaluation

The robustness of the O-SII buffer calibration can be investigated with respect to the validity of ex ante measurements of systemic importance by, for example, looking at how measurements of market perception of systemic impact have changed between two identification exercises.[100] The assessment of effectiveness should discuss how the O-SII buffer performed in reducing the probability of distress to an acceptable level; especially if the calibration did not take into account the buffer impact on the probability of distress. This may also be based on how market participants gauge the probability of bank failure, if market data are available.

For the assessment of the cost side of introducing the O-SII buffer, various methods could be applied as empirical experience with the requirements accumulates. When banks across the board are affected by the requirements, an event study might be applicable. Such studies proved successful in analysing market reaction to the introduction of the G-SII buffer.[101] Unintended effects should be examined to the fullest extent possible. As experience accumulates, short and long-term consequences of adjustment through deleveraging could be estimated. The stability and predictability of buffer calibration methods could be assessed. For example: how much stability did a specific bucketing system provide; did its design give any indication of a cliff effect on bucket thresholds or disincentivisation of excess growth in systemic importance; and how could it effect market competition in general? Evidence of leakages to unregulated entities which could distort the measurement of systemic importance or the application of the SII buffers should be assessed. For a discussion of unintended cross-border effects, see Chapter 11 of this Handbook.

[100] Conditional value at risk (CoVaR), conditional expected shortfall (CoES) or other market data based indicators could be used for this purpose.

[101] See Moenninghoff, Ongena and Wieandt (2015), and Bongini, Nieri and Pelagatti (2015).

Analyses of the effect of the introduction of O-SII capital buffers on the development of implicit funding cost subsidies could be useful to characterise changes of the second type of market failure, if it is feasible to estimate them with acceptable precision.

Calibration may provide justification for the effectiveness of the O-SII buffer in reducing the probability of distress (e.g. if the EEI approach is used). Similarly, analysis of the proportionality of implemented O-SII buffers can rely to a great extent on the assessment of calibration methods. In many cases, the consistent application of the calibration methods reviewed provides buffer rates that are proportional to the systemic importance and consequently to the systemic impact of the individual institution. Therefore, the proportional calibration method, the bucketing approach, and the EEI approach could be used to support the proportionality of the determined buffer rates.

Quantitative analyses in some Member States suggest that the activation of structural buffers has rather limited effects on the cross-border loan and capital markets and hence the real economy (for more details regarding the short and long-term effects of higher capital requirements, see footnotes 105 and 106).

4.2 SRB

4.2.1 Process of activation

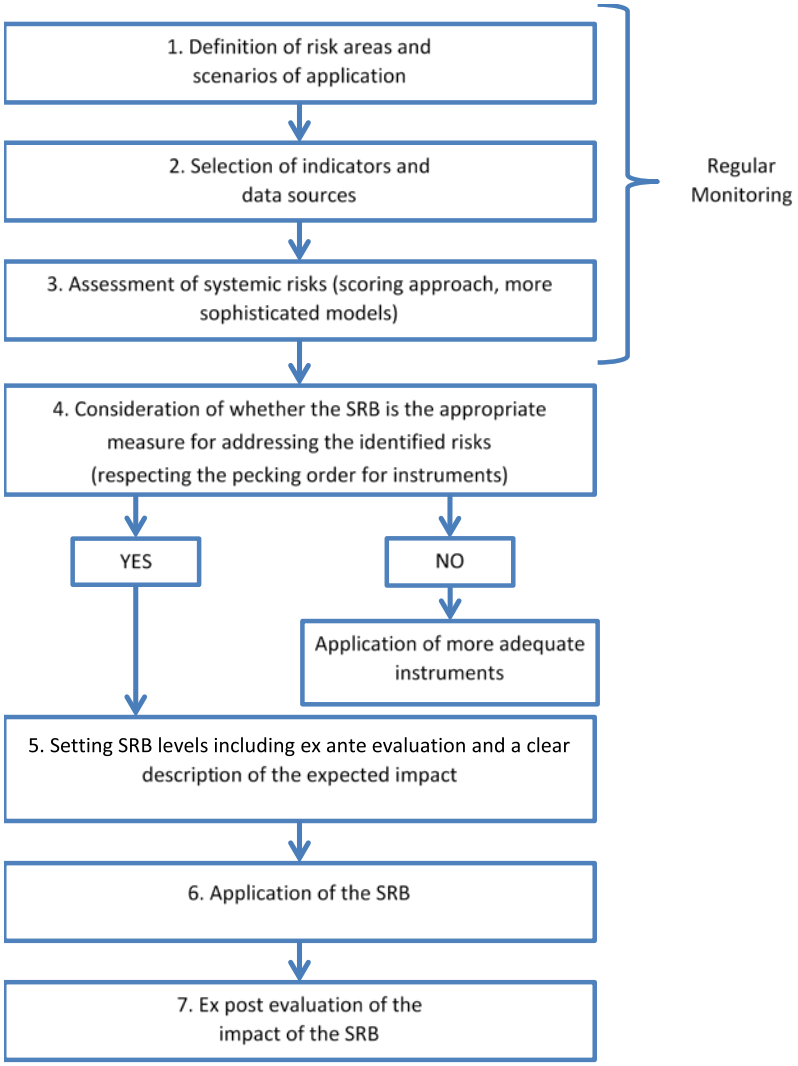
The path to activation of the SRB is not as clear cut as for the O-SII buffer. The following structured process (Chart 4.1) proposes a guideline for the activation of the SRB. The process should consist of several stages, starting with the definition of the risks potentially addressable by the SRB (Step 1); the selection of indicators for the regular monitoring of risks (Step 2); and the assessment of the identified risk areas (Step 3).

These three steps would constitute the regular monitoring of risks. Suggestions for possible systemic risk categories, as well as indicators for their identification, can be taken from Section 3.3 of this chapter. Once the build-up of a risk has been identified, the authority should consider whether an instrument that should be applied before the SRB can be activated (Step 4). Legally, all other micro- and macroprudential instruments, excluding Articles 458 and 459 of the CRR, need to be considered first before applying the SRB. Conceptually, non-capital-based measures may be more effective in mitigating a specific risk than capital-based instruments. If no other instrument is deemed adequate to mitigate the identified risk, and the SRB is considered to be the most appropriate instrument, then the calibration of the SRB rate including the ex ante evaluation of the impact would follow (Step 5) (see Sections 4.2.3 and 4.2.4 for suggestions on possible calibration and ex ante evaluation methods).

The calibration of the buffer should take into account the risk assessment from Step 3. Step 6 consists of the application of the instrument, which should include, in particular, adequate communication with relevant stakeholders, i.e. the institutions concerned, the EU level bodies and the NCAs/NDAs of other Member States which might be required to reciprocate the measure. Finally, in Step 7 an ex post evaluation of the impact of the buffer should be conducted against the objectives the authority wanted to achieve prior to activation (see Section 4.2.5).

Chart 4.1

Process for the activation of the SRB



Source: Deutsche Bundesbank, adapted by ESRB.

4.2.2 Combining and interpreting indicators

As explained in Section 3, there is scope to apply an SRB when risk indicators signal:

- a high probability of (large) shocks;
- significant amplification channels;
- a high degree of importance of the financial sector to the real economy.

First, the SRB should be introduced on the basis of potentially large conditional losses, rather than the probability of a large shock, which is more difficult to assess. However, it is generally appropriate to take the probability of a shock into account so that the SRB is only applied when risk is material, in terms of both probability and magnitude. That said, sources of shocks and their size are difficult to predict. One could argue that the presence of significant amplification channels

(common exposures, interconnectedness, etc.) and/or a large importance of the financial sector to the real economy are sufficient conditions for using the SRB. If so, an SRB should be applied where *conditional* losses to the financial sector and/or the real economy are large, regardless of the size of *expected* losses (which depend on the probability of a shock). The choice of approach depends essentially on the authority's risk aversion.

Second, the SRB can be used where there are large amplification channels. Indicators capturing such amplification channels should be measured over the cycle to prevent pro-cyclicality. For instance, setting an SRB during a downturn might worsen the economic situation.

Third, the SRB should be applied when distress in the financial sector could have serious negative consequences to (the financial system and) the real economy in a specific Member State. It follows that the SRB should not be applied when such consequences are likely to be absent or limited. A large impact on the real economy could be considered to be a sufficient condition for applying the SRB, regardless of the risks in the financial sector (i.e. regardless of the presence of structural risk factors and/or amplification channels).

Indicative thresholds combined with expert judgement could provide a balanced approach to the activation of the SRB. Thresholds could be derived for several metrics in order to provide guidance on activation or deactivation. There are substantial differences between Member States in their choices of metrics and their indicative thresholds. These quantitative measures need to be informed and supplemented by expert judgement, both to avoid indicative thresholds limiting the flexibility of the SRB and to take due account of country idiosyncrasies. In principle, early warning systems (EWSs) could also be developed to guide the application of the SRB. But the benefits of their use for the identification of systemic crises driven by structural (as opposed to cyclical) risks are not completely clear. In addition, taking into account national specificities in the development of an EWS would be especially challenging.[102]

4.2.3 Calibration

Determining the appropriate size of an SRB buffer can be achieved through a wide range of quantitative tools and instruments. The relevance of the different approaches may vary depending on the specific risks that the policy-maker is aiming to address. While certain approaches are best suited to address certain categories of risk (see Chart 4.2), in some cases, a hybrid approach, combining multiple methodologies, could provide the best guidance for calibrating an SRB. The following sections try to map the various analytical approaches to different financial risks. As emphasised in the previous sub-section, the use of one or more analytical tools and the use of qualitative input and expert judgement should be seen as complementary.

For instance, when dealing with **risks stemming from exposure concentration or asset commonality**, calibration could rely on estimating potential conditional losses based on several adverse scenarios (e.g. shocks to the PDs of various asset classes) with different probabilities of materialisation. In this case, stress tests could be used to identify macroprudential capital shortfalls

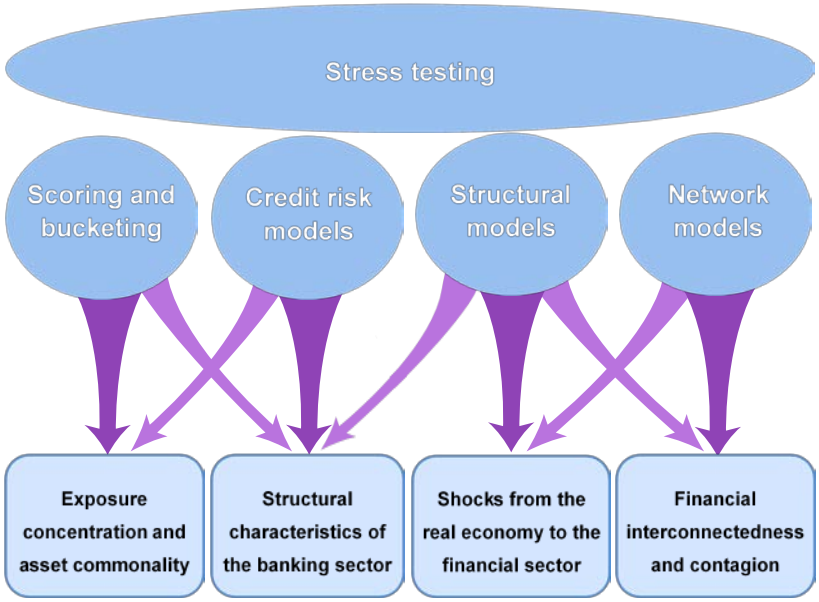
[102] Early warning approaches consist of defining critical thresholds for certain indicators that may signal approaching systemic crises. Because systemic crises are rare events, in order to have sufficient crisis observations, EWS critical thresholds are defined on the basis of a panel of countries. This leads to thresholds that are the same for all the countries in the panel.

based on standard credit risk modelling theory, thus providing guidance on setting a buffer level that would be appropriate to mitigate the estimated losses. The model could rely on the PD, LGD and exposure at default (EAD) estimates for each asset class. It would deliver loss estimates at individual bank level which could then be used to determine the appropriate level of the SRB.

When taking into account **financial interconnectedness and contagion**, models capable of capturing complex and dynamic relationships through network analysis can be used to identify the level of capital needed to prevent possible contagion effects. Indeed, the network models used should account for the transmission channels deemed to be most relevant for the domestic banking sector – be they interbank equity or debt exposures or, for example, asset fire sales for a particular asset class.

Chart 4.2

A mapping of quantitative calibration methods to structural risks



Source: ESRB Report on the use of structural macroprudential instruments in the EU.

If the policy-maker is concerned with risks stemming from the **structural characteristics of the banking sector and the potential negative impact on the real economy**, calibration should rely on a macro stress test framework featuring feedback loops between banks' balance sheets and macro-financial variables. One way to account for the "real-financial loop" is to complement stress test results with a counterfactual analysis of additional capital requirements based on a macro-financial model. The main advantage of this approach resides in its capacity to account both for certain structural vulnerabilities of the financial sector or the real economy and for their interactions, amplification channels and the aggregate impact of certain shocks. Moreover, simulating various scenarios could help uncover different risk sources which might otherwise be overlooked in a less rigorous modelling framework and, consequently, not be addressed adequately through the use of other macroprudential measures.

Assessing the **impact of shocks stemming from the real economy on the financial sector** requires a robust structural framework with strong theoretical foundations, along the lines of dynamic stochastic general equilibrium (DSGE) models which include explicit optimisation mechanisms. In fact, DSGE models can be used for two purposes: they can be used to design macro scenarios (e.g. an economic downturn) based on shocks that have a clear economic interpretation;[103] or they can be used to complement a stress test exercise through counterfactual analysis. Compared to top-down stress tests, they have the capacity to measure the dynamic effect of a change in macroprudential buffers on the real economy without having to rely on other external or satellite macro models. The disadvantage is that they only allow an assessment of the effects of an adverse shock on the entire banking sector and, therefore, cannot be used to evaluate the relative impact of a shock on individual (heterogeneous) banks.

Finally, **expert judgment** is a valuable complement to all analytical calibration tools. This is a direct consequence of the complex nature of systemic risk identification and measurement. The latter, for example, may need to be revised if new factors emerge (such as a new legal provision) which may lead to a change in the level of risk identified, and hence in the macroprudential policy decision. Expert judgement plays a crucial role in particular in the design of stress scenarios and in the definition of the macroprudential authority's objective function, be it a social welfare function, as in a DSGE model, or ad hoc, as in a stress test exercise. This line of reasoning also holds for less developed financial systems or in cases where data availability is low. Consequently, the importance of qualitative aspects, which cannot be precisely quantified or evaluated, but have the potential to have a significant impact on the macro-financial framework, should not be disregarded when determining the appropriate level of the SRB.

In addition to the quantitative instruments and tools available, macroprudential authorities may also refer to experience with historical financial crises. The losses during the recent crisis can be related to the indicators underlying the SRB decision. In a *crisis probability framework*, these indicators can be used to predict the probability of a financial crisis and then capital requirements should be increased to bring this probability down to the desired level.[104] Ultimately, it is important that macroprudential authorities assess the robustness of their results and also make use of expert judgement when setting the SRB rate.

4.2.4 Ex ante evaluation

A decision to implement an SRB should be always accompanied by an ex ante evaluation describing the policy-maker's reasoning for imposing the measure and the expected impact on the financial sector and real economy. After the measure has been imposed, an ex post evaluation should be conducted to gauge the realised impact of the measure and how this compares with the main objectives set by the authority as well as its ex ante evaluation. Both of these evaluation processes are closely linked to the assessments and decision-making processes that occur during

[103] Alternatively, scenarios can be built using vector autoregressive (VAR) time-series models. Compared to a DSGE model, a VAR model has the advantage of easily allowing the inclusion of additional key macro-financial variables (such as commodity prices, exchange rates or the slope of the term structure of interest rates). On the other hand, VAR models do not allow straitforward economic interpretation, as their identification is not based on an explicit economic theory (i.e. a rigorously defined transmission mechanism).

[104] Lo Duca and Peltonen (2011).

the calibration stage, which are discussed in Section 4.2.3. In practice, many policy-makers will have a sense of the goals of the measure in mind when calibration is being performed, so these two stages should not be thought of as separate, but rather as complementary.

Measuring the potential costs and benefits of introducing an SRB is closely related to the instrument's ability to limit the occurrence of future financial crises. In this context, it is important to measure both the short-term or transition costs related to higher capital requirements (see, for example, the reports of the FSB/BCBS *Macroeconomic Assessment Group*[105]) and the long-term gains prompted by the absence of systemic events (see, for example, the report of the BCBS's *Long-term Economic Impact (LEI) working group*[106]).

The main channel through which the SRB is expected to contribute to strengthening financial stability is by increasing the resilience of financial institutions on the long term, which will, in turn, reduce the likelihood of financial distress. In general, this holds true regardless of the specific type of capital buffer applied on top of the legal minimum capital requirements.[107] The increased funding costs for banks in the short term may lead institutions to opt for deleveraging, rather than increasing capital, thereby reducing output in the long term. At the same time, deleveraging might also occur in sectors where competition is higher and where substitutability may drive a reduction in lending by some banks, offset by increased lending by others.

Finally, consolidating market sentiment through the expectations channel can play an important role in the effectiveness of the SRB. Measuring the trade-off between a lower incidence of bank defaults and the short-term costs of raising equity could provide the basis for ex ante evaluation of SRB implementation.

4.2.5 Ex post evaluation

The primary objective of the ex post evaluation is to compare the realised impact of an SRB implementation with the objectives defined in the calibration process and the ex ante evaluation results. This analysis complements the ex ante evaluation by taking into account the observed behaviour of financial institutions.

Considering that (i) the SRB can be applied to capture a wide range of long-term non-cyclical risks, and (ii) the degree of heterogeneity in the various vulnerabilities and risks it addresses in countries in which it is implemented, its ex post evaluation can be challenging. This is compounded by the

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105 In the interim report (MAG, 2010a), the combined results of 89 models estimate that a one percentage point increase in capital leads to negative and transitory deviations of GDP from its baseline of 0.1 to 0.26% and may generate an increase of 15-17 basis points in lending spreads. The findings of the final report (MAG, 2010b), which focuses explicitly on the transitional costs of stronger capital requirements, are similar.

106 See BCBS (2010). The study targeted net benefits, measured in terms of the long-run change in annual GDP from its pre-reform path, with the trend growth rate unchanged. Departing from the assumption that banks have completed the transitions to new levels of capital and liquidity, the report's message for a broad range of capital ratios (8% to 16%) is that the net benefits of increased requirements remain positive, the expected positive gain being associated with a reduction in the frequency and severity of banking crises. Furthermore, the conclusions underline that the level of Tier 1 capital for which the net benefits are highest is between 14% and 15% of RWA (this has since been revised upwards to between 15% and 17%), assuming that crises have a moderate permanent effect.

107 In view of the difficulty of disentangling the effects of structural and cyclical buffers, most of the studies aimed at evaluating ex post effects of changes in capital requirements have focused on the benefits of raising additional capital independently of the specific buffer used.

fact that a proper evaluation can only take place when sufficient time has passed since activation, and also in circumstances where the macroprudential authorities have released the buffer, having assessed that the risks it was designed to capture have been mitigated or substantially reduced in intensity. Taking into account its flexible nature, the ex post assessment can be customised to address the main objective of the structural measure: from monitoring excessive concentration, through an ex post analysis of key indicators, to measuring the welfare costs of higher capital requirements and their ability to limit the occurrence of systemic events, in a structural framework.

At present, experience of ex post evaluation of SRBs is practically non-existent, owing to the fact that countries have only recently started implementing such measures and, consequently, there is limited empirical data on which to build a thorough quantitative assessment. Moreover, even if sufficient data existed, the methodology for evaluating the effectiveness would be analogous to that proposed for the ex ante evaluation, considering that measuring the long-term benefits of higher capital requirements in mitigating systemic crises is not straightforward.

Therefore, at present, ex post evaluation of SRBs can only be performed mainly on the basis of modelling frameworks that incorporate ex ante expectations of its effectiveness in mitigating the identified risks or on the basis of macro-stress tests based on updated information which may include limited effects of a recent SRB implementation. In this respect, looking at empirical data on market reactions after capital increases could provide some evidence on the role of expectations in consolidating the resilience of the banking sector.

4.3 Accumulation of instruments, including reciprocity

Different capital-based instruments should not be used to cover the same risk. For instance, if a bank is required to hold more capital against risk A through higher risk weights, it should not be required to hold extra capital against the same risk A through the SRB as well, unless risk A (or elements of risk A) are not fully addressed by the increased risk weights. Similarly, capital that is held for SRB purposes should not be counted as capital for Pillar 2 purposes.

If an instrument does not suffice to fully address a risk, a set of instruments (both capital buffers and other instruments) can be used jointly, provided that they have different transmission mechanisms. For instance, an SRB can be applied to banks with common exposures to the real estate sector, even if real estate risks are already covered by increased risk weights, since the former addresses systemic risks of the common exposures in real estate, which might not be covered by the latter.

The CRD IV restricts the combination of a G-SII buffer, an O-SII buffer and an SRB in order to prevent excessive accumulation.[108] The CRD IV also provides for a minimum combined buffer requirement at individual institution level, possibly in order to ensure a level playing field between subsidiaries of a group and individual, independent institutions. These articles seem redundant, however, since they only confirm the maximum accumulation rules.[109]

[108] Article 131(14) and (15) of the CRD IV and Article 133(4) and (5) of the CRD IV.

[109] Article 131(16) and (17) of the CRD IV and Article 133(6) and (7) of the CRD IV.

At a consolidated level, either the G-SII buffer or the O-SII buffer is applicable, but not both. The G-SII buffer is applied at a consolidated level (or at an individual level if the G-SII has no subsidiary).[110] The competent or designated authority in the Member State of the consolidated group is responsible for applying the buffer. The O-SII buffer can be applied at a consolidated, sub-consolidated or individual level, even if the subsidiary is part of a group. It is for the competent or designated authority of the subsidiary and of the parent institution to apply the O-SII buffer at the appropriate level. However, whenever a group is subject to both a G-SII buffer and an O-SII buffer at consolidated level, the higher of the two buffers applies. Its subsidiaries can also be identified as O-SIIs.

The CRD IV provides that whenever an SRB is applicable along with an O-SII or G-SII buffer at the same level, the highest buffer applies, although there is an exception to this (see below). This means that the SRB cannot be used as an "add-on" to complement the SII buffers. For example, the SRB cannot be used to top-up an O-SII buffer if the maximum rate (2% cap) is considered too low; it can only replace the O-SII buffer. Nor can the SRB be used in addition to the SII buffers if structural risks other than those related to SIIs (e.g. common exposures) need to be addressed. This limits the SRB's scope and effectiveness, as authorities cannot impose both an SII buffer and an SRB to address different systemic risks. The exception is where the SRB targets only domestic exposures, in which case the SRB is cumulative with the SII buffer.

A further aspect of accumulation pertains to the reciprocation of SRBs from other Member States. For example, if Member State A applies an SRB and Member State B also applies an SRB and, furthermore, requests reciprocation, Member State A has the option to reciprocate Member State B's SRB. As a general rule, it should consider whether the risk that emanates from Member State B is already covered by its own SRB (risk coverage principle). If so, an accumulation of SRBs may not be warranted and only the higher of the two should be applied to the relevant exposures, as clarified in Single Rulebook Q&A question 2017_3229.[111] In such cases, the higher of the two SRB rates applies. If, however, the two SRBs target different risks, both SRBs should be applied cumulatively. This could be achieved in the current framework if the reciprocating authority issues its own SRB decision combining the different risks. If this leads to a situation in which the cumulative SRBs imposed on an institution exceed the SRB notification and approval thresholds as measured against its total risk exposure amount, the respective notification and approval requirement pursuant to Article 133(11) to (16) of the CRD IV needs to be respected.

[110] Article 131(1) of the CRD IV and Article 6 of the CRR.

[111] See Single Rulebook Q&A question 2017_3229, available on the EBA's website at **http://www.eba.europa.eu/single-rule-book-qa**

Table 4.6

Accumulation rules of SII buffers and the SRB

	G-SII buffer	O-SII buffer	SRB
Level of application	At consolidated level or at individual level	At consolidated, sub-consolidated or individual level	At consolidated, sub-consolidated or individual level
Maximum (rule 1)	The higher of the G-SII buffer and O-SII buffer at consolidated level A banking group can be subject to both a G-SII buffer (at consolidated level) and an O-SII buffer (at sub-consolidated or subsidiary level).		Not applicable
Maximum (rule 2)	Where the SRB applies at the same level (consolidated, sub-consolidated or individual level) as an SII buffer, and the SRB covers domestic and cross-border exposures, the higher of the two applies. Where the SRB applies at the same level (consolidated, sub-consolidated or individual level) as an SII buffer, and the SRB covers only domestic exposures, both the SRB and the SII buffer apply.		

5 Decision-making, coordination and communication[112]

5.1 G-SII and O-SII buffers

The following steps can be identified:[113]

1. Member States must designate a competent authority/designated authority to be in charge of identifying the systemic institutions which have been authorised under their jurisdiction. Member States may designate more than one authority.[114]

2. The competent authority/designated authority must notify the names of the G-SIIs and O-SIIs and the respective sub-category to which each G-SII is allocated to the European Commission, the ESRB and the EBA. It is not necessary to consult them or request their opinion.[115] Notification should be timely, clear, complete and comparable. Two standard templates are provided for the notification of G-SIIs and O-SIIs, respectively. The same templates are also applicable for the notifications to the ESRB, the Commission and EBA (Annex 4.4). Emailing the template to the addresses provided or uploading the template to the appropriate eGate portal constitutes an official notification; no further official letter is required. For clarity and simplicity, Member States are recommended to include all their designated G-SIIs in one template and all their designated O-SIIs in one template.

3. The competent authority/designated authority must disclose to the public the names of the identified SIIs and – in the case of G-SIIs – the sub-category to which each G-SII is allocated.

4. Before setting or resetting an O-SII buffer, the competent authority/designated authority must notify the Commission, the ESRB and the EBA as well as the competent and designated authorities of the Member States concerned at least one month before the publication of the decision requiring an O-SII buffer to be maintained. There are several elements to the notification (listed in Article 131(7) of the CRD IV).

5. The competent authority/designated authority must review every year the identification of SIIs and the G-SII allocation into the respective sub-categories and report the result to the SIIs concerned, the Commission, the ESRB and the EBA. The updated information must be disclosed to the public.

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[112] Chapter 6 gives guidance on decision-making, coordination and communication for Pillar 2 measures.

[113] Article 131 of the CRD IV.

[114] The rationale behind the possibility of designating more than one authority is that certain G-SIIs and O-SIIs may carry out non-banking activities which are also considered to be systemically important. For instance, a bank managing an important payment system, or acting as a central securities depository or a central counterparty clearing house may be supervised by several types of authorities.

[115] However, they are not prevented from providing an opinion on an informal basis.

5.2 SRB

The following steps can be identified.[116]

1. A Member State may choose whether to implement the relevant SRB provisions in its national law. In other words, it can decide whether or not it wants to have the possibility of using this instrument. At the end of 2016, only three Member States, Ireland, Italy and Finland, had not transposed the SRB into national law.

2. Where a Member State decides to implement SRB provisions in its national law, the Member State must designate a competent authority/designated authority in charge of setting the SRB and of identifying the sets of institutions to which it applies. Given the interplay and overlap with the SII buffers, this Handbook suggests that Member States allocate the tasks of setting the SRB and the SII buffers to one and the same authority.

3. Before setting or resetting an SRB, the competent/designated authority must notify the Commission, the ESRB, the EBA and the authorities of other Member States concerned. This notification must take place at least one month before the publication of the decision announcing the setting of the SRB. One of the elements to be included in the notification is the justification for why none of the other measures in the CRD IV and the CRR (except for the national flexibility measures) are sufficiently effective to address the identified systemic risk. Notification should be timely, clear, complete and comparable. It is suggested that the standard template be used for notifying the ESRB, the Commission and the EBA (Annex 4.4).

4. Further coordination requirements depend on the timing, intended level and the geographic location of exposures covered by the SRB. The application of an SRB of above 3% on exposures in other Member States and above 5% on domestic and third-country exposures requires authorisation from the Commission (after the ESRB and perhaps the EBA have provided an opinion). A buffer rate of between 3% and 5% on domestic and third-country exposures applied to a subsidiary of a parent in another Member State may be subject to a binding mediation procedure carried out by the EBA. It should be noted that, in the case of multiple SRBs targeted at different systemic risks, the individual rates of all SRBs should be combined for each bank to determine the SRB level applicable to it. This aggregate level is used to check whether or not the thresholds in Table 4.7 are exceeded.

5. The competent authority/designated authority must announce the setting of the SRB by publication on an appropriate website. The information must include at least the buffer rate, the institutions to which it applies, the justification for the SRB (although this information should not be included if publication could jeopardise financial stability), the date from which it is applicable and the names of the countries with exposures recognised in the buffer. Any communications on the SRB should be timely, clear, complete and comparable. Other Member States may decide to recognise and apply the SRB to their domestic institutions for exposures located in the Member State setting the buffer. The Member State setting the buffer may ask the ESRB to issue a recommendation to one or more Member States to recognise the SRB. In the case of a significant market share of foreign-owned banks, the competent

[116] Article 133 of the CRD IV.

authority/designated authority setting the SRB should ask the authorities in other relevant Member States, possibly through an ESRB recommendation, to follow suit and apply the SRB to exposures located in the Member State setting the SRB as well. In the absence of such reciprocity, the SRB risks being a less effective tool. The same procedures apply to other Member States (re)setting the SRB.

5.3 Cooperation requirements for the implementation of structural buffers

As responsibility for the implementation of structural buffers (G-SII buffers, O-SII buffers, and SRBs) lies with the NCA or the NDA, depending on the national institutional set-up,[117] cooperation requirements need to be in place to enhance the consistency and transparency of the underlying decision-making procedures. In addition, under the SSM Regulation, the ECB has a top-up power with respect to macroprudential decisions taken by national authorities for credit institutions within the euro area.[118] Regarding the implementation of G-SII buffers, O-SII buffers and SRBs in the EU, a detailed coordination process between NCAs/NDAs, the Supervisory Board of the ECB and the ECB's Financial Stability Committee has been created. Accordingly, any notification of a measure relating to significant supervised entities requires the approval of the the Governing Council on a proposal from the Supervisory Board.[119]

The ESRB Recommendation on the macro-prudential mandate of national authorities[120] emphasises the leading role that national central banks need to play in macroprudential policy without undermining their independence. Therefore, if the NCA and the NDA in a Member State are distinct from the central bank, the cooperation requirements should preserve the central bank's role in the decision-making process regarding structural buffers.

Cooperation requirements with respect to the implementation of structural buffers have to ensure that all the information, expertise and control over the implemented instruments is available in the NDA to enhance the consistency and transparency of the underlying decision-making procedures. Although the identification process is rather prescriptive (based on the BCBS methodology for G-SIIs and the EBA guidelines for O-SIIs), there may still be some room for discretion. This is certainly true for institutions that are slightly above or below the identification threshold, as authorities are allowed to exercise supervisory judgment. With respect to the calibration of the O-SII buffer, the leeway is even greater, as different methodologies can be applied which are based on a discretionary set of components and parameters. Adequate procedures should be put in place to allow information sharing and, where needed, data sharing between authorities, including confidential information.

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[117] The ESRB publishes a list of national macroprudential authorities (in accordance with ESRB/2011/3) and national designated authorities (in accordance with Article 136 of the CRD IV) in EU Member States. The list is available at **https://www.esrb.europa.eu/national_policy/shared/pdf/esrb.170825_list_national_macroprudential_authorities_national_designated_authorities_in_EUMemberStates.en.pdf**

[118] See Article 5(2) SSM Regulation.

[119] See Article 13h.1 of the Rules of Procedure of the ECB.

[120] See ESRB/2011/3, available at **http://www.esrb.europa.eu/pub/pdf/ESRB_Recommendation_on_National_Macroprudential_Mandates.pdf**

Conflicts between macro and micro objectives with respect to the implementation of structural buffers should be avoided insofar as possible. If conflicts cannot be avoided, they should be resolved in a clear procedure with a view to avoiding inadequate capital requirements for SIIs at international and national level and an unlevel playing field across countries. To contribute to the consistency of overall capital requirements, cooperation requirements should avoid double-counting of risks and the neglect of certain risk areas. This specifically relates to the interaction of structural buffers with Pillar 2 measures whenever these are implemented with a system-wide stability perspective.

Table 4.7
Procedures relevant to the SRB

SRB level	Procedure (referring to the relevant sub-paragraph (§) of Article 133 of the CRD IV)
Domestic (local) exposures and exposures to third countries	
Up to 3%	Notification only (see step 3 of Section 5.2 of this chapter) (§13 and §11)
Between 3% and 5% where the entity is not a subsidiary of a parent established in another Member State	1. Notification (§13 and §11) 2. European Commission opinion (§14) 3. Competent authority/designated authority "complies or explains" (§14)
Between 3% and 5% where the entity is a subsidiary whose parent is established in another Member State	1. Notification (§13 and §11) 2. Recommendation from European Commission and the ESRB respectively (§14) 3. If authorities of concerned Member States disagree and if both recommendations are negative, can request EBA binding mediation (§14)
Above 5%	1. Notification (§13 and §12) 2. ESRB (and perhaps EBA) opinion to European Commission (§15) 3. Commission decides on adopting implementing act authorising the competent authority/designated authority to apply the SRB (§15)
Exposures to other Member States	
Up to 3%	1. Notification (§11) 2. No authorisation, but the buffer must be set equally on all exposures located within the EU (§8 and §18)
Above 3%	1. Notification (§12) 2. ESRB (and perhaps EBA) opinion to European Commission (§8 and §15 following §12) 3. Commission decides on adopting implementing act authorising the competent authority/designated authority to apply the SRB (§15)

Chapter 5
Liquidity instruments[121]

[121] The chapter was prepared by a team led by Jouni Timonen (Suomen Pankki – Finlands Bank) and comprising Antoaneta Amza (Banca Naţională a României), Pierluigi Bologna (Banca d'Italia, sub-group coordinator), Miguel Boucinha (Banco de Portugal) Christian Castro (Banco de España, sub-group coordinator), André Ebner (Deutsche Bundesbank), Chiara Fogo (ESRB Secretariat), David Forsman (Sveriges Riksbank), Karine Hervé (Banque de France), Anja Krarup Kopalska (Finanstilsynet), Antoine Lallour (Bank of England, sub-group coordinator), Asen Lefterov (ESRB Secretariat), Vincent Martin (Autorité de contrôle prudentiel et de résolution), Natalia Mas Guix (European Central Bank), Marina Milancevica (Finanšu un kapitāla tirgus komisija), Marko Myller (Suomen Pankki – Finlands Bank, sub-group coordinator), Benjamin Neudorfer (Oesterreichische Nationalbank), Victor Savin (European Commission, DG-ECFIN), Nikolaos Stavrianou (Bank of Greece), Karol Strzelinski (Narodowy Bank Polski), Tatjana Suler Stavt (Banka Slovenije), Michael Thom (European Commission, DG-MARKT) and Jan Willem van den End (De Nederlandsche Bank). Support was provided by Frank Dierick from the ESRB Secretariat in the function of Secretary.

Executive summary

This chapter provides high-level guidance to ESRB member organisations on the use of liquidity instruments for macroprudential purposes in particular in the light of implementation of the CRD IV/CRR.

Macroprudential policy is an area at an early stage of development; this is even more as regards the use of instruments to address systemic liquidity risk for which there is relatively little country experience to draw on. Moreover, some of these instruments, such as the LCR (liquidity coverage ratio) and the NSFR (net stable funding ratio), are still in the process of being finalised by the international supervisory community and their implementation is only scheduled in the medium term.

Compared with the work on other macroprudential instruments, this chapter therefore provides essentially conceptual and exploratory information rather than concrete operational guidance. There is a need to continue working in this area. As more data become available during the observation phase of the internationally agreed liquidity standards, their macroprudential dimension can be investigated in much greater detail.

This chapter is structured into four main parts. First, it discusses the externalities related to liquidity risk, the transmission mechanism through which the liquidity instruments address these externalities and possible unintended effects related to their use. Second, it reviews the individual instruments, distinguishing between volume-based instruments (LCR, NSFR, loan to deposit (LTD) or loan to stable funding (LTSF) limits) and price-based instruments (general liquidity surcharge and liquidity surcharge for systemically important institutions). Some of these instruments, including the LCR and the NSFR, can also be designed as time varying. Third, it lists potential indicators that authorities can employ to support policy decisions on the (de)activation and adjustment of liquidity instruments. These include both higher frequency market data and lower frequency balance sheet data. Finally, the last part of the chapter discusses relevant legal (procedural) and institutional issues related to the use of these instruments.

For practical reasons, the chapter focuses on the above-mentioned narrow set of instruments in the context of the CRD IV/CRR implementation. The chapter therefore does not aim to be comprehensive and it is acknowledged that other liquidity instruments could be (or are already) used for macroprudential purposes, such as reserve requirements, restrictions on funding in foreign currencies and on short-term wholesale funding. Their usefulness in the EU or euro area context should be explored in more detail in further analyses.

The main analytical findings and policy messages of the chapter are the following.

- **Systemic liquidity risk manifests itself in situations in which banks' normal funding and refinancing channels fail, which may prompt the central bank to act as lender of last resort.** This risk is crucial for understanding the recent financial crisis. With hindsight, it could be said that banks neglected systemic liquidity risk and "under-priced" it by not internalising the related externalities. **Liquidity risk was not sufficiently addressed by regulators and supervisors as,** for example, reflected in the lack of internationally agreed liquidity standards comparable to the Basel capital ratios as well as the important gaps in data for identifying and

monitoring the build-up of risk. International initiatives are under way to address this, but it will take time before they are fully implemented and their effects can be observed.

- **Liquidity risk is usually addressed by policies mitigating traditional bank runs by (retail) depositors. This, however, is insufficient to comprehensively address all externalities,** as a large part of funding and refinancing is now provided by wholesale markets or bilaterally between financial institutions. Other mechanisms are therefore needed to capture these new sources of risk. While solvency and liquidity are intertwined, the recent crisis has also demonstrated that solvency regulation alone is not enough and that liquidity-related vulnerabilities may be best targeted by using dedicated liquidity instruments.

- **Banks should internalise the externalities related to liquidity risk so that the socialisation of losses (public insurance) becomes truly a last resort and is priced accordingly.** This is part of the ambitious effort that is under way to reduce explicit and implicit reliance on public support for banks.

- **While the international liquidity standards currently being developed (the LCR and NSFR) address some of the externalities of liquidity, as presently designed they are not sufficient to do so comprehensively.** A case can therefore be made for additional macroprudential liquidity regulation. As the LCR and NSFR are still in the process of being finalised, the ESRB can only give conceptual and exploratory guidance on the use of macroprudential liquidity instruments at this stage. **A structural funding ratio is the preferred instrument for mitigating excessive maturity mismatch – the key intermediate macroprudential objective relevant for systemic liquidity risk.** Achieving a well-designed NSFR, also for macroprudential purposes, would contribute significantly to addressing structural liquidity risk and should therefore be a priority. In addition to a new minimum standard, a time-varying use of the NSFR would allow banks to adjust their resilience to liquidity risk over the financial cycle (similarly to the CCyB) and would also enable longer-term (structural) changes to be addressed. If the NSFR is implemented as a minimum requirement, a time-varying add-on of the ratio, including the possibility of deviating from (or "going below") the minimum prudential buffer in stressed situations, would help to reduce pro-cyclicality. But the macroprudential use of the NSFR would be challenging at this juncture as the international standard has not yet been finalised.

- **The CRD IV/CRR offers the possibility to introduce macroprudential liquidity instruments,** including a (time-varying) structural funding ratio such as the NSFR, via the national flexibility measures (Article 458 of the CRR) and Pillar 2.

- **A number of market-based and balance sheet indicators are identified that can guide the use of macroprudential liquidity instruments.** Regarding the activation of the instruments, a combination of indicators and expert judgement is necessary for the build-up phase, while market-based indicators (for instance the ECB's financial market liquidity indicator) could play a greater role in guiding the release phase.

- **Authorities considering using the instruments should exercise caution both in the overall setting of the instruments and with regard to the information used to guide their decisions,** given the general uncertainty on the effectiveness of the instruments in practice, the significant data gaps and the ongoing finalisation of the international liquidity standards.

1 Macroprudential objectives

A **systemic liquidity stress** can be defined as any situation in which banks' normal funding and refinancing channels fail and which may prompt the central bank to act as lender of last resort. Refinancing difficulties at one or a few systemically important institutions can be the beginning of a systemic liquidity stress. Such stresses can seriously disrupt the financial intermediation process and, as a consequence, they may have a severe adverse impact on the provision of credit to the real economy, even causing or amplifying a recession. Macroprudential policies related to liquidity aim at avoiding such stresses by reducing systemic liquidity risk.

Liquidity risk can materialise either in the form of **market liquidity risk** (inability to sell assets quickly with little or no impact on prices) or **funding liquidity risk** (inability to issue new debt or roll over existing debt). These two forms of risk may be linked and reinforce one another in a feedback loop.[122] Market and funding liquidity risks can be further distinguished by their type of emergence – **structural, cyclical or liquidity crisis**. Section 4.1 of this chapter provides definitions and further explanations of these conceptual distinctions.

The ultimate objective of macroprudential policy is to contribute to safeguarding financial stability by strengthening the resilience of the financial system and decreasing the build-up of systemic risks in order to protect the overall economy from significant output losses. In its Recommendation on intermediate objectives and instruments of macroprudential policy, the ESRB identified a number of intermediate objectives as operational specifications to this ultimate objective. One intermediate objective, which is particularly relevant for systemic liquidity risk, is **the mitigation and prevention of excessive maturity mismatch and market illiquidity**. This objective is in turn closely linked to the intermediate objective of mitigating and preventing excessive credit growth and leverage, as strong credit growth is often associated with an increased reliance on short-term and more volatile sources of funding.

Externalities motivating liquidity regulation in general

The aim of liquidity regulation is to ensure that banks are able to refinance themselves when their liabilities become due. High levels of maturity mismatch and low holdings of liquid assets increase the potential for runs on various types of bank liabilities. While banks' financial intermediation role is intrinsically linked with maturity and liquidity transformation, the level of mismatch may be excessive from a social viewpoint because of negative externalities.

A bank may choose not to improve its liquidity structure because it does not fully internalise the benefits of doing so. There are three main externalities which arise in such cases. First, in a period of stress, a bank may suddenly become unable to meet withdrawal requests and margin calls requiring liquid collateral. Rapid asset sales to meet such requests may have an impact on other banks via market prices. As a rule, banks do not internalise the system-wide impact of their actions and individual funding fragilities.[123] Second, authorities may decide to initiate rescue plans when a system-wide liquidity crisis occurs. These "bail outs" entail costly distortions, e.g. taxpayer support and/or exceptional monetary policy measures. Banks may expect such a rescue to be launched

[122] Brunnermeier and Pedersen (2009).

[123] Morris and Shin (2008). This externality may also comprise the problem of liquidity chains, where small maturity mismatches at the level of the single institution compound to large system-wide maturity mismatches.

every time a system-wide stress occurs and this expectation generates moral hazard.[124] Third, collective exuberance may lead banks to rapidly grow their balance sheets with unstable sources of funding in an attempt to meet performance benchmarks.[125]

These externalities justify having specific liquidity regulation in place. The BCBS has developed a proposal for internationally harmonised liquidity standards, namely the LCR and the NSFR. These standards are a key step towards establishing a liquidity regulation framework, but may not be sufficient to comprehensively address all externalities. While liquidity and solvency are intertwined, the recent crisis has demonstrated that solvency regulation alone is not sufficient and that liquidity-related vulnerabilities may be best targeted using dedicated liquidity instruments.

Liquidity buffer requirements mitigate the first type of externalities as they enable a bank to survive a stress period for a few weeks, i.e. strengthening their short-term resilience. This provides authorities with time to assess the situation and prepare an appropriate reaction. Examples of such requirements are the LCR and the liquid assets ratio (LAR).

Stable funding requirements identify stable liabilities and relatively illiquid assets and introduce a balance sheet constraint that compels banks to fund a proportion of the latter with some amount of the former. This addresses the other externalities by making funding more stable and/or by reducing the maturities of assets for every bank in the system. Examples of such requirements are the NSFR, a core funding ratio (CFR), the LTD and the LTSF. Stable funding requirements are the most appropriate type of instrument to mitigate and prevent excessive maturity mismatch and market illiquidity since they reduce the need for frequent refinancing of banks. Therefore, the international supervisory community should give the highest priority to reaching a sound agreement on the NSFR.

Specific goals of a (time-varying) macroprudential liquidity policy

The internationally harmonised minimum liquidity requirements developed by the BCBS are based on stress scenarios. These common minimum requirements function as backstops to ensure banks' resilience against idiosyncratic and market-wide shocks. The LCR and the NSFR are intended to be essentially mandatory but static minimum requirements during normal times, although banks would be allowed to deviate from the minimum LCR during periods of stress.

These requirements may therefore need to be supplemented with a macroprudential liquidity policy. This implies addressing both the structural and cyclical dimension of liquidity risk. Achieving well-designed prudential liquidity ratios also for macroprudential purposes would contribute significantly to addressing structural liquidity risk. In addition, the possibility to adjust the policy over time would enable developments to be taken into account such as changes in the financial cycle and other sources of cyclical risk, including those related to global liquidity.[126] The analogy can be made here with the countercyclical capital buffer under the CRR, where a macroprudential time-varying capital buffer complements the binding minimum capital requirements to address systemic imbalances resulting from excessive credit developments.

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[124] Farhi and Tirole (2012).

[125] Aikman et al. (2013).

[126] CGFS (2011) and Eickmeier et al. (2013). Ample global liquidity, reflected in large capital flows, may provide cheap and easily available funding for banks, bringing about an increased reliance on short-term wholesale funding. It is a key source of excessive credit expansion.

More specifically, a time-varying macroprudential liquidity policy is needed for a number of reasons. First, the liquidity requirements may potentially exhibit pro-cyclicality. This results from the fact that they have not been calibrated taking the financial cycle into account,[127] that their parameters are fixed in time, and that they make use of credit ratings that may also exhibit pro-cyclicality.

Second, in the expansion phase of the financial cycle, mechanisms and imbalances may build up with the potential to magnify and spread the costs of future crises. As intra-financial activities and leverage intensify, interconnectedness increases, intermediation chains lengthen and banks may be led to take similar risks – overlooking the possibility of a collective failure.

Third, tightening liquidity requirements can at times limit the build-up of systemic risk. Financial crises may appear to be triggered by specific shocks but their causes are often endogenous. For example, a credit boom may be fuelled by cheap foreign bank funding and securitisation. The funding decisions of each individual bank have little impact on the size of the overall imbalances, but the joint actions of all banks create risks of massive cross-border outflows or a sudden drying up of the securitisation market.

Finally, under different sets of circumstances, the macroprudential authority may judge that the externalities have become less severe, meaning that the build-up of imbalances has reversed and the risks subsided. If this is the case, it may be advisable to loosen the macroprudential requirements, especially where banks face tough conditions in the wholesale funding market or limitations on the new deposits they can attract.

Turning to the case of the LCR, macroprudential requirements would complement the minimum prudential requirements.[128] During times of stress (which can be institution specific or market wide), institutions are allowed to draw on their prudential liquidity buffers[129] (i.e. they can "go below" the 100% level otherwise required). The national competent (microprudential) authority evaluates ex post whether a given institution is indeed in a stress situation and, using the range of measures at its disposal, can ask the bank to restore its liquidity buffers if appropriate.[130] Time-varying macroprudential requirements could be added on top of the minimum prudential requirements during upturns and released during a downturn. Similarly, add-ons for systemically important institutions may be envisaged.

While this chapter focuses on banks, in practice macroprudential authorities should also monitor other financial institutions that engage in maturity transformation (shadow banks). Similar considerations to those expressed above would apply to these institutions. It is important that a comprehensive macroprudential monitoring covers any potential for maturity transformation migrating to the shadow banking sector after the introduction of regulatory changes (leakage).[131]

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[127] Liquidity requirements dampen the tendency to resort to cheap short-term financing in an upturn, but may aggravate funding stress in a downturn when stable long-term funding becomes more expensive. Note also that while the original Basel III proposals stated that institutions would have to maintain an LCR above 100% on a continuous basis, the 2013 revisions allow banks to use their stock of HQLA in both idiosyncratic and systemic stress events (BCBS (2013b)).

[128] In contrast to specific macroprudential requirements, minimum prudential requirements often serve both a macro- and microprudential purpose. Examples are the Basel III liquidity standards, the LCR and the NSFR. They are not explicitly calibrated to take the financial cycle or an institution's specific systemic relevance into account, but they nevertheless contribute to a safer financial system.

[129] In the case of the LCR, cf. Article 412 of the CRR. See also BCBS (2013b).

[130] The institution under stress should submit a plan for the timely restoration of compliance with the liquidity requirements. Until such compliance is restored, the institution is subject to liquidity reporting with a higher frequency and shorter delays.

[131] European Commission (2013).

2 The instruments, their transmission and effects

2.1 Transmission mechanism

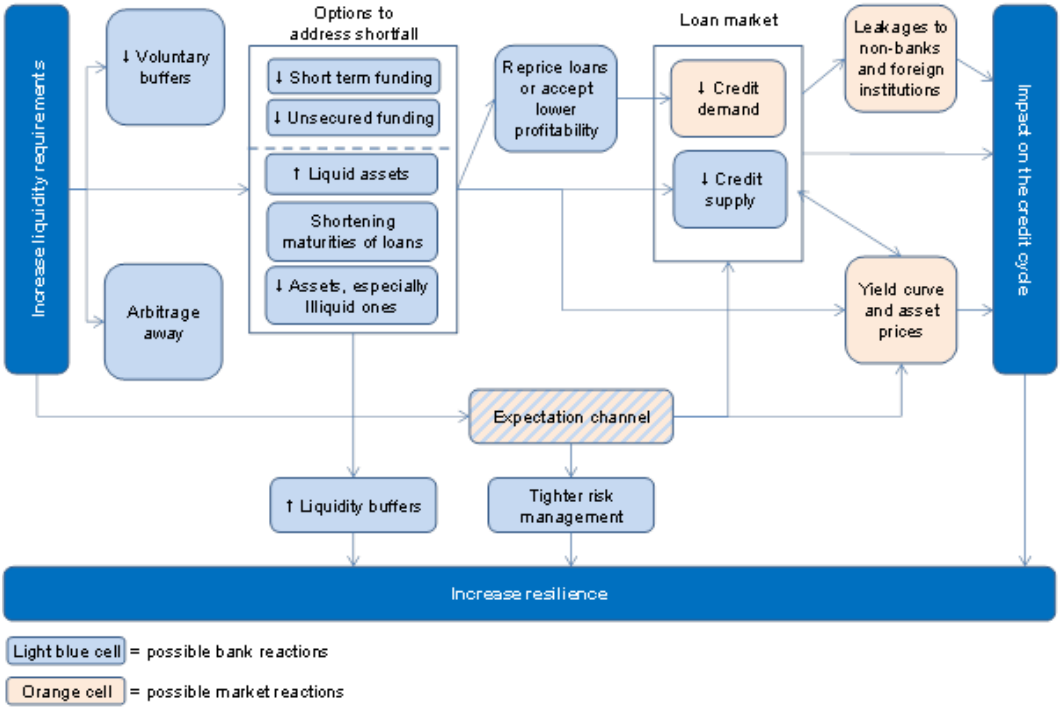
There are two main types of volume-based liquidity instruments that can also be used for macroprudential purposes: **liquidity buffer requirements** and **stable funding requirements**. Assessing their transmission mechanism is complex. Very little empirical investigation exists, all the more so because, with a few exceptions, the LCR and NSFR have not yet been implemented. The stylised transmission map[132] in Figure 5.1 illustrates in a high-level way the qualitative effects that are expected when tightening liquidity requirements. In normal circumstances price-based liquidity instruments such as liquidity surcharges have a similar transmission mechanism as volume-based ones. Indeed, macroprudential policies can, in principle, use either volume or price-based instruments to achieve the same change in banks' balance sheets.

Tighter standards improve the **resilience** of the banking system because they reduce the need for every bank to refinance itself frequently. This in turn reduces the risk of forced asset sales on possibly disadvantageous terms that may result in adverse funding conditions for all market players. When a liquidity requirement is tightened, banks adjust their balance sheets towards holding more liquid assets and relying on more stable and longer-term funding sources. If longer-term funding sources are marginally more costly, these adjustments to the banking sector's aggregated balance sheet tend to reduce the intermediation to the real economy and may dampen the **financial cycle**.

[132] Note that the map does not aim to fully represent all transmission channels. The transmission may also vary depending, for example, on the interest rate environment and market conditions.

Figure 5.1

Stylised transmission map for the use of liquidity instruments



Source: Adapted from CGFS (2012).

The transmission of liquidity buffer requirements

If the minimum liquidity buffer, defined as liquid assets over short-term net outflows, is increased banks can meet this requirement by increasing the maturity of their funding. They can also rebalance their assets, i.e. buying highly liquid assets and selling illiquid ones. Both methods of compliance will entail certain costs since the return on highly liquid assets will normally be lower than that of more illiquid assets and long-term funding may be more expensive.

Nevertheless, the potential costs associated with higher requirements can be expected to be limited by the fact that macroprudential tightening should take place in the upswing of the financial cycle that is when long-term borrowing and safe assets are not overly expensive. Also, the cost for banks could be counterbalanced by other factors. For example, higher buffers reduce the liquidity risk which, in turn, should reduce banks' funding costs. This effect should at least partly mitigate the concern that liquidity tightening might affect banks' willingness to finance the real economy and the passing-through of costs to borrowers thereby potentially reducing loan demand.

In the case of a smooth turning of the financial cycle, authorities could gradually loosen the requirements. This would have positive effects on banks' net interest income and their willingness to provide loans to the real economy, or result in an increased demand for loans because of the resulting lower interest rates.

There are various ways in which the additional macroprudential requirements could be used in a stress situation. For instance, the framework could allow institutions to draw on the additional buffers under the same conditions as the minimum prudential buffers (i.e. no prior approval needed), or require a decision on release by the macroprudential authority at the banking-system level.[133] The release of the macroprudential buffer could help to ensure the usability of the minimum prudential buffers by reducing the potential "stigma" associated with drawing on the buffers. Fully releasing the macroprudential liquidity buffer at the onset of a systemic liquidity event will make it clear to the market that banks are not acting in isolation in a reaction to an idiosyncratic situation, but rather that they are using their buffers in response to a systemic shock. Nevertheless, potential unintended effects related to a public announcement should be taken into account (see below).

The transmission of stable funding requirements

Stable funding requirements aim at controlling the gap between the stable funding available to a bank and its illiquid assets. What constitutes truly stable funding and truly liquid assets may change over time and across jurisdictions. Macroprudential policy should be flexible enough to accommodate for such changes.

The introduction of a stable funding requirement can contribute to smoothing the financial cycle in the upswing, even if the requirement remains fixed in time. More generally, time-varying adjustments of the funding requirement can contribute to such smoothing by limiting or relaxing banks' medium-term maturity and liquidity transformation. In the upswing phase of the cycle, tighter funding requirements can help to limit excessive credit growth by increasing the cost of borrowing. In the downswing, a relaxation of the requirements can help to reduce or absorb (potentially higher) funding costs, thus supporting the provision of credit to the real economy. In the case of a financial crisis, fully releasing the macroprudential requirement will free resources which can then be used to sustain the supply of credit to the real economy.

Expectations

As in the case of monetary policy, expectations can be a part of the transmission mechanism of liquidity requirements. If banks understand macroprudential liquidity policy and believe it is credibly based on the use of a few transparent indicators, they are likely to modify their balance sheets preceding the actual tightening.

Unintended effects

Attention should be paid to any unintended effects of a tightening of liquidity policy, such as possible shifts to the shadow banking sector, disintermediation and regulatory arbitrage, in

[133] In practice, it may be difficult to justify why a bank may draw on the minimum prudential buffer but not on the macroprudential buffer if it is affected by liquidity stress. This would especially be the case if an SII is affected by idiosyncratic liquidity stress.

particular during credit booms. Authorities should seek to address such leakages as they have the potential to reduce the effectiveness of the liquidity policy and negatively affect other areas.

- **Liquidity buffer requirements.** The effectiveness of (higher) buffer requirements can be hampered if banks decide to comply by reducing their voluntary buffers compared to the minimum requirements. If, on the other hand, these buffers are maintained as a safety margin that allows banks to remain comfortably above the regulatory minimum, they should not affect the transmission of the liquidity requirements. In addition, the buffer requirements may contribute to shifts in the demand and supply of assets and higher concentration risk as they create incentives for banks to invest in the same types of liquid assets. Macroprudential authorities and supervisors should seek to avoid that the requirement to hold these assets contributes to a decrease in their market liquidity thereby affecting in the process the liquidity of other asset classes as well. This can be achieved, for example, by ensuring that the buffer is sufficiently diversified and truly usable in stress situations. Other possible effects relate to banks' increased recourse to secured financing (e.g. impact on asset encumbrance, haircuts and cliff effects, and ranking of depositor claims).

- **Announcement effects of buffer release.** An important unintended effect is the potential feedback effect that the announcement of a buffer release might have on the financial system. The announcement itself may be considered as tantamount to an official declaration of a systemic event. One approach could be to make the release decision a quasi-automatic process based on the triggering of publicly observed market indicators (market spreads, a fall in trade volumes, etc.). This approach reduces the risk that the announced decision is interpreted as reflecting the supervisor's own private negative observations, and thereby the probability of causing panic. As a possible alternative, banks could draw on the buffer when they experience a stress event, similar to what is envisaged for the LCR. This would not require any official announcement but still ensure the usability of the buffer.

- **Stable funding requirements.** Time-varying liquidity requirements additional to static minimum requirements should enable macroprudential authorities to avoid the risks of excessive deleveraging and mitigate the negative consequences that may arise when stable funding is most expensive or scarce. Indeed, decreased availability of long-term wholesale funding may lead to an increase in banks' demand for customer deposits and the associated increase in price competition may result in a decrease in profitability and render deposits more volatile.

- **Cross-border dimension.** Authorities should take cross-border effects into account when evaluating the appropriate macroprudential policy action. For example, a tightening of liquidity requirements may increase the resilience of the banking sector both domestically and abroad, because the interconnectedness of financial systems does not stop at national borders. Some policies may require coordination and reciprocity agreements between jurisdictions in order to maximise their effectiveness. Coordination also aims at addressing situations where, for example, home bias results in some banking groups deleveraging more in host countries, amplifying the instruments' effects and, in the worst case, causing a "credit crunch" in countries with large foreign ownership of the banking sector.

2.2 Interaction with monetary policy[134]

Macroprudential liquidity regulation may contribute to the smooth transmission of monetary policy. Indeed, one of its aims is to set the right conditions ex ante so that banks do not unduly rely on the central bank's function as lender of last resort. To the extent that macroprudential liquidity regulation reduces the probability of systemic liquidity crises, it should also reduce the need for exceptional monetary policy measures ex post.

The interaction between liquidity requirements and monetary policy may also lead to some unintended effects. Stable funding requirements, such as the NSFR, may render banks less sensitive to changes in the monetary policy stance. Liquidity buffer requirements, like the LCR, affect banks' incentives to hold different types of assets and therefore may have an impact on the implementation of monetary policy.[135] Possible areas of impact are as follows.

- **Interbank market.** The LCR provides banks with incentives to lengthen the maturity of their funding. This could result in a possible steepening of the yield curve, although it is difficult to assess the magnitude of such potential effects. The introduction of the LCR is likely to increase the demand for certain types of secured funding which could lead to a widening of the spread between secured and unsecured rates. Indeed, this has already been observed since the beginning of the financial crisis. The decoupling of developments in secured and unsecured rates and the decrease in liquidity in short-term money markets could pose some challenges to the implementation of monetary policy. In particular, as argued in Bech and Keister (2012) and Schmitz (2011), the use of a short-term unsecured rate as a target rate may no longer be the best option.

- **Central bank lending.** Under the LCR, central bank funding backed by non-high-quality liquid assets (non-HQLA) is considered to be a more stable funding source than the market. Moreover, the set of assets eligible as collateral for central bank funding is wider than that for LCR compliance purposes. Taken together, these features are likely to lead to a higher demand for central bank liquidity using non-HQLA as collateral. To mitigate the resulting higher risk exposure, central banks may adjust haircuts, narrow the set of collateral eligible for central bank operations and impose limits on central bank funding. The BCBS has made some revisions to the LCR framework, enabling central banks to provide a restricted-use committed liquidity facility (RCLF), even in jurisdictions with no structural shortage of HQLA. Under a RCLF, banks would be able to purchase a commitment from the central bank to grant liquidity against collateral and in exchange for a fee. Even when undrawn, banks would be able to recognise the RCLF liquidity in the pool of HQLA, although subject to a range of conditions and limitations. The Swedish experience of implementing the LCR (Annex 5.1), however, has not revealed any negative impact on the Swedish money or repurchase (repo) market, nor on Sveriges Riksbank's monetary policy operations. Overall, it is important to distinguish between the potential one-off effects when implementing measures such as the LCR and the potential effects of using the liquidity regulation for additional macroprudential reasons. The latter effects will probably be smaller and differ depending on whether the use relates to the activation or deactivation of the measure.

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[134] It should be noted that the use of macroprudential liquidity instruments might also interact with other macroprudential instruments, but this is not considered further in this chapter.

[135] This is an issue that is being investigated in greater detail at the international level by the Eurosystem (i.e. the ECB and the national central banks of those Member States that have adopted the euro), the EBA and the BCBS.

3 Description of the instruments

Conceptually, liquidity instruments used for macroprudential purposes can be broadly grouped into volume and price-based instruments. **Volume-based instruments** impose minimum requirements in terms of short-term liquidity buffers that banks have to hold (liquidity buffer requirements) or impose restrictions on banks' maturity mismatches (stable funding requirements). **Price-based instruments** target the cost of illiquidity and maturity mismatches, thereby closing the gap between the relevant social and the private marginal costs. One such example is a surcharge for reliance on certain funding sources, such as short-term wholesale funding, which reflects the increased systemic risk and externalities associated with their use. Both classes of instruments can either be fixed in time or vary over time depending on changing financial stability conditions.

This section considers in greater detail some of the instruments that can be used to address systemic liquidity risk: (i) a (time-varying) LCR, (ii) a (time-varying) NSFR, (iii) (time-varying) LTD and LTSF limits, (iv) a general liquidity surcharge, and (v) a liquidity surcharge for SIIs. A number of general conclusions can be drawn from this overview.

- **Importance of the NSFR.** A structural funding requirement is a promising instrument for addressing systemic liquidity risk as it focuses on the core of financial intermediation, namely structural liquidity and maturity transformation. If the NSFR is implemented as a minimum requirement, a time-varying use of the instrument in the form of an additional macroprudential buffer (including the possibility of "going below" the minimum requirement as for the LCR) would be helpful in addressing pro-cyclicality concerns. But the macroprudential use of the NSFR would be challenging at this juncture as the international standard has not yet been finalised. Under the CRD IV/CRR, the so-called national flexibility measures (Article 458 of the CRR) and Pillar 2 (e.g. Articles 103 and 104 of the CRD IV) offer the possibility to use liquidity instruments for macroprudential purposes.

- **Simpler variants of the NSFR.** The (time-varying) LTD and LTSF limits are simpler variants of the (time-varying) NSFR that have the advantage of being less data intensive, easier to calibrate and easier to communicate to the wider public. At the same time, they do not capture the maturity and liquidity transformation of banks completely since they only focus on certain elements of a bank's balance sheet. Nevertheless, a number of countries, some in the EU, have used these simpler liquidity instruments with success. The LTD and LTSF are outside the scope of the CRD IV/CRR and are therefore left to national discretion.

- **Role for liquidity surcharges.** Liquidity surcharges (prices) are easier to adjust than liquidity buffers (quantities) so they are less prone to "stickiness" and are therefore less pro-cyclical. Liquidity risk surcharges can be challenging to implement, however, mainly owing to the lack of experience with their use and their fiscal or quasi-fiscal nature. Interpreting the surcharges as analogous to a risk-sensitive deposit insurance premium – in this case a systemic liquidity risk insurance premium – could lessen some of these challenges. Thus, the surcharges might accrue to a resolution or crisis support fund (or even get rebated back to the banks on a flat rate basis once the fund reaches a certain target size).

Annex 5.1 contains an overview of countries that have used liquidity instruments for macroprudential purposes. Several countries already have an LCR-type prudential liquidity

instrument in place, but an NSFR-type instrument is much less common. There are also examples of simpler variants of the LCR and NSFR that focus on particular sub-classes of assets or liabilities. In a number of Member States, the liquidity ratios differentiate between domestic and foreign currency, or deposits held by residents and non-residents. Monetary policy instruments used by (formerly) non-euro area Member States for macroprudential purposes include reserve requirements. Funding sources that are considered to be more volatile and risky, such as non-domestic and/or foreign currency funding, can in that respect be subject to specific reserve requirements.

3.1 LCR

Description: The LCR promotes the short-term resilience of a bank's liquidity risk profile by ensuring that it has an adequate stock of unencumbered HQLA that can be converted into cash easily and immediately in private markets to meet its liquidity needs for a 30-calendar day liquidity stress scenario.

In its simplest form, a (time-varying) LCR for macroprudential purposes could be implemented as a (time-varying) macroprudential buffer over the minimum LCR. Under this specification a generic (time-varying) LCR would take the form of: LCR macro = alpha * LCR, where LCR macro is the (time-varying) macroprudential liquidity buffer, LCR is the minimum prudential requirement and alpha is a multiplicative (time-varying) positive scalar. Authorities can adjust this alpha thereby tightening or relaxing the macroprudential requirement. As a result, the total LCR buffer would be the sum of the prudential buffer and the macroprudential buffer: LCR total = (1 + alpha) * LCR = LCR + alpha * LCR = LCR + LCR macro. This specification is comparable to the CCyB under the capital requirements, as the CCyB builds on the microprudential ratio of capital over total risk-weighted assets.

Alternatives: A simple (time-variant) liquidity ratio of highly liquid assets over total assets could be used as a backstop measure to the (time-varying) LCR. Such a measure would focus on the proportion of highly liquid assets in relation to total assets rather than on in their matching with stressed net outflows in a standardised scenario – like the LCR. Different horizons for the liquidity stress scenario could be envisaged. In addition, haircuts and regulatory factors (e.g. run-off and roll-over rates) in the numerator and denominator of the LCR could be adjusted in order to focus on particular assets, funding sources or sectors.

Objective, nature and impact: Mitigate the negative effects stemming from market illiquidity and, to a lesser extent, from an excessive short-term maturity mismatch.

Advantages

Builds on an internationally harmonised regulatory instrument that is partly microprudential but also serves a macroprudential role, designed to mitigate liquidity risk.
Increases banks' resilience to short-term liquidity risk in a flexible way over the financial cycle.
Can be easily adjusted and updated as the understanding of risks evolves (through the haircuts and regulatory factors applied to the assets and liabilities in the ratio).
A prompt and timely deactivation of the time-varying macroprudential buffer may facilitate the use of the LCR buffer during a liquidity stress scenario.
Harmonised data will be available under a uniform reporting format from 2015 onwards (Article 415(3) of the CRR), thereby facilitating comparability across institutions and countries.

Disadvantages

Definition of LCR under the CRD IV/CRR will most likely be finalised in 2014 and phased in gradually from 2015 onwards.
Complexity resulting from the calibration of an additional, (time-varying) macroprudential layer, and which may be challenging to communicate.

Relevant operational issues

The (time-varying) macroprudential buffer could be activated in periods of excessive market liquidity characterised by unusually high values of assets used as collateral, compressed spreads and low volatility. The (time-varying) buffer could be used in parallel with the minimum prudential buffer in circumstances of idiosyncratic bank and market-wide stress (e.g. a sudden dry-up of market liquidity), or progressively adjusted in the case of a more gradual change in macro-financial conditions.
Interaction with monetary policy should be considered.

Relevant legal/institutional issues

Article 412 of the CRR: introduces a general prudential liquidity coverage requirement.
Article 412(3) of the CRR: allows a bank to use its liquid assets to meet its obligations under stressed circumstances.

Article 412(5) of the CRR: a Basel III-like LCR could be implemented before a minimum LCR is specified and fully introduced in the EU.
A national competent authority could in principle also use Article 103 of the CRD IV (Pillar 2) to impose a time-varying LCR to institutions with a similar liquidity risk profile.
National flexibility measures under Article 458 of the CRR (in particular Article 458(2)(d)(v)): procedure with a European Commission/Council implementing act, the competent or designated authority can adopt stricter national measures when justified because of changes in the intensity of macroprudential or systemic risk with the potential to have serious negative consequences in a Member State. Reciprocity is allowed.

3.2 NSFR

Description: The NSFR measures the proportion of long-term assets which are funded by long-term, stable funding. It requires a minimum amount of funding that is expected to be stable over a one-year time horizon based on liquidity risk factors assigned to assets and off-balance sheet liquidity exposures.

In its simplest form, a (time-varying) NSFR for macroprudential purposes could be implemented as a (time-varying) macroprudential buffer over the minimum NSFR. The specification would be equivalent to using the (time-varying) LCR for macroprudential purposes but with the NSFR as a basis (see Section 3.1). By limiting/relaxing the firm's medium-term maturity and liquidity mismatches between assets and liabilities at different stages of the financial cycle, a time-varying NSFR could contribute to preventing excessive credit expansions or contractions.

Alternatives: A simple (time-varying) CFR of the amount of stable funding over total liabilities could be used as a backstop measure to the (time-varying) NSFR. Such a measure would focus on the proportion of stable funding in terms of total liabilities rather than on the matching with stressed available stable funding in a standardised scenario – similar to the NSFR. Alternatively, the CFR could be calculated as stable funding over loans and advances, a ratio recently introduced by the Reserve Bank of New Zealand.

Different horizons for the standard could be envisaged. In addition, the regulatory factors (such as the factors reflecting the available and required funding) in the numerator and denominator of the NSFR could be adjusted in order to focus on particular assets, funding sources or sectors. [136] As with the other regulatory factors embedded in the macroprudential liquidity instruments – and particularly those that build on the BCBS standards – adjusting factors in the NSFR would in practice require proper calibration and would be subject to the relevant CRD IV/CRR provisions implementing the internationally agreed regulatory standards in the EU.

Objective, nature and impact: To mitigate negative effects stemming from an excessive maturity and liquidity mismatch.

Advantages

Focuses on the central processes of financial intermediation that are key in the dynamics of banking crises, namely structural liquidity and maturity transformation.
Full balance sheet measure of maturity transformation.
Builds on an internationally harmonised future regulatory instrument that is partly microprudential but also serves a macroprudential purpose.
Can be easily adjusted and updated as the understanding of risks evolves (through the ratio's regulatory factors that are applied to most of the balance sheet).
Can be relaxed to help banks meet the total requirement (harmonised minimum + macroprudential add-on) in circumstances where liquidity is scarce or expensive.
Increases the resilience of banks to liquidity risk in a flexible way over the financial cycle.
Conceptually powerful and in line with academic literature in the field. [137] [- Harmonised data will be available under a uniform reporting format from 2015 onwards (Article 415(3) of the CRR), thereby facilitating comparability across institutions and countries.

Disadvantages

Definition of NSFR under the CRD IV/CRR will most likely only be finalised and implemented by 2018.
Additional complexity resulting from the calibration of an additional (time-varying) layer, and which may be challenging to communicate.

[136] The LTD and LTSF ratios can be seen as variants of the NSFR.

[137] See, for example, Brunnermeier, Krishnamurthy and Gordon (2012).

Relevant operational issues

Could be activated in periods of excessive maturity and liquidity transformation usually characterised by high reliance on volatile sources of funding in proportion to the total amount of liquid assets in the system. It could be lowered in times of stress allowing institutions to draw on additional or different funding sources. The buffer could also be relaxed progressively when the amount of excessive maturity and liquidity transformation in the system gradually diminishes.

Relevant legal/institutional issues

Article 413 of the CRR: introduces a general prudential stable funding requirement.
A national competent authority could, in principle, also use Article 103 of the CRD IV (Pillar 2) to impose a (time-varying) NSFR to institutions with a similar liquidity risk profile.
National flexibility measures under Article 458 of the CRR (in particular Article 458(2)(d)(v)): procedure with a European Commission/Council implementing act, the competent or designated authority can adopt stricter national measures when justified because of changes in the intensity of macroprudential or systemic risk with the potential to have serious negative consequences in a Member State. Reciprocity is allowed.

3.3 LTD and LTSF limits

Description: Limit (cap) on customer loans over customer deposits (LTD). The denominator can be expanded by including also other sources of stable funding such as longer-term debt, equity and other elements depending on a jurisdiction's specific features (LTSF). Similarly, the definition of the numerator can be broadened so as to include other illiquid assets, such as illiquid securities with features which are not substantially different from loans. While conceptually more attractive, these more comprehensive definitions may be more challenging to implement in a harmonised way with the information which is currently available. By adding a time-varying component, the ratios can be calibrated to address the cyclical risk attached to excessive maturity and liquidity transformation in a similar way to the time-varying NSFR buffer.

Objective, nature and impact: Limit over-reliance on short-term, less stable wholesale funding that fuels excessive credit growth and leverage. Can be used both as a structural and a cyclical instrument. May reduce pro-cyclicality as it contains credit growth in the upturn.

Advantages

Simple
Low data needs
Easy to communicate

Disadvantages

Certain business models (e.g. institutions with significant investment banking activities) might find it harder to comply with the ratio.
May constitute an entry barrier for newly created banks that are building up their deposit base.
Does not consider all elements of the balance sheet.

Relevant operational issues

LTD and LTSF ratios can be seen as NSFR variants as they focus on particular sub-classes of assets or liabilities. A CFR ratio can be regarded as an inverted LTSF ratio.
Can complement the LCR and the NSFR.
Need for an encompassing definition of loans and deposits to avoid regulatory arbitrage; securitisations, impairments and write-offs may influence the ratios.
Need to assess the interaction with other liquidity instruments and instruments that impact credit growth and leverage.
Can be applied on a consolidated as well as an individual basis. The latter has the advantage that it sets an incentive for subsidiaries to strengthen their local funding base and become less dependent on parent funding, and therefore increases overall resilience during stress periods. Disadvantages are that banks' treasury management may be less efficient and that it may contribute to market fragmentation.

Relevant legal/institutional issues

Instruments that are outside the CRD IV/CRR and therefore left to national discretion.
A national competent authority could, in principle, also use Article 103 of the CRD IV (Pillar 2) to impose (time-varying) LTD and LTSF limits to institutions with a similar liquidity risk profile.

3.4 General liquidity surcharge

Description: A general liquidity charge can take the form of a Pigouvian levy[138] in relation to a bank's liquidity risk (e.g. as measured by its reliance on short-term funding or its NSFR). [139] The charge would decrease as a bank's funding maturities get longer, asset maturities are shortened or more stable sources of funding are used.

Objective, nature and impact: Discourage excessive reliance on short-term market funding that fuels excessive credit growth and leverage by internalising the related negative externalities.

Advantages

Instrument that through the use of prices compels the bank to internalise the externalities resulting from its contribution to systemic liquidity risk.
Owing to potentially lower adjustment costs compared with quantity requirements, possible reduction of pro-cyclical effects that, in the case of buffer-type requirements, may be associated with the switch from binding to non-binding constraints or with a sudden move in one of the relevant quantities.
Surcharge can contribute to financing the general government budget or a bank resolution fund.

Disadvantages

Limited practical experience with instrument.
May create incentives for increased risk-taking by banks in search of strategies which are profitable enough to compensate for the cost of the surcharge.

Relevant operational issues

The surcharge could be increased in periods when banks' incentives to rely on (cheaper) short-term wholesale funding markets are higher and reduced when these incentives recede. They could also be lowered in times of stress and when institutions draw on additional or different funding sources. The surcharge could be relaxed progressively when the excessive reliance on unstable sources for fuelling loans expansion diminishes.
The surcharge could be used as a transition instrument to provide an incentive for smooth convergence to the new NSFR liquidity standards.
Different definitions of unstable funding and maturity horizons could be envisaged.
Possible use of the surcharge to finance part of the general government budget or a bank resolution fund.

Relevant legal/institutional issues

Article 105 of the CRD IV (Pillar 2): the competent authority can impose a prudential charge related to the disparity between the actual liquidity position of a bank and any liquidity and stable funding requirements at national or EU level.

Other specific issues: The liquidity charges could be designed as a cross-sectional liquidity instrument (i.e. applicable to all banks) or, analogous to capital surcharges for SIIs, only apply to large banks based on their contribution to systemic risk (see also Section 3.5). Alternatively, liquidity charges could apply to all banks in a risk-adjusted way so that those that contribute more to systemic liquidity risk (through their interconnectedness or through their possible impact on the financial system) pay proportionately more.

3.5 Liquidity surcharge for SIIs

Description: In its simplest form this instrument could be designed as a liquidity charge adapted to banks' contributions to systemic liquidity risk. It could be structured as a buffer on top of the minimum requirement for the LCR or the NSFR.

Objective, nature and impact: Address negative externalities or spillovers stemming from excessive liquidity risk or maturity transformation by SIIs, including moral hazard.

Advantages

Instrument that through the use of prices compels the SII to internalise the externalities resulting from its contribution to systemic liquidity risk.
Takes into account the differences in banks' contribution to systemic risk.

Disadvantages

L No practical experience with instrument.

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[138] A Pigouvian levy (or tax) is applied to a market activity in order to address the negative externalities generated by it (costs incurred by parties not engaging in the activity).

[139] For example, as described in Perotti and Suarez (2009, 2011).

Relevant operational issues

Different methods have been suggested to measure banks' possible contribution to systemic liquidity risk (see, for example, IMF (2011)). Alternatively, a purely indicator-based measurement approach – such as for the capital surcharges for systemically important banks (BCBS) – could be envisaged.
Different methods of measuring banks' contribution to systemic liquidity risk could deliver different allocation mechanisms for the liquidity (or capital) surcharges. For example, liquidity stress tests may be used to measure banks' liquidity shortfall and the impact on systemic market and funding liquidity, thereby identifying a bank's contribution to systemic liquidity risk.

Relevant legal/institutional issues

FSB (2010) raises the possibility of a liquidity surcharge for SIIs.
Article 105 of the CRD IV (Pillar 2): the competent authority can impose a specific liquidity requirement to capture liquidity risks to which an institution is (or might be) exposed taking into account, among others, the business model of the institution and the systemic liquidity risk.

4 Possible indicators for the use of the instruments

4.1 Potential indicators

The indicators on which authorities will base the use of liquidity instruments for macroprudential purposes should reflect the intermediate policy objectives, namely the mitigation and prevention of excessive maturity mismatches and market illiquidity.[140] More granular intermediate objectives could be relevant as well if systemic liquidity risks were to arise in relation to specific developments, for example in the case of lending and borrowing mismatches in foreign currency or excessive asset encumbrance. The indicators need to capture the different possible manifestations of systemic liquidity risk which, in practice, may overlap.

Structural liquidity risks

Structural risks can arise from financial innovation and changes in regulation, taxation, saving and investment patterns and the overall structure of the financial system (e.g. interconnectedness and size of the system). They may be the result of long-term trends which at first sight may not present a risk to the financial system. Such risks call for indicators that signal structural weaknesses gradually building up over an extended period, e.g. indicators that reflect changes in business models, funding strategies and asset or market activities. In addition, surveys, market intelligence and supervisory information could be helpful to timely capture such risks.

Cyclical liquidity risks

Cyclical liquidity risks relate to the business cycle and/or the lower frequency financial cycle.[141] For example, increasing leverage in an upturn might be funded by short-term wholesale funding. In a downturn, by contrast, banks tend to reduce their leverage and maturity mismatches. This pro-cyclical behaviour reinforces liquidity risk cycles, thus creating externalities. Liquidity cycles can have varying periodicities depending on the market in which banks are active. They can also be asymmetric with upturns lasting longer than downturns.[142] Thus, indicators capturing liquidity cycles may signal the need for tightening in an upturn and release in a downturn. They should therefore measure time-varying market conditions, thereby acting like a barometer. These market conditions could be reflected in price-based indicators (e.g. deposit or loan rates), or quantity-based metrics (such as volume indicators of stocks and flows). The indicators could be complemented by soft information, such as surveys and market intelligence.

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[140] Liquidity instruments may also help to limit excessive credit growth, for example by raising the cost or limiting the amount of short-term funding which may be fuelling an over-expansion of banks' balance sheets.

[141] Borio (2012). Financial cycles, which are longer than business cycles, can cover credit, leverage, housing and equity market cycles, which are at the core of financial intermediation and thus directly affect financial intermediaries.

[142] In line with what has been shown by Claessens, Kose and Terrones (2011) for financial cycles.

Liquidity crises

Liquidity crises emerge as abrupt corrections of unsustainable trends or cycles in liquidity conditions. Corrections may be driven by shifts in risk appetite or shocks in confidence. Increased risk aversion can hit trading volumes in market segments and cause market liquidity to dry up. A confidence shock may cause funding withdrawals and bank runs. Such shocks can be systemic owing to contagion. Risk indicators capturing liquidity crises should measure stress conditions preferably in real time and thereby act like a thermometer. These stress conditions are most likely to be reflected in price-based indicators, such as market liquidity indices or funding spreads.

Systemic liquidity risk can manifest itself in complex and changing forms, and so careful monitoring of hard and soft information is required. Even key indicators might become outdated or non-significant under specific market circumstances and therefore authorities should be aware of the need to revise the indicators' signalling efficiency on an ongoing basis.

In order to compile a list of relevant and useful indicators, an extensive survey was carried out by the ESRB of systemic liquidity risk indicators used by central banks, regulators and international organisations. A broad list of possible indicators was drawn up based on the survey results, distinguishing between the three manifestations of liquidity risk mentioned above.

In a second step, the broad list was narrowed down on the basis of indicator relevance, simplicity and data availability in order to make it more manageable for the data collection process and empirical work. At least one indicator for each type of liquidity risk was retained.

Table 5.1 provides a classification grid of the shortlist of indicators – some of them with their generic specifications – that was used for the empirical assessment. The table maps the indicators according to their main objective and type of manifestation of systemic liquidity risk. Going forward, the possible role of global liquidity indicators (e.g. changes in international capital flows) could also be assessed, although the effects of global liquidity are expected to be captured already to a certain extent by some of the indicators listed.

Table 5.1

Classification grid of the selected liquidity indicators

	Structural	Cyclical	Crisis
Market illiquidity	Medium/long-term averages of market liquidity metrics, e.g. bid-ask spreads, turnover, trade volumes and/or securities issuance	Market liquidity metrics, e.g. bid-ask spreads, turnover, trade volumes, and/or securities issuance. Standard deviation of market liquidity metrics, correlation between market liquidity metrics and CDS index for banks Bank funding indicator capturing breakdown of issuance of secured vs. unsecured borrowing CDS spreads (large banks) Interbank interest rate spreads, including LIBOR-OIS spread	ECB financial market liquidity indicator (FMLI) and its components, e.g. for equity and bond markets Market liquidity metrics, e.g. bid-ask spreads, turnover, trade volumes, and/or securities issuance. Standard deviation of market liquidity metrics, correlation between market liquidity metrics and CDS index for banks CDS spreads (large banks) Interbank interest rate spreads, including LIBOR-OIS spread
Maturity mismatch (funding risk)	Central bank lending Weighted average maturity of assets and liabilities LTD and/or LTSF (e.g. deposits + capital + long-term debt) Simple generic core funding ratio: [deposits + capital + long-term debt]/total liabilities (or loans) Simple generic asset liquidity ratio: liquid assets/total assets	Weighted average maturity of assets and liabilities LTD and/or LTSF (e.g. deposits + capital + long-term debt) Simple generic core funding ratio: [deposits + capital + long-term debt]/total liabilities (or loans) Simple generic asset liquidity ratio: liquid assets/total assets Bank funding indicator capturing breakdown of issuance of secured vs. unsecured borrowing	Central bank lending Bank funding indicator capturing breakdown of issuance of secured vs. unsecured borrowing
Liquidity/cash hoarding	Central bank lending		Interbank interest rate spreads, including LIBOR-OIS spread Central bank lending
Concentration risk	Composition of bank funding	Composition of bank funding	
Currency mismatch	Net open position in foreign currencies/total assets; alternatively foreign currency liabilities/total assets, foreign currency swap rates	Net open foreign currency position/total assets; alternatively foreign currency liabilities/total assets, foreign currency swap rates	ECB financial market liquidity indicator – foreign currency component Exchange rate volatility Foreign currency swap rates volatility

4.2 Assessing the performance of the indicators

Strategy for the empirical analysis

The empirical work in this section draws mainly on available ECB data sources and especially on the ESRB risk dashboard. The ESRB collected data for the shortlist of indicators listed in Table 5.1 (Section 4.1) and established a database for performing empirical analyses of the indicators.

The empirical strategy consists of assessing the ability of the different liquidity indicators (the so-called right-hand side, or RHS, variables) in explaining or anticipating periods of systemic liquidity crises (the so-called left-hand side, or LHS, variable).

Systemic liquidity crisis events are identified by using two key **stress indicators** that reflect the main intermediate macroprudential objectives, namely preventing and mitigating market illiquidity and excessive maturity mismatches. These crisis events can then be used as **LHS variables** in the further empirical analysis. **Market illiquidity** is captured by the ECB's financial market liquidity indicator (FMLI), which is a composite indicator that reflects stress in various market segments. **Maturity mismatch risk** (or **funding risk**) is captured by the use of central bank funding. The underlying rationale is that stress in funding markets opens up financing gaps in banks with large maturity mismatches – gaps that eventually have to be filled by central bank funding as last resort.

However, it should be kept in mind that although the FMLI or central bank funding captures liquidity stress, this stress is not necessarily systemic in terms of financial stability.[143] Moreover – owing to data constraints – the analysis focuses on EU-wide stress events; it does not analyse country-specific episodes, which may differ from EU-wide developments and should be investigated in further studies. The cyclical and structural liquidity risk indicators on the shortlist can signal stress events and can be used as **RHS variables**. These **signalling indicators** may show a build-up of liquidity risk over a certain horizon prior to a crisis. It is likely that several indicators will convey the same signal. Graphical inspection can indicate the lead time of the indicators preceding the crisis and can indicate potential threshold values. More advanced signalling approaches (like AUROC) are less suitable at this stage. First, data availability – particularly cross-country data – constrains the empirical analysis. Second, systemic liquidity crises are rare events, which limits the number of LHS outcomes. Third, liquidity risk typically has non-linear features, which makes econometric analysis challenging. Therefore, the indicators are only used to obtain an overall impression of the conditions that are likely to be associated with systemic liquidity crises.

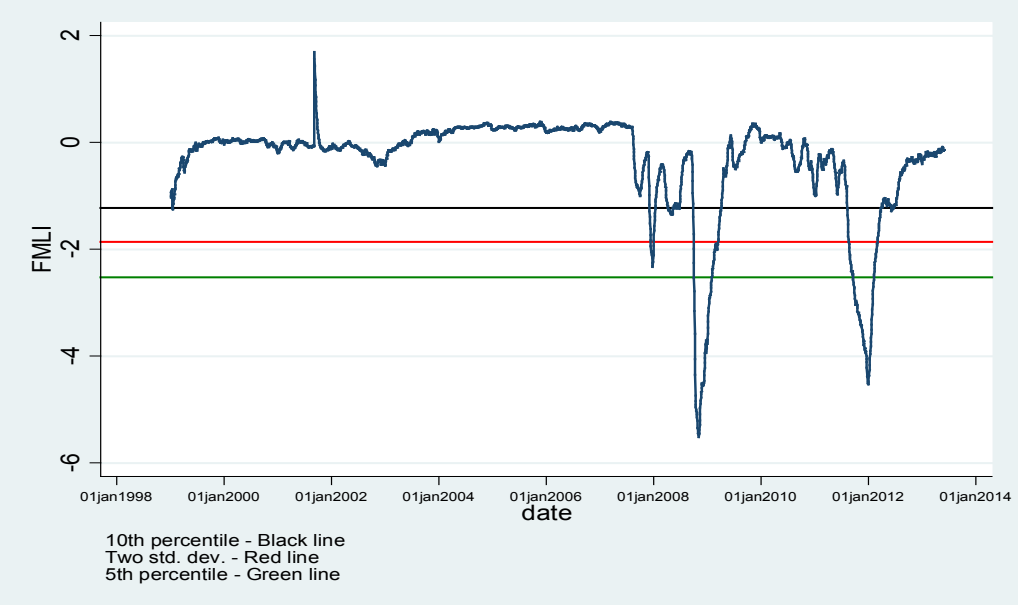
[143] IMF (2011) defines systemic liquidity risk as the risk of simultaneous liquidity difficulties at multiple financial institutions. It proposes three indicators: (i) a systemic liquidity risk index (SLRI) to gauge a systemic tightening in market and funding liquidity; (ii) a systemic risk-adjusted liquidity (SRL) model that calculates the joint probability of simultaneous liquidity shortfalls and the marginal contribution of a financial institution to systemic liquidity risk; and (iii) a macro stress-testing model, which includes a systemic liquidity component. The link between the three indicators and systemic liquidity risk is assumed but not formally and empirically established.

The left-hand-side variable: periods of systemic illiquidity

The ECB's FMLI is used to assess market illiquidity risk. The FMLI is a composite indicator of individual market liquidity measures in the forex, equity, bond and money markets[144] and consists of daily data for the period from January 1999 to May 2013 (see Figure 5.2). It is important to capture tail events in the distribution of the FMLI which last for a minimum amount of time in order to distinguish them from short-lived liquidity jumps. A fifth percentile threshold is therefore used to determine whether or not a systemic liquidity crisis has occurred, which identifies the following two periods: period 1 from 6 October 2008 to 2 February 2009 and period 2 from 26 September 2011 to 8 February 2012.

The first period identified starts in October 2008, approximately one year after the onset of the sub-prime crisis, and leads to a dry-up of liquidity particularly in short-term wholesale funding markets. The second period starts in September 2011 and coincides with increasing tensions in the sovereign debt markets prompting a "flight to safety" and straining the collateralised funding markets.

Figure 5.2
Identifying periods of systemic illiquidity using the ECB's FMLI



Sources: ECB financial market liquidity indicator and own calculations.

It is questionable whether the two periods represent distinct crisis events as they both originate from the financial crisis starting in 2007. The empirical analysis will accordingly target this particular financial crisis. Thus, there is a risk that the indicators selected on the basis of the above analysis will be too focused on this single crisis event and will not signal any other potential future liquidity

[144] Further information can be found in the ECB's Financial Stability Review, June 2007 and in Box 2 entitled "Financial market liquidity" of the Bank of England Financial Stability Report, April 2007. The FMLI provides a useful aggregate picture of market liquidity although some open questions remain as regards the data at the level of the individual FMLI components.

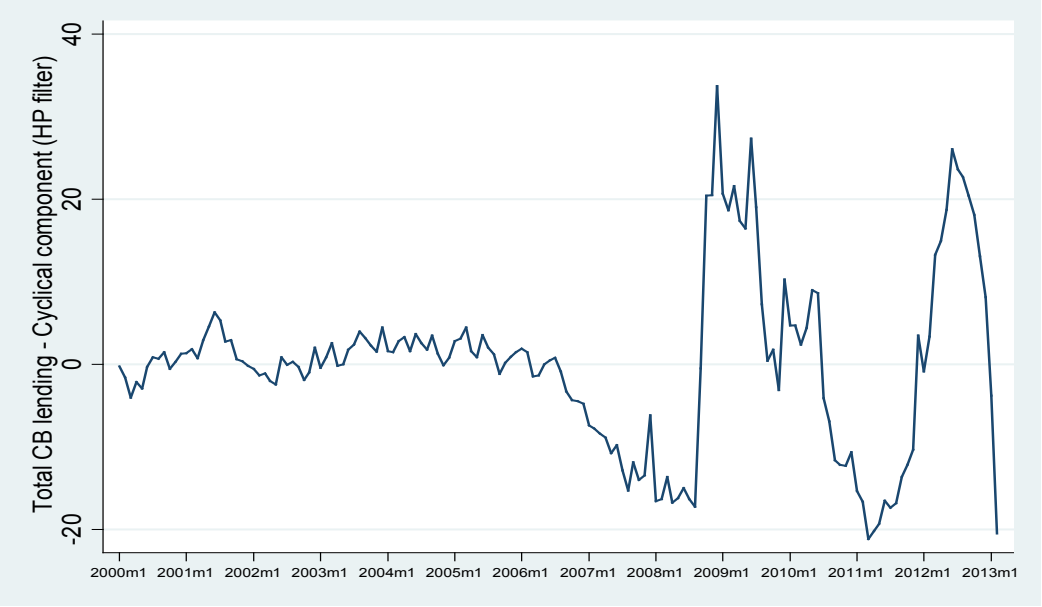
crises. Furthermore, as the two liquidity crisis events are closely related, the slow-moving RHS variables (balance sheet indicators) might bring little added value to the second stress period.

Turning to the **maturity mismatch risk** or **funding risk**, this is better captured by indicators such as dependency on central bank funding. Total central bank lending in the EU is used as a proxy for system-wide funding distress in the EU. As the original series of this indicator shows an upward trend for the period covered, Figure 5.3 below shows the cyclical component of the series after applying a Hodrick-Prescott filter to facilitate the analysis.

The figure shows two peaks. The first one starts around September/October 2008 and lasts until October 2009. A second peak starts around December 2011 and lasts until December 2012. This shows starting periods similar to those identified by the FMLI, but the duration of the stress periods is longer for the total central bank lending indicator. This difference could be the result of comparing a price-based indicator with a quantity-based indicator, but further investigation is needed.

Given the close coincidence in signalling the starting point of the two stress periods previously identified and given the frequency available for some of the RHS indicators, the two FMLI stress periods are used for the further empirical analysis.[145]

Figure 5.3
Identifying periods of systemic illiquidity using total central bank lending



Sources: ECB and own calculations.

[145] The observed evolution in both the FMLI and central bank lending tends to confirm the high correlation between market and funding illiquidity, particularly in stress periods, as documented in previous studies such as Drehmann and Nikolaou (2009). These authors study the bidding behaviour of market participants in central banks' open market operations, using the spread between the weighted average bid rate and the policy rate or the marginal bid rate to measure funding stress.

The right-hand-side variables: descriptive statistics

The charts in Annex 5.2 show the evolution of the previously identified indicators in the period before and after the two **FMLI** stress events (Chart 1). The time-windows used are (i) three years (or when data start) ahead of the crisis until two years after the crisis for the stress period starting in October 2008; and (ii) from the end of the first crisis period until the last observation in the series for the stress period starting in September 2011.

The figures show that some indicators, particularly those based on **higher frequency market data**, are coincident with the FMLI, which is partly a result of the FMLI's construction. The figures also suggest that these indicators are more suited to signalling the release of macroprudential liquidity instruments rather than their activation. In general, their predictive power is relatively low. Nevertheless, the observed increase in the volatility of some market-based indicators, such as interbank interest rate spreads (Chart 5) and forex markets (Chart 4), and of the FMLI itself is a certain leading signal to guide the use of the liquidity instruments. Long periods of very low volatility are worrisome as they are associated with underpricing of risk and changes in risk perception.

Indicators based on **balance sheet data** change more slowly. Harmonised cross-country data are only available two years before the first stress period and there is little variation concerning mean and median values of liquid asset ratios and funding composition (Chart 7 and following). However, some information can be obtained by looking at the development of minimum and maximum values. For instance, minimum ratios of liquid assets to short-term liabilities started to decline approximately 16 months prior to the stress period (Chart 8), while maximum values and the 75th percentile of the distribution of the share of central bank funding in credit institutions' liabilities increased after the stress period (Chart 12). This may be explained by (some) banks reducing their voluntary buffers before turning to the central bank. In addition, liquidity flows, such as money market and non-retail funding, seem to have some predictive power with funding from these sources shrinking in the run-up to the stress episode (Chart 10).

Overall, the short time series of available country-level balance sheet data is an important drawback to meaningful cross-country empirical analysis. To gain further insights from longer time series, evidence from other data sources and studies is presented in Annex 5.3. Future work may explore the use of other data sources (e.g. non-harmonised supervisory or central bank data, commercial databases of banks' balance sheets) in order to exploit the cross-sectional information for the liquidity indicators.

In **conclusion**, the tentative empirical analysis shows that data availability, especially for balance sheet data on a harmonised and consolidated basis, is an important constraint. Nevertheless, some preliminary conclusions can be drawn.

- In times of stress, market and funding liquidity risks are highly correlated.
- Fast-moving coincident indicators, such as composite indicators of market liquidity risk, are useful indicators to signal the timing of systemic liquidity events, their duration and intensity.
- Although market-based indicators are often coincident with liquidity stress indicators, volatility tended to increase prior to the recent financial crisis.
- The degree of dependence on unstable sources of funding, a higher and increasing level of maturity/liquidity transformation (e.g. approximated by the LTD ratio and the CFR, and the

amount of reserves of liquid assets to absorb shocks in times of stress) are associated with growing aggregate imbalances.

- Balance sheet data are available with a much lower periodicity and change more slowly over time than market data, highlighting the need for longer time series to capture the build-up of financial imbalances.
- LTD ratios are promising indicators (Annex 5.3), which seem to have some predictive power. However, varying data availability and definitions make cross-country comparison difficult.
- While system-wide measures are important, risks emerging in single SIIs or parts of the financial/banking system should also be monitored, as they may be masked by aggregate figures.

Data gaps

While standard measures of market liquidity are commonly available (especially price-based indicators), at least for broad indexes of securities, measures of maturity mismatch and funding illiquidity are generally more difficult to obtain. The crisis revealed major information gaps concerning linkages between institutions, as well as common exposures and liabilities to financial sectors and national markets. Data on securities lending and repos were missing or incomplete both at the transaction and firm level, there was insufficient monitoring of new funding instruments, and disclosures and regulatory reporting on banks' funding plans were not always adequate. More generally, compiling long series of balance sheet information on key liquidity items across countries is a challenging task. This complicates the calculation and comparison of more detailed aggregate liquidity ratios.

Work is currently under way to close these identified data gaps. At the international level, the BIS is overhauling its international banking statistics (IBS) which will also increase the information available on bank funding. The enhanced IBS will also feed into the G20 data gaps initiative (FSB and IMF).

Given the rise in secured financing in the run-up to the crisis and the role it played at the onset of the crisis, data availability on securities lending and repos should be significantly enhanced. The FSB has published recommendations, calling on authorities to collect granular data on these activities carried out by large international financial institutions. Moreover, the FSB encourages the establishment of trade repositories to collect transaction data and it plans to coordinate a set of market-wide surveys by national authorities.

At the European level, the ESRB is conducting a specific survey on the re-use of collateral (first data due by June 2013). The ESRB has also identified data gaps regarding the monitoring of bank funding plans, the development of new funding structures, and the evolution of uninsured "deposit-like" instruments. To close this gap, the ESRB asked the EBA in its Recommendation on funding of credit institutions to develop guidelines on harmonised data templates.[146] These templates will provide comparable data with respect to the changes in banks' funding profiles. Macroprudential authorities will find these data useful for assessing systemic liquidity risk and calibrating liquidity instruments for macroprudential purposes.

[146] Recommendation of the ESRB of 20 December 2012 on funding of credit institutions (ESRB/2012/2), OJ C 119, 25.4.2013, p. 1. The reporting deadlines for this Recommendation were subsequently extended by up to twelve months.

4.3 Linking the indicators to the instruments

From the empirical analysis in Section 4.2 it is clear that there is much work still to be done to develop fully fledged policy rules to guide decisions on the use of liquidity instruments for macroprudential purposes. Against this background, the analysis should be seen as a first step towards gradually operationalising the instruments in the EU. Given the general uncertainty on the effectiveness of the instruments in practice and the significant data gaps identified, authorities considering using the instruments are advised to exercise caution with regard to both the overall setting of the instruments and the information used to guide their decisions. Another observation is that the behaviour and predictive power of the indicators may change once they are used for the (de)activation of policy instruments.

Against this background, some preliminary guidance will be provided on how the liquidity indicators can be linked to the use of the instruments.

Time-varying instruments – the build-up phase

Systemic liquidity risk typically builds up over a prolonged period before suddenly materialising into financial instability upon the occurrence of a trigger event. The evolution over time of different ratios capturing liquidity and maturity transformation are useful indicators to identify cyclical patterns in banks' balance sheets. Such patterns could trigger or amplify market-wide liquidity shocks and may fuel credit booms. Sharp and steady increases in securities issuance and unsecured lending may point to a liquidity-driven credit boom and a gradual deterioration of banks' funding position. Changes in the observed patterns of such indicators that coincide with signals of excessive market liquidity provide stronger signals for policy action using the time-varying instruments. In particular, a prolonged period of compressed spreads and low volatility in the composite indicators of market illiquidity, interbank and bid-ask spreads, and exchange rates, together with steadily increasing trade volumes provide further supporting evidence of growing imbalances at the system level.

Time-varying instruments – the release phase

Composite indicators – such as the FMLI – and use of central bank funding appear to provide reliable guidance regarding liquidity stress events (including sudden stops) pointing to a release of the time-varying liquidity instruments. The intensity of the liquidity stress event could also be assessed through the use of additional market-based indicators, such as interbank interest rate spreads, bid-ask spreads and turnover/trade volume. The standard deviation of the indicators and the index of banks' CDS provide further insight into the intensity and progression of a liquidity event. These indicators would be helpful in formulating a stepwise approach to releasing liquidity buffers and could assist in identifying whether the liquidity situation has stabilised, meriting no further action.

Cross-sectional instruments

Cross-sectional instruments include general liquidity surcharges and liquidity surcharges for SIIs. The allocation of charges could follow a simple indicator-based approach as in the BCBS framework for SIIs where the proportion of banks' short-term or unstable funding is used to determine the level of penalty in terms of liquidity charges.

5 Legal and institutional framework

Clarity on the applicable legal and institutional framework is a necessary pre-condition for using the instruments. This framework will determine how the instrument can be used effectively, which authority will be in charge, and what rules and procedures apply. Authorities will have to assess whether a threat to financial stability might materialise (and if so, when), whether an instrument should be activated (and if so, when), which instrument(s) should be used and what its appropriate level should be. Further work needs to be undertaken before practical guidance can be provided here.

5.1 General framework

For the decision-making process and procedures related to the use of the instruments, it is useful to begin with some general comments (see also Annex 5.4 and Chapter 1). The applicable process and procedure, as well as relevant responsible authority, will depend on whether or not the use of the instrument in question is covered by the CRD IV/CRR. If so, the national margin for manoeuvre will be more restricted by EU rules, in particular because of the maximum harmonisation approach. In the event the use of the instrument **does not fall under the CRD IV/CRR**, however, such as the LTD and LTSF caps, it will be left to national discretion.

In accordance with the Basel III framework, the EU rules introduce liquidity requirements – the LCR (called liquidity coverage requirement under the CRD IV/CRR) and the NSFR (called stable funding requirement) – both to be further specified over a transition period. To the extent that national rules overlap with the European liquidity requirements already in place, the national rules would be inapplicable. In particular, national authorities should not adopt a national liquidity requirement that is in fact a national version of the LCR or which affects the LCR in a significant way when the LCR is effectively in place.

The liquidity instruments **under the CRD IV/CRR** encompass either the **express liquidity requirements** (i.e. the liquidity coverage requirement and the stable funding requirement) or **Pillar 2 measures**.

In the first case, under the **national flexibility measures (Article 458 of the CRR)** national authorities have the possibility to introduce stricter national liquidity measures in response to changes in the intensity of macroprudential or systemic risks with the potential to have serious negative consequences to the financial system and the real economy in a Member State. Other Member States may then recognise the measure. However, relying on this article entails a more demanding procedure: notification, submission of relevant evidence, etc.[147]

In the second case (Pillar 2), two provisions are particularly relevant. First, **Article 103 of the CRD IV** allows national competent authorities to apply the Supervisory Review and Evaluation Process (SREP) to institutions with similar risk profiles in a similar or identical manner when they "are or might be exposed to similar risks or pose similar risks to the financial system". Accordingly,

[147] See Chapter 7 of the Handbook for a more detailed discussion on the use of Article 458 of the CRR.

the assessment of systemic risk is included in the list of technical criteria evaluated through the SREP (Article 98(1)(j) of the CRD IV).

Once such a risk is identified, competent authorities have the power to impose **specific liquidity requirements**, including restrictions on maturity mismatches between assets and liabilities (Article 104(1)(k) of the CRD IV), to a group of institutions. Article 103 of the CRD IV requires that competent authorities notify the EBA, which must monitor supervisory practices and issue guidelines to ensure a consistent application of this provision throughout the EU.

The second relevant provision is **Article 105 of the CRD IV**. It enables competent authorities to impose **liquidity surcharges** based on the difference between the actual liquidity position of a bank and any liquidity and stable funding requirements required (at national or EU level). As a Pillar 2 measure, liquidity surcharges may be applied in a similar or identical manner to a group of institutions with similar risk profiles pursuant to Article 103 of the CRD IV.

One of the operational challenges in this respect is how to avoid possible overlap between microprudential and macroprudential measures, which calls for a close coordination between microprudential and macroprudential authorities.

On a general note, Pillar 2 measures are applied following from the SREP and are not subject to express reciprocity provisions. However, in the context of the SREP, the college of supervisors is strongly encouraged to develop a common understanding of a banking group's risks. The college is further required to do everything in its power to reach a joint decision on measures related to liquidity (Article 113(1)(b) of the CRD IV). In that sense, there are clear possibilities for reciprocity.

The authority responsible for the use of instruments that fall under the CRD IV/CRR will be the so-called national competent authority and/or the designated authority, both to be appointed by the individual Member States. The **national competent authority** is in charge of banking supervision under the CRD IV/CRR. For a number of well-defined areas (e.g. application of stricter national measures under Article 458 of the CRR), the Member State can make a separate national authority responsible, the so-called **designated authority**.[148] (Member States may designate more than one authority for the purposes of identifying G-SIIs and O-SIIs.)

Finally, additional procedural rules apply to the countries that will be part of the **Single Supervisory Mechanism** (SSM). Under the SSM Regulation,[149] the national authorities of participating Member States must notify the ECB of their intention to implement measures aimed at addressing systemic or macroprudential risks (Article 5(1)). The ECB can object to these measures. Similarly, the ECB is required to notify the national authorities (Article 5(4)) of its intention to apply higher capital buffers than already applied by the national authorities or more stringent measures to address systemic or macroprudential risks (Article 5(2), "topping up" power). The national authority may object to the measures. These objections, expressed by means of opinions, are not legally binding, but there is a

[148] In most Member States, the designated authority under the CRD IV/CRR will be the national central bank, but in a significant minority of cases, it will be the (sometimes still to be established) macroprudential authority (see the ESRB Recommendation on the macro-prudential mandate of national authorities). In a few Member States where the central bank is not exclusively responsible for banking supervision, the designated authority will be the banking supervisor or a government ministry. For the instruments that are not regulated under the CRD IV/CRR, Member States are free to determine the responsible authority.

[149] Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions. OJ L 287, 29.10.2013, p. 63.

general duty of cooperation in good faith that applies to the national authorities and the ECB (Article 6(2)).

The SSM Regulation specifies that for the purpose of carrying out its tasks under the SSM Regulation the ECB shall apply all relevant EU legislation, and where this EU law is composed of directives, the national legislation transposing those directives (Article 4(3) SSM). The notification obligation and topping-up power would therefore not apply to exclusively national instruments, such as the LTD and LTSF caps.

5.2 Liquidity coverage requirement

There is a **liquidity coverage requirement** in terms of a general obligation on institutions to hold liquid assets to cover their outflows under stressed conditions over a period of 30 days and which applies immediately with the entry into force of the CRD IV/CRR (Article 412(1) of the CRR). A more specific quantitative requirement in the form of a ratio will be phased in as of 2015 by a Commission delegated act. Banks are allowed to use the liquid assets to meet their obligations under stressed circumstances (Article 412(3) of the CRR). These can be bank-specific but may also be of a wider, market-related nature, or both. Member States have the option to introduce or maintain national liquidity requirements before the LCR is specified and fully introduced in the EU (Article 412(5) of the CRR). This provision could possibly be applied in combination with Pillar 2 measures (Article 103 of the CRD IV).

A **liquidity reporting** requirement applies immediately as of the day of entry into force of the CRD IV/CRR, but the scope of the reporting obligation could be adjusted in 2015 with the introduction of the binding LCR requirement (Article 415(1) of the CRR). Since 2011, however, the EBA has been collecting data on its own initiative through a voluntary LCR data collection exercise. In 2013 this exercise was broadened to include NSFR data.

A **(time-varying) LCR buffer** is a potential macroprudential instrument that can take the form of a (time-varying) buffer be introduced over and above the minimum prudential requirement (see Section 3.1). There are two possible ways to apply the buffer. First, the competent or designated authority could for reasons of macroprudential or systemic risk use the procedure under **Article 458 of the CRR** (national flexibility measures). This article should only be used where Pillar 2 liquidity measures are deemed ineffective and inadequate to address the systemic liquidity risk.[150] Second, the national competent authority could in principle also use **Article 103 of the CRD IV** (Pillar 2) to impose a time-varying LCR on institutions with a similar liquidity risk profile.

5.3 Stable funding requirement

There is a **stable funding requirement** in terms of a general obligation on institutions to ensure that long-term obligations are adequately met with a diversity of stable funding instruments under both normal and stressed conditions (Article 413(1) of the CRR) and which applies from 2016

[150] The requirement that Pillar 2 measures are considered before having recourse to Article 458 of the CRR, however, does not concern the cases where the stricter national measures of Article 458 address the whole banking sector.

(Article 521(2)(b) of the CRR). A more specific requirement on stable funding in the form of a ratio might be introduced following a legislative proposal by the Commission no earlier than 2017. Similarly to the liquidity coverage requirement, the CRR provides Member States with the option to introduce or maintain national provisions in the area of stable funding requirements before binding minimum standards are specified and fully introduced in the EU (Article 413(3) of the CRR). This provision could possibly be applied in combination with Pillar 2 requirements (Article 103 of the CRD IV). In contrast to the liquidity coverage requirement, however, there is no comparable possibility for the bank to go below the minimum stable funding requirement without supervisory approval.

A **stable funding reporting** requirement applies immediately as of the day of entry into force of the CRD IV/CRR.

A **(time-varying) NSFR buffer** is a potential macroprudential instrument that, just like a (time-varying) LCR, can take the form of a (time-varying) macroprudential buffer over and above the minimum prudential buffer (Section 3.2. See also the comments in Section 5.2 which apply here as well).

5.4 LTD and LTSF limits

(Time-varying) LTD and LTSF limits as described in Section 3.3 are possible **national instruments** that fall outside the scope of the CRD IV/CRR and are therefore left to national discretion. However, if such limits are introduced as a macroprudential measure under Pillar 2 using Article 103 of the CRD IV, the EBA would need to be involved in the way described in Section 5.1.

Following the ESRB Recommendation on intermediate objectives and instruments of macroprudential policy, prior to the application of such measures at the national level, the ESRB will need to be informed in the event that significant cross-border effects on other Member States or the single market are expected. Moreover, if an authority is of the view that reciprocity is needed it should notify the ESRB and the national macroprudential authorities of the Member States concerned.

5.5 General liquidity surcharge

A Pigouvian-type liquidity surcharge as described in Section 3.4 could be introduced on the basis of **Article 105 of the CRD IV**. This article provides for the application of administrative penalties or other administrative measures, including prudential charges, reflecting the difference between the actual liquidity position of a bank and any liquidity and stable funding requirements established at national (e.g. LTD or LTSF limits) or EU level (e.g. the LCR, NSFR).

However, there are a number of interpretation issues in relation to this article. First, it is ambiguous whether the measures mentioned are intended only for a transition period until the new liquidity and stable funding requirements are implemented at EU level (Recital 102 of the CRD IV) or whether they would also apply beyond this period as the general wording of the last paragraph of Article 105 of the CRD IV would seem to suggest.

Second, Article 105 of the CRD IV also relates to the **Pillar 2** requirements since its first paragraph refers to the SREP. Accordingly, the competent authority will, for the purpose of determining the appropriate level of liquidity requirements, assess whether any specific liquidity requirements are necessary in order to capture liquidity risks to which an institution is or might be exposed, taking into account, among others, systemic liquidity risk that threatens the integrity of the financial markets of the Member State concerned. The use of Article 105 of the CRD IV under Pillar 2 also opens up the possibility of combining it with **Article 103 of the CRD IV**, i.e. applying it in a similar or identical way to institutions with a similar risk profile.

5.6 Liquidity surcharge for SIIs

A liquidity surcharge could also be envisaged for SIIs, in particular systemically important banks as a subset of all banks in a Member State. (See the comments in Section 5.5, which also apply here).

Chapter 6
Pillar 2 and its macroprudential use[151]

[151] This chapter was prepared by a team led by Olivier Jaudoin (Banque de France) and comprising Caroline Niziolek (Oesterreichische Nationalbank), Philipp Hochreiter (Finanzmarktaufsicht Öesterreich), Stijn Ferrari (Nationale Bank van België/ Banque Nationale de Belgique), Michal Skorepa (Česká národní banka), Jens Reich (Bundesanstalt für Finanzdienstleistungsaufsicht), Ulla Tischler (Eesti Pank), María Luisa Leyva (Banco de España), Luis Garcia (European Banking Authority), Alvaro Benzo, Florentine Hopmeier and Sebastijan Hrovatin (European Commission), Balazs Zsamboki (European Central Bank), Jukka Vauhkonen (Suomen Pankki – Finlands Bank), Jean-Baptiste Feller (Banque de France/Autorité de contrôle prudentiel et de résolution), Anna Maria Rinaldi (Banca d'Italia), Dobromił Serwa (Narodowy Bank Polski), Ana Rita Mateus (Banco de Portugal), Gabriela Hoholea (Banca Naţională a României), Matilda Gjirja (Finansinspektionen), Vicky White (Bank of England/Prudential Regulation Authority), Timon Kosenko and Marcel-Eric Terret (ESRB Secretariat). Support was provided by Jeroen Brinkhoff from the ESRB Secretariat in the function of Secretary.

Executive summary

Pillar 2 provides a broad toolbox to address firm-specific systemic risks. The tools include, among others, additional own funds, specific treatment of assets, limitation of operations, tightening of liquidity requirements and additional disclosure. These tools can be used as a targeted "add-on" to the other macroprudential instruments.

The Supervisory Review and Evaluation Process (SREP) evaluates whether a bank contributes to systemic risks, as identified by macroprudential authorities. The competent authorities can use Pillar 2 measures to prevent or mitigate these risks and should do so when they offer the most effective and efficient solution.

Pillar 2 has the advantage of offering different tools to address systemic risks. It can target specific banks and specific exposures.

The main disadvantages are the potential lack of transparency and coordination between micro- and macroprudential authorities. Pillar 2 measures should be used on their own merits to address systemic risk and not as a means of circumventing the coordination and disclosure requirements related to the other macroprudential instruments.

These disadvantages can be overcome in two ways.

- It is recommended that the competent authority coordinates with the national macroprudential authority when evaluating systemic risks under the SREP and when addressing systemic risks by using Pillar 2 measures.
- It is recommended that competent authorities require bank disclosure of applied Pillar 2 measures addressing systemic risks, where it is considered that disclosure would be beneficial for financial stability and without prejudice to the disclosure level of microprudential Pillar 2 measures.

1 Pillar 2 as a macroprudential tool

The aim of Pillar 2 is twofold: to address (elements of) risks that are not sufficiently covered by Pillar 1 and to provide incentives for banks to enhance risk management. To this end, Pillar 2 is based on the SREP and enables Member States to impose requirements aiming to improve the internal procedures, controls and risk management of banks. This chapter, however, focuses on the macroprudential use of other measures including additional own funds, the strengthening of liquidity requirements, and additional disclosure (Section 2).

The CRD IV allows Pillar 2 to be used for macroprudential purposes.[152] It requires competent authorities to take systemic risks into account when carrying out SREPs. Indeed, competent authorities should take into account not only the risks to which the institutions are or might be exposed but also the risks that an institution poses to the financial system.

Where national authorities previously were able to address a systemic risk through national regulation, this risk may now be covered through Pillar 2. Before the current CRD IV/CRR came into force, authorities in Member States could address a systemic risk through national regulation "topping-up" the Pillar 1 or Pillar 3 requirements (minimum harmonisation rules under the previous CRDs). By contrast, the current CRD IV/CRR contains maximum harmonisation rules. Only pre-defined and delimited requirements may be set within Pillar 1 and Pillar 3, while Pillar 2 allows more flexibility. Hence, if the requirements in Pillar 1 and Pillar 3 are deemed insufficient or inadequate, competent authorities may apply Pillar 2 to address systemic risks.

Furthermore, the CRD IV provides that Pillar 2 measures can be applied to a group of institutions with similar risk profiles. Systemic importance is a possible criterion justifying such group measures.[153] This means that the *same* measure can be applied to different banks with similar profiles, but they need to be applied on an *individual* basis, because Pillar 2 measures are entity specific.

[152] Articles 97 and 98 of the CRD IV.

[153] The EBA is mandated to monitor supervisory practices in that respect. The EBA must also issue guidelines specifying how similar risks should be assessed and how to ensure that Article 103(1) of the CRD IV on the application of supervisory measures to institutions with similar risk profiles is consistently applied.

Box 6.1
Pillar 2: ICAAP, SREP and stress tests

Pillar 2 is not merely a simple capital adequacy assessment. It combines institutions' Internal Capital Adequacy Assessment Process (ICAAP) and supervisors' Supervisory Review and Examination Process (SREP). Pillar 2 measures can only be applied once conclusions have been drawn from the SREP, which also involves assessing the ICAAP, accompanied by supervisory stress tests. In principle, the bank and the competent authority have similar incentives to identify and assess risks that the bank itself is exposed to, but the bank has no incentive to identify and assess systemic risks which it poses to the system itself.

Competent authorities should therefore pay special attention to systemic risks which the bank poses to the system, e.g. by including this assessment in an annual stress test. The CRD IV requires the EBA to draft guidelines to further specify common procedures and methodologies for the SREP. The identification and assessment of systemic risk based on the bank's potential systemic impact should be part of these guidelines.

A stress test is a useful tool to assess systemic risks and the results can be used as a basis for applying Pillar 2 measures. Stress tests of individual banks have been used regularly as a supervisory tool by microprudential supervisors in order to identify risks and potential capital absorbency needs. Coordinated stress tests that cover large parts of the banking system are more recent. When used for microprudential purposes they provide a valuable tool to benchmark banks and the results of various stress tests performed by banks. For macroprudential purposes, they provide valuable information by revealing how significant economic or financial shocks would affect the banking system as a whole.

Stress tests and most macroprudential instruments share a common objective, namely building resilience. They are not substitutes but complements: the indicators used to implement macroprudential tools can be useful in designing the stress test scenarios, while the capital losses or liquidity strains revealed by the stress test can help calibrate macroprudential tools.

2 Macroprudential instruments under Pillar 2

There are many different instruments available to competent authorities under Pillar 2.[154] Although the CRD IV provisions on Pillar 2 expressly mention systemic risk in relation to additional own funds requirements, the range of Pillar 2 measures for macroprudential purposes is much broader. They include at least the following measures.

- Additional own funds requirements. The use of this is mandatory where risks or elements of risks are not covered by the capital requirement under Pillar 1.[155] The size of the required additional own funds can be calculated, for example, by assuming an increase of the applicable risk weights for the relevant portfolio.
- Requirements to reinforce internal capital adequacy assessment and internal governance arrangements, as well as establishing recovery and resolution plans.
- Requirement for the bank to present a plan to restore compliance with supervisory requirements.
- Requirement to apply a specific provisioning policy or treatment of assets (i.e. specific weighting of assets in the calculation of own funds requirements, re-classification/valuation of assets according to their risk profile); requirement to limit certain business and/or operations or to reduce risks. These tools are well suited to address sectoral systemic risks.
- Restrictions on variable remuneration, requirements to use net profits to strengthen own funds, restrictions on (or prohibition of) distributions or interest payments to shareholders and other own fund providers.
- Specific liquidity requirements. The competent authority must take several elements into account, including systemic liquidity risk threatening the integrity of the financial markets.
- Additional reporting or disclosure requirements.

This list is non-exhaustive. Member States may empower their competent authorities to use other tools deemed useful for Pillar 2. Note however that Member States cannot use Pillar 2 to loosen the requirements below the Pillar 1 (or CRR) minimum applicable to all institutions.

Most of the tools under Pillar 2 complement the macroprudential instruments in Pillar 1 and Pillar 3. Their economic impact is therefore transmitted through the same channels. Pillar 2 measures can work both as price instrument (by increasing the capital requirements) or as a volume instrument (by limiting certain exposures). They can also be used to enhance transparency by requiring additional reporting or public disclosure. The macroprudential use of the additional own funds requirement under Pillar 2 can be based on the risk drivers and indicators identified for the SRB (Chapter 4). However, since the Pillar 2 measures are firm specific, the indicators also need to be applied at the level of the individual entity, rather than to the entire sector.

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[154] Articles 104 and 105 of the CRD IV list the powers that competent authorities can use under Pillar 2. In this handbook these powers are referred to as Pillar 2 tools or Pillar 2 instruments.

[155] Article 104(2)(b) of the CRD IV.

One difference between other macroprudential instruments and Pillar 2 measures concerns eligible capital. The buffers for systemically important institutions and the SRB can only be met by CET1 capital. Under the CRD IV, however, Pillar 2 additional capital requirements can be met by regulatory own funds that are lower quality, at the discretion of the competent authority.[156]

Another difference concerns the supervisory consequences in the event of a breach of the requirements.[157] Failure to meet the macroprudential buffers will be sanctioned by a restriction on distributions of profits and the requirement to draw up a capital conservation plan. If this plan is rejected by the competent authority, other necessary measures will be imposed. By contrast, in the event of a breach of Pillar 2 requirements, the competent authorities can take the immediate supervisory measures deemed necessary, just as in the case of a failure to meet the minimum capital requirements under Pillar 1.

[156] Principles for setting additional own funds requirements based on the SREP outcomes and the question of the quality of own funds to be eligible for such purposes will be addressed by the EBA in the guidelines on common procedures and methodology for the supervisory review and evaluation process.

[157] Articles 102, 141 and 142 of the CRD IV.

3 The interplay between Pillar 2 and other measures

In contrast to Pillar 1 requirements, Pillar 2 measures are firm specific. The decisions taken under Pillar 2 are individual decisions applicable only to an institution or to a specific list of institutions. Consequently, Pillar 2 measures can target individual institutions or a group of institutions with a similar risk profile and can thereby be tailored to fit a particular situation. By contrast, Pillar 1 measures apply to all banks.

There is an economic as well as a legal basis for using Pillar 2 measures when certain systemic risks may not be addressed by other macroprudential instruments as effectively as by Pillar 2 measures. Ideally systemic risks are first addressed through general provisions, such as the CCyB. Pillar 2 measures must take those general provisions into account but can then complement them in order to increase the effectiveness of macroprudential policy and address the systemic risks of individual banks.

In practice Pillar 2 measures may be the first to be applied when targeting systemic risks. The reason for this is that firm-specific decisions may be easier and quicker to adopt than implementing general provisions. This is especially relevant in the case of a risk which materialises suddenly. Nevertheless, these Pillar 2 measures addressing systemic risk need to be revised if general measures under Pillar 1 are adopted thereafter.

Certain Pillar 2 measures, if used for macroprudential purposes, overlap with the national flexibility measures.[158] The scope of the Pillar 2 measures (own funds, large exposures, public disclosure, liquidity and risk weights) is largely the same as the national flexibility measures under Article 458. Their scope of application is also similar as they can both be applied to a group of banks. As mentioned above, the national flexibility measures are only to be applied by the competent or designated authority after other measures, including Pillar 2 measures, have been considered.

[158] Article 458 of the CRR.

4 Advantages and disadvantages of using Pillar 2

The advantages of Pillar 2 measures are related to its flexibility. There are three main advantages for using Pillar 2 to address systemic risk.

1. Pillar 2 provides a broad set of supervisory tools. In particular, Pillar 2 measures can be used to impose capital requirements on certain portfolios of banks which are considered to be the root of the systemic risk. For instance, capital surcharges through assumed increases in risk weights can be implemented on specific segments of the mortgage market, targeting only new credits or specific high-risk segments such as high LTV mortgages.[159] Another example is the capital requirement addressing the risk of forex lending to unhedged borrowers, as recommended by the ESRB.[160] This enables the competent authorities to increase capital requirements on this specific part of the loan portfolio (i.e. those loans that are denominated in foreign currency) instead of applying the increase to all types of loans.

2. Pillar 2 allows the competent authority to address the source of systemic risks. The only constraint is that the competent authority should demonstrate – through its SREP or supervisory stress test – that a specific systemic risk is linked to the bank to which the Pillar 2 measure is to be applied. Pillar 2 can be used when an emerging systemic risk concerns only a group of banks and requires rapid intervention of the competent authority, for instance in the case of a sudden build-up of an unbalanced trading book in a few large banks.

3. Pillar 2 measures are not bound by pre-defined limits. The competent authority can therefore adapt the measure and determine the appropriate size of the capital surcharge. An example is the risk weight floor on mortgages introduced in the framework of Pillar 2 by the Swedish supervisor Finansinspektionen in 2013. It set a capital add-on equivalent to a risk weight floor of 15% for Swedish mortgages, thereby tripling the capital requirement for mortgages applicable to Swedish banks using an IRB model. At this juncture, this would be more difficult to achieve using Pillar 1 measures.[161]

However, there are three disadvantages to using Pillar 2 measures to address systemic risks. These shortcomings are related to the microprudential nature of Pillar 2.

1. Pillar 2 measures typically lack transparency. They are unlikely to be disclosed because they may reveal confidential information. In the vast majority of Member States the publication of Pillar 2 decisions is governed by rules of professional secrecy. Although this may constitute a strength in the micro-supervision context, as it enhances the exchange of information between

[159] Note that this is achieved by the competent authority requiring additional own funds to be held under Pillar 2, equivalent to what the additional Pillar 1 requirement would have been if the risk weights were changed.

[160] Recommendation of the ESRB of 21 September 2011 on lending in foreign currencies (ESRB/2011/1), OJ C 342, 22.11.2011, p. 1.

[161] The introduction of the risk weight floor amounted to SEK 20 billion of extra capital, thereby tripling the capital requirement for mortgages applicable to banks using an IRB model. Achieving the same effect, i.e. tripling the capital requirement for mortgages at the targeted banks, using, for instance, the CCyB, would have required the buffer to be set at 21%. This buffer level would have had an unacceptable effect on other exposure classes, since the CCyB cannot be limited to just one exposure class. It would also have affected other banks as well, rather than just the targeted ones.

banks and competent authorities, it does not facilitate the conduct of macroprudential policy. Macroprudential policy in general benefits from public disclosure owing to its signalling effects. This is also why the disclosure of Pillar 1 macroprudential measures is required by law.

This shortcoming may be partially overcome however. The CRR promotes transparency by requiring institutions to disclose upon demand from the competent authority the results of their ICAAP, including the composition of the additional own funds requirements based on the SREP.[162] Thus, competent authorities can request disclosure of additional own funds requirements under Pillar 2 without having to disclose them themselves. They are recommended to do so for macroprudential purposes, however, where disclosure is considered beneficial for financial stability.

2. Coordination with macroprudential authorities is not required under the CRD IV with respect to Pillar 2 measures. The involvement of macroprudential authorities is therefore limited, which may lead to an unbalanced solution in the event of a conflict of interest between micro- and macroprudential supervision. When Pillar 2 measures are used for macroprudential purposes, full transparency towards and coordination with macroprudential authorities is beneficial to macroprudential policy. Section 5 discusses how to achieve this.

3. Unlike Pillar 1 requirements, Pillar 2 measures are firm specific. Pillar 2 measures are therefore more likely to be contested in discussions with supervisors and ultimately in court. Moreover, the bank concerned may put pressure on the competent authority to soften the measure.

In conclusion, Pillar 2 provides a broad and flexible toolbox to address systemic risks offering the possibility of tailor-made solutions. Competent authorities should choose Pillar 2 on its own merits and not use it in order to circumvent the coordination and disclosure requirements related to alternative macroprudential instruments. Competent authorities should coordinate as far as possible their macroprudential Pillar 2 measures with the relevant national macroprudential authorities. In addition, competent authorities are recommended to require banks to disclose applied Pillar 2 measures addressing systemic risks, where disclosure would benefit financial stability and without prejudice to disclosure level of microprudential Pillar 2 measures.

[162] Article 438(b) of the CRR.

5 Institutional issues

There is no legal obligation in the CRD IV to inform or consult the ESRB or a national macroprudential authority on the use of Pillar 2 for macroprudential purposes. When a supervisory review shows that an institution poses a systemic risk, the competent authority is required to inform the EBA about the results of the review. Notification to the EBA is also required when the competent authority decides to apply Pillar 2 measures to a group of institutions with similar risk profiles. Where the measure is addressed to individual institutions, only general communication procedures between competent authorities and the EBA apply.

As mentioned above, it is recommended that competent authorities coordinate with macroprudential authorities when evaluating systemic risks under the SREP and when considering Pillar 2 measures to address these risks. Indeed, input from macroprudential authorities in the context of the SREPs can aid and facilitate the competent authorities' assessment of systemic risks. Furthermore, by adopting Pillar 2 measures to prevent or mitigate systemic risks, the competent authority affects the overall systemic risk, which is relevant to the macroprudential authority. Even without a legal basis in the CRD IV/CRR this cooperation is beneficial and recommended both at the national and European level.[163]

One way of achieving this cooperation could be for the ESRB to issue a recommendation to competent authorities and the EBA in relation to the use of Pillar 2 measures to address a certain systemic risk. The ESRB can provide warnings and issue recommendations. Thus, the ESRB can recommend that national competent authorities apply Pillar 2 measures and that the EBA issue guidelines harmonising the implementation of the recommended Pillar 2 measures by the national authorities. An example of this is the ESRB Recommendation on lending in foreign currencies, which was followed by EBA guidelines.[164]

Finally, coordination between different competent authorities is facilitated by the colleges of supervisors. Most Pillar 2 decisions addressing systemic risks are applied to banking groups for which a college of supervisors has been established. The college must try to reach agreement on the conclusions of the SREP, including the evaluation of systemic risks, and any additional own funds and liquidity requirements under Pillar 2 to address these risks.[165] In the absence of a joint decision, the competent authorities may take individual decisions on the entities they supervise, but only after every effort has been made to reach an agreement, unless the EBA takes a binding decision after a mediation process. The consolidating supervisor, chairing the college, may invite the relevant macroprudential authorities as observers in the college.

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[163] Article 56(b) of the CRD IV provides for the exchange of information between the competent authorities and the authorities responsible for maintaining the stability of the financial system in the Member State through the use of macroprudential rules.

[164] Recommendation of the ESRB of 21 September 2011 on lending in foreign currencies (ESRB/2011/1), OJ C 342; The EBA published guidelines on capital measures for foreign currency lending to unhedged borrowers under the SREP on 20 December 2013 (EBA/GL/2013/02).

[165] Article 113 of the CRD IV. Note that a joint decision is not required for other Pillar 2 measures to address systemic risks, such as increased disclosure or limits on the distribution of profits.

Chapter 7
National flexibility measures under Article 458 of the CRR[166]

[166] This chapter was prepared by a team led by Silvia Pezzini (Bank of England) and comprising Alexander Trachta (Oesterreichische Nationalbank), Mario Deprés (Banco de España), Balazs Zsamboki (European Central Bank), Luis Garcia (European Banking Authority), Andreas Strohm (European Commission), Jean-Luc Thevenon (Autorité de contrôle prudentiel et de résolution), Roberta Fiori (Banca d'Italia), Tomasz Gromek (Narodowy Bank Polski), Florin Balauta (Banca Nationala a Romaniei), Erik Lenntorp (Sveriges Riksbank), Marcus Petterson (Sveriges Riksbank), Marcel-Eric Terret (ESRB) and Valia Rentzou (ESRB). Support was provided by Carmelo Salleo and Timo Kosenko from the ESRB Secretariat in the function of Secretary.

Executive summary

Article 458 of the CRR includes "national flexibility measures" that allow national authorities to impose stricter prudential requirements to address systemic risks subject to strict legal requirements and a notification/approval procedure. The instruments in Article 458 of the CRR serve different purposes and target different dimensions of systemic risk. They may be applied by the competent or designated authorities for up to two years, with possibility of extension. The aim of this chapter is to provide operational guidance on the use of the following measures (instruments) for the purpose of macroprudential policy.

- **Own funds requirements** may be increased above the level laid down in the CRR, that is a Common Equity Tier 1 capital ratio of 4.5% of risk-weighted assets, a Tier 1 capital ratio of 6% of risk-weighted assets and a total capital ratio of 8% of risk-weighted assets.
- **The capital conservation buffer** may be increased above the level laid down in the CRD IV, that is a common equity Tier 1 ratio of 2.5% of risk-weighted assets.
- **Measures concerning intra-financial sector exposures** which may include a tightening of, in principle, all CRR prudential measures for intra-financial sector exposures. This Handbook focuses on risk weights, capital buffer add-ons and tightening of large exposure limits on risk exposures to other banks, investment firms, insurers, a range of investment funds and other regulated and unregulated financial institutions. Alternatively, these measures may target securitisation, covered bonds and other financial sector exposures.
- **Measures concerning large exposure requirements** which may include tightening the limits on single-exposure concentrations or the less stringent limits that trigger intensive supervision and monitoring. Alternatively, currently existing exemptions for certain sets of exposures may be removed.
- **Public disclosure requirements** may include requiring institutions to disclose at a higher frequency, at a more granular level, or using specific formats.

Additional instruments provided for in Article 458 of the CRR target liquidity and real estate-related systemic risks and are described in the separate thematic chapters in this Handbook.

The key policy messages of this chapter are as follows.

- **Application of the national flexibility measures under Article 458 of the CRR is limited in scope and subject to a series of both procedural (regulatory) and substantive conditions.** National authorities may only use these instruments if they can justify that they are necessary to address particular systemic risks and that these risks cannot be adequately addressed by a specified list of other instruments, e.g. Pillar 2. Furthermore, the use of the instruments provided for in Article 458 of the CRR is subject to a demanding notification/approval process, involving notification by the national authority, the provision of opinions by the ESRB and EBA, a proposal from the European Commission and a European Council decision.

- **In the context of the notification/approval process, national authorities will need to provide clarity about the intended objectives of the planned measures,** the expected benefits and whether they envisage potential unintended consequences and cross-border spillovers.

- **The ESRB plays an important role in the approval process,** as the CRR requires the ESRB to submit an opinion to the European Commission on the appropriateness of using the instruments notified under Article 458 of the CRR. More broadly, the ESRB also has a key role to play in advising how national macroprudential policies can be designed to mitigate any material unintended consequences and cross-border spillovers. The ESRB will focus on the overall benefits of macroprudential measures from a financial stability perspective considering both domestic and cross-border effects. As countries gain more experience with macroprudential policy and learn about its implications, the ESRB will play a key role in improving the collective understanding of its effects, domestic and cross-border, and of how different instruments interact with each other and with other policies.

1 National flexibility measures under Article 458 of the CRR

Article 458 of the CRR provides for “national flexibility measures” that enable national authorities to impose stricter prudential requirements to address systemic risks subject to strict legal requirements. In particular, measures may only be applied pursuant to Article 458 of the CRR if the national authority can justify that the identified systemic risk cannot be adequately and effectively addressed by other instruments. Furthermore, they are subject to a notification and approval process, involving opinions from the ESRB and EBA on the envisaged national measures, a possible proposed implementing act of the European Commission and a final decision by the European Council.

Article 458 of the CRR provides for a broad set of possible measures (instruments) concerning the level of own funds, large exposure limits, public disclosure requirements, the level of the capital conservation buffer, liquidity requirements, risk weights for the residential and commercial property sector, and intra-financial sector exposures.

This chapter outlines the main characteristics of these instruments with the exception of those related to liquidity and real estate systemic risks, which are described in separate thematic chapters.

2 Overview of instruments and transmission mechanism

National flexibility measures can be used to mitigate both cyclical and structural aspects of systemic risk. A short overview of the instruments and their transmission mechanisms is given below. More detailed discussion on specific instruments can be found in Section 3.

Own funds requirements and the capital conservation buffer

Higher own funds requirements and capital conservation buffers reduce broad-based systemic risk by increasing banks' resilience and their capacity to absorb future potential losses when existing levels of minimum requirements are considered insufficient. Like other capital instruments, they can also help to excessive credit growth and leverage insofar as they increase the internal cost of providing loans. The macroprudential measures related to own funds and the capital conservation buffer requirements entail increasing the level above the minimum microprudential requirements (Pillar 1).

Measures for intra-financial sector exposures

These measures are aimed at reducing risks arising from excessive or underpriced intra-financial sector exposures. They can also be used to reduce concentrations of exposures within the financial sector and interconnectedness. The category encompasses a broad range of macroprudential measures which can be applied to risk exposures to other banks, investment firms, insurers, a range of investment funds and other regulated and unregulated financial institutions. These risk exposures may include securitisation, covered bonds and other financial sector exposures. The macroprudential measures include increasing risk weights, imposing capital buffer "add-ons" and tightening large exposure limits. Other measures might be adopted when macroprudential authorities have gained more experience with risks in the financial sector and how to tackle them.

Large exposure requirements

Large exposure requirements can be tightened to address systemic risk arising from high counterparty concentration and interconnectedness (and the associated potential for contagion). In some cases, tightening can also have indirect effects on the intermediate objective of mitigating and preventing excessive credit growth. The microprudential regime for large exposures sets strict limits on single-exposure concentrations and other less stringent limits that trigger intensive supervision and monitoring. An authority could make these limits stricter using Article 458. Quantitative limits could be set at higher levels for particular subsets of institutions and current exemptions for specific sets of exposures could be removed.

Public disclosure requirements

This instrument complements other requirements and measures by facilitating public scrutiny of financial institutions. As a result, it strengthens the resilience of the financial system. Possible macroprudential measures include requiring institutions to disclose information at a higher frequency, at a more granular level, or using specific formats. Increased public disclosure can boost market discipline, reduce information asymmetries and enhance comparability of information across different institutions.

3 Description of instruments

3.1 Own funds requirements and capital conservation buffer

Macroprudential goal

To reduce broad-based systemic risk when other capital measures or buffers are considered insufficient.

Microprudential regime

The own funds requirement sets a minimum level of a Common Equity Tier 1 capital ratio of 4.5% of RWA, a Tier 1 capital ratio of 6% of RWA and a total capital ratio of 8% of RWA. The capital conservation buffer is a common equity Tier 1 "add-on" of 2.5% of RWA that provides additional loss-absorption capacity in stressed periods.

Macroprudential measures

Increase the level of own funds requirements (no upper limit).
Increase the capital conservation buffer above 2.5% of CET1 (no upper limit).

Advantages

Increase resilience against losses.
Incentive to reduce excessive or under-valued exposures.
Limitations on distributions (e.g. dividends) until institutions meet the requirement in full, which indirectly builds further capital and resilience.

Disadvantages

Potential incentive for banks to lend to riskier borrowers.
Deactivation might be delayed and inadvertently create a credit crunch.

Level of application of the measure

Consolidated or individual.

Scope of application

All domestically authorised institutions or a subset of them.

Institutional aspects

Description

Applying stricter macroprudential measures means either increasing the level of own funds requirements above their minimum levels or raising the capital conservation buffer above the 2.5% level.

There is an important difference between the two instruments. Own funds requirements must be complied with at all times. However, institutions can comply with the capital conservation buffer requirements progressively, provided that they limit their earnings distributions. Thus, increases in capital conservation buffers might be preferable to raising the level of own funds requirements if institutions' resilience can indeed be built up progressively in this way.

Intended objectives and impact

Rationale

Increases in own funds requirements or the capital conservation buffer effectively increase the minimum capital requirement for banks and can be considered as a response to broad-based systemic risk. In particular, an increase in systemic risk might be expected in the following cases, insofar as financial stability is threatened.

- A deterioration in the risk profile of all or of a subset of banks exposed to similar risks.
- An excessive supply of credit that might amplify the business cycle.[167]
- An excessive concentration of risks to a specific sector of the real economy when sectoral measures are not sufficient.

Impact

There are two main channels through which these instruments affect systemic risk.

- Increase in resilience against losses. This can be done either through raising additional capital or organically through retained earnings and limitations on distributions (e.g. dividends).
- Incentive to reduce excessive credit growth or to restructure portfolios in favour of lower risk assets.

Unintended domestic effects

First, higher capital requirements might increase the internal cost of providing loans and reduce the flow of credit to the real economy.[168] Recent studies, such as the report by the Basel Macroeconomic Assessment Group, have analysed the quantitative impact of an increase in capital requirements on banks' lending behaviour.[169] Most find that an increase in regulatory capital requirements generates a modest tightening in credit conditions.

Second, higher capital requirements might generate undesired effects when systemic risk (e.g. excessive lending) is concentrated in certain economic sectors or activities. Increasing the amount of capital across the whole balance sheet might encourage banks to reduce the provision of credit to sectors with sustainable growth and low profitability while continuing or increasing credit supply to higher-growth, higher-risk activities. This could occur in the absence of a commensurate increase in risk weights and have a negative effect on healthy parts of the economy without reducing systemic risk.

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[167] Please note that this risk could also be addressed by the CCyB.

[168] In certain circumstances, however, slower growth in credit will be an intended effect.

[169] See, for an overview of the empirical literature, CGFS (2012) and Macroeconomic Assessment Group (2010).

Third, negative effects on lending might also arise if deactivation of the instruments is unduly delayed. Requiring a higher own funds ratio than is needed might hamper credit supply and limit the potential of the real economy.

Complementarity and substitutability with other capital instruments

The transmission mechanism of own funds requirements and the capital conservation buffer is similar to that of other capital requirements and capital buffers provided for in the CRD IV/CRR. The key differences are as follows.

- Unlike the CCyB, these two measures can directly and uniformly apply to all exposures, not only domestic exposures.
- Unlike the SRB, which must be at least 1%, there are no restrictions on the calibration of these instruments.
- Unlike Pillar 2 measures, these measures are transparent and help anchor financial markets' expectations on the macroprudential stance.

Cross-border spillovers

An increase in own funds requirements or the capital conservation buffer at the national level can have both positive and negative spillovers on the financial system of other countries.

Positive cross-border spillovers include:

- A lower risk of contagion for other countries and a lower probability of a systemic crisis by improving the resilience of the domestic banking system and reducing the probability and impact of potential defaults.
- Signals an increase for specific risks, also at a cross-border level.
- Contributes to containing an excessive supply of credit that might amplify the financial cycle and threaten financial stability in countries with synchronous financial cycles.

Negative cross-border spillovers include:

- A shift of voluntary capital buffers from other entities in the group, reducing their resilience to a possible stress and their ability to extend credit and support economic activity.
- A reduction of cross-border lending which, in the case of countries with asynchronous cycles, could (in the absence of alternative funding sources) damage potential economic growth.
- A sudden change in market sentiment if the measures are perceived as reflecting concerns as to the soundness of a banking system. This could threaten financial stability in banking systems with similar characteristics and business models, leading to a generalised loss of confidence.

Cross-border coordination regarding, for instance, reciprocity and the appropriate phase-in of measures could mitigate negative cross-border spillovers.

3.2 Measures for intra-financial sector exposures

Macroprudential goal

To reduce systemic risk from exposures towards the financial sector (or sub-sectors) by changing the prudential requirements on risk exposures to other banks, investment firms, insurers, a range of funds and other regulated and unregulated financial institutions.

Microprudential regime

Risk weights or capital buffers applied to institutions, securitisation, covered bonds, etc. but the range of permissible measures is wide.

Macroprudential measures

In principle all (Pillar 1) CRD IV/CRR prudential measures are available. Measures could include (on stock/flows):

Increasing microprudential capital requirements (e.g. via floors in the Standardised Approach (SA) or multipliers/parameter floors in the Internal Ratings-Based (IRB) approach).
Tightening the large exposures limit.

Advantages

Increasing capital requirements enhances resilience against losses.
Increasing the cost of funding for financial entities and signalling their riskiness may create incentives to reduce excessive or underpriced exposures.
Tightening large exposure requirements reduces interconnectedness.

Disadvantages

Regulatory arbitrage.
May also affect banks' decisions on lending to real economy.

Level of application of the measure

Consolidated or individual.

Scope of application

All domestically authorised institutions or subsets of them; all exposures at those institutions or a subset of them.

Institutional aspects

Description

This tool comprises measures to change the prudential requirements with respect to intra-financial sector (or sub-sector) exposures. Its purpose is to target sectoral risks which are likely to pose a threat to financial stability. The measures can be used in a countercyclical manner, e.g. to counter excessive credit growth within the financial sector and absorb related losses during a downturn, but also to address structural developments (e.g. excessive exposures to certain types of financial entities).

Threats to financial stability include the concentration of risk within the financial sector or towards a small number of counterparties (e.g. monoline insurers) or excessive risk-taking and leverage fuelled by intra-financial sector credit. The network of intra-financial sector exposures may also increase the potential for contagion via counterparty risk. Shocks to one or more institutions also pose liquidity risks.

National flexibility measures to change the capital requirements for intra-financial exposures can take several forms. For example, the microprudential sectoral risk weights could be increased by applying a multiplicative scalar (either to the IRB parameters or to the IRB outcome directly) or by raising risk weights for certain exposures (for banks using the SA).[170] More specifically, for IRB banks, this could include introducing, or increasing if already existing, floors to specific parameters (e.g. PD, LGD, AVC[171]) or adding a multiplicative scalar or capital buffer add-ons to the IRB capital charge (KIRB). An additional measure could be to tighten the large exposure limit.

Intended objectives and impact

Rationale

If exposures in the intra-financial sector are judged to be excessive (in absolute terms or relative to real economy lending) or underpriced and to create threats to financial stability, macroprudential authorities may seek to mitigate this vulnerability by increasing banks' capital requirements with respect to intra-financial sector exposures. This will have the effect of increasing banks' resilience to potential losses on these exposures by requiring them to hold extra capital against them. It will also discourage new lending in the sector by making these exposures more costly to fund. An example is the temporary increases in risk weights and provisions in India in 2005-07. This tool might have been useful, in retrospect, in the United Kingdom between 2003 and 2007, when bank and other financial corporate debt rose sharply accompanied by increasing reliance on unstable, short-term wholesale funding (such as deposits from MMFs).[172]

Impact

Raising capital requirements for intra-financial sector exposures pursuant to Article 458 increases the amount of capital that banks must have when holding exposures to other financial sector entities, relative to the baseline set by the microprudential regime. Typically, prudential requirements with respect to these exposures are computed as part of the frameworks for credit risk, counterparty credit risk and market risk. Macroprudential authorities may want to use this measure when it is considered that lending within the financial sector poses a threat to financial stability, with the ultimate goal of reducing the likelihood and severity of financial crises.

Raising capital requirements for intra-financial sector exposures aims at reducing systemic risk via the following channels.

- By requiring banks to hold an additional buffer of capital against intra-financial sector exposures, it increases a bank's resilience and its capacity to absorb losses, which may be greater than anticipated under the credit risk measured by the normal microprudential regime.

[170] See Annex 5 of CGFS (2012).

[171] The asset value correlation (AVC) is the correlation between an obligor's creditworthiness and the general state of the economy and reflects interconnectedness between borrowers.

[172] Bank of England (2011).

- By raising the cost of providing credit in the financial sector (both in absolute terms and relative to other sectors), this measure provides an incentive for banks to rein in excessive or underpriced exposures.
- By reducing lending to the financial sector, this tool mitigates systemic risk by containing interconnectedness within the financial system and the possibility of contagion effects between institutions.

Empirical evidence on the impact of these measures is not yet available. Credit institutions' size and business models as well as the prevailing economic conditions will affect how they respond to the policy measure. Also, the speed of transmission of these measures will depend on whether they are applied to the stock of existing exposures, to new lending or both – these options all appear to be permitted under Article 458 of the CRR.

Unintended domestic effects

First, banks might attempt to circumvent tighter regulation, which would create leakages in implementation. For example, banks might do this by (i) modifying other model parameters to offset the macroprudential increase in capital requirements – supervisors should endeavour to monitor this; (ii) continuing to carry out the same activity but through a different legal entity not subject to the requirements; and (iii) by using derivatives to generate a synthetic exposure to a given asset rather than a formal exposure subject to risk weights. Also, institutions such as hedge funds might be difficult to define precisely, since they fall within other IRB categories (in this case, the corporate asset class).

Second, changes in capital requirements for intra-financial sector exposures might affect lending to the real economy as banks reassess their lending activities. Banks might either lend more to sectors of the real economy because they become relatively cheaper to fund or, conversely, they could reduce lending to the real economy if banks want to maintain intra-financial sector exposures unchanged as a share of their portfolio and do not intend raise new capital.

Cross-border spillovers

Setting higher capital requirements for or limits to intra-financial sector exposures could have similar spillover effects to those caused by increasing own funds requirements and large exposure limits. Such effects are likely to extend beyond national borders given the high degree of interconnectedness of the European financial system. However, the spillover effects may be less significant than those of own funds requirements, as limiting intra-financial exposures is a targeted measure.

Positive spillovers include:

- A lower risk of contagion and consequently a lower probability of a systemic crisis in countries with interconnected financial systems.

- Reduced risks to financial stability stemming from an excessive supply of credit where banks rely on cross-border funding and countries are in the same phase of a financial cycle.

Negative spillovers include:

- Constraining intra-financial sector credit in one country could limit the extension of credit to the real sector and thereby affect economic activity in another country where banks' supply of credit is heavily dependent on the availability of cross-border funding.
- If limits to intra-financial sector exposures are perceived as a concern over the soundness of banks or the financial system, it may contribute to a sudden shift in market sentiment against banking systems with similar characteristics.

Banks may also substitute intra-financial sector lending with direct cross-border lending to the real sector, thus supporting real sector activity. This could be considered as either positive or negative, depending on the business cycles of the respective countries. Cross-border coordination between authorities regarding reciprocity and the appropriate phase-in of measures could mitigate negative cross-border spillovers.

3.3 Large exposure requirements

Macroprudential goal

To reduce systemic risk from concentration and interconnectedness.

Microprudential regime

A counterparty exposure incurred by a bank is defined as "large" if its value is equal to or exceeds 10% of the bank's eligible capital. Meeting this definition triggers additional monitoring, control and reporting requirements. The limit for large exposures is 25% of the bank's eligible capital. For exposures to other banks, the value shall not exceed 25% of the bank's eligible capital or EUR 150 million, whichever is the higher under certain conditions.

Macroprudential measures

Reduce threshold for labelling counterparty exposures as "large".
Reduce the limit or remove exemptions for large exposures.
Apply more severe account of risks in computing exposures.

Advantages

Put upper bound on losses from counterparty default and from network effects.
Mitigate the risk of contagion posed by interconnectedness in the financial system.

Disadvantages

Might affect small banks relatively more than larger banks and lead to shift of credit demand and therefore risk concentration to larger banks.
Could introduce more synchronous shocks across banks through increase of exposures to common counterparties.
Might drive banks away from interbank funding and towards central bank and market funding.

Level of application of the measure

Consolidated or individual.

Scope of application

All domestically authorised institutions or subsets of them; all exposures at those institutions or a subset of them.

Institutional aspects

Description

Large exposure microprudential requirements aim to intensify the supervision of exposures to single counterparties when they reach critical levels and to restrict them beyond certain levels. The ultimate aim is to reduce the risk of concentration and contagion linked to counterparty default.

In the microprudential framework, an exposure is defined as large if its value is equal to or exceeds 10% of the lending bank's eligible capital.[173] The "large exposure" label triggers additional monitoring, control and reporting requirements with respect to the exposure. The size of a large exposure to a client or a group of connected clients is capped after taking into account the effect of credit risk mitigation techniques.[174] A number of exposures are exempted (e.g. central governments) and the regime allows for some national discretion (e.g. to fully or partially exempt covered bonds).

Macroprudential measures could include:

- reducing the 10% threshold for labelling counterparty exposures as "large" or the 25%/ EUR 150 million cap for counterparties, or groups of connected counterparties;
- removing exemptions included in the CRR (e.g. on exposures to central counterparties);
- adapting the method of calculating the exposure by mandating more severe models and mitigation techniques.

Under the national flexibility measures, national authorities may tighten the large exposure limit by a maximum of 15% for a period of up to two years following a simplified procedure (i.e. provided that justification and notification requirements are met).

Intended objectives and impact

Rationale

Tightening large exposure requirements pursuant to Article 458 is a quantity-based measure aimed at mitigating concentration risk and the risk of propagation of shocks through the financial system. While other policy measures can also be used to this end, policy-makers may sometimes prefer to rely, at least in part, on measures such as these rather than on price-based measures that affect

[173] Eligible capital for large exposure requirements includes Tier 1 and Tier 2 capital.

[174] Shadow banks are to be dealt with separately. The EBA will issue guidelines setting aggregate or individual limits for exposures to shadow banking entities which carry out banking activities outside a regulated framework. By end-2015, the Commission will assess the appropriateness and the impact of imposing such limits and will submit a report to the European Parliament and the Council, together, if appropriate, with a legislative proposal on exposure limits (Article 395(2) of the CRR).

the cost of credit, e.g. capital requirements.[175] Situations where a more stringent large exposure restriction may temporarily be activated are:

- an increase in interconnectedness between financial institutions, which increases the risk of systemic contagion via direct counterparty losses or via indirect exposures through other financial institutions;
- an increase in the sectoral concentration of banks' portfolios which is deemed to pose a systemic threat (e.g. concentration in a sector with only a few counterparties).

Impact

Large exposure restrictions, when applied to the individual exposures, mitigate contagion by limiting the maximum loss incurred in the event of counterparty default. Similarly, a tightening of large exposures aimed at a specific sector puts an upper bound on the losses from individual defaults in the sector. By applying large exposure limits to sub-sectors, e.g. shadow banks, limits may also help offset regulatory arbitrage.

Exposures tend to increase in financial cycle upswings, partly because exposure limits are set relative to capital. A tighter large exposure restriction compels banks to diversify their counterparty base thereby reducing the risk posed should a hub becomes financially distressed. Large exposure limits can also be used to contain exposure to specific sectors, e.g. if institutions cannot diversify their counterparties because substitutes do not exist.

There are very few empirical studies[176] on the effects of this instrument. Large exposure restrictions have so far been applied only as a microprudential tool and mainly as a backstop to the capital requirements. This results in considerable uncertainty on the intended as well as the unintended effects of large exposure limits on intra-financial and real economy lending.

Unintended domestic effects

The tightening of large exposure requirements is a quantity-based measure that can reduce the financial system's maximum capacity to lend and transact with an individual counterparty. If the impact on the cost of credit and liquidity is more significant than anticipated, negative consequences on lending to the real economy and intra-financial sector lending may follow. For example, limiting the amount of credit supplied to a particular economic sector or to large firms may inhibit growth in areas of the economy in which a country has a comparative advantage. Furthermore, stricter large exposure limits can lead to a shift of credit demand from smaller to larger banks.

[175] On the choice between the two types of instruments, see Chapter 8.

[176] There are some private sector impact studies on changes to large exposures regimes, e.g. The Clearing House (TCH) (2011), but which are less relevant in this context.

Finally, large exposure limits applied to interbank exposures might drive banks away from interbank funding and towards central bank and market funding, with potential unintended consequences for payment systems and the implementation of monetary policy.

Cross-border spillovers

Stricter limits on large exposures can be met through an increase in the level of capital held by a bank and/or through a reduction in the exposures to individual counterparties or groups of connected counterparties.

In the first case, any cross-border spillovers will be similar to those associated with higher requirements for own funds and the capital conservation buffer. The second case implies a cross-border shift of assets to banks operating abroad. Positive cross-border spillovers include diversification of certain risks (e.g. country risk). Negative cross-border spillovers include contagion risk and synchronicity of shocks faced by banks through exposures to common counterparties.

It is emphasised, however, that these are the positive and negative spillovers of sound policy decisions. An inappropriate tightening of large exposure limits could lead to further negative cross-border spillovers, including excessive deleveraging manifested through a credit crunch or fire sales and sudden changes in market sentiment which may be detrimental to financial stability and economic growth. A proper risk assessment and impact analysis of tightening large exposure limits as well as cross-border coordination could minimise the potential for and impact of negative cross-border spillovers.

3.4 Public disclosure

Macroprudential goal

Discourage excessive risk-taking and increase transparency to market participants when systemic risks are high.

Microprudential regime

Yearly (at least) disclosure of capital levels, buffers, requirements and exposure to various risks.

Macroprudential measures

Higher frequency of disclosure; higher granularity, e.g. by sector or location of exposures; requiring comparable formats for disclosure or disclosure on readily accessible media.

Advantages

Creates incentive for banks to take risks with appropriate safeguards in view of the necessity of disclosure.
Decreases uncertainty among investors.

Disadvantages

Risk of disorderly reactions in acute crisis.
May increase stress in weaker banks.

Level of application of the measure

Individual.

Scope of application

All domestically authorised institutions or subsets of them; all exposures at those institutions or a subset of them.

Institutional aspects

Description

The public disclosure requirements are a complement to the regulatory and supervisory requirements. Their aim is to increase market discipline by reducing information asymmetries. The microprudential regime requires disclosure of a broad range of items, mostly on (at least) an annual basis.[177] Some microprudential disclosure requirements are particularly relevant from a macroprudential perspective, such as capital buffer disclosures along with the geographical distribution of exposures, indicators of global systemic importance (as mentioned in Article 131(2) of the CRD IV[178]), asset encumbrance and market risks.

Intended objectives and impact

Rationale

The aim of macroprudential disclosure requirements is to reduce the probability of market failure associated with informational asymmetries: a "market for lemons"[179] and related phenomena like bank runs and liquidity spirals. Disclosure requirements give banks an incentive to anticipate and adjust their risk-taking policies and adopt sound risk management practices.[180]

More and high-quality disclosure can help mitigate systemic risk both during a crisis and during a boom. In particular, there are two roles for disclosure.

- When systemic risk is building up: increased disclosure could discourage excessive risk-taking in the light of possible scrutiny by supervisors and market participants.
- When systemic risk is high: by obliging banks to disclose more information about the risks to which they are exposed, supervisors help investors to better understand the financial conditions (risk profile) of each bank. This is likely to reduce uncertainty about which banks are viable and which need restructuring or resolution. Increased disclosure requirements, coupled with decisive action to clean up the banking industry, are believed to have accelerated the recovery in the Swedish financial crisis in the 1990s.

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177 For example, information relating to risk management objectives and policies; scope of application; level of own funds; capital requirements; exposure to counterparty credit risk; capital buffers; credit risk adjustments; use of External Credit Assessment Institutions (ECAIs); exposure to market risk and operational risk; exposures in equities not included in the trading book; exposures to interest rate risk on positions not included in the trading book; exposure to securitisation positions; remuneration policy; and leverage.

178 Article 131(2) of the CRD IV requires disclosure of five categories of indicators of global systemic importance: size of the group; interconnectedness; substitutability of the services or the financial infrastructure provided by the group; complexity; and cross border activity.

179 For example, in Akerlof's analysis, a market may altogether disappear (the most extreme form of illiquidity) if information is sufficiently asymmetric.

180 However, effective market discipline requires that (i) disclosure is meaningful and consistent across time and banks; and (ii) investors are able to process the information effectively and have the incentive and ability to rein in banks' risk-taking, which may be weak if the bank is considered "too important to fail". Sowerbutts and Zimmerman (2013).

Stricter disclosure requirements under Article 458 can be more effective if accompanied by a financial stability report giving a narrative of the facts to be disclosed and explaining the systemic risk that they are intended to mitigate.

Stricter disclosure requirements are also likely to reinforce the effects of other instruments by informing the public, investors/market participants and other banks of risks as well as of the regulatory actions taken to mitigate them. In this sense stricter disclosure requirements can be a useful complement to virtually all other instruments.

In addition to national flexibility measures, European bodies such as the EBA or the ESRB can facilitate coordination across countries and enable comparability of additional disclosure requirements.

Impact

Macroprudential authorities have recently started to use public disclosure as a macroprudential instrument.[181] Experience in terms of the effectiveness of disclosure as a macroprudential instrument for financial stability purposes has been varied. Market participants valued the disclosure exercise that accompanied the 2012 European and US stress tests which reduced information opacity and is thought to have contributed to reducing prevailing market stress.[182] Similarly, the disclosure associated with the 2012 Spanish banks' stress test, which released information on their loan books, allowed investors to form a better opinion both at the individual and sector level. On the other hand, market participants' reaction to the information disclosed destabilised banks' share prices. After the 2011 EBA stress test results were publicised, European banks' stocks fell and banks' CDS prices rose (although it is difficult to separate the effect of the announcement from that of other economic developments).

Unintended domestic effects

While there is general agreement that market discipline (Pillar 3) is overall beneficial, it may also result in negative externalities for financial institutions and for the financial system as a whole.[183]

A number of potential unintended effects can arise, linked to the time consistency of the desirability of disclosure, pro-cyclicality, distributional effects, and risks of disorderly reactions in acute crises.

- At times of general market uncertainty, financial markets cannot distinguish strong from weak banks. This means that there is in effect a cross-subsidisation from less risky to riskier banks. In times of acute crisis and contagion, removing cross-subsidies between banks can cause sudden shifts in market sentiment towards some banks.

[181] Examples include the ESRB Recommendations on funding of credit institutions (ESRB/2012/2, OJ C119, 25.4.2013, p. 1) and on money market funds (ESRB/2012/1, OJ C146, 25.5.2013, p. 1); the Financial Policy Committee recommendations in 2011 on disclosure of Basel III leverage ratios and in 2012 on greater consistency and comparability of UK banks' Pillar 3 disclosures; and the Swiss National Bank recommendation in 2012 on disclosure of risk-weighted assets.

[182] See Bank of England (2011) and Petrella and Resti (2013). Other empirical studies on stress tests include Ellahie (2012) and Bischof and Daske (2012).

[183] For an overview of the unintended consequences of banking regulation and supervision from a European perspective, see, e.g. Nouy (2013) and Tadesse (2006).

- At times of general market uncertainty and high risk aversion, disclosure can trigger adverse market reactions. Depositors may overreact to disclosure that reveals financial problems and cause a bank run despite the bank being solvent. Similarly, investors may force the bank's share price down. Both reactions would be inefficient insofar as they threaten the viability of the bank and would not have happened in the absence of disclosure. Individual failures could, in turn, have systemic implications if they trigger contagion in the financial system. When requiring additional disclosure at such times, authorities should have credible supervisory backstops in place for weak banks, including recovery and resolution plans.
- One theme in the theoretical literature argues that disclosure can distort institutions' incentives and lead banks to make sub-optimal choices. For example, in order to pass the stress tests and send a positive signal, banks may choose sub-optimal portfolios or inefficient asset sales that reduce economic efficiency, or decide to sacrifice long-term objectives to meet short-term goals.[184]

Cross-border spillovers

Positive cross-border spillovers of increased disclosure include:

- Providing/setting comparable benchmarks across jurisdictions, thus improving resource allocation and promoting the supply of funds to sound institutions.
- Building incentives to increase voluntary capital buffers, to contain excessive risk-taking and to adopt best practices.

These positive effects are strengthened when disclosure practices tend to converge across countries, thus allowing for meaningful comparisons between institutions and increased market discipline.

Negative cross-border spillovers include:

- Potentially contributing to a sudden change in market sentiment with the potential to threaten financial stability also at the cross-border level given the high interconnectedness of the financial system.
- Increased disclosure requirements at a national level may also result in a shift of assets or liabilities to other jurisdictions that have not adopted equivalent disclosure requirements.

To limit any negative effects, authorities should consider whether increased disclosure under national flexibility measures should be accompanied by measures to boost confidence (for example, in the case of stress tests revealing a capital shortfall, the introduction of backstops or efficient resolution mechanisms if not already existing). Negative spillovers could also be mitigated through cross-border coordination between authorities in order to achieve consistent disclosures by the institutions exposed to the same risk.

[184] See Goldstein and Sapra (2012).

4 Indicators and activation

This section suggests a number of indicators that can help guide the use of the macroprudential instruments covered in this chapter. These indicators can be mostly built using Common Reporting (COREP) and Financial Reporting (FINREP) data sources once they become available, which will minimise the need for ad hoc data collection and ensure comparability across countries. It should be noted, however, that national flexibility measures cannot be introduced on the basis of indicators alone, as Article 458 of the CRR provides for a specific procedure to be followed (notification, justification and other conditions).

At this stage, the proposed indicators can be considered alongside a wider set of information, including market and supervisory intelligence, to guide the use of the instruments. Over time, once COREP data sources become available, further work should be done to assess their effectiveness in contributing to the identification of systemic risk (e.g. whether there are key thresholds indicating the build-up of risk) and whether they should be used more actively to guide the activation of policy instruments.

Annex 7.1 provides details on how to construct the indicators.

4.1 Suggested indicators

a) Indicators for own funds requirements and the capital conservation buffer

Authorities are asked to refer to indicators guiding the use of other own funds-based instruments, such as the systemic risk buffer and, if the source of risk is considered to be time varying, the countercyclical capital buffer. Indicators might relate to banks' balance sheets (e.g. leverage, average risk weights) or the quality of their assets (e.g. valuations of assets, average and marginal LTV ratios, financial conditions of banks).

b) Indicators for measures for intra-financial sector exposures

The combination of indicators of credit growth and leverage in the intra-financial sector, as well as information on asset price growth (such as equity prices) can be effective in signalling the build-up of systemic vulnerabilities. Indicators may include the following.

Ratio of financial corporate debt (including debt of banks and other financial corporates) to GDP:

- When this ratio deviates from its long-term trend or from equivalent ratios in other sectors (e.g. non-financial corporate debt, government debt and household debt) it may suggest exuberance in the financial sector.

Intra-financial activity versus real economy lending:

- Compares banks' total intra-financial sector exposures with total banking book and total bank assets. If intra-financial activity is serving an economic purpose, growth in this sector should

not significantly outpace that seen in the real economy. The separate elements of the data should be available in COREP and countries' lending data.

Breakdown of intra-financial activity by transaction type:

- Considers the mix of banks' exposures as well as the year-on-year growth rate by transaction type (e.g. interbank lending, repo-style transactions, OTC derivatives, other). Growth in the financial sector that is concentrated around particular types of transactions may need further monitoring or policy action. Supervisors may collect these data on major banks as part of recovery and resolution plans.

Largest exposures to financial sector entities over the same financial sector entities' highest quality capital (as a measure of intra-financial large exposures):

- Concentration of lending activity in the interbank markets or payment systems may highlight structural vulnerabilities. Information on cross-institutional exposures is needed to assess the potential for domino effects. From a macroprudential point of view, exposures to systemically important institutions may be of particular interest.

Funding gap[185]*:*

- The proportion of customer loans[186] not covered by customer deposits.[187] It measures the reliance on interbank and other wholesale market funding and the degree of intra-financial sector linkages. Despite this indicator's conceptual simplicity, it has some shortcomings: computing the funding gap involves methodological choices that can affect the results; the data available for most countries do not allow the ratio to be computed properly; and it may need to take into account structural differences across countries, e.g. in some countries the share of savings invested in deposits versus market instruments is lower than others.

c) Indicators for large exposure requirements

Possible indicators of the need to activate large exposure instruments are:

The ratio of large exposures to total credit, in aggregate and by sector:

- This indicator of the degree of concentration in credit growth shows whether a limit on large exposures would have a significant impact on total credit.

- The threshold above which stricter large exposure limits might be activated would depend on what is considered to be excessive growth, e.g. involving some form of comparison of current to historical growth rates. Banks' leverage and other measures of banks' riskiness should also be considered – the higher the leverage, the higher the risk of busts following credit booms.[188]

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185 New versions of the ESRB risk dashboard will include a loan-to-deposit ratio depicting total loans to households and non-financial companies over total deposits from these sectors.

186 Loans and advances held for trading, designated at fair value through profit or loss, available for sale loans and receivables, held to maturity.

187 Deposits other than from credit institutions, held for trading, designated at fair value through profit or loss, measured at amortised cost.

188 See, among others, Schularick and Taylor (2012).

The ratio of banks' large exposures to a sector relative to bank capital:

- Numerator: the sum of banks' large exposures to a sector of economic activity, e.g. commercial real estate; denominator: bank capital.
- This indicator is meant to capture whether the banking system as a whole is excessively exposed to a specific economic sector. It can be complemented by indicators on the soundness of the sector under consideration, e.g. the price-to-rent ratio for commercial real estate, the loan-to-value ratio of exposures to the sector.
- The threshold above which stricter large exposure limits might be activated would depend on the degree of diversification of banks' portfolios, the health of the sector and banks' general level of risk, measured, for example, by leverage.

The ratio of the ten largest exposures to unregulated financial entities over these institutions' equity:

- This indicator, built from data on banks' counterparties, captures whether the largest counterparties of major banks at a consolidated or sub-consolidated level are well capitalised. This indicator can be complemented by indicators of leverage at these unregulated financial institutions, or other measures of risk.
- The threshold above which stricter large exposure limits might be activated, assuming it is deemed to be an effective instrument, would depend on whether banks' exposures to these nodal financial institutions are deemed high and how risky they are assessed to be.

d) Indicators for public disclosure

Because of the very broad scope of the possible measures to increase disclosure requirements under Article 458, it is difficult to construct meaningful quantitative indicators for activating this instrument. Supplementary requirements for macroprudential purposes have so far been developed ad hoc for specific situations. Going forward, a framework could be developed to identify situations that might benefit from additional disclosure (e.g. exposures to cyclical sectors). The competent or designated authority could publish an assessment and related evidence of a specific systemic risk or vulnerability within the banking sector and seek additional disclosures from domestically authorised institutions in its jurisdiction. The authorities (as well the ESRB) could also consider whether it would be desirable and/or feasible to start a coordinated disclosure exercise across other Member States to obtain comparable data across countries.

5 Decision-making and coordination

5.1 Authorities responsible for using instruments

Under the CRR, every Member State must designate an authority to be in charge of applying national flexibility measures under Article 458 of the CRR. This can be the authority in charge of microprudential banking supervision (competent authority) or another authority designated for that purpose (designated authority). Member States therefore have the option to assign micro- and macroprudential supervision of banks under the CRD IV/CRR to different authorities.

5.2 Legal requirements for coordination

The application of the macroprudential measures available under Article 458 of the CRR is subject to a procedure at European level comprising prior notification (to the European Commission, the European Parliament, the European Council, the ESRB and the EBA) and non-objection (by the Council, based on a recommendation by the Commission, taking into account the ESRB and EBA opinions). If the Council does not reject the proposed measure, the Member State may apply the measure for a period of up to two years. The measure can be extended for one year at a time, following the same procedure.

Article 458(10) of the CRR grants national authorities some limited discretion, notwithstanding the procedure for adopting national flexibility measures. Authorities may increase the risk weights for real estate and intra-financial sector exposures by up to 25% as well as tighten the large exposure limit by up to 15% for a period of up to two years following a simplified procedure. Full notification together with supporting information (explanation/justification) is required, however, in accordance with Article 458(2) of the CRR. It should also be noted that measures applied under Article 458 of the CRR are not subject to mandatory reciprocity.

Article 458 of the CRR requires the notifying national authority to submit relevant quantitative or qualitative evidence of the changes in the intensity of macroprudential or systemic risk, the reasons why such changes could pose a threat to financial stability at national level and an explanation as to why the proposed measure(s) are deemed necessary (“suitable, effective and proportionate”) by the national authority. Article 458 of the CRR also requests the notifying national authority to justify why other CRD IV/CRR measures (e.g. Pillar 2) cannot adequately address the macroprudential or systemic risk identified, taking into account the relative effectiveness of those measures. Finally, Article 458 of the CRR requires the notifying authority to assess the likely positive or negative impact of the draft measure(s) on the internal market, based on the information which is available to the Member State concerned. The ESRB has designed a template for Article 458 notifications, covering all these aspects.

Section III: Implementation
Chapter 8
Selecting macroprudential instruments[189]

[189] This chapter was prepared by Elias Bengtsson (ESRB Secretariat). It draws on analytical work by a team comprising Marcus Pettersson (Sveriges Riksbank), Mads Harmsen (Danmarks Nationalbank), Carmelo Salleo (European Systemic Risk Board), Silvia Pezzini (Bank of England), Andreas Strohm (European Commission) and Timo Kosenko (European Systemic Risk Board).

Executive summary

Authorities in EU Member States have a wide range of macroprudential instruments at their disposal to address systemic risk, especially since the entry into force of the CRD IV/CRR. This chapter offers general advice on selecting macroprudential instruments.[190] The four main messages are as follows.

- Authorities must have a clear view on the intermediate objective(s) of macroprudential policy they want to achieve. If the objective is clearly identified, the list of potential instruments can be significantly narrowed down.
- In selecting instruments, macroprudential authorities should consider both the economic and legal aspects, and favour instruments with high effectiveness in the light of the desired objective(s) and low social costs.
- In practice, this means favouring instruments that, individually or in combination, target the type, nature and source of risk; are proportionate to the level of systemic risk; provide limited arbitrage opportunities; foster market discipline through transparency; and cause limited negative distortions to the financial system and cross-border spillovers.
- The legal aspect relates to the various conditions set out in the CRD IV and CRR. Somewhat simplified, authorities are required to consider using the instruments available under the CRD IV (e.g. Pillar 2) before applying national flexibility measures of Article 458 of the CRR.

The remainder of the chapter is outlined as follows:

- Section 1 provides an overview of how different sets of macroprudential instruments provided for by the CRD IV/CRR can be used to target specific intermediate objectives.
- Section 2 contains a general discussion on the economic aspects to consider when selecting instruments, including their positive features and the potential advantages of using combinations of instruments.
- Section 3 focuses on the legal considerations to be taken into account in selecting macroprudential instruments (CRD IV/CRR).
- Annex 8.1 provides an overview of the various economic and legal features of the macroprudential instruments covered in this chapter.

[190] The chapter also covers a number of instruments of national competence outside the scope of the CRD IV/CRR.

1 Selecting instruments based on intermediate objectives

Authorities in EU Member States have a wide range of macroprudential instruments at their disposal. This chapter offers a framework for choosing instruments. By outlining a number of key aspects to consider, the framework is intended to be widely applicable and sufficiently flexible to accommodate for idiosyncratic circumstances.

The starting point is the intermediate objectives of macroprudential policy specified by the ESRB.[191] Once authorities have identified a particular systemic risk and assigned it to one or several of these objectives, the list of potential instruments can be significantly narrowed down. Table 8.1 lists the macroprudential instruments that are suitable for each intermediate objective.[192]

Table 8.1

Intermediate objectives and the corresponding appropriate macroprudential instruments

Intermediate objective	Suitable macroprudential instruments (legal reference)
Mitigate and prevent excessive general credit growth and leverage	Countercyclical capital buffer (Article 130; Articles 135-140 of the CRD IV) Systemic risk buffer (Articles 133-134 of the CRD IV) Increased capital conservation buffer (Article 458 of the CRR) Increased own funds requirements (Article 458 of the CRR) Leverage ratio (national law)
1*. Mitigate and prevent excessive sectoral credit growth and leverage (e.g. real estate)[193]	Sectoral RWs (Article 124 of the CRR for real estate or Article 458 of the CRR) Sectoral LGD floors (Article 164 for retail real estate or Article 458 of the CRR) Sectoral LTV limits (national law) Sectoral LTI or DSTI limits (national law)
Mitigate and prevent excessive maturity mismatch and market illiquidity	Liquidity charges (Article 105 of the CRD IV) LTD limits (Article 103 of the CRD IV) Liquidity buffers (Article 458 of the CRR) NSFR (Article 458 of the CRR) Other stable funding requirements (national law)
Limit direct and indirect exposure concentrations	Systemic risk buffer (Articles 133-134 of the CRD IV) Large exposure requirements (Article 458 of the CRR) Increased own funds requirements (Article 458 of the CRR) Measures for intra-financial sector exposures (Article 458 of the CRR)
Limit the systemic impact of misaligned incentives with a view to reducing moral hazard	Capital buffers for G-SIIs (Article 131 of the CRD IV) Capital buffers for O-SIIs (Article 131 of the CRD IV) Systemic risk buffer (Articles 133-134 of the CRD IV) Increased capital conservation buffer (Article 458 of the CRR) Increased own funds requirements (Article 458 of the CRR)

In selecting which instrument(s) to use from this broader list, macroprudential authorities should consider both the economic and legal aspects. These aspects are closely interrelated, as an instrument's effectiveness is influenced by its legal boundaries (i.e. in terms of levels, scope of application, etc.).

191 ESRB Recommendation of 4 April 2013 on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1).

192 The macroprudential use of disclosure requirements is omitted from this table. For a discussion on how disclosure can be used for macroprudential purposes, see Chapters 2 to 7.

193 This row lists the additional instruments that may be used if excessive general credit growth and leverage is attributable to a particular sector.

2 Economic considerations

Macroprudential authorities should strive to use those instruments which will bring the highest net benefits to society.[194] In practice, this means assessing an instrument's effectiveness in relation to the desired objective and the social costs it may entail through imposing restrictions on entities and activities (a cost-benefit analysis).

Macroprudential authorities should favour instruments that limit negative spillovers by targeting the type, nature and source of risk; are proportionate to the level of systemic risk; provide limited arbitrage opportunities; foster market discipline through transparency; and generate limited cross-border spillovers.[195] Each of these desirable characteristics is discussed separately below. (Tables 1-5 in Annex 8.1 provide an overview of the key features of the different instruments with respect to the intermediate objectives.)

The legal framework surrounding each instrument has a considerable bearing on these characteristics. It is also important to note that for any given macroprudential instrument, authorities are likely to face "trade-offs" between the characteristics and any additional ones authorities might deem important. Assigning different weights to different characteristics is thus a key policy choice.

Following the discussion on the various desirable characteristics below, a number of cases are considered where a combination of instruments may outperform any single instrument.

2.1 Desirable characteristics of macroprudential instruments

2.1.1 Targeting the type and nature of systemic risk

From an economic perspective, the more an instrument is targeted to what the authority wants to achieve, the lower the associated costs.[196] There are several dimensions to whether an instrument is targeted or not. One way to conceptualise this is to contrast the *nature*, *type* and *source* of systemic risk.

Type of systemic risk relates to the particular objective(s) that the authority seeks to address through using the instrument, whereas *nature of systemic* risk relates to whether the systemic risk is predominantly cyclical or structural. Most instruments typically target primarily one (or a few limited) macroprudential intermediate objective(s). Also, certain instruments are often better suited to addressing either structural or cyclical risk. This is also reflected in the legal conditions applicable to certain instruments, which may expressly require them to be used to address cyclical or structural systemic risk. For example, the SRB is designed to mitigate long-term non-cyclical risk whereas G-SII/O-SII buffers are intended to address structural problems relating to systemic banks.

194 For an overview and discussion, see Arregui et al. (2013).

195 The list of characteristics is non-exhaustive.

196 For a discussion on targeted versus broad-based instruments, see Lim et al. (2011).

In principle, choosing an instrument that is targeted to the type and nature of systemic risk reduces the extent and likelihood of spillovers. That said, the (de)activation of most (if not all) macroprudential instruments will influence the financial system to some extent and lead to spillovers on either its structural or cyclical dimensions.

Such spillovers may be either desirable or undesirable. Introducing higher capital buffers applicable to systemically important banks is a good example. While the buffers are primarily structural, the increased requirements may also have a dampening effect on the credit cycle.[197] Whether or not that spillover is desirable is situation specific. If excessive credit growth is a concern for authorities, the dampening effect is desirable. If, on the other hand, authorities fear a credit crunch, it is not.

Authorities should therefore consider the potential spillovers when selecting macroprudential instruments. Where spillovers are desirable, they increase the overall effectiveness of an instrument. Undesirable spillovers can be reduced by appropriate calibration, timing of (de)activation and phasing in/out of instruments.

2.1.2 Targeting the source of systemic risk

Another dimension is whether the instrument addresses the *source of systemic risk*. The *source of systemic risk* depends on whether risk is primarily attributable to banks or their clients; to all or just a subset of banks; and to banks in general or merely to particular (sectoral, geographical or individual) exposures or activities. Just as for the type and nature of systemic risk, an instrument that is targeted to the source of systemic risk is likely to be more effective and lead to fewer spillovers.

By way of example, in the case of an unsustainable demand-driven real estate boom, it may be more effective and less costly to select instruments that primarily target bank borrowers (such as LTV or LTI limits) rather than bank-oriented measures (such as higher capital requirements on mortgages through minimum RWs or LGD floors).[198]

Targeting an instrument to the source of systemic risk means considering the appropriate scope of application. In certain cases, systemic risk may be attributable to a mere subset of a banking system, or even individual banks. When the legal framework of an instrument allows it to be applied solely to the bank(s) in question, it is likely to be less costly. This also applies to instruments that can differentiate between banks in terms of their contribution to systemic risk (such as the SRB).

Similar reasoning applies to situations in which banks generally contribute to (or are exposed to) systemic risk, or whether risk arises from their involvement in certain sectors or even sub-sectors. In the latter case, instruments which can be applied to a subset of exposures may be less costly. For example, authorities can use Pillar 2 to apply capital surcharges to specific parts of the loan

[197] This dampening effect may occur in at least two ways. First, higher capital costs may transmit into higher lending rates, which may reduce demand for credit. Second, banks may reduce their supply of credit in order to meet the higher capital requirements.

[198] Instruments that raise the cost of providing real estate credit for banks may not be able to curb strong inelastic borrower demand.

book, such as for loans in foreign currency.[199] A related matter concerns whether instruments can be applied to the whole entity or only to the entity's domestic exposures.

2.1.3 Proportionate to the level of systemic risk

The ability to adjust the levels of restrictions or requirements imposed by an instrument is key to increasing effectiveness. This is typically not problematic in cases where systemic risk is low and authorities wish to introduce correspondingly low restrictions or requirements.

However, some instruments provided for under the CRD IV/CRR are subject to limits as to the levels of requirements and restrictions that can be imposed. For instance, authorities are not permitted to freely impose OSII-buffers above 2% of RWA and applying SRB buffers above 3%.[200] This curbs authorities' ability to impose proportionate restrictions or requirements in cases where systemic risk is deemed to be very high.

2.1.4 Limiting arbitrage opportunities

Macroprudential instruments restrict or impose costs on certain activities which gives the banks to which they are applied an incentive to circumvent them. Other market participants will also have an incentive to substitute these activities with alternatives outside the scope of the instrument. If arbitrage opportunities exist, the effectiveness of the instrument will be affected, since systemic risk may arise through substitution or originate from other entities (leakage).[201]

Authorities should therefore select instruments that offer relatively few arbitrage opportunities. The availability of such opportunities not only depends on the design of the instrument, but also on the ability of authorities to monitor and address risks in other parts of the financial system. For instance, using macroprudential instruments that target activities, as opposed to (all or a subset of) banks, reduces the probability of risky activities migrating to other entities. By way of example, curbing excessive credit growth in real estate by imposing restrictions that apply to all borrowers through activity-based regulation is one potential way to limit leakages to shadow banking.

Another important determinant is the degree and quality of coordination between authorities in different countries, including whether there are reciprocity agreements in place. Reciprocity can avoid situations where branches of foreign banks replace domestic banks in conducting an activity for which the latter face restrictions or additional requirements. For the use of certain instruments under the CRD IV/CRR, such reciprocity is mandatory.[202]

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199 This is not the case for the SRB which cannot be applied to a subset of sectoral exposures.

200 The cap on the discretionary use of the SRB varies depending on whether it is applied to domestic, EU or third-country exposures.

201 For a discussion on such leakages, including country experiences, see Arregui et al. (2013).

202 For a discussion on cross-border aspects, see Chapter 11.

2.1.5 Fostering market discipline and expectations through transparency

The effectiveness of a macroprudential instrument can be strengthened where the influence of borrowers, investors and other market stakeholders influence banks to meet the requirements. Such market discipline hinges on market participants having a clear understanding of the purpose and design of the instrument and easy access to sufficient information to be able to assess compliance.

This implies that authorities should favour instruments whose purpose and design can be easily communicated and explained.[203] It also implies favouring instruments for which there are no significant hurdles to the disclosure of information on compliance. In this respect, those Pillar 2 measures for which rules of professional secrecy hinder disclosure may be less appropriate.[204]

2.1.6 Limiting negative spillovers on other countries

The use of macroprudential instruments is likely to have positive net effects even outside the Member State in question, since the risk of negative financial or macroeconomic spillovers to other countries is reduced. However, this does not apply in all circumstances.

For instance, if capital requirements are raised to limit excessive credit growth domestically, banks with international lending activities may opt to cut back their supply of credit in other countries as well. If credit cycles are synchronised across countries, this would be welcome. But if other countries are in a different stage of the credit cycle, increasing capital requirements to address domestic risks might contribute to weaker credit growth or even a credit crunch abroad. To the extent possible, macroprudential authorities should favour instruments for which such negative spillovers are limited.[205]

2.2 Increasing effectiveness by combining macroprudential instruments

When systemic risk calls for macroprudential intervention, authorities can choose to either activate a single instrument or use a combination of instruments. In principle, using a single instrument has the benefit of being easier to calibrate and communicate. It may also be easier to assess its effects. However, in certain circumstances, using multiple instruments may more appropriate than using a single instrument.[206]

One such circumstance relates to situations in which systemic risk is both structural and cyclical or involves several types of systemic risk. In such situations, it may be appropriate to apply a singly

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[203] Over the longer term, this may also increase the effectiveness of macroprudential policy generally by shaping expectations. For an extended discussion on communicating macroprudential policy, see Chapter 10.

[204] For a discussion on the advantages and disadvantages of macroprudential use of Pillar 2, see Chapter 6.

[205] For an extended discussion on cross-border issues, see Chapter 11.

[206] See also Lim et al. (2011) for a discussion on how different macroprudential instruments can complement each other.

instrument, especially where that instrument generates positive spillovers the types of systemic risk or across its structural or cyclical dimension.

However, such situations might also call for a combination of instruments. For example, consider a situation where there is a prolonged phase of excessive credit expansion fuelled by systemically important banks enjoying cheap financing supported by implicit state guarantees. Here, authorities might wish to address moral hazard owing to systemic importance while simultaneously increasing the banks' ability to sustain credit supply in case the boom turns into bust. One potential combination of instruments could be the CCyB to address cyclical risks and raising own fund requirements through Pillar 2 to re-align incentives and increase resilience.

Another reason for using a combination of instruments concerns situations in which one instrument is inadequate in relation to the level of systemic risk. Since some instruments are subject to limits (caps) with regard to the requirements and restrictions that can be imposed, several instruments may be necessary for macroprudential policy to be proportionate to the level of systemic risk. For example, authorities may wish to introduce capital requirements under Pillar 2 to complement the capital buffers on systemic banks.[207]

Combining instruments may increase their overall effectiveness when systemic risk is driven by both demand and supply. One such example could be a real estate boom fuelled by both lenders and borrowers. In this situation, authorities may wish to consider combining instruments that affect borrowers with instruments that dampen the supply of loans by banks.[208] Also, it may be necessary to complement the price-based instruments (such as higher risk weights) with quantity-based instruments (such as LTI/DSTI/LTV limits).

Combining instruments can also limit arbitrage opportunities. For instance, activating increased capital requirements together with conduct-based restrictions on borrowers would limit the scope for the less-regulated sector to step in and substitute banks as a source of credit.

[207] Somewhat simplified, the GSII and OSII buffers are capped at 3.5% and 2% of RWA respectively, and the discretionary use of the SRB depends on its level and on its scope (whether it is applied to domestic, EU or non-EU country (third-country) exposures).

[208] See the annex to the ESRB Recommendation on intermediate objectives and instruments of macro-prudential policy, (ESRB/2013/1).

3 Legal considerations

Selecting instruments should also reflect the various legal conditions set out in the CRD IV and CRR. For instance, certain instruments require authorities to consider, before making use of them, the sufficiency of other instruments according to a predefined process. These instruments are the SRB and the instruments foreseen under Article 458 of the CRR.[209] In particular:

- Before setting or re-setting an SRB, authorities must consider why the existing instruments under the CRD IV/CRR (excluding Articles 458 and 459 of the CRR) are insufficient, individually or in combination, to address the identified systemic risk. Such considerations must take the relative effectiveness of those instruments into account.[210]

- Similarly, before applying any of the national flexibility measures provided under Article 458 of the CRR, authorities must consider whether any of the following instruments could adequately address the systemic risk instead, taking into account their relative effectiveness: risk weights and LGDs targeting real estate risks, Pillar 2 measures, the systemic risk buffer or the countercyclical capital buffer.[211]

Furthermore, the notification procedures and information requirements vary depending on the instrument in question. For instance, for the G-SII buffer, notification to the European Commission, the ESRB and the EBA is required, whereas the requirements associated with the SRB become more demanding the higher the buffer rate. For national flexibility measures under Article 458 of the CRR, the notification procedures and information requirements are particularly strict. Tables 1-5 in Annex 8.1 provide information on the level of procedural requirements attached to each instrument under the CRD IV/CRR.

The economic considerations of effectiveness and social costs discussed above are closely linked to the legal considerations. These are key to determining whether the minimum requirements in the CRD IV/CRR need to be complemented by using instruments through Pillar 2 or national flexibility measures of Article 458 of the CRR.

For each of the intermediate objectives specified by the ESRB, Table 8.2 below presents a sequence – based on the legal considerations relating to each instrument – which authorities can use in selecting instruments.[212] The ranking provided in the table does not reflect the economic considerations discussed in Section 2 of this chapter.

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209 These include the level of own funds, large exposure requirements, public disclosure requirements, level of the capital conservation buffer, liquidity requirements, risk weights for targeting asset bubbles in the residential and commercial property sector, and measures for intra-financial sector exposures.

210 Consideration needs to be given to the other legal requirements that have to be met before setting or re-setting the SRB (Article 133 of the CRD IV).

211 Similarly, there are other requirements that need to be met before applying national flexibility measures. A simplified procedure is laid down for some of the measures under Article 458(10) of the CRR.

212 See the ESRB Recommendation on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1).

Table 8.2

Sequencing of macroprudential instruments according to the CRR/CRD IV

	Intermediate objectives of systemic risk			
	Mitigate and prevent excessive credit growth and leverage	**Mitigate and prevent excessive maturity mismatch and market illiquidity**	**Limit direct and indirect exposure concentrations**	**Limit the systemic impact of misaligned incentives with a view to reducing moral hazard**
Consider first	CCyB (Article 136 of the CRD IV) All CRD IV/CRR instruments, excluding Articles 458 and 459 of the CRR	Liquidity charges (Article 105 of the CRD IV) Pillar 2 (Articles 101, 103, 104 and 105 of the CRD IV), SRB (Article 133 of the CRD IV)	All CRD IV/CRR instruments, excluding Articles 458 and 459 of the CRR	G-SII (Article 131 of the CRD IV) O-SII (Article 131 of the CRD IV) All CRD IV/CRR instruments, excluding Articles 458 and 459 of the CRR
	SRB (Articles 133-134 of the CRD IV)	Liquidity buffers (Article 458 of the CRR) NSFR (Article 458 of the CRR) Liquidity charges (Article 458 of the CRR)	SRB (Articles 133-134 of the CRD IV), CCyB (Article 136 of the CRD IV) Increased large exposure requirements (Article 458 of the CRR) Increased own funds requirements (Article 458 of the CRR) Measures for intra-fin. sector exposures (Article 458 of the CRR)	SRB (Articles 133-134 of the CRD IV)
Consider last	Increased own funds requirements (Article 458 of the CRR)			Increased own funds requirements (Article 458 of the CRR) Increased conservation buffer (Article 458 of the CRR)

Note: LTV and LTI limits fall under national competence and therefore do not influence the sequencing of the CRD IV/CRR instruments.

Chapter 9
Overcoming inaction bias: the use of indicators in guiding policy[213]

[213] The chapter was prepared by a team led by Ola Melander (Sveriges Riksbank) and comprising Julia Giese (Bank of England) and Christian Glebe (Deutsche Bundesbank), Support was provided by Frank Dierick from the ESRB Secretariat in the function of Secretary.

Executive summary

This chapter explores how indicators can be used to guide macroprudential policy and in particular to overcome inaction bias. The costs of policy action (e.g. forgoing profitable opportunities, incurring compliance costs) apply in the short term and are quickly visible while its benefits (higher and more stable economic growth, lower fiscal costs) only accrue in the medium to long-term and are less obvious.

Inaction bias could be overcome by embedding indicators signalling a need for policy intervention in a strong institutional framework. Under such a framework of guiding or presumptive indicators, the need for a tighter policy stance would be presumed when indicator values exceed indicative thresholds. In this way, the burden of proof would shift to those arguing in favour of an unchanged policy stance.

However, data availability and conceptual considerations determine the appropriateness of the framework for different macroprudential objectives and instruments. Judgement and country-specific circumstances must continue to play an important role. A loosening of the policy stance in particular requires more room for discretion as indicators are typically less robust in terms of signalling the need for release or deactivation of instruments. More generally, policy-makers should be willing to act on the basis of qualitative risk assessments even if indicators are not showing unambiguous signals for such action. Making statistical signals a requirement for policy action could risk worsening inaction bias instead of alleviating it.

The ESRB can make a significant contribution by providing guidance on the general principles for using indicators in macroprudential policy. Such guidance could include pursuing further cross-country analytical work on indicators and thresholds, and using a guided discretion approach in its own monitoring of systemic risks.

1 Decision-making process of a macroprudential authority

An authority that is in charge of preventing and mitigating systemic risks by applying macroprudential instruments typically has to assess whether systemic risks are building up, whether an instrument should be activated and, if so, which one, when and at what level. If an instrument is already active, the authority has to decide whether to increase or decrease its level (calibration). Finally, when risks to financial stability have receded or, alternatively, during periods of financial stress, the authority has to decide whether to loosen the instrument or deactivate it. Therefore, the decision-making process (activation, calibration and deactivation) is based on ongoing surveillance/analysis.

A question arises for policy-makers whether to embed policy guidance or rules in their decision-making process, or whether to act purely on the basis of discretion (expert judgement). Policy-makers can draw on monetary policy experience: both monetary and macroprudential policies are confronted with short-term costs (forgoing profitable transactions, incurring compliance costs, etc.) and long-term gains (higher and more stable economic growth, lower fiscal costs). Faced with public pressure in response to the short-term costs, a natural bias might exist against tightening macroprudential policy or in favour of premature deactivation (so-called **inaction bias**). Authorities responsible for national macroprudential supervision and policy may also have a tendency to leniency towards domestic institutions for several reasons. These can include an interest in protecting national champions, regulatory capture and public pressure.

A clear framework outlining when policy-makers should act might help to overcome this inaction bias. For example, Goodhart (2011) suggests a framework of **presumptive indicators** (see Section 2.3). If these flag a rising systemic risk, there would be a presumption in favour of policy action. However, taking this further into a requirement for policy action may not be desirable given uncertainty about the signalling ability of indicators, the varying nature of risks and the limited knowledge about how macroprudential policy is likely to affect the real economy. The exercise of caution is therefore recommended.

2 Rules vs. discretion

2.1 Addressing the inaction bias problem

In principle, a framework for using macroprudential instruments could combine both rules-based and discretionary elements to try to maximise the advantages and minimise the disadvantages. Such a combined, or "guided discretion", approach could be especially relevant for time-varying instruments. A **guided discretion** approach formulates certain presumptions as to when action can be expected in response to the development of key indicators (see Section 2.3). A distinction can be made between bounded discretion and conditional rules. Under **bounded discretion**, discretionary judgement can be applied within given limits. **Conditional rules** reflect the notion that rules can be overridden in a discretionary way. Such mixed approaches seem to be the ones already adopted in a number of countries (see Section 3).

Arguments **in favour of discretion** stem from the consideration that macroprudential policy is a relatively new area and that financial markets evolve over time. Therefore, learning effects play a more prominent role than in other policy areas. Indicators that worked well in predicting past crises may fail for new crises.[214] A discretionary element is important because some drivers of financial markets are probably difficult to embed in a rule (e.g. fiscal policies) and quantify (e.g. market and supervisory intelligence). Indicators should be interpreted in a state-dependent way which requires judgement. For example, debt-servicing indicators should be interpreted taking into account the prevailing interest rate environment. It may also be necessary to interpret several indicators jointly, for example high debt service ratios may be less of a concern where they are combined with low loan maturities at origination.

On the other hand, the risk of inaction bias is an argument **in favour of rules** in the decision-making process. The costs of applying a macroprudential measure are likely to appear relatively soon, but the benefits of successful mitigation of systemic risk may accrue only in the future (and to different entities) and be difficult to measure. Therefore, the combination of a rules- and discretion-based approach in macroprudential decision-making is central in avoiding inaction bias.

Establishing a clear mandate and objective for macroprudential policy is essential to avoiding such bias. For Member States, the basis for this has been provided by the ESRB Recommendation on the macro-prudential mandate of national authorities (ESRB/2011/3), the ESRB Recommendation on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1), a set of policy instruments under the CRD IV/CRR, as well as additional instruments that are available under national discretion. A clear mandate and objective for macroprudential policy as well as sufficient operational independence for the macroprudential authority would help to address any potential credibility problems resulting from the exercise of discretion. Accountability may be further strengthened by requiring the macroprudential authority to explain a decision not to act where indicators signal a possible need for policy measures.

[214] Agur and Sharma (2013).

The institutional set-up at the **national level** can have an influence on the decision-making process: the higher the number of participants in the process, the higher the number of views which need to be coordinated in order to reach a policy decision, and therefore the greater the risk of inaction bias.[215] For countries participating in the Single Supervisory Mechanism (SSM), the ECB's topping-up power[216] is a further tool which can be used to avoid inaction bias.

At the **European level**, it is important to avoid complex, formal procedures that risk strengthening the inaction bias. The ESRB could play an important role in developing such a guided-discretion approach by providing guidance in terms of general principles and compiling best practices based on country experience. It could also help by providing further cross-country analysis to guide the practical use of specific instruments at the national level, focusing in particular on the role of indicators, thresholds and calibration. The ESRB could use such an approach in its own monitoring of systemic risks in Member States, based on cross-country analytical work, but taking into account country-specific circumstances. This could entail using indicative thresholds from cross-country analysis as a starting point for the analysis of country-specific risks, while bearing in mind data issues and country-specific circumstances more generally.

2.2 Taxonomy of rules vs. discretion

The respective roles of rules and discretion can be identified in the macroprudential authority's decision-making process. Depending on the frequency of reviewing the rules and the frequency of allowing exceptions to those rules, several cases are possible. At one end of the spectrum is a set of fixed rules, based on (a core set of) indicators, which must always be complied with; these indicators can be published or not. At the other end of the spectrum is complete discretion but with an explanation of the decisions taken. There are several possibilities in between these two extremes. For example, the rules might be fixed but reviewed periodically (e.g. every year) or exceptions may be allowed (with or without explanation), either on a discretionary basis or under pre-determined circumstances. Another possibility is for sets of indicators to be published but with no requirement to follow them within strict rules – instead the indicators are complemented by the use of judgement and additional information.

The choice, or balance, between rules and discretion in decision-making as well as the set of relevant indicators may differ in the build-up (tightening) and release phases. Furthermore, a distinction has to be made for different baseline scenarios: the appropriate approach may be different in a situation where measures have already been taken as opposed to a situation where policy action is being considered for the first time.

[215] See also Agur and Sharma (2013), p. 14-16. This argument should not be misunderstood as being in favour of the single institution approach: a higher number of participants also means that views can be collected from different fields of expertise. But a well-defined and clear mandate for decision-making is essential.

[216] The SSM Regulation provides that the ECB may, if deemed necessary, apply higher requirements for capital buffers and more stringent measures aimed at addressing systemic or macroprudential risks than the ones established by the national competent or designated authorities.

2.3 Role of indicators

Indicators are at the core of a guided discretion approach to the use of macroprudential instruments. Considerations concern not only the choice and combination of indicators (single indicator or a set of indicators), but also the link between indicators and macroprudential objectives and instruments (including thresholds and calibration). Different objectives and instruments may require different (sets of) indicators. The link between indicators and objectives/instruments comprises the following aspects:

- choice of indicators;
- combining indicators (set of indicators, core set, complementary set);
- weighting of indicators;
- mapping of indicators to objectives/instruments;
- decision on (a combination of) instruments;
- decision on the scope of the instrument;
- decision on the activation of the instrument(s), lower indicative threshold;
- calibration of the instrument(s);
- decision on the deactivation of the instrument(s).

To apply the indicators for policy decisions, it is necessary first to determine the level of the indicator at which the intermediate objective of maco-prudential policy is in danger. For forward-looking guidance, indicator "danger zones" could be specified at which there would be a presumption for policy action to mitigate and prevent systemic risks (see also the methodology for CCyBs, Chapter 2). The "danger zones" can be based on indicative thresholds for the indicators, as derived from formal statistical evaluation, but also be influenced by the literature, historical distributions, cross-sectional averages, etc.[217] The set of indicators or speed of action would in many cases be likely to differ between the build-up (tightening) and the release phase. The role for judgement would typically be larger in the release phase than in the build-up phase as the indicators for the release or deactivation of instruments are generally less robust.

In practice, policy decisions should be supported by the combined information provided by the selected indicators vis-à-vis their indicative thresholds, as well as general timing considerations and judgement. Goodhart (2011) advocates "**presumptive indicators**". When two or three of such presumptive indicators signal rising vulnerabilities, i.e. have crossed a lower threshold, the authority would have to act or explain publicly why it chooses not to. Put differently, the burden of proof would be shifted from those arguing that a tighter policy stance is warranted to those arguing that no change to the policy is appropriate. It is possible to calculate lower thresholds for individual or

[217] CGFS (2012) provides in Annex 3 a methodological framework for the statistical assessment of risk indicators helpful in identifying vulnerabilities in the household sector. The thresholds are set at a level to minimise the noise-to-signal ratio while retaining the capacity of the indicators to identify at least two-thirds of the crises (see also Borio and Drehmann (2009) for a detailed discussion of the issue).

combinations of indicators from cross-country data. By contrast, deriving upper thresholds and providing a full-fledged calibration would be a much more complex task.

Whether thresholds are communicated to the public or used internally in policy-making institutions is also an area for debate. Developing guides for internal use would enable lessons to be learned from initial experience in applying macroprudential policy, at least in the early stages, although communication to the public would increase transparency, build credibility and strengthen the expectation channel of policy. That said, given the need to supplement indicator analysis with judgement when deciding on policy action, and the fact that the analytical framework surrounding the use of macroprudential tools is still in its infancy, such disclosure may lead to confusion and misunderstandings over when policy instruments are likely to be activated. This risk should be weighed against the potential benefits of extensive disclosure in these areas.

Signals provided by various indicators could be combined to guide a policy decision in several ways: either formally by using empirical analysis or less formally through a simple weighting scheme (e.g. with equal weights for each indicator). For example, assume four indicators have been linked to a particular objective and a given indicative threshold has been identified for each of them. The macroprudential authority could then apply the following response function: (i) as soon as one of the indicators reaches the threshold, a closer monitoring is initiated, complemented by intensified analysis of soft information; (ii) if a second indicator reaches its threshold, the authority carefully considers the merits of policy tightening, retaining discretion on whether or not to act; and (iii) if the threshold of a third indicator is concurrently breached then the authority is bound to act with limited room for discretion.[218] Such a **ladder approach** has a number of advantages.

- It reduces the importance of specific indicator thresholds, mitigating the risk of "false alarms" and partly addressing identification problems and potential Lucas critique[219] considerations.
- It provides a framework for constrained/guided discretion allowing the combination of expert judgement and a rules-based approach. Warning signals from indicators tend to act as triggers for deeper analysis, allowing qualitative information to be taken into account. It also reduces the impact of uncertainty related to the measurement of a particular indicator.
- It facilitates communication with other authorities and the public.

The disadvantage of the ladder approach is that it may delay policy activation as it relies on several indicators. Applying policy measures at the right time is clearly of great importance. However, the costs of delayed and early intervention are asymmetric: delayed action resulting in a costly financial crisis is generally more expensive than premature intervention. Moreover, delay may reduce the effectiveness of macroprudential policy, in particular in the build-up phase of vulnerabilities. This would argue in favour of relatively early policy intervention, also taking into account other (qualitative) information, even if the statistical indicators do not provide statistically unambiguous signals for policy action.

[218] A similar approach is envisaged by the Committee on the Global Financial System (CGFS (2012)).

[219] The "Lucas critique" refers to the fact that in economic analysis empirical relationships are estimated from periods where people have particular expectations based on the prevailing policy framework; once the policy framework and expectations change, the estimated empirical equations also change, making them useless for predicting the results of policy action.

Using indicators in a guiding or “presumptive” way could help mitigate inaction bias, but there is still an important **role for judgement**. For example, the setting of the baseline instrument is essential when determining the possible need for further policy action. If a country has already implemented several tightening measures, the need for further policy tightening in response to a signal from a given indicator is not as urgent as it would be in the absence of any measures. Another example of the important role of judgement is that indicators cannot be expected to send the right signals in all cases and so policy-makers must be willing to act based on qualitative assessments of systemic risk, including market and supervisory intelligence, even if statistical indicators are not providing clear signals to act. In particular, policy-makers should not put too much faith in the ability of statistical trends to capture equilibrium levels. Making statistical signals a pre-condition for policy action would risk worsening inaction bias instead of alleviating it.

Country-specific considerations also need to be taken into account. Country-level data can be widely heterogeneous in terms of availability, definitions, aggregation and range of the series (see for example Box 3.4 in Chapter 3 on the LTV). This makes it difficult to establish hard rules because a cross-country comparison is preferable to understand whether an indicator is useful from an empirical point of view, in particular if the aim is developing guidance at the European level. More generally, given the different national economic, political and fiscal environments, a one-size-fits-all decision-making process or set of indicators cannot reflect the characteristics of individual countries.

Moreover, indicators are likely to be used in different ways for different instruments with the appropriate balance between rules and discretion likely to vary. While indicators may be derived and assessed with relative ease for overall risks related to credit growth or time-varying risks emanating from the housing market, it may be harder to derive indicators for other structural instruments owing to data availability constraints as well as conceptual considerations.

3 Country experiences

The results of an ESRB survey on the designated authority and macroprudential instruments suggest that Member States use neither strict rules, nor complete discretion, but rather take a mixed approach. The case studies presented in the box (both EU and third country) have similar findings.

Box 9.1
Case studies on the use of rules vs. discretion

Hardly any EU country or country on which information is publicly available has so far opted for a decision-making process that fully relies on either rules or discretion, most choosing a mixed approach. These approaches are called “guided discretion” (Swiss National Bank (2013)), “constrained discretion” (Bank of England (2009)), or “conditional rules”. This is in line with the BCBS guidance on CCyBs where the credit-to-GDP gap is intended to be a reference point in taking buffer decisions along with other relevant indicators, leaving an important role for judgement.

Sectoral capital requirements/risk weights

- **Switzerland:** The Swiss National Bank (SNB) can make proposals on setting the CCyB on residential real estate exposures in Switzerland. It follows a guided discretion/ladder approach (SNB (2013)). Guidance stems from the analysis of a set of key indicators (domestic mortgage volume and house price indicators) and additional indicators (risk-taking measures of banks, alternative housing credit and price indicators, and general economic environment indicators). The more homogeneous the picture the key indicators convey, the more heavily the SNB will be influenced by the guidance, but exact indicators or thresholds are not communicated publicly. The discretionary element is justified by the need for flexibility in policy-making and lack of experience using the instrument. The implementation period can vary between three and 12 months depending on the severity of imbalances and the strength of dynamics.
- **UK:** The Financial Policy Committee (FPC) is expected to regularly review two lists of indicators when taking decisions on the CCyB and sectoral capital requirements (SCR) (Bank of England (2013)). Both changes in indicators and their absolute level will be taken into account. It is noted that “the greater the degree of imbalance as measured by the core indicators, the more homogeneous the picture that the different indicators convey, and the more consistent that picture is with market and supervisory intelligence, the more likely it is that the FPC will adjust the CCyB and SCRs in response”. A clear role is also given to judgement, which accounts for other indicators and market or supervisory intelligence.
- **Norway:** Norges Bank bases its advice to the Ministry of Finance on setting the CCyB on four main indicators. Norges Bank’s analysis is published in the quarterly “Monetary Policy Report with financial stability assessment”. However, the central bank will also take into account other factors when determining the appropriate size of the buffer, especially in the release phase. Furthermore, Norges Bank will not only analyse developments relative to statistical trends, but will also compare current levels with historical averages. The appropriate size of the buffer will be viewed in the light of other requirements applying to banks, particularly when new requirements are introduced.

- **The BCBS guidance for national authorities operating the CCyB:** More generally, the BCBS suggests a guide for setting the CCyB which is based on the deviation of the credit-to-GDP gap from its long-term trend. A linear function is used by way of example for mapping the credit-to-GDP gap to the CCyB rate.[220] The guide is only intended to be an indicative relationship, not an automatic rule, leaving an important role for judgement. A similar approach has been adopted in the CRD IV (see Article 136 of the CRD IV).

Loan to value /loan to income caps

Korea: The Korean authorities began to use LTV and LTI caps in 2002 and 2005 respectively.[221] The instruments were differentiated according to loan type and geographical region, following a discretionary approach.[222] Different caps are relevant in different regions and for different types of borrowers. Tighter limits apply in so-called speculative zones. Whether a region belongs to a speculative zone follows a formal definition. Therefore, the decision whether an instrument in a certain region is applied follows a rule, but the level of the instrument is set using the authority's discretion.

Europe (from an ESRB survey): In Sweden the Finansinspektionen decides on the level of the LTV cap. Even if there is no established procedure for altering the cap, the effect and the level of the cap are assessed through an extensive data collection exercise once a year. In Finland the cap is a constant non-binding recommendation by the Finanssivalvonta. In Norway the cap is implemented by the Finanstilsynet. The cap is altered on the basis of evaluations of developments in the housing market, households' debt levels and other macroprudential/systemic risk considerations.

220 See BCBS (2010).

221 See Igan and Kang (2011), p. 23-24.

222 The definitions of the LTV and DTI ratios for Korea can be found in Lee (2013), p. 8.

4 Conclusions

Experience, also in the light of the recent financial crisis, shows that there is a natural tendency towards inaction in macroprudential decision-making given the visible short-term costs and the less obvious longer-term benefits. A framework of presumptive or guiding indicators could contribute to mitigating this inaction bias. It would need to be combined with the appropriate institutional set-ups at the national and European levels to minimise the risk of such bias.

In a framework of guided discretion combining elements of a rules-based approach and the need for judgement, indicator values above indicative lower thresholds would initiate further surveillance or policy action. The balance between reliance on indicators and discretion has to reflect conceptual differences between instruments, data availability and country-specific circumstances. Importantly, given that quantitative indicators can never capture all aspects of systemic risks, policy-makers need to be willing to act based on qualitative information and assessments of the level of systemic risk even in the absence of statistical signals for such action.

The ESRB could play an important role in the development of a guided-discretion framework by providing general guidance to Member States and by carrying out further cross-country analytical work on indicators. It could also use a guided-discretion approach in its own monitoring, taking country-specific circumstances into account.

Chapter 10
Macroprudential policy communication[223]

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Executive summary

Communication policy is an important and integrated part of the macroprudential framework. This chapter provides good principles and best practices regarding communication on macroprudential policy. It may serve as a practical frame of reference for national authorities when organising their communication on macroprudential policy.

The main messages of this chapter are the following:

- The key objectives of communication in macroprudential policy are (1) to notify of policy action, (2) to enhance market discipline and manage expectations, and (3) to foster accountability.
- Different institutional set-ups for macroprudential policy in EU jurisdictions require consistency and cooperation at all three levels: (1) single institution, (2) national and (3) cross-border.
- There are five main components that make up the content of macroprudential communication:
  (a) The institutional framework
  (b) Macroprudential strategy
  (c) Risk assessments
  (d) Activation (and de-activation) of macroprudential measures
  (e) Follow-up
- Target audiences include, among others: (1) the general public, (2) financial institutions, (3) journalists, (4) politicians and (5) other relevant public authorities.
- Communication tools include: (1) publications (e.g. FSR), (2) internet-based tools (e.g. websites), (3) media relations (e.g. press releases and conferences) or events (e.g. speeches).
- The content and tools of communication should be adjusted according to the target audience and the objectives of communication.
- Key challenges for effective communication on macroprudential policies include: (1) coordination problems between multiple authorities, (2) explaining technical and complex macroprudential measures in plain language, (3) ensuring consistent communication tailored to the target audience and (4) proper timing of communication.

1 Objectives, general principles and best practices of communication on macroprudential policy

1.1 Main objectives

European legislation, in particular the CRD IV/CRR package, confers certain communication requirements on national authorities when implementing macroprudential measures. However, aside from any legal requirements, communication of macroprudential policy is an important part of the macroprudential framework. To improve its effectiveness it should be aligned with the set of principles and best practices outlined below. For clarity, communication, as further defined in this chapter, pertains primarily to *public (external)* communication, as distinct from the continuous *non-public (internal)* communication on macroprudential policy issues that takes place between the authorities concerned and the ESRB.

Communication of macroprudential policy has the following goals:

- **Notification of policy action:** Policy actions must be communicated to the institutions and/or authorities to which they apply and may be relevant. Where the tool itself has a binding effect on the institution(s) concerned, communicating it may be subject to legal requirements. Clear communication is needed, especially when notification is accompanied by a request that the measure be reciprocated by other Member States (which can be implemented, for instance, via an ESRB Recommendation) or by a third (non-EU) country.
- **Enhancing market discipline and managing market participants' expectations:** Communication to the public and market participants can itself be a policy tool. This is especially the case when the macroprudential authorities and/or the ESRB (such as by issuing a warning or recommendation) seek to emphasise potential vulnerabilities in the financial system and to steer market expectations and risk assessments of financial institutions in a forward-looking manner. A related and complementary objective to this could be to help foster broader understanding among the general public of: i) the sources of financial vulnerabilities and potential contagion mechanisms, as well as ii) the institutional basis for macroprudential policy. A better understanding of risks and macroprudential policy objectives by financial institutions might also increase their risk awareness and thus encourage them to undertake self-corrective actions.
- **Fostering accountability:** Communication of macroprudential policy can also facilitate public scrutiny and thus enhance accountability of a macroprudential authority, in particular when communication of a policy measure contains a certain justification and reasoning for the policy measure[224]. In this context, pre-defined legal requirements and/or well-established best practices (e.g. preparing an annual report, hearings before the parliament) may – to a certain degree – standardise the content of communication which, in turn, can facilitate public scrutiny[225]. Consistent communication builds the reputation of the macroprudential authority and increases the effectiveness of its policy in the long run.

[224] As regards macroprudential policy measures that have direct effects on consumers – e.g. LTV/LTI measures applied on mortgage loans – it can be helpful, when developing such measures, to conduct a broad public consultation prior to activation, so as to enhance the understanding of their implications and to adjust their calibration, as necessary, on the basis of feedback received.

[225] In its recommendation on the macro-prudential mandate of national authorities (ESRB/2011/3), the ESRB advises making the macroprudential authority ultimately accountable to the national parliament.

1.2 Principles and best practices

Regarding the **principles and best practices** for communicating macroprudential policy, the following provide some guidance (the ordering of the list does not indicate a ranking of principles in terms of importance and/or relevance[226]):

1. **Transparency:** As a general rule, the results of macroprudential analyses and information on discussions concerning macroprudential policy actions should be made public, providing publication does not constitute a threat to financial stability.

2. **Predictability and consistency:** Consistent communication increases predictability with regard to the risk assessment and policy actions of a macroprudential authority. This helps to reduce adjustment costs for economic actors. In practice, predictability and consistency could involve the regular publication of macroprudential analyses and risk assessments, with a predefined schedule and form. However, it should be borne in mind that although predictability is desirable, some flexibility might also be needed to ensure that communication is efficient.

3. **Timing:** Communication on the activation of macroprudential instruments should be timely enough – in line with the specific features of the instrument at hand – to mitigate the accumulation of systemic risk. At the same time, the timely announcement of a measure can help to reduce adjustment costs for the target group.

4. **Proportionality:** The scale, scope and content of communication should be tailored to the particular situation and target audience. Proportionality should therefore be assessed according to the complexity of risks and the policy measures taken. Moreover, the information delivered to the public should be comprehensive with regard to the reasoning for a given action and the adequacy of the measures taken. The rationale for the measure should be well explained, ideally supported by a cost/benefit analysis.

5. **Clarity:** The guiding principle should be the KISS rule (keep it short and simple). Most importantly, this means that content and language are tailored to the target group.

6. **Coordination:** The authorities involved in macroprudential policy should aim to speak with one voice and coordinate their communication. This takes on particular importance in the context of collective risk assessments and/or concerted policy actions. However, if the authorities involved make different risk assessments and/or have different views on the warranted policy action, this should be communicated for reasons of transparency and accountability. Moreover, coordination plays an important role with regard to the reciprocation of policy measures (see Section 2.3).

[226] Macroprudential policy communication is to a certain degree comparable to communication in other political fields, in particular monetary and financial policy. It is therefore appropriate to use the IMF Code of Good Practices on Transparency in Monetary and Financial Policies as a reference point and to adapt the principles according to the specific requirements of communication in the macroprudential field.

2 Institutions responsible for communication

Different institutional set-ups for macroprudential policy in the EU Member States influence the way communication is organised. Therefore, macroprudential communication can be analysed on three levels: single institution, national and cross-border.

2.1 Organisation of public communication – single institution level

The external communication policy of a single institution is a result of coordination and teamwork between different organisational units. External communication on macroprudential policy usually follows the same general communication rules as for other policies. For instance, the macroprudential department prepares the content of communication, while the communication department takes care of the process itself. Spokespersons should be supported by the macroprudential department and the communication department. It might also be beneficial to gather feedback from target audiences.

Another related issue is how communication on macroprudential policy should be aligned with communication on other policy areas within the same institution, such as when – in addition to monetary policy – a central bank is also responsible for prudential policies. Coordination and constant staff contacts between different policy areas and coordination meetings may help to reduce the risk of conflicting messages and reputational risk.

2.2 Organisation of public communication – national level

The need for cooperation in communication arises when several national authorities share responsibilities or are involved in macroprudential policy. This is especially the case if the macroprudential authority is a collegial body. Establishing coordination mechanisms is desirable. However, coordination should not infringe on the right of various authorities to communicate separately on the same subject. The central bank's independence plays a key role in this respect.

Several good practices might be suggested. Press releases and other documents to be published should be discussed at meetings of the collegial body. The secretariat of the collegial body should ensure that the external communication is in line with the decisions taken. Moreover, creating a contact group consisting of staff level experts from cooperating institutions is likely to foster informal cooperation. This could contribute to the consistency of the communication processes. Should no consensus be found, explaining the reasons behind the differences in opinions or inaction would be beneficial in terms of the accountability of participating institutions.

2.3 Organisation of public communication – cross-border level and reciprocity

When a macroprudential measure is introduced at national level, its effectiveness strongly depends on the extent to which it is reciprocated by other EU Member States and, to some extent, by countries beyond the EU. Therefore, clear communication with other EU macroprudential authorities and the ESRB[227] is necessary. Clear cross-border communication channels include notification procedures.

When informing other national macroprudential authorities and the ESRB of a forthcoming macroprudential measure, the activating Member State should clearly explain the rationale behind the measure and justify its timing, calibration and the need for reciprocity.

National authorities should also be encouraged to continue informal early information-sharing with the ESRB (e.g. at the staff level) about planned macroprudential actions. Furthermore, it would also be beneficial to exchange information about the introduction of measures, even if notification is not obligatory according to EU regulations.

Last but not least, communication with non-EU macroprudential authorities is also warranted, especially in countries with material links to third countries (e.g. the US). In such cases, reciprocity and the implementation of national macroprudential measures might be strengthened, e.g. by sending official letters to relevant non-EU authorities.

[227] The ESRB's role includes assessing macroprudential measures and recommending their reciprocation, and communicating on the measures to be reciprocated.

3 Content of macroprudential policy communication

Communication on macroprudential policy should cover at least five topics (see table 10.1): 1) institutional framework, 2) macroprudential strategy, 3) assessment of systemic risk, 4) activation (and de-activation) of macroprudential instruments and (possibly) future action, and 5) follow-up of macroprudential measures taken.

3.1 The institutional framework

The institution entrusted with a macroprudential mandate, namely the macroprudential authority, should be communicated. The information on the macroprudential authority should specify:

- its legal basis;
- its objectives and tasks;
- the powers (whether binding or non-binding) and instruments at its disposal;
- accountability mechanisms.

In the CRD IV/CRR context, it is desirable to communicate which institution is a designated authority in a particular jurisdiction. It would be useful to describe the distribution of responsibilities between macro- and microprudential authorities. Where multiple institutions have responsibilities in macroprudential policy, communication on the institutional framework should also describe governance and the decision-making process, i.e. how macroprudential tools are allocated between different authorities, who chooses the instruments and decides on their (de-)activation, how the decision-making process is structured, and how coordination between the different authorities is organised.

3.2 Macroprudential strategy

The aim of the strategy is to explain to the public the main idea behind macroprudential policy and its objectives, tools and institutional set-up at national level. The macroprudential strategy should be treated as a comprehensive document that establishes a sound framework for the application of macroprudential instruments. In terms of content, the macroprudential strategy could elaborate on:

- the objective of macroprudential policy;
- the institutions involved in macroprudential policy and their powers and instruments (i.e. see Section 3.1.) together with the legal background;
- macroprudential instruments;
- the decision-making process;
- communication policy.

3.3 The assessment of systemic risk and ex ante communication

One of the macroprudential authority's key tasks is to identify, analyse and assess systemic risks for financial stability. Authorities are advised to communicate regularly on their assessment of risk, regardless of whether or not macroprudential measures have been taken. For this purpose, authorities might define and disclose a publication schedule of systemic risk reports/analyses (e.g. risk dashboard, heat maps).

When systemic risk increases, information on macroprudential tools which can potentially be used to address this risk might also be included in risk assessment analysis. This may increase risk awareness among market participants, promote market discipline and trigger self-corrective action, thus reducing the need for policy intervention. In this respect, the disclosure of guiding indicators and indicative thresholds may serve as commitment devices for taking macroprudential action[228]. However, such disclosure may lead to confusion and misunderstandings over when policy instruments are likely to be activated. This risk should be weighed against the benefits of extensive disclosure. Alternatively, quantitative information might be published together with the macroprudential authority's commentary interpreting the levels of different ratios. Such a quantitative explanation might increase understanding of the situation within the financial system, especially for a non-professional audience.

3.4 The activation (and de-activation) of macroprudential measures

Communication on a macroprudential measure activated to curb systemic risk should include a description of the systemic risk identified and how the measure is expected to mitigate it. Authorities should explain the key operational features of the measures, e.g. scope of application, level, timing, phasing-in arrangements and, when appropriate, expected duration. Authorities should also disclose the rationale for activating macroprudential measures, in line with their mandate and objective. The challenging task is to communicate more than one macroprudential instrument activated at the same time. The rationale for using several macroprudential instruments should be explained (e.g. to limit regulatory or cross-border arbitrage, to address the elevated level of systemic risk, to tackle systemic risk from different angles, and to increase the effectiveness of macroprudential policy action), in particular due to the fact that having multiple macroprudential instruments working together means a higher regulatory or administrative burden for financial institutions. Authorities should also duly consider the appropriate timing for communication on de-activation of macroprudential tools. In particular, in such a case, a communication with due justification should follow, explaining how de-activating the measure would contribute to achieving macroprudential objectives.

[228] The disclosure of certain indicators is mandatory in some cases (e.g. the countercyclical capital buffer, Art. 136 of the CRD IV). Macroprudential authorities may establish disclosure policies or additional communication requirements in national rules.

3.5 Follow-up

When a macroprudential authority has only soft powers, such as recommendations, a follow-up procedure to check compliance is desirable, even if recommendations are not formally backed by a *comply or explain* mechanism.

In the follow-up process, the publication of the *ex post* assessment of measures taken is important. Given that some actions take a long time to have an effect and data is available only with a lag, it would be unreasonable to come to conclusions as to their effectiveness too early. Authorities should communicate on transmission channels of the macroprudential instrument, its actual impact on the financial sector and the real economy as well as any possible side effects. If feasible, the publication could also include an overall assessment of the effectiveness of the macroprudential measure introduced.

Table 10.1
Content of macroprudential communication

Institutional framework	Macroprudential strategy	Systemic risk assessment	Activation of measures	Follow-up
Mandate Legal framework Objective – general Governance Decision-making Powers and available instruments	Rationale for macroprudential policy Objectives (overall and intermediate) Institutional framework Coordination mechanisms Communication policy (key principles)	Risk identification and assessment Principles of guided discretion (possibly) Guiding indicators (possibly) Indicative thresholds (possibly) Institutional framework (selected content)	Operational features: - Scope of application - Level - Timing and phasing-in - Likely duration (possibly) Rationale and transmission channel Systemic risk assessment (selected content) Institutional framework (selected content)	Actual impact of the measure on the financial system and the real economy Side effects (possibly) Activation of the measure (selected content) Systemic risk assessment (selected content) Institutional framework (selected content)

4 Target audiences

4.1 Typology of audiences

Since communication on macroprudential policy aims to manage expectations and build a common understanding of risks, a granular approach to the target audience is advised. To this end, it could be useful to distinguish the following target groups for macroprudential communication:

- General public (including borrowers)
- Financial institutions (including creditors)
- Journalists
- Politicians
- Other policy-makers (public authorities).

4.1.1 General public

The general public, including borrowers, is the most recognisable target group for macroprudential communication as all macroprudential measures implemented eventually have a direct or indirect impact on the whole of society (i.e. households and businesses). The general public and borrowers are not professionals; therefore the message addressed to them should be short, concise and easy to understand. In this case, communication could take the form of press releases, press conferences or media appearances.

4.1.2 Financial institutions

Financial institutions and market participants are a professional audience and thus require more complex information and explanation of policy actions. To meet their expectations, the basic information included in press releases and media appearances could be supplemented by more sophisticated and technical details. However, such one-way communication might, in some cases, be insufficient. Therefore, feedback gathered during direct consultations with industry could constitute another form of communication.

4.1.3 Journalists

Journalists are a special target group, even though they are not direct addressees of macroprudential measures *per se*. However, they may play a pivotal role in the successful communication of those measures in practice by channelling information from the macroprudential authority on to the general public.

4.1.4 Politicians

Macroprudential measures can sometimes be politically unpopular as benefits are only visible in the medium or long term while the costs of implementation are immediate. That is why it can be useful to explain to politicians the rationale behind the implementation of macroprudential measures to mitigate or prevent systemic risks (e.g. pointing to the high economic and social costs of crisis in the past).

Furthermore, in jurisdictions where the macroprudential authority has only soft tools (i.e. recommendations) and legislative power is in the hands of the government or the parliament, subsequent approval by politicians might be required to:

- introduce the macroprudential measures into legislation and/or
- activate the recommended macroprudential measures.

In such circumstances, due effort should be devoted to convincing politicians of the potential costs of inaction bias. Such efforts can foster prompt and decisive policy action to address the risks to financial stability, as well as fulfil the accountability obligations of institutions involved in macroprudential policy.

To this end, an active approach is needed to establish well-functioning communication channels with policy-makers, both on a regular and ad hoc basis, e.g. hearings in parliament, meetings with MPs, letters to the parliament, etc.

4.1.5 Other policy-makers (public authorities)

The efficiency of macroprudential policy is influenced by a variety of other policies (e.g. monetary, microprudential, macro-economic, fiscal, competition or housing policies) due to existing interactions. Therefore, it is important to ensure that the effects of the instruments applied by the macroprudential authority are not undermined by contradictory decisions taken in other policy areas. For this reason, transparent and comprehensive communication explaining which systemic risks are targeted by macroprudential policy instruments is vital. It is also possible for the macroprudential authority to make recommendations to other public authorities, asking them to take – or refrain from – certain actions. However, the compliance of those authorities will to a large extent depend on the understanding of the macroprudential objectives, the identified systemic risk and the potential negative effects.

4.1.6 Target audiences and communication tools – a recap

This categorisation may help to tailor the language and content of a message to the target audience and select the most appropriate communication tools (for suggested allocation, see table 10.2). It should be remembered that depending on the objective of the communication, different tools might be deployed even for the same audience. Such an approach should ensure that the specific message is both received and correctly understood by each category of addressees.

Table 10.2

Target audiences (by sub-groups) and tools of macroprudential policy communication – an example

Sub-groups of target audience	General public (borrowers)	Financial institutions	Journalists	Politicians	Other policy-makers
Annual report	*	**	**	***	***
FSR	**	***	**	*	***
Press releases	**	***	***	**	***
Direct meetings (e.g. hearings in parliament)	*	**	***	***	***
Letters	n/a	***	n/a	***	***
Press conference/ speeches	**	***	***	**	*
Minutes	*	***	***	*	*
Social media	***	*	***	***	*
Risk dashboard	*	***	**	*	**
Educational documents (e.g. thematic notes, leaflets, brochures, FAQ documents)	***	*	***	***	*
Professional documents (analytical papers, working papers)	*	***	*	*	***
Public or targeted consultations	**	***	*	*	**
Website	***	***	***	***	***

Notes: the number of stars reflects how well a particular communication tool can reach a certain target audience. Three stars (***) mean the most suitable communication tool, while one star (*) means the least suitable communication tool.

5 Communication tools

5.1 Types of communication tools

In many cases, possible communication tools overlap or interlink with each other. The following categorisation is not meant to be exhaustive but aims to provide a general framework dealing with different kinds of communication tool.

5.2 Publications

The first group, *publications*, includes reports, shorter bulletins and brochures. These communication tools are particularly useful for communicating the institutional set-up, macroprudential strategy, assessment of systemic risk, and in general for communication associated with comprehensive and analytical content. Policy statements, in turn, may include documents of reasoned decisions, recommendations, warnings, or opinions, partly similar to the ESRB recommendations. Minutes, in particular, are meant to explain in more detail the content of macroprudential authorities' meetings and thus their usage is justified as they enhance transparency and facilitate accountability. However, the usage of minutes may be restricted by the non-public nature of meetings and confidential content. Consultations provide a more interactive form of communication with either broad or targeted audiences.

5.3 Internet-based tools

A second category, identified as *internet-based tools*, interlinks and overlaps with other tools of communication to a particularly large degree, as they can also be communicated via the internet (e.g. reports adapted to a web format etc.). However, it also encompasses tools in their own right, such as web pages, web publications and the use of social media to link to official websites and to announce official publications. In terms of content, internet-based tools are flexible and the macroprudential web page should gather all kinds of macroprudential relevant information in one place and act as a central hub for communication.

5.4 Media relations

A third category, *media relations*, involves press releases, press conferences, press briefs, and FAQ documents as well as interviews and other media contact. This group is associated with oral communication and it is particularly used to enhance the principle of two-way communication as well as to strengthen macroprudential authorities' communication message.

5.5 Events

A fourth group, *events*, covers speeches, seminars, conferences, hearings (possibly linked with public consultations) and other types of meetings or other interactions with stakeholders. The fourth group is similar to the third one, except for the primary audience targeted. Both these categories of tools are particularly useful in order to increase the general awareness of macroprudential policy and to share information with other institutions.

5.6 Time-span and nature of communication tools

One way to compare and further understand the different communication tools is to consider their time-span and nature. Specifically, publications are more extensive and in a sense more “long-lasting” or structural; hence their time-span is longer. Media relations and events are more dynamic by nature and are rather short-lived. In this regard, internet-based tools, in turn, cover a wider range of communication, having both dynamic and more structural aspects. At the early stage of macroprudential policy, communication is mainly extensive as there is a need to communicate the institutional set-up, strategies and other more comprehensive information. However, as macroprudential policy is being developed, communication moves more towards dynamic communication.

5.7 One-way and two-way communication tools

Macroprudential policy communication tools can be either one-way or two-way. Many communication tools mentioned above are one-way. This means that the macroprudential authority communicates on certain issues (e.g. identified risk, actions taken) but does not receive any feedback. Two-way communication engages the receiver of the message. It could be, for example, a recommendation based on a *comply or explain* principle that requires an addressee to take a position on the recommendation. Another example would be public or targeted consultations, e.g. on a draft of new legislation with macroprudential interest.

The category of two-way communication also includes informal means of communication such as bilateral contacts or meetings with different target groups (e.g. politicians, financial institutions). Such consultations give macroprudential authorities both the opportunity to provide a more in-depth explanation of the rationale behind the measure and the chance to learn stakeholders' point of view and thus feed into the potential "in-house view". As a result, it might be easier for the macroprudential authority to influence and encourage addressees to undertake pre-emptive actions. Feedback received by the authority might support the calibration of macroprudential measures and help to predict the market reaction to these measures.

Table 10.3 gives an indicative summary of what kinds of tools could be best suited to a message's particular content.

Table 10.3
Macroprudential communication illustration – an example

Content/Tools	Publications	Internet-based tools	Media relations	Events
institutional set-up	***	**	*	**
strategy	***	**	**	**
assessment of systemic risk	***	***	**	**
planned or taken actions	*	***	***	***
follow-up	*	***	***	**

Note: The number of stars indicates how suitable a particular group of communication tools is for communicating different content (three stars (***) meaning most suitable).

6 Challenges in communication on macroprudential policy

Challenges in macroprudential communication are various and can be divided into four categories as suggested below. They have been identified on the basis of a survey conducted among ESRB member institutions in December 2014. Of course, this classification is simplified and many challenges are related to several of these categories.

6.1 Coordination problem

A coordination problem may arise **within the macroprudential authority or among the authorities that are involved in macroprudential policy** (see Section 2). Internal coordination problems were identified by several respondents in the ESRB communication survey. Some respondents in the survey indicated that there were plans to establish a coordinating secretariat, or that one had already been established to tackle this challenge.

6.2 Content and tools of communications

A general challenge linked to the **content and tools of communication** (see Sections 3 and 5) is, on the one hand, how to ensure the clarity of the message and, on the other hand, how to formulate the message to meet the communication objectives. Another challenge in this area is related to communication horizons and how to distinguish them depending on the communication's content and objective.

The challenge most frequently mentioned in the ESRB survey was how to tailor the message to reach target audiences, particularly transforming complex and technical issues into plain and relatively simple communication. A similar type of challenge is the question of the “optimal amount” of transparency in communication: on the one hand, the authorities must avoid communicating too little, but also must avoid communicating too much, which might create information chaos. In addition, regarding transparency, macroprudential actions are justified by analysis that is partly based on confidential data, a fact that may be challenging in terms of communication.

6.3 Target audiences

As regards **target audiences** (see Section 4), a major challenge is how to promote sufficient knowledge of macroprudential policy among the general public, but also with other audiences. This is complemented by the additional challenge of how to select the (proper) communication tools to reach target audiences. Audience reactions at different stages of financial cycles may diverge; particularly in situations of stress, certain types of communication might have destabilising effects and/or not enough communication could aggravate market stress.

6.4 Timing

The timing of the announcement of the activation (or de-activation) of macroprudential instruments may pose a challenge. Setting the transition period from the moment the activation of a measure is announced until the time when the measure actually comes into force might be problematic. This is particularly relevant for borrower-based measures such as the LTV limit, where early communication can lead to front-loading, yet delayed communication runs the risk of a lack of public understanding and acceptance of the measure. At the same time, for instruments such as capital buffers, a longer transition period may be required, e.g. to give the regulated institutions more time to comply with the requirements. Therefore, communication should be early enough to achieve objectives and give the addressees enough time to adjust to macroprudential measures.

Clear solutions to many of these challenges are hard to find at this early stage. Many of them will become easier to tackle as macroprudential authorities gain more experience in communicating macroprudential policy. Some general principles to address challenges at this stage are setting clear objectives and targets, keeping things (content, tools, etc.) as simple as possible, ensuring enough human resources for communication and, in particular, being active in following up communication (e.g. analysing the effectiveness of communication).

Chapter 11
Cross-border effects of macroprudential policy and reciprocity[229]

[229] This Chapter was prepared by a team coordinated by Stéphanie Stolz (ESRB Secretariat) and comprising Aliénor Margerit (European Commission), Rhiannon Sowerbutts (Bank of England), Jon Frost (De Nederlandsche Bank), Dawid Zochowski (European Central Bank), and Stephan Fahr (European Central Bank). It replaces an earlier chapter prepared by Silvia Pezzini (Bank of England), Jean-Luc Thevenon (Autorité de Contrôle Prudentiel) and Tomasz Gromek (National Bank of Poland).

Executive summary

In an integrated financial system like the EU Single Market, strong policy coordination is needed to ensure the effectiveness of national macroprudential policy. National measures are justified, given the divergence of cyclical and structural risks in Member States. Yet measures can have spillovers to other countries (outward spillovers) and can sometimes be circumvented by foreign branches and cross-border lending (inward spillovers). Given its mandate, the ESRB has an important coordination role in assessing measures, discussing cross-border effects, and recommending mitigating measures, including reciprocity.

This Chapter lays out an analytical framework for assessing cross-border effects. It identifies five channels of propagation, through which macroprudential measures can affect other countries: (i) cross-border risk adjustments, (ii) network formation and potential for contagion, (iii) regulatory arbitrage, (iv) altering monetary transmission, and (v) trade effects. Individual channels are considered particularly relevant for different types of instruments. This offers guidance for assessments that can be drawn up for new macroprudential measures.

The ESRB has also agreed on a framework for voluntary cross-border reciprocity. Under EU law, mandatory recognition is limited to a few cases. For most macroprudential measures, recognition is either voluntary or unspecified. Where macroprudential measures target risk exposures in a country, they should ideally be reciprocated. To ensure this, Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures and Decision ESRB/2015/4 on a coordination framework regarding the notification of national macroprudential policy measures by relevant authorities, provide that the ESRB will triage measures, make information on them publicly available and follow up on its recommendation. A process is defined for the notification of measures, the decision on reciprocity, communication and monitoring. This Chapter explains the framework and describes how it can work in practice.

1 Introduction

In the EU's integrated financial system, national macroprudential policy should not be conducted in isolation. While macroprudential policy is primarily conducted at the national level, notwithstanding the competences of the ECB in the banking union, coordination of national measures and approaches is essential. Such coordination helps ensure consistent policy implementation across borders and limit the scope for undesirable spillovers between Member States and regulatory arbitrage among financial institutions.

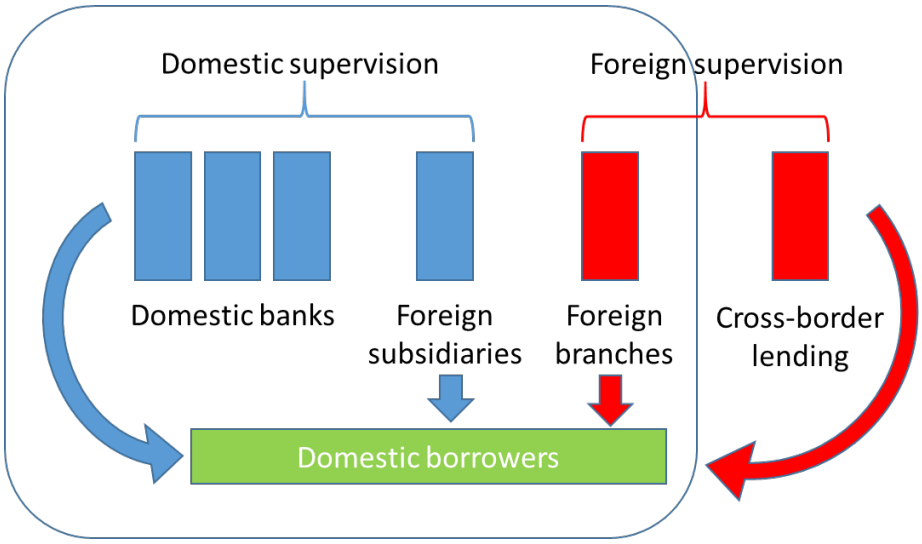
Given its broad mandate and EU-wide perspective, the European Systemic Risk Board (ESRB) is well placed to ensure the cross-border coordination of macroprudential policies in the EU. The ESRB founding Regulation[230] entrusts the ESRB with a broad coordination mandate and the task to ensure consistent policy responses among Member States. Additionally, the ESRB was entrusted by the CRD IV/CRR package with specific responsibilities in the activation of certain macroprudential instruments by Member States, in order to promote timely and consistent policy responses among the Member States, prevent unjustified diverging approaches and improve the functioning of the internal market. When assessing the impact of a given macroprudential measure, the ESRB should recommend mitigating measures, where necessary, in particular its reciprocation.

Reciprocation of measures is the means by which to safeguard the effectiveness and consistency of macroprudential policy across borders within the EU. Without reciprocity, macroprudential measures taken in a given Member State in principle only apply to domestic institutions and subsidiaries of foreign service providers operating in that Member State. They do not necessarily affect branches of foreign service providers in that Member State or foreign service providers based elsewhere in the EU but directly exposed to macroprudential risk in the activating Member State. Because foreign branches and cross-border lending fall in principle under foreign supervision, they are – without reciprocity – not bound by many macroprudential measures (Figure 11.1). This makes policy implementation inconsistent at the EU level and renders it relatively easy for financial service providers to circumvent national macroprudential measures.

[230] Regulation (EU) No 1092/2010 of the European Parliament and of the Council of 24 November 2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board.

Figure 11.1

A schematic view of the application of macroprudential measures



A voluntary extension of the principle of reciprocity in macroprudential policies beyond the mandatory requirements in EU law therefore appears warranted. Without reciprocity, a different set of (macro-)prudential requirements can be applicable to the same risk exposure in a given Member State, depending on the legal status and jurisdiction of the financial service provider, potentially leading to leakages and regulatory arbitrage, distortion of competition and unintended external effects on other Member States. The concept of reciprocity is well established in international law and the benefits of reciprocity have notably been emphasised by the International Monetary Fund in its recommendations for a macroprudential policy framework.[231] In Europe, the work of the Nordic-Baltic Macroprudential Forum also points to the same conclusion. Yet the cases where reciprocity is mandated under EU law are limited. Furthermore, as evidenced by Member States' recent experience in activating macroprudential instruments, cases of voluntary reciprocity beyond existing EU law requirements are still rare.

The Single Supervisory Mechanism (SSM) has helped deepen policy coordination between many Member States. For the 19 countries participating in the SSM, direct microprudential supervision of significant institutions (SIs) has been transferred as of 4 November 2014 to the ECB. This pooling of responsibilities should help harmonise supervisory practices. Moreover, based on Article 5 of the SSM Regulation[232], the ECB has the power to adopt legally binding macroprudential measures within the scope of the CRR/CRD IV. It can apply higher requirements for capital buffers than those applied by national relevant authorities and more stringent measures aimed at addressing systemic or macroprudential risks, in line with Article 105 of the SSM Framework

[231] See for example Staff Guidance Note on macroprudential policy, IMF, November 2014.

[232] Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions.

Regulation[233]. SSM countries and the ECB have new procedures for coordinating macroprudential policy. For the implementation of macroprudential policy, these changes mean that the ECB can also be considered a designated authority (Article 9(1) of the SSM Regulation), and that new macroprudential policy measures by SSM countries or the ECB will have to go through the relevant coordination procedures defined by the ECB, before draft/preliminary decisions are communicated to the ESRB.

Drawing on the work of the ESRB IWG Expert Group on cross-border effects of macroprudential policy and reciprocity, the purpose of this Chapter of the Handbook is threefold. Specifically, it aims to (i) describe the ESRB's role in coordinating macroprudential policies within the EU, (ii) propose a framework to help Member States and the ESRB assess the potential cross-border impact of macroprudential policies, and (iii) outline a voluntary reciprocity framework for the European Union, going beyond existing provisions under EU law. The ESRB framework for voluntary reciprocity is laid down in Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures and in Decision ESRB/2015/4 on a coordination framework regarding the notification of national macroprudential policy measures by relevant authorities.

[233] Regulation (EU) No 468/2014 of the European Central Bank of 16 April 2014 establishing the framework for cooperation within the Single Supervisory Mechanism between the European Central Bank and national competent authorities and with national designated authorities.

2 Coordination role of the ESRB

2.1 General coordination role

The ESRB founding Regulation has entrusted the ESRB with a general coordination role in the field of macroprudential policy. According to the Regulation[234], the ESRB should contribute to ensuring financial stability and to mitigating systemic risk that may negatively affect the internal market and, in turn, the real economy. By addressing risks to financial stability, it should contribute directly to an integrated Union supervisory structure necessary to promote timely and consistent policy responses among the Member States, thus preventing unjustified diverging approaches and improving the functioning of the internal market. The ESRB may recommend relevant action and thus contribute to counteracting potential inaction bias, including both the activation and de-activation of macroprudential measures, which may be present in macroprudential policy in some circumstances. The ESRB can also assist Member States in monitoring and assessing potential cross-border spillovers.

According to the CRD IV/CRR, the ESRB shall provide its opinion on whether the conditions for certain national macroprudential measures adopted under Article 458 of the CRR and Article 133 of the CRD IV are met. The CRD IV/CRR framework also foresees that decisions of Member States on countercyclical capital buffer rates are coordinated as much as possible. In this regard, the ESRB should issue recommendations in order to guide Member States and should facilitate discussion between authorities about setting buffer rates, including defining relevant variables. In order to better coordinate the actions of national macroprudential authorities and to prepare its opinions under Article 458 of the CRR and Article 133 of the CRD IV, in 2014 the ESRB established an Assessment Team reporting to the ESRB Advisory Technical Committee.[235]

The role of the ESRB Assessment Team has gradually evolved beyond preparing opinions under Article 458 of the CRR and Article 133 of the CRD IV. Member States tend to notify measures of macroprudential interest, in a broad sense, which are then discussed by the Assessment Team during teleconferences, whenever the need arises.

2.2 Issuing ESRB opinions required under EU law (Article 458 of the CRR, Article 133 of the CRD IV)

By EU law, the ESRB is required to provide opinions or issue recommendations on specific macroprudential measures. According to Article 458 of the CRR and Article 133 of the CRD IV, the ESRB should deliver such opinions and recommendations within one month of receiving notification of the measures. The ESRB assesses the appropriateness of the intended measures from a macroprudential perspective, based on the notification received from the respective authority

[234] See footnote 2 above.

[235] Decision of the European Systemic Risk Board of 27 January 2014 on a coordination framework regarding the notification of national macroprudential policy measures by competent or designated authorities and the provision of opinions and the issuing of recommendations by the ESRB (ESRB/2014/2).

and its own analysis. The merit of the notified measures is assessed in terms of justification, effectiveness, efficiency and proportionality. Macroprudential policies can have material positive spillovers to other countries by reducing the build-up of systemic risk and the probability and impact of systemic crises. In macroprudential policy, the costs and benefits of policy measures tend to occur along different time horizons. Changes in lending are likely to happen quickly and can be measured to a large extent. Benefits to financial stability, conversely, are perceived only over longer time horizons and are difficult to quantify. While risks to financial stability are difficult to quantify ex ante, the recent financial crisis, during which financial instability propagated from one country to another, clearly showed significant costs ex post.

In its assessment, the ESRB should consider potential cross-border implications of notified measures, and, if deemed necessary, recommend certain amendments to the measures notified, in particular their reciprocation, in order to mitigate potential negative spillover effects within the context of the Union internal market. To prepare its opinion, the ESRB should have a range of information at its disposal. This includes both ad hoc information on the specific measure – the notification templates therefore contain respective questions on inward and outward cross-border spillovers – and regular information on the materiality of financial stability interlinkages across borders (on the need to receive regular information, see Section 3 “Analytical framework to assess cross-border effects” under this Chapter).

A smooth and efficient process for opinions or recommendations is crucial to meet tight deadlines. This is precisely the reason why the ESRB Assessment Team was established. As important elements of such a smooth and efficient process, notifying authorities are asked to provide notifications of measures in English, using the templates published by the ESRB on its website, and to draw up the notification as precisely and concisely as possible.

2.3 Reciprocity as a means to mitigate negative spillovers (both inward and outward)

Without reciprocity, regulation may be inconsistent across countries, and it is easy for financial service providers to circumvent national macroprudential measures. This has two negative effects: leakage and regulatory arbitrage as well as reduced resilience in other Member States. For the country taking the action, there may be negative inward spillovers as potential capital inflows from circumventing financial institutions could weaken the effect of the macroprudential measure; for a country whose financial institutions circumvent the measure there is a negative effect on resilience. The ESRB can play a key role in recommending reciprocity to mitigate both of these negative effects. For a limited number of macroprudential measures, there is already mandatory recognition under EU law. Yet for other measures, a voluntary reciprocity framework for the EU is outlined below (see Section 4 “Reciprocity framework” under this Chapter).

2.4 Recommending mitigating measures for outward spillovers

When a proposed policy measure entails more benefits than costs from a domestic perspective, but imposes material cross-border costs on other countries, the ESRB can play a key role. The ESRB can help devise ways to mitigate negative spillovers, while preserving the benefits of the measure. In particular, the ESRB should draw on its central role among Member States to encourage dialogue between relevant authorities. Therefore, the ESRB can recommend to:

- mitigate negative effects, where possible;
- consider if the measure can be replaced by another one with similar benefits and fewer and/or less harmful spillovers;
- take the necessary macroprudential measures, where Member States remain inactive in the face of a build-up of systemic risk;
- reframe policies in such a way as to preserve the objective of increasing resilience in one jurisdiction but not causing contractions in lending or capital shifts to other jurisdictions;
- not adopt the proposed policy measure, if the cross-border effects are material and cannot be mitigated.

3 Analytical framework to assess cross-border effects

Cross-border effects of macroprudential measures can be divided into inward and outward spillovers. In the case of outward spillovers other countries are affected by a macroprudential policy action carried out by an individual Member State. If the induced spillovers create additional systemic risks, the affected country may need to adopt countervailing measures. In contrast, inward spillovers occur when foreign financial institutions circumvent regulation by exploiting arbitrage opportunities. One such example is where branches of foreign service providers increase lending as a result of tighter credit standards or as a result of capital requirements imposed on domestic service providers. In the absence of reciprocity arrangements, branches are not bound by domestic macroprudential policy measures. To prevent these types of spillovers, coordination between countries is important, and reciprocity arrangements may mitigate these spillovers.

Generally, spillovers from macroprudential policies are positive for financial stability in other Member States, as a reduced risk of financial instability in the acting Member State will also reduce the risk of possible contagion to other Member States. However, in some cases, spillovers may also be negative. This may depend on the relative stage of financial cycles across countries. A tighter macroprudential policy could pose additional financial stability risks to another country, if it further boosts credit growth when this is already strong (outward spillovers). But the same outward spillovers would instead stabilise the financial system, if the foreign country is experiencing a phase of excessive deleveraging. The degree of synchronisation of financial cycles across countries is therefore of relevance when assessing spillovers.[236]

In cases of (material) cross-border spillovers, the policy response will most probably be aligned according to (i) the direction of spillovers (inward or outward), and (ii) the sign of spillovers (i.e. whether they are positive or negative). The sign of the spillovers may change, depending on where in the financial cycle a country is. For instance, a tightening of macroprudential policy that leads to a reduction of the credit growth abroad entails a positive outward spillover if the foreign economy is in the peak of the financial cycle, and a negative outward spillover if that economy is in the through.

As shown in Table 11.1, reciprocity of measures appears particularly warranted in the case of inward negative spillovers. In other cases, reciprocity is not necessarily the most appropriate policy response. If reciprocity is best aimed at reducing or eliminating regulatory arbitrage, the behavioural adjustment of service providers is more appropriately encouraged through a general coordination of policies. The appropriate level of consolidation is also an element to be considered. Cross-country spillovers may strongly differ depending on the level at which macroprudential instruments are applied (i.e. consolidated, sub-consolidated or individual levels), mainly as a consequence of intragroup arbitrages, especially within large banking groups. It is therefore important to clearly identify the best consolidation level at which to apply the macroprudential instruments, in order to reduce negative spillovers.

[236] See also Meller and Metiu (2015), "The synchronization of European credit cycles", Deutsche Bundesbank Discussion paper 20/2015.

Table 11.1

Potential policy implications of reciprocation in a cross-border perspective

Sign / Direction of spillovers	Inward	Outward
Positive	Domestic macroprudential action **reinforced at home**: risk of excessive initial action by home country, e.g. when foreign service providers (branches and cross-border lenders) adapt their behaviour in reaction to home country regulation due to increased risk awareness	Domestic macroprudential action reduces **systemic risk in host country**: risk of free-riding by host authority and therefore incentive for inaction of host country authority (**coordination warranted**)
Negative	Domestic macroprudential action **weakened at home (leakage)**: risk of lack of collaboration of host authorities (**mandatory recognition warranted**)	Domestic macroprudential action **increases systemic risk in host country (spillover, regulatory arbitrage)**: risk of uncooperative equilibrium where host authority takes independent action (**coordination or optional reciprocity warranted**)

There are several transmission channels through which macroprudential policy action can affect other countries. Some cross-border transmission channels may be particularly relevant in the context of one macroprudential instrument, but negligible for other instruments. Other channels may exist theoretically, but have virtually no impact in practice. This Section therefore seeks to classify transmission channels in order to provide a framework for assessing their significance, by framing it in terms of inward/outward and positive/negative spillovers, and for various groups of macroprudential instruments, i.e. capital instruments, sectoral instruments, liquidity instruments and non-bank instruments. For this, the economic and financial cross-border transmission channels may operate via: (i) cross-border adjustment of risk exposures of lenders, through e.g. changes in real economy lending and borrowing; (ii) changing network formation and its potential for contagion, especially relevant in cross-border networks among financial institutions; (iii) regulatory arbitrage, whereby financial institutions exploit cross-country differences in regulatory frameworks to circumvent macroprudential requirements; (iv) altering credit conditions through the relative cost of lending; or (v) trade effects. The remainder of this Section thus describes these various channels in more detail and attempts to assess their importance for various types of macroprudential instruments.

Cross-border risk adjustments

(a) **Adjustments of cross-border credit exposures.** Macroprudential instruments may affect service providers' cross-border portfolio allocation, whereby service providers may change their holdings of foreign direct credit exposures. This can be in the form of cross-border direct lending or securities exposures or through subsidiaries or branches active in the other country.[237,238] For example, an increase of sectoral capital

[237] See Houston, Lin and Ma (2012), "Regulatory Arbitrage and international bank flows", *The Journal of Finance*, No 67(5), October, pp. 1845-1895,

[238] See Bremus and Fratzscher (2014), "Drivers of structural change in cross-border banking since the global financial crisis", *Journal of International Money and Finance*, No 52, pp. 32-59.

requirements for commercial real estate lending may decrease cross-border exposures to that sector, but at the same time it may increase cross-border lending to households or other types of lending to non-financial corporations, after a macroprudential action. Moreover, higher capital requirements could lead to a rebalancing of service providers' portfolios in order to increase cross-border lending, which becomes less expensive as it requires holding a smaller amount of capital per unit of lending. In a similar vein, tighter LTV ratio caps introduced on domestic lenders may limit demand for mortgages from domestic borrowers and lead to a shift to lending from abroad.[239]

(b) **Adjustments of cross-border securitisation activity.** Macroprudential policy may alter service providers' incentives for cross-border transfer of credit risk, for instance by encouraging/discouraging the originate-to-distribute type of model, which may also rely on international funding sources.[240] The originate-to-distribute business model has led to a build-up of large cross-border securitisation holdings by some lenders, in the years prior to the global financial crisis. Higher capital requirements for balance sheet exposures may have encouraged originate-to-distribute activity of lenders, whereby they shed exposures from their balance sheet to free capital for further lending. Macroprudential policies may alter the incentives for securitisation activity and may shift lending to foreign markets, should policies such as tighter limits on LTV ratios restrict domestic loan demand.

(c) **Access to cross-border capital markets.** Lenders can meet higher capital requirements by raising new equity, by deleveraging – leading to lower risk-weighted assets – or by a combination of the two. Access to capital markets and the related ability or willingness to raise capital may be an important facilitating or mitigating factor for deleveraging. For instance, if financial institutions have easy access to international capital markets, service providers may meet the new higher capital requirements by raising funds in those markets. Thus, a possible deleveraging after a tightening of macroprudential policy may be avoided or limited, in the absence of sufficient local capital. Should access to capital markets be difficult, cross-border spillovers may occur through a stronger contraction in foreign lending relative to domestic lending.

Network formation and potential for contagion

(d) **Adjustments of cross-border liquidity/funding lines.** Macroprudential policies may affect portfolio choices of financial service providers and of their market activity, in particular in terms of providing or receiving funding (subordinated loans) and liquidity (interbank and repo markets). This in turn affects the network structure of the system, which is an important factor determining contagion. With more integrated financial markets, macroprudential policies may spill over more easily and could potentially have detrimental effects if backstops are not in place to mitigate their transmission.

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239 See Aiyar et al. (2014), "The international transmission of bank capital requirements: Evidence from the UK," *Journal of Financial Economics*, for evidence on capital requirements; and Hills et al. (2015), "Cross-border regulatory spillovers: How much? How important? What sectors? Lessons from the United Kingdom", mimeo, for evidence on LTV requirements.

240 See Żochowski, D. (2015), "Macroprudential policy in a monetary union", mimeo, European Central Bank.

(e) **Adjustment of asset prices.** Macroprudential policies can have an effect on the demand for certain sets of financial assets and thus influence their price formation. Asset prices, in turn, may affect service providers' portfolio choices: overvaluation can invite pro-cyclical risk-taking, while extreme downward price adjustments can lead to portfolio rebalancing and spur fire-sales, which may have adverse wealth effects due to externalities. Especially prices of high quality and liquid assets may be influenced by changes in risk weights and liquidity requirements.

(f) **Common exposures.** Macroprudential policies can change a service provider's portfolio composition. One possible result is that the portfolio composition may change to become more or less heterogeneous, thereby decreasing or increasing the system's common exposures to certain sectors, for instance sovereign risk. Financial service providers, after capital requirements are increased, might try to comply by selling assets with higher risk weights and increase their exposure to assets with lower (or zero) risk weights, such as most sovereign bonds. The same holds true for liquidity measures: if liquidity requirements become stricter, financial service providers might be forced to sell illiquid assets and invest in assets recognized as "high quality liquid assets" within the liquidity framework, particularly sovereign bonds. Therefore, macroprudential measures can lead to increased cross-border common exposures, which can, inter alia, increase the financial system's vulnerability to sovereign default risks and contagion effects.

Regulatory arbitrage

(g) **Capital regulatory arbitrage.** Increasing capital requirements may alter incentives for circumventing the regulatory restrictions, by actively shifting capital within the group, by shedding capital-intensive activity from the balance sheet to special purpose vehicles, or by opening branches or converting subsidiaries into branches, in jurisdictions where capital requirements are higher. This may imply that lending may become direct rather than via a subsidiary, while keeping the overall level of exposures unchanged.[241]

(h) **Liquidity regulatory arbitrage.** Liquidity restrictions could lead to cross-border allocation of liquid assets, mostly in the form of intragroup transfers, without however changing the liquidity position of the entire group.[242]

(i) **Shadow banking activity.** Stricter regulation of banks can also lead to "waterbed effects" by paving the way for credit growth in the non- (or under-) regulated (shadow) banking sector. As the shadow banking system operates more strongly internationally than the banking sector, the shift towards shadow banking may involve stronger cross-border effects. On the other hand, macroprudential instruments aimed at financial markets and non-bank financial institutions can help prevent such leakages and ensure consistency in regulation across sectors.

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[241] See Houston, Lin and Ma (2012), op. cit.; Bremus and Fratzscher (2014), op. cit.; and Aiyar et al. (2014), "Identifying channels of credit substitution when bank capital requirements are varied", Bank of England Working Paper 485, for an example in the UK.

[242] As long as intragroup cross-border liquidity transfers are possible also in crisis times, the reallocation may not pose a problem. Yet the recent crisis has revealed situations where impediments to the liquidity allocation generate pockets of illiquidity even within groups.

Altering the effects on credit conditions

(j) **Relative cost of lending.** Macroprudential policy can affect the relative cost of lending in a cross-border dimension. This may reinforce or weaken the monetary policy transmission mechanism, depending on whether the monetary and macroprudential policies work in tandem or in opposite directions. Macroprudential policy may provide a more targeted instrument to account for different cross-country positions of the financial cycle. This is particularly important for euro area countries, which share monetary policy and microprudential supervision of significant institutions.

(k) **Changing term structure.** Amending bank liquidity and funding requirements or restricting investment funds' liquidity mismatch may affect the term structure of the yield curve. In a cross-border dimension, this may result in different transmission of monetary policy across countries, due to the relative importance of demand and supply of assets along the yield curve.

Trade effects

(l) **Foreign trade.** By influencing credit, macroprudential policy may affect economic activity, which in turn could result in altering the foreign trade activity by changing exports and imports. Given the granular aspect of macroprudential policies, these trade effects may differ across economic sectors.

(m) **Relative prices of tradable and non-tradable goods.** Housing cannot be traded across borders. Macroprudential policy may change the relative prices of tradable and non-tradable goods and in this way affect the foreign trade patterns.

Table 11.2 summarises the main transmission channels as listed above and their relative importance, depending on the type of macroprudential instruments. The ranking presented in the form of a colour code in the Table is mainly based on expert judgement. The most important transmission channels of macroprudential instruments, as identified by the expert group, are the following:

- **for capital instruments** – capital strengthening in international markets and capital regulatory arbitrage (in particular for groups);
- **for sectoral instruments** – adjustment of cross-border credit exposures and securitisation activity, capital regulatory arbitrage and shifts to non-bank activity;
- **for liquidity instruments** – liquidity regulatory arbitrage, shifts to non-bank activity and changing the term structure of the yield curve;
- **for market/non-bank instruments** – adjustment of cross-border liquidity/funding lines, adjustment of asset prices and liquidity regulatory arbitrage.

Table 11.2

Relative importance of main transmission channels of macroprudential instruments

Degree of importance of the channels for spillovers: Potentially strong transmission / Potentially medium-strong transmission / Potentially weak-medium transmission / Transmission channel considered to be weak or absent		Legal basis / consolidation	Cross-border risk adjustment: Adjustments of cross-border credit exposures	Cross-border risk adjustment: Cross-border loan origination inward spillover	Cross-border risk adjustment: Adjustments of cross-border securitisation activity	Cross-border risk adjustment: Access to cross-border capital markets	Network and contagion: Adjustments of cross-border liquidity/funding lines	Network and contagion: Adjustment of asset prices	Regulatory arbitrage: Capital regulatory arbitrage	Regulatory arbitrage: Liquidity regulatory arbitrage	Regulatory arbitrage: Shadow banking activity	Lending: Altering relative cross-border cost of lending
Capital instruments	Global systemically important institution buffer (G-SII)/ Other systemically important institution buffer (O-SII)	consolidated level										
	Systemic risk buffer/ Other systemically important institution buffer (O-SII)	consolidated level										
		sub-consolidated/ solo level (exposure-based)										
	Counter-cyclical buffers	consolidated level										
	Leverage ratio	consolidated level										
Sectoral choice	Sector-specific capital buffers, large exposure restrictions	exposure-based										
	Risk weights Loss given defaults	exposure-based										
	Loan-to-value, loan-to-income, debt-to-income, debt-servicing-to-income (on new loans)	exposure-based										
Liquidity positions	Liquidity coverage ratio, liquidity charges	consolidated level										
	Net stable funding ratio	consolidated level										
	Loan-to-deposit	consolidated level										
		solo level										

Monitoring and assessing potential cross-border spillovers of macroprudential measures is an essential part of any reciprocity framework. Before considering whether to request the reciprocation of a macroprudential measure from other Member States, an activating Member State needs to properly analyse the potential for cross-border spillover effects associated with that measure. For this reason, a comprehensive analytical framework for assessing possible cross-border spillover effects is required. Such a framework should foster a common understanding of policy measures and support Member States in assessing the impact of their policies, both in advance of their activation and on an on-going basis where needed. The ESRB can help Member States monitor and assess the cross-border impact of their macroprudential policy measures. While Table 11.2 provides the main transmission channels in a conceptual manner, the question is which specific indicators provide the required information.

An adequate and complete assessment requires a detailed dataset, including locational data, bank consolidated data, securities holdings statistics and ultimately supervisory statistics. A coherent dataset to assess spillovers does not yet exist, mainly because of the less developed data collection relative to the cross-border dimension of banking. Nevertheless, data in relation to some channels are publicly available, while other channels can only be analysed by using confidential, mostly supervisory, data. Therefore, a combination of public and confidential data sources is needed, which in turn calls for numerous plausibility and cross-checks in order to provide a consistent assessment of spillovers.

In assessing the channels of cross-border spillovers, the relevant indicators provided in Table 11.3 can be used. The table provides the list of the most relevant channels in the context of cross-border effects of macroprudential policy, as well as indicators that could be calculated on the basis of public or supervisory data. These indicators should inform the assessment of the potential for cross-border spillovers. The assessment framework should allow for the assessment, at least, of the risk adjustment channel and the regulatory arbitrage channel, which are considered the most relevant.

Table 11.3

List of channels and the respective indicators

Channel	Channel Description	Indicators
Risk adjustment	Cross-border loan origination spillover (inward/outward)	Cross-border loans (direct or through branches) in foreign currency to borrowers abroad (outward spillover)
		Direct cross-border credit/loans exposure to selected sectors relative to assets or relative to total credit/loans held by domestic institutions
		Foreign currency loans of non-financial sectors (households and NFCs) by foreign financial institutions and their branches (inward spillovers)
		Sovereign securities held by foreign banks/ total assets (the denominator could also be sovereign securities held by domestic institutions) NFC securities held by foreign banks to total assets (the denominator could be NFC securities held by domestic institutions)
		Combined loan+securities exposures / total loan+securities exposures held by domestic institutions
		Total assets of foreign branches/ total assets of the domestic banking sector
		Cross-border loans and loans through branches to total foreign loans
	Securitisation activity (cross-border risk shifting)	Outstanding securitised assets/total credit
	Capital strengthening (raise capital in international markets)	Cross-border (bank) equity exposure/Total home own funds (proxy of appetite for cross-border exposure)
Network & contagion	Cross-border portfolio exposures (assets, liabilities)	Interbank security holdings (Interbank network through securities)
		Share of liabilities from cross-border sources (securities and deposits)
	Cross-border asset price effects (portfolio rebalancing, wealth effects)	Currency mismatch between assets and liabilities
		Sovereign bond holdings
Regulatory arbitrage	Intragroup capital management	Distribution of capital ratios at solo level across jurisdictions
		Capital ratio contribution of foreign entities to the home group
		Own funds contribution to total home country own funds
	Intragroup liquidity management	Distribution of liquid assets over total assets at solo level across jurisdictions
	Shift in activity from affected to non-affected bank / non-bank	Assets held by foreign Investment Funds and foreign Financial Vehicle Cooperations relative to total financial sector
Monetary policy	Altering relative cross-border cost of lending	Rate spread between foreign and domestic lending

4 Reciprocity framework

4.1 Rationale for reciprocity

Given an integrated financial sector, effective macroprudential policy requires reciprocation. While the European Single Market brings clear economic benefits, financial integration, in combination with macroprudential policies at national level, can result in unintended consequences for the effectiveness and consistency of policies. These consequences can take several forms:

- **Leakages and regulatory arbitrage** – foreign service providers offering cross-border services directly or through their branches are not affected by the national measures and can continue to provide their services without meeting the macroprudential requirements. In addition, service providers that would otherwise fall within the scope of such requirements (i.e. because they have a local subsidiary) can actively re-route their activities through these channels, in order to circumvent host country measures. Thus, leakages and regulatory arbitrage – resulting from the rational behaviour of service providers – can severely undermine the effectiveness of national macroprudential policy measures.[243]

- **Distortion of competition** – branches of foreign service providers and foreign service providers directly offering cross-border services may use their competitive advantage (e.g. through relatively lower capital requirements for exposures generated in the activating Member State) over domestic service providers and subsidiaries of foreign service providers to increase their market share.

- **External effects on other Member States** – despite being exposed to the same risks as domestic service providers and subsidiaries of foreign service providers, branches of foreign service providers and foreign service providers directly offering cross-border services would not be required to build up resilience against these risks, for example via national capital measures in their home Member State. Moreover, to the extent that these institutions enjoy a competitive advantage relative to domestic service providers and foreign service providers' subsidiaries, they could be incentivised to increase their exposure to the relevant macroprudential risks, thereby putting their home Member State at greater risk than would otherwise be the case. If these macroprudential risks were to materialise, the service providers' buffers could prove insufficient, with severe negative consequences for their home financial systems.

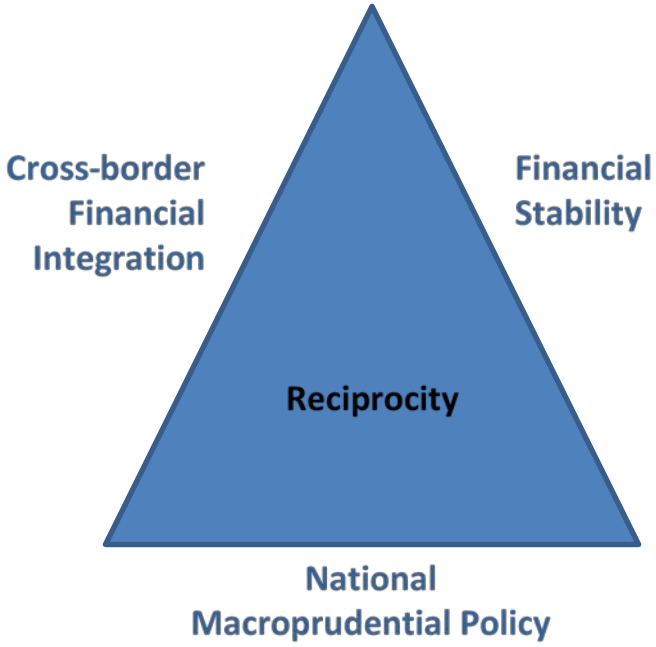
If a macroprudential measure does not apply to branches of foreign service providers and/or to the direct lending of foreign service providers within the national jurisdiction, it is advisable to expand the cross-border perimeter of that measure through reciprocity. Reciprocity could, in that context, be defined as "an arrangement whereby the relevant authority in one jurisdiction applies the same, or equivalent, macroprudential measure, as is set by the

[243] For empirical studies of these effects, see Aiyar, S., Calomiris, Charles W. and Wieladek, T. (2014), "Does Macro-Prudential Regulation Leak? Evidence from a UK Policy Experiment", Journal of Money, Credit and Banking, Vol. 46(s1), pp. 181-214; and Reinhardt, D. and Sowerbutts, R. (2015), "Regulatory arbitrage in action: evidence from banking flows and macroprudential policy", *Staff Working Paper No 546*, Bank of England.

activating relevant authority in another jurisdiction, to any financial institutions under its jurisdiction, when they are exposed to the same risk in the latter jurisdiction."[244]

In this way, voluntary reciprocity can provide a solution to the dilemma facing Member States when conducting national macroprudential policy within the EU. This dilemma can be illustrated by the triangle of incompatibilities below (see Figure 11.2). In the absence of coordination, the goals of financial stability, cross-border financial integration and national macroprudential policy could conflict with one another. Within an integrated EU financial system, financial stability cannot be achieved if Member States rely only on national macroprudential policy, because exposure to national macroprudential risks extends beyond national jurisdictions. The incompatibilities depicted in the triangle can be overcome through reciprocity.[245]

Figure 11.2
Triangle of incompatibilities of national macroprudential policy



4.2 Existing provisions for reciprocity

Various degrees of stringency in the cross-border recognition of national macroprudential measures exist in EU legislation. The legislation provides for: (i) mandatory recognition, regardless of the calibration of the measure; (ii) mandatory recognition up to a certain threshold; and (iii) voluntary recognition (reciprocity), with potential involvement of the ESRB at the request of the activating Member State. Recognition of national measures by other Member States, regardless

[244] See definition (f) Section 2 the ESRB Recommendation ESRB/2015/2 (link)

[245] On a related note, see Schoenmaker, D. (2011), "The financial trilemma," *Economic Letters*, No 111, pp. 57–59.

of the calibration, is only mandatory under Articles 124 and 164 of the Capital Requirements Regulation (CRR), whereby institutions in other Member States must reciprocate the measures taken by the activating Member State in respect of real estate exposures. Recognition is also mandatory in the case of the countercyclical capital buffer (CCyB), where it is set at a level of up to 2.5%.[246] As regards the systemic risk buffer (SRB) and measures under Article 458 of the CRR, the Member State concerned may ask the ESRB to issue a recommendation inviting other Member States to reciprocate the national measure. For institution-specific capital buffers – such as the macroprudential use of Pillar II as well as the other systemically important institutions (O-SII) and globally systemically important insurers (G-SII) buffers – the provisions in the legal text do not mention any form of reciprocation. Table 11.4 below provides an overview of the current rules for recognition.

Table 11.4
Recognition provisions in EU Law

Macroprudential measure	Legal basis	Recognition in EU law
Countercyclical capital buffer	130, 135-140 of the CRD IV	Mandatory (up to 2.5%)
Higher RWs for SA banks	124 of the CRR	Mandatory
Higher LGDs for IRB banks	164 of the CRR	Mandatory
National flexibility measures	458 of the CRR	Voluntary
Systemic risk buffer	133-134 of the CRD IV	Voluntary
Pillar II measures	103 of the CRD IV	Not mentioned
G-SII buffer	131 of the CRD IV	Not mentioned
O-SII buffer	131 of the CRD IV	Not mentioned
LTV and L/DTI limits	National law	Not mentioned
Loan-to-deposit rules	National law	Not mentioned

For macroprudential measures that only rely on a national legal basis, the way in which they are implemented may mean that they can immediately achieve the necessary coverage without needing to request reciprocation. The most relevant example of this is credit flow restrictions (loan-to-value (LTV) and loan/debt-to-income (L/DTI) limits) which, when applied using consumer protection regulation, may apply to all products sold in a country without the need for reciprocity. This "best practice" can allow authorities to avoid leakages both internationally – via foreign branches and direct cross-border lending – and also to non-banks. This may be especially efficient given that reciprocity might not be straightforward for macroprudential measures not harmonised at EU level, which may have different definitions across Member States. However, it may not always be possible to use consumer protection regulation for macroprudential purposes. Several countries make use of macroprudential "speed limits", for example only allowing 20% of loans an institution grants to be above a 90% LTV ratio. This cannot be implemented using consumer protection regulation, as it effectively limits the exposures of individual institutions.

[246] Moreover, the ESRB recommends recognition of CCyB rates set in other Member States for domestic exposures, even when these rates are higher than the 2.5% threshold; see Principle 6, Recommendation A of the Recommendation ESRB/2014/1.

Slovakia and Ireland have both used their central banks' legal acts to ensure that their actions also applied to foreign banks in their country, obviating the need for reciprocity procedures, which are particularly complicated in the case of non-harmonised instruments. As this option may not be available in all countries, authorities should take into account that the way in which they implement an instrument may have implications for potential leakages and the need for reciprocity, and they should take measures that affect the whole market, where possible.

4.3 Guiding principles for a reciprocity framework

The ESRB General Board has adopted a framework (Recommendation ESRB/2015/2) which sets out the process of cross-border voluntary reciprocity for macroprudential policy measures. It does not replace the provisions in EU legislation mentioned above, but is intended to complement them. The framework has struck a balance between the need to be as simple and easy to implement as possible, and to also reflect the broad scope and complexity of the different macroprudential instruments available at national level.

In addition to striking an appropriate balance between simplicity and differentiation, the framework also reflects a number of high-level principles. In particular, the framework was designed to be:

(i) **well-founded,** in the sense that reciprocity decisions should reflect due consideration of the cross-border impact of measures;

(ii) **effective,** in the sense that the possibility for leakages and regulatory arbitrage should be prevented;

(iii) **efficient and simple,** in the sense that it uses some degree of automaticity in the process while remaining a voluntary decision by Member States;

(iv) **transparent** and taking due account of the need for proper communication; and

(v) **flexible,** in the sense that it can be revised and adapted where needed, when experience in implementing it has been accumulated.

4.4 Triage

The ESRB will triage measures based on whether they should be reciprocated, in accordance with the agreed framework. The need for cross-border recognition of macroprudential measures and, thus, the case for reciprocity, is not equally compelling for all measures. Measures such as higher risk weights or LTV limits that target exposures but do not automatically apply to foreign branches and cross-border lending should always be reciprocated.[247] Measures like the SRB, which can be used for exposures or for institutions, may require the

[247] Reciprocity for macroprudential measures that fall under national responsibility might not be straightforward, as their definition may differ between Member States. In such cases, the ESRB may also give guidance on how to reciprocate them (see below).

ESRB's judgement. Table 11.5 provides a non-exhaustive list of measures and also indicates which ones should – always or in certain cases only – be reciprocated. To ensure the effectiveness of the framework, reciprocity, while still voluntary, would be expected from all Member States ("broad approach") if an activating Member State requests it (see discussion below).

Table 11.5
Indicative list of measures to be reciprocated and guiding principles

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

4.5 Operationalising the framework[248]

The ESRB Recommendation on reciprocity allows for considerable discretion on the part of the relevant authorities. While the ESRB has adopted a general recommendation to reciprocate specific measures, the way in which this will be implemented is at the relevant authorities' discretion.[249] As the reciprocity framework is based on voluntary decisions, relevant authorities retain the possibility not to reciprocate in duly justified cases. It is expected that these will be a minority of cases.

Simplified and automatic national legal procedures can help make decision-making more efficient and strengthen the process. To help reduce the administrative burden resulting from reciprocity, national authorities may adopt ex ante umbrella decisions to reciprocate measures with a certain degree of automaticity,[250] when this is legally possible, or delegate the decision to a lower-level body. There is an additional important benefit as this fosters communication on macroprudential policy by making Member States' actions more certain and predictable.

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[248] This Section was revised by Thomas Deckers (Bundesanstalt für Finanzdienstleistungsaufsicht), supported by Tomasz Gromek (ESRB Secretariat), to align the text with the approach introduced in 2017 to harmonise the application of the de minimis principle. It draws heavily on the work by the Drafting Team on Reciprocity Issues chaired by Stéphanie Stolz (ESRB Secretariat). The Drafting Team comprised: Tamás Borkó (Magyar Nemzeti Bank), Eward Brouwer (De Nederlandsche Bank), Maria Carlsen (Danmarks Nationalbank), Thomas Deckers (Bundesanstalt für Finanzdienstleistungsaufsicht), Anna Jernova (Bank of England), Stephan Fahr (ECB), Faidra Frygana (ESRB Secretariat), Alexander Gruber (Finanzmarktaufsicht), David Lindfield (Finansinspektionen), Petranda Mansour (ESRB Secretariat), Samuel McPhilemy (Bank of England), Daniel Papp (Magyar Nemzeti Bank), Tiago Páscoa (ESRB Secretariat), Manuel Pelzer (Bundesbank), Julio Ramos-Tallada (Banque de France), Miljana Valdec (Hrvatska Narodna Banka), Nijolė Valinskytė (Lietuvos Bankas), Cristina Vespro (National Bank of Belgium).

[249] While discretion remains with the relevant authorities, it should be noted that – in accordance with the definition of reciprocity contained in Recommendation ESRB/2015/2 – reciprocation by the same measure will be prioritised (where possible, i.e. where the instrument is available in national law).

[250] In some cases, this could be done through an ex ante decision of the relevant authority to reciprocate in all cases where the ESRB recommends reciprocation.

The ESRB plays a pivotal role, as its recommendation will trigger an automatic reciprocation by Member States – in line with national arrangements and procedures – unless a Member State makes use of its right to oppose its implementation ("act or explain" mechanism). This means that procedures must be in place to ensure that decision-making relies on appropriate scrutiny at the ESRB level. This is necessary in order to guarantee that enough political ownership exists within the ESRB to ensure that not complying with an ESRB recommendation is only ever considered in exceptional and justified circumstances.

There are four stages to the reciprocity process: the notification and reciprocation request, the decision on reciprocity, the communication phase and the continuous monitoring thereafter (see Figure 11.3).

Figure 11.3
Stages of the reciprocity process

On the basis of a notification and a request for reciprocation from the relevant authorities of the activating Member State[251], the ESRB assesses the case made in the request. In addition, at the request of an activating authority, the ESRB will initiate the legal process for reciprocation by adding the measure to the list of measures to be reciprocated in Recommendation ESRB/2015/2.[252]

The ESRB and the relevant authorities will cooperate on communication. After internal discussion, the ESRB will communicate the decision on reciprocity to the national authorities, and to the ECB in its macroprudential capacity, where applicable. Moreover, the ESRB will publish the measures on its website and translate them into all official languages in the Official Journal of the European Union. Meanwhile, national authorities are responsible for communication to financial institutions, using a form of their choice.

Macroprudential authorities should cooperate with microprudential supervision to monitor the impact of measures. After a measure is introduced, it is important to monitor its impact at an economy-wide level, across borders and for individual institutions. Macroprudential authorities generally monitor overall effects, while microprudential supervisors (including the ECB) are responsible for gauging compliance.

While authorities should always seek to reciprocate with exactly the same measure, in some cases they may reciprocate on a best effort basis. This could arise because authorities do not have the same instrument available in a given country or because the instrument is not

[251] This is without prejudice to the ECB's macroprudential competences in the banking union, and to any procedures that may be implemented to handle the exercise of these competences vis-à-vis national authorities in the activating Member State.

[252] Recommendation ESRB/2015/2 will be updated when necessary, collating all new measures notified by authorities and recommended for reciprocation by the General Board.

harmonised. This requires a pragmatic solution. The ESRB will usually provide guidance on alternative instruments and/or any additional steps necessary to ensure equivalence. A measure can be considered comparable if it has, as far as possible: (i) the same economic impact, (ii) the same scope of application, and (iii) the same consequences (sanctions) for non-compliance.[253] The ESRB may determine whether such alternatives are acceptable in each case.

Authorities may apply the de minimis principle for financial service providers (hereinafter also referred to as institutions) with non-material exposures to the identified macroprudential risk in the activating country. To guide the application of the de minimis principle, the activating Member State will propose an institution-level maximum materiality threshold when asking for reciprocation, taking into account the guiding principles on the calibration of the threshold level as described below. The Assessment Team on national macroprudential measures) of the ESRB will assess this threshold and, if it deems the proposed threshold to be inappropriate, may suggest a new threshold.[254] The threshold deemed appropriate by the ESRB, approved by the Advisory Technical Committee and the General Board, is included in the amendment of Recommendation ESRB/2015/2, which recommends the reciprocation of the respective measure. These materiality thresholds should be understood to be recommended maximum thresholds, i.e. reciprocating Member States always have the option to set a lower threshold, or even no threshold for their jurisdiction.[255] As already implied by Recommendation ESRB/2015/2, Member States that apply the de minimis principle need to monitor whether leakages and regulatory arbitrage materialise and promptly close the regulatory loophole if needed. If no single financial service provider has an exposure above the threshold, this is seen as a sufficient explanation for not applying reciprocation actions until the threshold is breached for the first time. The specific application of the materiality thresholds is subject to review if an ESRB member institution makes such a request with reasoned arguments.

Assessing the materiality of cross-border activities in a manageable way requires a simple and comparable indicator. In this regard, a common materiality indicator, guiding principles on the calibration of the threshold level by the activating Member State and a first initial orientation value, and methodological principles regarding the final decision on materiality by the reciprocating Member States are outlined below.

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253 Regarding criterion (i), a reciprocating capital measure, for instance, would have the same economic impact if it has the same effect on capital requirements as the capital measure to be reciprocated. Criterion (ii) provides that both the reciprocating measure and the measure to be reciprocated should apply to the same exposures. And criterion (iii) means that non-compliance with the reciprocating measure should entail the same supervisory actions as non-compliance with the measure to be reciprocated.

254 The considerations for setting the threshold level will evolve over time as new research and evidence becomes available. Avoiding excessive formalism allows best practices on setting thresholds to evolve over time based on the accumulated experience with the reciprocity framework.

255 If a reciprocating Member State chooses to apply a higher threshold for reciprocation, this should be sufficiently explained, in line with the general “comply or explain” nature of recommendations.

Institution-level materiality indicator to capture leakage and regulatory arbitrage

Sum of institution's risk exposure[256] in the activating Member State held by:

(a) branches of the institution located in activating Member State; and/or

(b) direct cross-border activity of the institution

as a share of total risk exposure held in the activating Member State by all institutions reporting in that country, including foreign branches operating in the activating Member State if data are available. Activating Member States are recommended to propose the threshold in absolute terms (EUR or other monetary units). The absolute threshold should be supported by the relative size (as a percentage) of total risk exposure data.

Guiding principles on threshold calibration

Calibrate thresholds such that:

- they capture activity relevant for financial stability in the activating Member State:
    - Be aware of situations where the material exposure stems from many banks with small exposures.
    - In relative terms and to better account for spillovers, lower thresholds might be chosen if the targeted market is closely linked to markets in several other Member States and is therefore systemically important for the European Union as a whole. This does not interfere with the general principle that every country (irrespective of its systemic importance for the EU) should be able to set the threshold in a way that safeguards its own financial stability.
- they minimise the potential for regulatory fragmentation:
    - If the measure to be reciprocated foresees a threshold for the financial institutions in the activating Member State, the same thresholds should be used when requesting reciprocity (if it fulfills the other guiding principles).
- they avoid high implementation costs for the reciprocating Member States, when the exposures are negligible:
    - Activating Member States are recommended to set well-justified thresholds in order to increase their probability of acceptance, duly taking into account the principle of proportionality.

[256] Equals the exposure classes used by the activating Member State in order to identify the systemic risks to which the respective instrument (SRB, measures according to Article 458 of the CRR, measures based on national legislation, etc.) will be applied.

The activating Member State may use 1% of the total exposure (as defined above) as a starting value when calibrating a materiality threshold. The 1% value is inspired by the experience of two cases in which an institution-level maximum materiality threshold of 1% was provided.[257] However, regardless of the value chosen the choice should be well justified using the guiding principles. The Assessment Team on national macroprudential measures can use these guiding principles to check the appropriateness of the proposed threshold level and suggest an alternative threshold if deemed necessary.

When deciding on the materiality of individual institutions in order to apply the de *minimis* principle, the following methodological principles should be taken into account by reciprocating Member States:

(a) The general principle of full reciprocity (i.e. without applying any de *minimis* principle) should be upheld as a starting point for the decision-making process.

(b) Reciprocating Member States should assess materiality in line with the unit of measurement of the threshold as proposed by the activating Member State, e.g. total risk exposure.

(c) When assessing the materiality of institutions with branches located in the activating Member State and direct cross-border activity to this Member State, national supervisory data at individual bank level should be used. These data will be able to distinguish between these two cases on the one hand and the activity of subsidiaries (not to be considered by reciprocating Member States when assessing materiality) on the other. In order to make the materiality assessment comparable across Member States, consolidated data from the Common Reporting Framework, such as COREP and FINREP, can be used to complement it, acknowledging that the consolidated cross-border exposure of an institution has to be adjusted for the activity of the institution's foreign subsidiaries.

(d) If no single financial service provider has an exposure above the threshold, this is seen as a sufficient explanation for not applying reciprocation actions until the threshold is breached by one financial service provider.

[257] Once more experience on the threshold calibration is gained, the value of 1% might be updated in the future and/or be included as a default option in the future.

Annexes

Annex 3.1
Figures on selected real estate indicators

a) Residential real estate

Figure 1
Household credit-to-GDP gap

(BIS)

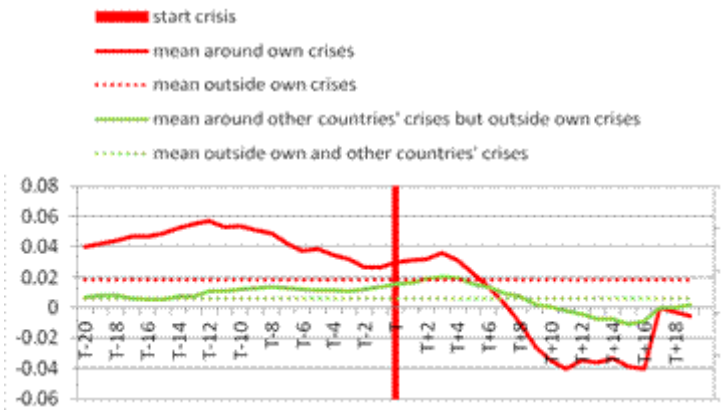


Figure 2
Nominal house price gap

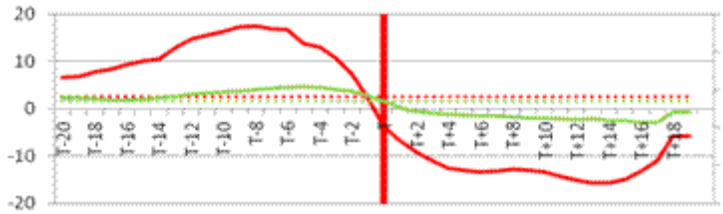
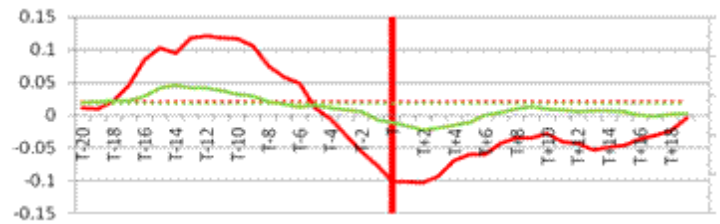


Figure 3
House price-to-income growth

(year-on-year percentage changes)



Source: ESRB.

b) Commercial real estate

Figure 4

NFC credit-to-GDP gap

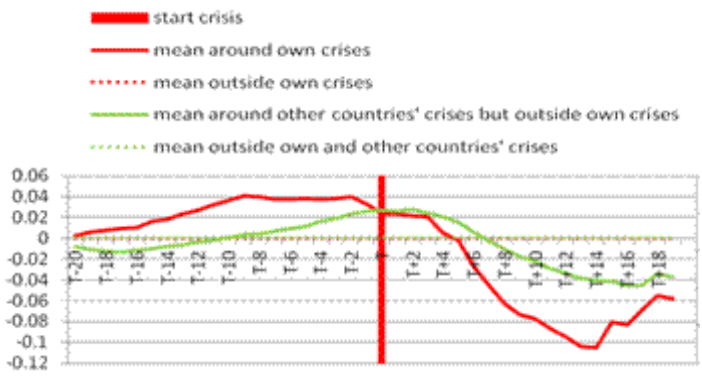


Figure 5

Commercial property prices gap

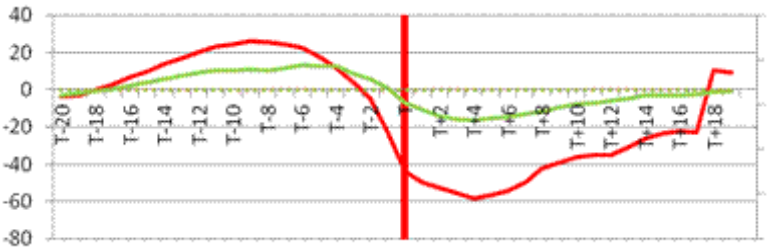
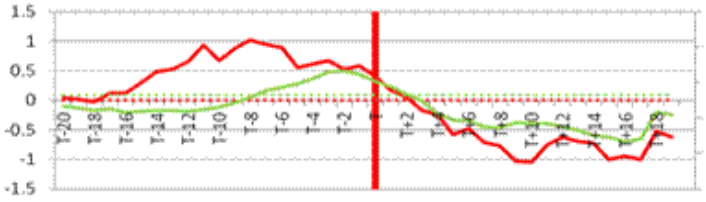


Figure 6

Other buildings investment-to-GDP

(with normalised national data)



Source: ESRB.

c) Country-specific examples for Spain and Ireland compared with butterfly results

Figure 7

Household credit as a percentage of GDP

(BIS)

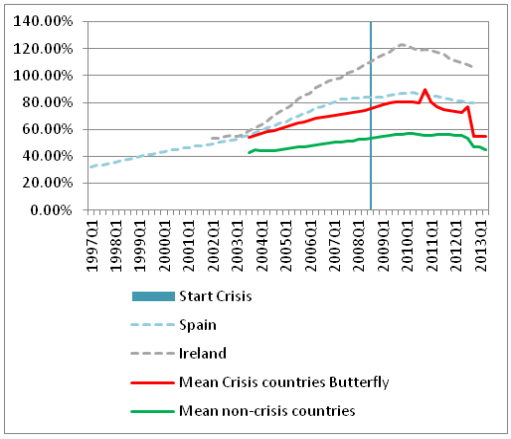


Figure 8

Nominal house prices gap

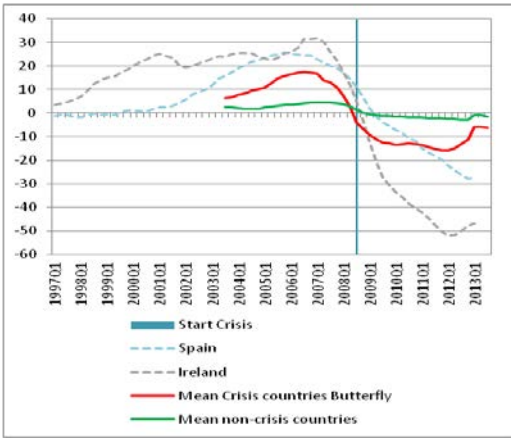


Figure 9

NFC credit to GDP

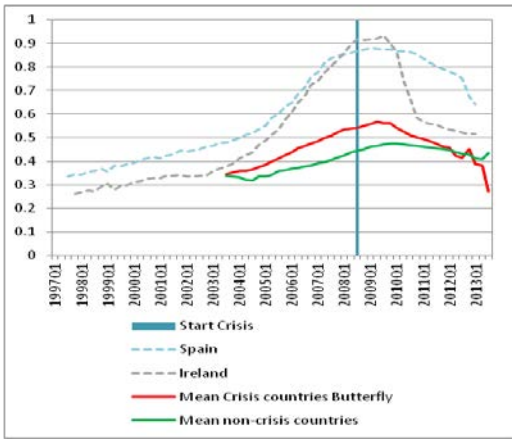
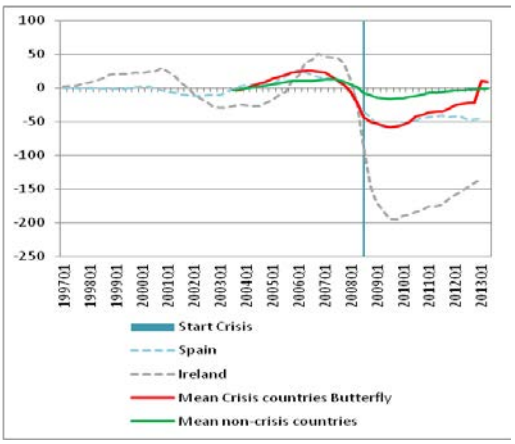


Figure 10

Commercial real estate prices gap



Source: ESRB.

Annex 3.2
Overview of legal/institutional aspects of real estate instruments

	Legal basis	Responsible authority	Procedural aspects	Reciprocity
Sectoral capital buffer	Article 133 of the CRD IV (Pillar I – systemic risk buffer)	Competent or designated authority	- Notification to the European Commission, the ESRB, EBA, and competent or designated authorities of the Member States/third countries concerned. - Commission opinion, implementing act or recommendation (together with an ESRB recommendation) needed for buffer above certain threshold. - ESRB and EBA opinions for buffers exceeding a certain threshold.	Allowed
	Article 458 of the CRR, Article 92 of the CRR (Pillar 1 – national flexibility)	Competent or designated authority	See Chapter 7.	Allowed
	Article 103 of the CRD IV (Pillar 2)	Competent authority	- Notification to the EBA. - EBA to monitor supervisory practices and issue guidelines.	Development of a common view of risks in supervisory colleges encouraged
RW	Article 124(2) of the CRR (Pillar 1)	Competent authority	- Prior consultation of the EBA and publication by the EBA of RWs/criteria. - Six-month transitional period for banks. - EBA is to publish the higher RWs (or stricter criteria) - EBA to develop RTS	Compulsory
	Article 458 of the CRR (Pillar 1 – national flexibility)	Competent or designated authority	- Subsidiarity requirement for RWs over 150%. - Subject to the procedure of Article 458 of theCRR; only notification requirement applies in case of a RW increase of 25%. - See also Chapter 7.	Allowed
	Article 103 of the CRD IV (Pillar 2)	Competent authority	- Notification to the EBA. - EBA to monitor supervisory practices and issue guidelines.	Same as for Article 103 of the CRD IV above
LGD	Article 164(5) of the CRR (Pillar 1)	Competent authority	- Notification to the EBA. - EBA to publish LGD values. - EBA to develop RTS.	Compulsory
	Article 458 of the CRR (Pillar 1 – national flexibility)	Competent or designated authority	See Chapter 7.	Allowed
	Article 103 of the CRD IV (Pillar 2)	Competent authority	- Notification to the EBA. - EBA to monitor supervisory practices and issue guidelines.	Same as for Article 103 of the CRD IV above
LTV	Outside of the CRD IV/CRR	National competence	- National competence. - Prior notification of the ESRB in case of expected significant cross-border effects.	National competence
LTI/DSTI	Outside of the CRD IV/CRR	National competence	- National competence. - Prior notification of the ESRB in case of expected significant cross-border effects.	National competence

Annex 3.3
LTV limits currently in place in EU Member States

Based on the outcome of dedicated ESRB surveys in 2013, it can be concluded that regulation regarding an explicit LTV limit is currently in place in nine Member States (CY, FI, HU, LT, LV, NL, PL, RO and SE). Additionally, in AT and DE, there is an 80% LTV limit which is relevant only for mortgages provided by building societies and which is considered rather as the de facto limit in both countries. Ten Member States (AT, CZ, DE, DK, ES, FR, IT, SE, SI and SK) mentioned that they have LTV limits on mortgage loans included in the pool for covered bonds, ranging between 40% and 100% depending on the type of the collateral.[258]

Country		Explicit LTV limit	Application of explicit LTV limit[13)]	De facto LTV covered bonds
Austria	AT	80%[1)]	building societies	60%
Belgium	BE			
Bulgaria	BG			
Cyprus	CY	70%[2)]	banks supervised by the central bank	
Czech Republic	CZ			70%
Germany[3)]	DE			60%
Denmark	DK			40%–80%[4)]
Estonia	EE			
Spain	ES			60%;80%[5)]
Finland	FI	90%[6)]	banks	
France	FR			60%; 80%; 100%[14)]
Greece	GR			
Croatia	HR			
Hungary	HU	45%–80%[7)]	institutions providing financial services in Hungary	
Ireland	IE			
Italy	IT			60%; 80%[8)]
Lithuania	LT	85%	banks incl. foreign branches, credit unions	
Luxembourg	LU			
Latvia	LV	90%	lenders granting mortgages to households	
Malta	MT			
Netherlands	NL	104%[9)]	financial institutions under supervision	
Poland	PL	95%;75%[10)]	banks	

[258] The implicit application of LTV in the form of a preferential RW in the capital requirements calculation is not being considered in this box. Note that LTV limits for mortgage loans included in the pool for covered bonds only place constraints on the financing through covered bonds rather than on the total loan relative to the value of the property. The extent to which such LTV limit for covered bonds is restrictive depends on the importance of covered bonds as a source of financing in a particular country.

Country		Explicit LTV limit	Application of explicit LTV limit[13)]	De facto LTV covered bonds
Portugal	PT			
Romania	RO	60%–85%[11)]	banks, non-bank financial institutions	
Sweden	SE	85%	credit institutions providing mortgages	60%–75%[15)]
Slovenia	SI			60;80%[12)]
Slovakia	SK			70%
United Kingdom	UK			

Source: ESRB survey. Table may be be incomplete.

[1)] 80% cap applies for building society loans.

[2)] Exception: 80% limit for primary permanent residence.

[3)] Building society Act which only applies to building societies: mortgage must not exceed 80% of the lending value without sufficient additional security (de facto cap).

[4)] Danish mortgage banks may choose between three types of bond to fund their loans: (i) traditional mortgage bond; (ii) covered mortgage bond; and (iii) covered bond. The maximum LTV on all three types of bond are between 40% and 80% of the mortgaged property depending on the type of property. In the case of traditional mortgage bonds, the LTV limit is applicable only at the time of issuance. In the case of covered and covered mortgage bonds, the LTV limit must be applicable throughout the loan term. In general, the LTV limits by property category are: 80% for owner-occupied housing, 60% for commercial properties, 60% for summer cottages and 40% for undeveloped sites. The LTV limit for commercial properties can be extended to 70% if the lender submits additional capital as collateral.

[5)] 80% for residential and 60% for commercial mortgages. The limit of 80% may be increased up to 95% under certain circumstances if the exposure has a bank guarantee from an institution different from the bank granting the loan.

[6)] Non-binding recommendation by the Finnish FSA of maximum 90% LTV.

[7)] 80% for local currency (HUF) loans, 60% for euro loans, 45% for other currency loans.

[8)] 80% for residential and 60% for commercial mortgages.

[9)] The cap will be gradually lowered by 1 percentage point each year until it reaches 100% in 2018.

[10)] Banks were supposed to establish and implement maximum LTV levels internally until 2013. The 95% LTV limit for household real estate valid from 2014 will gradually decrease to 80% in 2017 and the 75% LTV limit for commercial real estate will apply from July 2014. Higher LTV limits will apply (90% for household real estate and 80% for commercial real estate) provided that the borrower insures the part of exposure surpassing the basic LTV limit or provides additional collateral in the form of a bank account deposit or PLN-denominated securities issued by the Treasury or Narodowy Bank Polski.

[11)] LTV 85% for local currency loans, 80% for foreign exchange loans for hedged borrowers, 75% for unhedged euro borrowers and 60% for unhedged borrowers in other currencies, no LTV restriction on mortgages supported by national programme "Prima Casa".

[12)] 80% for residential mortgages and 60% for commercial mortgages.

[13)] The information is related to column "Explicit LTV limit".

[14)] Bonds issued by sociétés de credit foncier (real estate credit companies) or sociétés de financement de l'habitat (housing loan companies) are legally subject to LTV caps depending on the type of property or guarantee.

[15)] 60% for office or commercial collateral, 70% for agricultural collateral and 75% for residential collateral.

The explicit LTV limits vary both across types of loan within a country as well as across Member States. The LTV limit in individual Member States is usually related to the type of loan (commercial versus residential) and currency of the loan (domestic versus foreign currency) with foreign currency mortgages usually being subject to stricter LTV limits (for example in Hungary and Romania).

The heterogeneity among Member States also stems from differences in the coverage of institutions to which the explicit LTV limit is applied. The most complex coverage of an explicit LTV limit is in Hungary, where all the institutions providing financial services in Hungary are covered, in Latvia where the LTV limit applies to all lenders granting mortgages to households and in Romania, where it applies to both banks and non-bank financial institutions. In the Netherlands, the limit applies to all financial intermediaries subject to code-of-conduct supervision. In other Member States (CY, FI, LT, PL and SE) the LTV limit applies mainly to credit institutions/banks.

Annex 4.1
Overview of instruments for systemic risks

Table 1

Overview of the SII-buffers

Description: The G-SII buffer and O-SII buffer are CET1 buffer requirements on total risk exposures for a set of pre-defined banks which are deemed “too big to fail” in the international or national context respectively. Both are applicable from 2016. The G-SII buffer is calibrated in buckets of 1%, 1.5%, 2%, 2.5% and 3.5%. The O-SII buffer is calibrated between 0 and 2%.

Objective: To increase resilience of individual banks and the banking sector. The intermediate objective is to limit the systemic impact of misaligned incentives with a view to reducing moral hazard.

Advantages

Broad-based buffer related to all risk exposures.
Based on international framework (BCBS).
Clarity on indicators, thresholds and buckets for the G-SII buffer.
Flexibility in application of O-SII buffer allows national specificities to be taken into account.
Both buffers leave room for expert judgement.

Disadvantages

O-SII buffer is capped at 2% which is thought to be too low.
Potential leakage/arbitrage to less-regulated and non-regulated entities.
In the case of an O-SII buffer, possible cross-border spillovers to other countries in which the bank operates.
Risk of strengthened perception of “too big to fail”.
Buffers do not always accumulate with SRB.

Relevant operational issues

In the build-up phase buffers also affect the financial cycle. Implementation should take into account the importance of appropriate timing and phasing-in.
For application of the O-SII buffer, authorities need to decide which indicators to use and which weighing to allocate to each indicator.
For the application of the O-SII buffer, calibration can be based on the principle of “equal expected impact”, but this is not straightforward.

Relevant legal/institutional issues

The G-SII buffer is mandatory (EBA technical standards will apply).
The O-SII buffer is optional (EBA guidelines will be available).
Member States must designate a competent or a designated authority to be in charge of the SII buffers.
The SIIs and the buffer rates must be notified to the European Commission, the ESRB and the EBA one month before publication of the decision. There is no obligation to consult them or request their opinion.
SIIs and their allocated buffer rates are disclosed to the public.
The identification of the SIIs and the buffer rates applied shall be reviewed every year. This review shall also be notified to the Commission, the ESRB and the EBA and disclosed to the public.
The ESRB provides standard notification templates.

Table 2

Overview of the SRB

Description: The SRB is an optional CET1 buffer requirement on total risk exposures for all or a subset of banks to address structural systemic risks otherwise not covered by the CRR. It is applicable from 2014 and its rate is at least 1%.

Objective: To increase resilience of individual banks and the banking sector. The intermediate objectives can be to limit the systemic impact of misaligned incentives with a view to reducing moral hazard, to limit direct and indirect concentration of exposures and to mitigate or prevent excessive leverage.

Advantages

Broad range of structural risks can be targeted.
It allows differentiating between banks.
Flexible as buffer rates lower than 3% only require notification but the procedural requirements are more demanding for higher SRB rates.
The level is, in principle, unlimited. Only the coordination and procedural (authorisation) requirements increase along with the intended level and cross-border impact.

Disadvantages

In the absence of a clear-cut definition and indicators of structural systemic risk, potential diverging practices between authorities, scope for regulatory arbitrage and policy uncertainty for the banking sector.
It may not accumulate with the SII-buffers.
Authorities need to justify why other macroprudential instruments (except for national flexibility measures) do not suffice to address the identified systemic risk.

Relevant operational issues

In the build-up phase, the SRB buffers also affect the financial cycle. Implementation should take into account the importance of appropriate timing and phasing-in.
Calibration can be based on the outcome of stress tests, but this is not straightforward.

Relevant legal/institutional issues

Member States need to first decide whether to implement the SRB in national law.
Member States must designate a competent or a designated authority to be in charge of the SRB.
Up to 3%, the SRB must be notified to the European Commission, the ESRB and the EBA one month before publication of the decision. There is no obligation to consult them or request their opinion.
The ESRB provides standard notification templates.
The SRB is disclosed to the public.
The SRB must be reviewed at least every second year.

Table 3

Overview of the Pillar 2 additional own funds requirement

Description: The Pillar 2 additional own funds requirement enables competent authorities to address firm-specific systemic risks which are otherwise not covered by Pillar 1 buffers. The systemic risks should be considered through the SREPs. The measure may involve not only an additional CET1 requirement but also a lower quality of capital. It may apply to a subset of exposures.

Objective: To increase resilience of individual banks. The intermediate objectives can be to limit the systemic impact of misaligned incentives with a view to reducing moral hazard, to limit direct and indirect concentration of exposures and to mitigate or prevent excessive leverage.

Advantages

The measure can be tailored to specific exposures.
It is bank specific and therefore targeted at the source of the systemic risk.
The level is, in principle, unlimited.
It is a flexible buffer, coordination is only required within the college of supervisors.

Disadvantages

Disclosure is not mandatory.
Coordination with macroprudential authorities is not mandatory.
Pillar 2 measures are individual decisions that are more likely to be contested in court and in discussions between supervisors and banks.

Relevant operational issues

Competent authorities must consider systemic risks through the SREP. The EBA should provide guidance to this end.
Calibration can be based on the outcome of stress tests, but this is not straightforward.

Relevant legal/institutional issues

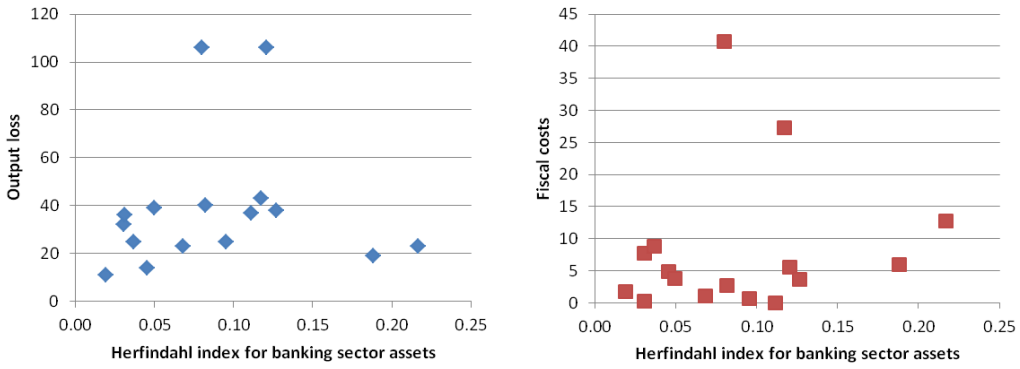
Pillar 2 measures fall under the mandate of competent authorities.
Competent authorities need to reach a joint decision in the college of supervisors on the conclusion of the SREP.
It is recommended that competent authorities coordinate with macroprudential authorities in evaluating systemic risks under the SREP for systemically important banks and in any decisions to impose additional own funds under Pillar 2 to address systemic risks.
It is recommended that competent authorities require banks to disclose the additional own funds requirement under Pillar 2.

Annex 4.2
Concentration and size of the financial sector as indicator

The figures below show the relevance of the concentration and the size of the financial sector for the costs of the recent banking crisis for fifteen euro area Member States.

Figure 1

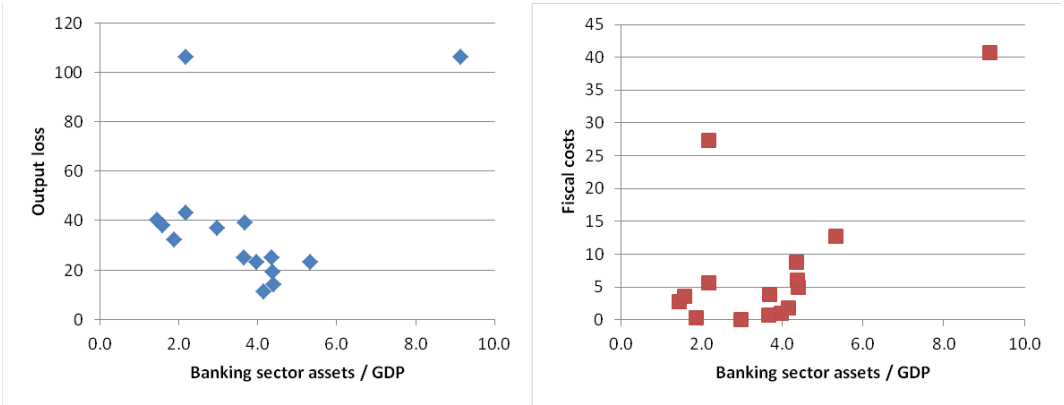
The relevance of financial sector concentration for the impact of financial crises



Sources: Laeven and Valencia (2013), ECB.
Notes: the horizontal axis measures concentration in terms of the Herfindahl index applied to banks' assets in 2008, as reported by the ECB. The vertical axis measures output loss and fiscal costs in respectively the left-hand and the right-hand panel (as a percentage of GDP), as estimated by Laeven and Valencia to be due to the banking crisis in a given country.

Figure 2

The relevance of financial sector size for the impact of financial crises



Sources: Laeven and Valencia (2013), ECB.
Notes: the horizontal axis measures the size of the banking sector in terms of the banks' assets in 2008, as reported by the ECB. The vertical axis measures output loss and fiscal costs in respectively the left-hand and the right-hand panel (as a percentage of GDP), as estimated by Laeven and Valencia to be due to the banking crisis in a given country.

Although the small number of observations does not allow formal statistical analysis, data in both panels of Figure 1 seem to support a finding that concentration is among the determinants of the overall macroeconomic impact of distress in the banking sector. In Figure 2 the output loss as a result of the crisis is unrelated to the size of the banking sector relative to the whole economy.[259] There seems however to be a relationship between the fiscal costs and the size of the banking sector.

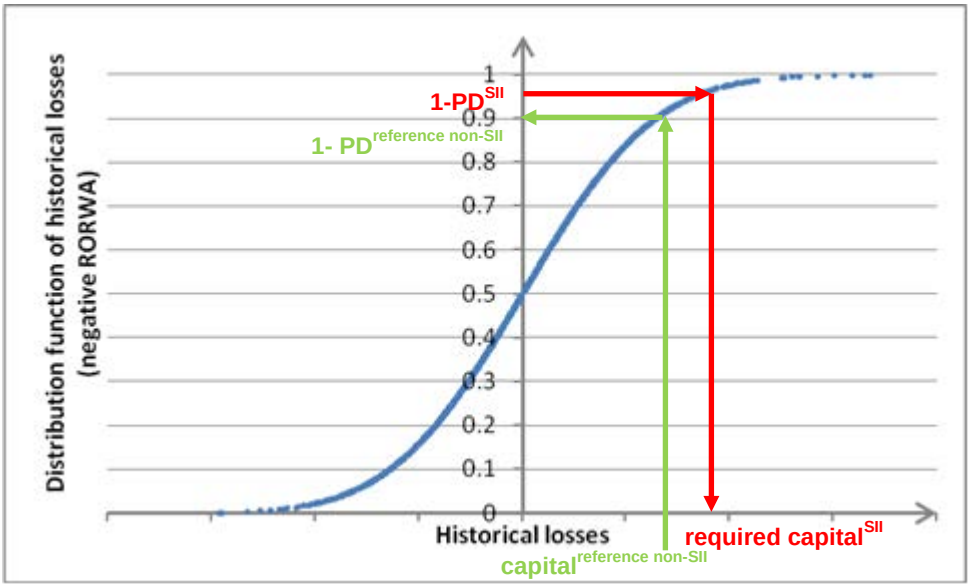
[259] The macroeconomic costs may have been mitigated by other factors related to the size of the banking sector. For example, countries with larger banking sectors may have applied, on average, higher capital requirements to their banks via Pillar 2 measures before the recent banking crisis.

Annex 4.3
Explaining the RORWA approach

The “equal expected impact” approach requires the calculation of the probability of default of a reference non-SII and the required capital ratio for the SII. The “return on risk-weighted assets” (RORWA) approach provides these calculations. In contrast to Merton model-based methods, which assume that the equity of a given institution is publicly traded, the RORWA approach is applicable more generally.

The RORWA approach relies on observations of institutions’ historical losses relative to RWA. As a hypothetical illustration, Figure 1 below plots the cumulative distribution of historical losses relative to RWA. The horizontal axis plots institutions’ historical losses and the vertical axis denotes the probability with which a given loss level is not exceeded based on the historical loss distribution. Hence, one minus this probability would be the probability that losses do exceed the given level.

Figure 1
Historical RORWA distribution



The probability of default of the reference non-SII ($PD^{reference\ non\text{-}SII}$) is obtained as follows. First, assume a capital ratio for the reference non-SII (e.g. 7% of RWA) and a capital ratio below which institutions are assumed to fail (e.g. 4.5% of RWA). Denote the difference between these two capital ratios as $capital^{reference\ non\text{-}SII}$ (which, in this example, equals 7% – 4.5% = 2.5%). The reference non-SII fails if the amount of losses relative to RWA exceeds this capital cushion, $capital^{reference\ non\text{-}SII}$. The distribution function of historical losses can then be used to find the probability with which losses will not be larger than $capital^{reference\ non\text{-}SII}$ (the green arrows). One minus this probability will then be the implied probability of default for the reference non-SII: $PD^{reference\ non\text{-}SII}$.

Given an (assumed) relative economic impact of the failure of the reference non-SII to that of the failure of the SII (relative impact$^{non\text{-}SII}$), the probability of default of the SII (PD^{SII}) is obtained by multiplying $PD^{reference\ non\text{-}SII}$ with relative impact$^{non\text{-}SII}$ ("equal expected impact" principle). The required capital ratio (above the level below which the institution is assumed to fail) for the SII (required capital^{SII}) is then obtained by applying the inverse historical loss distribution function again to (1-PD^{SII}) (the red arrows).

Annex 4.4
Notification templates on the O-SII buffer, G-SII buffer and the SRB

Notification template for Article 131 of the CRD IV – Global Systemically Important Institutions (G-SIIs)

Please send this template to

- **notifications@esrb.europa.eu** when notifying the ESRB;
- **macropru.notifications@ecb.europa.eu** when notifying the ECB;
- **notifications@eba.europa.eu** when notifying the EBA.

Emailing this template to the above-mentioned addresses constitutes an official notification, no further official letter is required. In order to facilitate the work of the notified authorities, please send the notification template in a format that allows electronically copying the information.

1. Notifying national authority	
1.1 Name of the notifying authority	**If several designated authorities, please mention all of them**..
2. Description of the measure	
2.1 Concerned institution(s)	On which **institution**(s) is the measure applied (name and LEI code)?
2.2 Level of the buffer applied	What the level of the buffer (in %) applied to the institution(s)?
2.3 Names of subsidiaries	If any of the concerned institutions is a parent institution, please name the subsidiaries of the institution notified as O-SIIs (please give name and LEI code).
3. **Timing of the measure**	
3.1 Timing of the	What is the date of the official decision? For SSM countries when notifying the ECB: provide the date when the decision referred to

Decision	in Article 5 of the SSMR shall be taken.
3.2 Timing of the Publication	What is the date of publication of the notified measure?
3.3 Disclosure	Information about the communication strategy of the notified measure to the market.
3.4 Timing of Application	What is the intended date of activation (i.e. as of which date shall the measure be applicable)?
3.5 Phasing in	What is the intended timeline for the phase-in of the measure?
4. Reason for activation of the G-SII buffer	
4.1 Indicators used for designation of the G--SII (Article 131.2)	Please provide information on the following categories of indicators: a. size of the group; b. interconnectedness of the group, with the rest of the financial system; c. substitutability of the services or the financial infrastructure provided by the group; d. complexity of the group; e. cross border activity of the group, including cross border activity between Member States and between a Member State and third countries Please provide relevant information in a separate Excel file. If available, the information set that was sent to the BIS can be used.
4.2 Scores and buckets (Article 131.2 and 131.9)	Please provide information on: a. which overall score and bucket is attributed to each G-SII b. which score is attributed to each category c. what qualitative supervisory judgement has been taken into account? Please provide relevant information in a separate Excel file. If available, the information set that was sent to the BIS can be used.
5. Cross-border and cross-sector impact of the measure	

5.1 Assessment of cross-border effects and the likely impact on the internal market **(Recommendation ESRB/2015/2)**	Assessment of the cross-border effects of the implementation of the measure. a. Assessment of the spillover channels operating via risk adjustment and regulatory arbitrage. The relevant indicators provided in Chapter 11 of the ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector[260] can be used. b. Assessment of: o cross-border effects (leakages and regulatory arbitrage) of the implementation of measure in your jurisdiction (inward spillovers); and o cross-border effects on other Member States and on the Single Market of measure (outward spillovers).
5.2 Assessment of leakages and regulatory arbitrage within the notifying Member State	Referring to your country's specific characteristics, what is the scope for "leakages and regulatory arbitrage" in your own jurisdiction (i.e., circumvention of the measure/leakages to other parts of the financial sector)?
6. Combinations and timing of the G-SII notified	
6.1 combinations between G-SII and O-SII buffers (Article 131.14)	In case both G-SII and O-SII buffers applied to the same institution at the consolidated level, which of the two buffers is the highest?
6.2 Combinations with SRB buffers (Article 131.14 + Article 133.5)	Are any of the institutions subject to a systemic risk buffer? If yes, please provide the following information: a. What is the level of the systemic risk buffer (in %) applied to the concerned institution b. Is the systemic risk buffer applied to all exposures located in your Member State only? c. Is the systemic risk buffer applied at the same consolidation level as the G-SII buffer?
6.3 Interaction with other measures	How does the buffer requirement interact with other measures addressing the same risk (e.g. with other supervisory measures)?
7. Miscellaneous	

[260] Available on the ESRB's website at www.esrb.europa.eu.

7.1 Contact person(s) at notifying authority	Contact person(s) for further inquiries (name, phone number and e-mail address)
7.2 Any other relevant information	

Notification template for Article 131 of the CRD IV – Other Systemically Important Institutions (O-SII)

Please send this template to

- **notifications@esrb.europa.eu** when notifying the ESRB;
- **macropru.notifications@ecb.europa.eu** when notifying the ECB;
- **notifications@eba.europa.eu** when notifying the EBA.

Emailing this template to the above-mentioned addresses constitutes an official notification, no further official letter is required. In order to facilitate the work of the notified authorities, please send the notification template in a format that allows electronically copying the information.

1. Notifying national authority	
1.1 Name of the notifying authority	If several designated authorities, please mention all of them.
2. Description of the measure	
2.1 Concerned institution or group of institutions	On which institution(s) is the measure applied (name and LEI code)? Is the measure applied on: - The highest level of consolidation - A sub-consolidated level - An individual level
2.2 Level of the buffer applied	What is the level of the buffer (in %) applied to the institution(s)?
2.3 Name of the EU ultimate parent institution	Please provide the name and the LEI code of the EU ultimate parent institution of the group of each of the concerned institutions, in case the EU ultimate parent institution is not the concerned institution itself.

2.4 Names of subsidiaries	If any of the concerned institutions is a parent institution and the buffer is applied on a (sub)consolidated level, please name the subsidiaries of the institution that are notified as O-SIIs (please give name and LEI code).
3. Timing of the measure	
3.1 Timing of the Decision	What is the date of the official decision? For SSM countries when notifying the ECB: provide the date when the decision referred to in Article 5 of the SSMR shall be taken.
3.2 Timing of the Publication	What is the date of publication of the notified measure?
3.3 Disclosure	Information about the communication strategy of the notified measure to the market.
3.4 Timing of Application	What is the intended date of activation (i.e. as of which date shall the measure be applicable)?
3.5 Phasing in	What is the intended timeline for the phase-in of the measure?
3.6 Review of the measure	When will the measure be reviewed (Article 131(6) and 131(12) specify that the buffer, the identification of O-SIIs and the allocation into subcategories must be reviewed at least annually)?
4. Reason for O-SII identification and activation of the O-SII buffer	
4.1 Scores of concerned institution or group of institutions, as per EBA guidelines on the assessment of O-SIIs **(Article 131.3)**	Please list here the name, overall scores, category scores, and indicator values of the identified O-SIIs related to a. size; b. importance for the economy of the relevant Member State or the Union, capturing substitutability/financial institution infrastructure; c. complexity, including the additional complexities from cross-border activity; d. interconnectedness of the institution or (sub-)group with the financial system. When notifying the ECB or EBA, please provide relevant information (methodology, calculations and formulas, data sources, information set used for denominators) in a separate Excel file.

4.2 Methodology and indicators used for designation of the O-SII **(Article 131.3)**	Please provide information on: a. whether you followed the EBA guidelines on the assessment of O-SIIs b. which threshold score has been set to identify O-SIIs c. which overall score is attributed to the O-SIIs d. which of the optional indicators have been used to justify supervisory assessment decisions, if any, and what are the scores e. why these optional indicators are relevant for the Member State f. why the bank is systemically important in terms of those particular optional indicators g. whether relevant entities with relative total assets not in excess of 0.02% have been excluded from the identification process h. names and scores of all relevant entities not excluded from the identification process (could be sent in a separate excel file, see 4.1) i. whether non-bank institutions have been included in the calculations
4.3 Supervisory judgement	Has any of the institutions listed in 2.1 been identified through supervisory judgement as laid down in EBA guidelines on the assessment of O-SIIs? If yes, please list the respective institutions.
4.4 Calibrating the O-SII buffer	Please provide information on the criteria and indicators used to calibrate the level of the O-SII buffer requirement and the mapping to institution-specific buffer requirements.
4.5 Effectiveness and proportionality of measure	Please provide a justification for why the O-SII buffer is considered likely to be effective and proportionate to mitigate the risk.
5. Cross-border and cross-sector impact of the measure	
5.1 Assessment of cross-border effects and the likely impact on the internal market **(Recommendation ESRB/2015/2)**	Assessment of the cross-border effects of the implementation of the draft measure. c. Assessment of the spillover channels operating via risk adjustment and regulatory arbitrage. The relevant indicators provided in Chapter 11 of the ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector[261] can be used. d. Assessment of:

[261] Available on the ESRB's website at www.esrb.europa.eu.

	o cross-border effects (leakages and regulatory arbitrage) of the implementation of the measure in your own jurisdiction (inward spillovers); and o cross-border effects on other Member States and on the Single Market of the measure (outward spillovers).
5.2 Assessment of leakages and regulatory arbitrage within the notifying Member State	Referring to your country's specific characteristics, what is the scope for "leakages and regulatory arbitrage" in your own jurisdiction (i.e., circumvention of the measure/leakages to other parts of the financial sector)?
6. Combinations and interactions with other measures	
6.1 Combinations between G-SII and O-SII buffers (Article 131.14)	In case both G-SII and O-SII criteria applied to the same institution at the consolidated level, which of the two buffers is the highest?
6.2 Combinations with SRB buffers **(Article 131.14 + Article 133.5)**	Are any of the institutions subject to a systemic risk buffer? If yes, please provide the following information: a. What is the level of the systemic risk buffer (in %) applied to the concerned institution b. Is the systemic risk buffer applied to all exposures located in your Member State only? c. Is the systemic risk buffer applied at the same consolidation level as the O-SII buffer?
6.3 O-SII requirement for a subsidiary (Article 131.8)	In case the O-SII is a subsidiary of an EU parent institution which is subject to a G-SII or O-SII buffer on a consolidated basis, what is the G-SII or O-SII buffer rate on a consolidated basis of the parent institution?
6.4 Interaction with other measures	How does the buffer requirement interact with other measures addressing the same risk (e.g. with other supervisory measures)?
7. Miscellaneous	
7.1 Contact person(s) at notifying authority	Contact person(s) for further inquiries (name, phone number and e-mail address)

7.2 Any other relevant information	

Template for notifying the intended use of a systemic risk buffer (SRB)

Please send this template to

- **notifications@esrb.europa.eu** when notifying the ESRB;
- **macropru.notifications@ecb.europa.eu** when notifying the ECB;
- **notifications@eba.europa.eu** when notifying the EBA.

Emailing this template to the above-mentioned addresses constitutes an official notification, no further official letter is required. In order to facilitate the work of the notified authorities, please send the notification template in a format that allows electronically copying the information.

1. Notifying national authority and scope of the notification	
1.1 Name of the notifying authority	If several designated authorities, please mention all of them.
1.2 Type of measure intended (also for reviews of existing measures)	Which SRB measure do you intend to implement? - Activate a new SRB - Change the level of an existing SRB - Change the scope of an existing SRB (incl. changes to subset of institutions) - De-activate an existing SRB - Maintain an existing SRB
2. Description of the notified measure	
2.1 Institutions covered by the intended SRB	Please inform whether the intended SRB addresses: - All credit institutions authorised in the Member State? - One or more subsets of credit institutions in the sector (please provide the names and identifiers (LEI code) of institutions covered)? - A subsidiary whose parent is established in another Member State (please indicate the names and identifiers (LEI code) of subsidiaries)

	If the SRB does apply to a subset of institutions, please describe the criteria for selection of relevant institutions.
2.2 Buffer rate **(Article 133(11)(f) of the CRD IV)**	Specify the intended SRB rate. If different buffer requirements apply to different institutions, please specify for each institution mentioned under 2.1.
2.3 Exposures covered by the SRB	Please indicate the exposures to which the SRB applies: - Only to domestic exposures; - Domestic exposures and exposures in other Member States; - Domestic exposures and exposures to third countries; - All exposures.
3. Timing of the measure	
3.1 Timing of the Decision	What is the date of the official decision? For SSM countries when notifying the ECB: provide the date when the decision referred to in Article 5 of the SSMR shall be taken.
3.2 Timing of the Publication	What is the date of publication of the notified measure?
3.3 Disclosure	Information about the communication strategy of the notified measure to the market. Do you also intend to publish the justification for the SRB?
3.4 Timing of Application	What is the intended date of activation (i.e. as of which date shall the measure be applicable)?
3.5 Phasing in	What is the intended timeline for the phase-in of the measure?
3.6 Review/deactivation of the measure	Until when will the measure presumably be in place? What are conditions for its deactivation? How often will the appropriateness of the level and the scope of the measure be reviewed? (Article 133(10)(b) of the CRD IV specifies that reviews must take place at least every second year.) On what indicators would the decision be based on?
4. Reasons for the intended SRB	
4.1 Description of the long-term non-cyclical systemic risk in your Member State **(Article 133(11)(a) of the CRD IV)**	Description of the long-term non-cyclical systemic risks not covered by the Capital Requirements Regulation (CRR). Please include: - Whether these risks are widespread in the whole financial sector?

	- Or whether they are concentrated only in one or more subsets of the sector?
4.2 Reasons why the dimension of the long-term non-cyclical systemic risk threatens the stability of the financial system in your Member State **(Article 133(11)(b) of the CRD IV)**	Reasons why the long-term non-cyclical systemic risk threatens financial stability justifying the systemic risk buffer rate.
4.3 Indicators used for the activation of the measure	Provide the indicators on the basis of which the measure is to be activated. When notifying the ECB, if possible please provide the data the decision is based on (preferably an Excel-file).
4.4 Effectiveness and proportionality of the measure **(Article 133(11)(c) of the CRD IV)**	Explanation why the draft measures are deemed likely to be, effective and proportionate to mitigate the risk. E.g. how will the effectiveness of the measure be assessed? Based on which indicators? What are the expected transmission mechanisms?
4.5 Justification of inadequacy of existing measures in the CRD IV or in the CRR, excluding Articles 458 and 459 of the CRR, to address the identified risks **(Article 133(11)(e) of the CRD IV)**	Justification for why none of the existing measures in the CRD IV or in the CRR, excluding Articles 458 and 459 of the CRR, alone or in combination, will be sufficient to address the identified macroprudential or systemic risk taking into account the relative effectiveness of those measures.
5. Cross-border and cross-sector impact of the measure	
5.1 Assessment of cross-border effects and the likely impact on the internal market **(Article 133(11)(d) of the CRD IV and Recommendation ESRB/2015/2)**	Assessment of the cross-border effects of the implementation of the measure. e. Assessment of the spillover channels operating via risk adjustment and regulatory arbitrage. The relevant indicators provided in Chapter 11 of the ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector[262] can be used. f. Assessment of: o cross-border effects (leakages and regulatory arbitrage) of the implementation of the measure in your own jurisdiction (inward spillovers); and o cross-border effects on other Member States

[262] Available on the ESRB's website at www.esrb.europa.eu.

	and on the Single Market of the measure (outward spillovers).
5.2 Assessment of leakages and regulatory arbitrage within the notifying Member State	Referring to your country's specific characteristics, what is the scope for "leakages and regulatory arbitrage" in your own jurisdiction (i.e., circumvention of the measure/leakages to other parts of the financial sector)?
5.3 Reciprocation by other Member States **(Article 134(4) of the CRD IV and Recommendation ESRB/2015/2)**	Does the authority request the ESRB to issue a recommendation to other Member States to reciprocate the measures in accordance with Article 134(4) of the CRD IV? What are the reasons for requesting or not requesting reciprocation? In case of requesting reciprocation, please provide a concise description of the measure to be reciprocated. If the ESRB deems the request for reciprocation justified, the provided description will form the basis of translation into all EU official languages as part of an update of Recommendation ESRB/2015/2.
6. Combination of the SRB with other buffers	
6.1 Combination with G-SII and/or O-SII buffers (Article 133(4) and (5) of the CRD IV)	a. Is a G-SII buffer and/or O-SII buffer applied to the same institution? At which consolidation level? b. In case a G-SII buffer and an O-SII buffer are both applied to the institution at a consolidated level, which one of the buffers is the highest? c. Can the SRB be applied cumulatively with the G-SII and/or O-SII buffer(s)? (Article 133(5) of the CRD IV) In case not, which buffer is the highest?
6.2 Other relevant information	Any other relevant information (e.g. interaction with other supervisory measures, description of any other measures addressing the same risk).
7. Miscellaneous	
7.1 Contact person(s) at notifying authority	Contact person(s) for further inquiries (name, phone number and e-mail address).
7.2 Any other relevant information	

Annex 5.1
Country experiences on the use of liquidity instruments for macroprudential purposes

Case study on the LTD ratio: Portugal

Against the background of increased difficulties in banks' access to market funding and excessive leverage of the private and public non-financial sectors, and in the context of the programme of economic and financial assistance agreed in 2011, Banco de Portugal established a set of measures aimed at converging to a more balanced funding profile for the banking system. These measures included an indicative target of 120% for the LTD ratio of the eight largest banking groups to reach by 2014, corresponding to an average decrease of around 40% compared with end-2010. The ratio is defined on a consolidated basis and the definition of loans is net of impairments, includes securitised non-derecognised loans and excludes interbank loans. The denominator includes mostly customer deposits but also stable funding lines from parent companies, qualifying shareholders or multilateral institutions.

The purpose of using this instrument was to allow for an orderly and gradual deleveraging of the banking system and the non-financial sector, without excessively constraining economic agents' access to bank financing. The measure was effective in that it allowed for a significant decrease in the LTD and most of the adjustment has occurred through an increase in deposits.

Complementary measures included guidance for gradually decreasing the dependence on ECB funding and the introduction of a deduction from Core Tier 1 capital which was based on the amount of deposits with interest rates that exceeded a certain threshold above the EURIBOR rate. The purpose of the latter measure was to avoid an excessive increase in interest rates for deposits that could augment their volatility and hamper banks' profitability, as well as have a negative impact on other agents relying on household savings (e.g. insurance corporations, mutual funds and pension funds). Banks were required to report more detailed information on a daily basis (including data on deposits) and quarterly information on their funding and capital plans (current position and plans for convergence towards a more balanced position over the medium term).

Case study on the LTD ratio: South Korea

In the years leading up to the recent financial crisis, the Korean banking sector experienced an increase in LTD ratios, peaking at 140% in 2008 owing to an extensive build-up in short-term external debt. As the financial crisis hit, Korean banks were unable to roll over their maturing short-term external liabilities as global liquidity conditions worsened. The Korean authorities introduced a series of macroprudential measures in the aftermath of the financial crisis to deal with large and volatile capital flows. One of the measures was a mandatory 100% cap on banks' LTD which came into force end-2012 and which was largely felt in intra-financial lending. Other macroprudential instruments used to increase banks' liquidity position were a levy on short-term debt (ranging from

2 to 20 basis points according to debt maturity) and other caps and limits on foreign currency (forex) denominated transactions and derivative positions. The combination of the various measures had an immediate effect after their announcement. LTD ratios decreased significantly owing to an increase in deposits exceeding loan growth. Short-term external borrowing was reduced to roughly 30% below pre-crisis levels.[263]

Case study on the LTSF ratio: Austria

The sustainability package (published in March 2012) provides for the monitoring of stock and flow loan-to-local stable funding ratios (LLSFRs) at the subsidiaries of Austria's three largest banks,[264] as well as the supervision of the risk-adequate pricing of intragroup liquidity transfers to their subsidiaries. These measures are based on the Austrian supervisors' experience that banking subsidiaries which entered the recent financial crisis with high (i.e. above 110%) stock-LLSFRs were significantly more likely to exhibit higher loan loss provisioning rates than other banking subsidiaries that had a more conservative and balanced business and growth model. Therefore, banking subsidiaries with stock-LLSFRs above 110% are considered to be "exposed" and the sustainability of their new business has been closely monitored, starting with data from end-2011.

The exact definition of the LLSFR and its components (in the stock) is: volume of loans to non-banks after provisioning divided by the local stable funding (i.e. deposits from non-banks + supranational funding + capital from third parties + the total outstanding volume of debt securities with original maturities of one year or more issued by the subsidiary to investors outside their consolidated group). The flow ratio is defined using the year-on-year changes in the stock of these components, i.e. flow-LLSFR = (stock of loan portfolio in (t) – stock of loan portfolio in (t-1))/(stock local stable funding in (t) – stock local stable funding in (t-1)).

End-2012 most subsidiaries were not exposed, since they had a stock-LLSFR below 110%, while all but one subsidiary above the early warning threshold exhibited sustainable trends in their new business. These findings are updated quarterly and shared and discussed with the affected banks and their host and home supervisors.

Given that the LLSFR (as well as the LTD) has anti-cyclical properties, its monitoring only started in 2012 and that most of the addressed subsidiaries are located in markets with currently subdued loan growth, there is too little experience to comment on the instruments' effectiveness. The acid test for its effectiveness will rather come in boom times and/or in regions with dynamic lending growth.

Case study on core funding and maturity mismatch ratios: New Zealand

In the years preceding the financial crisis, New Zealand's banking sector was characterised by high dependence on short-term wholesale cross-border funding. The share of non-resident funding had

[263] Lim et al. (2011) and JPMorgan (2013).

[264] Erste Group Bank, Raiffeisen Zentralbank and Unicredit Bank Austria.

grown to about 40% of total funding, 60% of which had residual maturities of less than three months. The banks experienced difficulties rolling over their short-term debt when international markets were impaired after the collapse of Lehman Brothers. In the light of this, the Reserve Bank of New Zealand (RBNZ) introduced, inter alia, two quantity-based macroprudential liquidity measures to deal with these structural risks. The proposals were presented in October 2008 and came into effect in April 2010:

A one-year core funding ratio (CFR), defined as core funding over total loans and advances. Core funding broadly includes all wholesale funding with a maturity above one year, including subordinated debt, plus retail deposits and Tier 1 capital. The minimum CFR requirement (which has been implemented gradually, from 65% in 2010, 70% in 2011 and 75% in 2013) aims to ensure that banks hold sufficient retail and long-term wholesale funding in order to lower the vulnerability of the banking system to any major shock. The impact of this measure is expected to be stronger during booms, when banks resort to short-term foreign currency funding to support credit growth. It is expected that banks will rely and compete more for retail deposits and to borrow with longer maturities, which will increase lending rates and in turn reduce excessive credit growth. In this case, the RBNZ may not need to raise its monetary policy rate during a credit expansion to the same extent as in a situation without the CFR requirement.

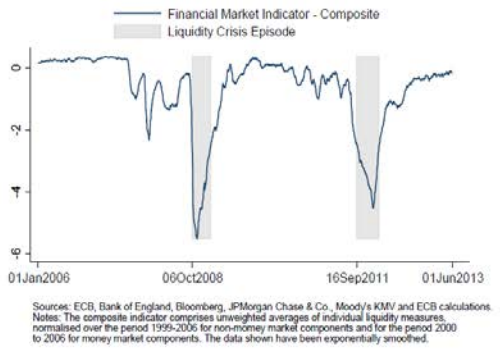
A one week and a one month mismatch ratio (similar to the LCR) to reduce the risk that an individual bank is affected by a short-term loss of confidence. It is defined as the mismatch dollar amount over total funding, where the mismatch dollar amount comprises primary liquid assets after haircuts plus contractual inflows minus contractual outflows due within the relevant period. To meet the minimum requirement (not less than 0% at the end of each business day), a bank needs to hold a sufficient stock of liquid assets to be able to fill the projected mismatch between cash inflows and outflows. The implementation of these ratios had a rapid effect, even before they were formally implemented, as banks began to lengthen their wholesale funding structure immediately after the announcement of the new requirements. New Zealand's short-term external debt dropped continuously from 68% of GDP in December 2007 to 51% in December 2011. The share of non-resident funding dropped from 40% in 2009 to 36% in 2011, reaching 30.6% in 2013.

Case study on the LCR: Sweden

In January 2013 Sweden implemented the LCR based on the BCBS agreement of December 2010. An LCR of at least 100% is required for all currencies combined, as well as in euro and USD separately. This implementation was motivated by the fact that the Swedish banking system is large and highly concentrated. Problems in an individual bank can thus quickly spread and become systemic. The largest banks are also highly dependent on wholesale funding, with LTD ratios of around 200%. Their structural maturity mismatch, as measured by the NSFR, is high as well. In addition, short-term wholesale funding is largely provided by foreign investors. Some of these foreign investors, such as US money market funds, have proved to retreat more and faster than domestic investors in times of stress. To comply with the standards, the banks have mainly issued senior unsecured debt in the market and placed the proceeds with central banks leading to an increase in their LCR ratios. The banks have also rebalanced their liquidity buffers, from lower to higher quality, and termed out their funding which also contributed positively to their LCR.

Annex 5.2
Selected figures of liquidity indicators

Chart 1

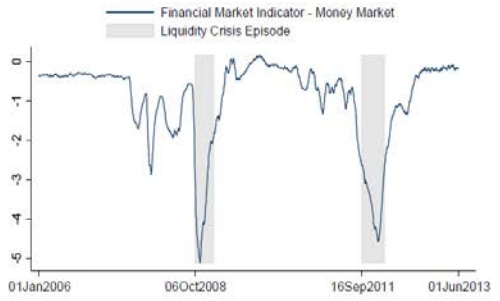


Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.
Notes: The composite indicator comprises unweighted averages of individual liquidity measures, normalised over the period 1999-2006 for non-money market components and for the period 2000 to 2006 for money market components. The data shown have been exponentially smoothed.

Chart 2

Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.
Notes: The composite indicator comprises unweighted averages of individual liquidity measures, normalised over the period 1999-2006. The data shown have been exponentially smoothed.

Chart 3

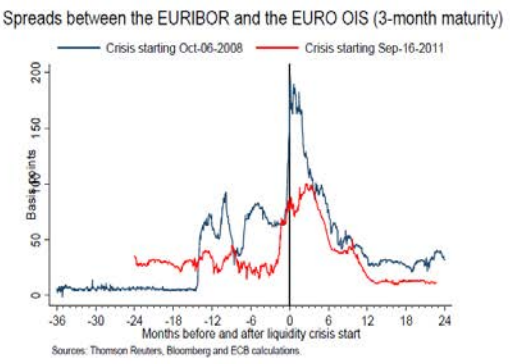


Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.
Notes: The composite indicator comprises unweighted averages of individual liquidity measures, normalised over the period 2000-2006. The data shown have been exponentially smoothed.

Chart 4

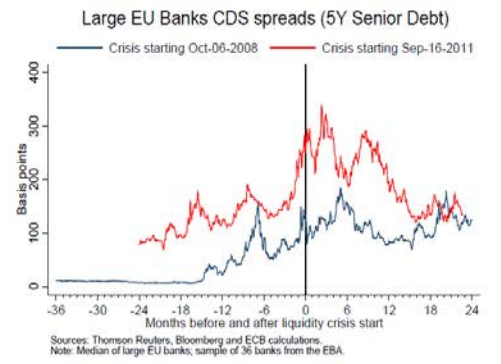
Sources: Bloomberg and ECB calculations.
Note: Volatility is implied by at-the-money option prices observed in the market for major currencies, based on three-month maturity.

Chart 5



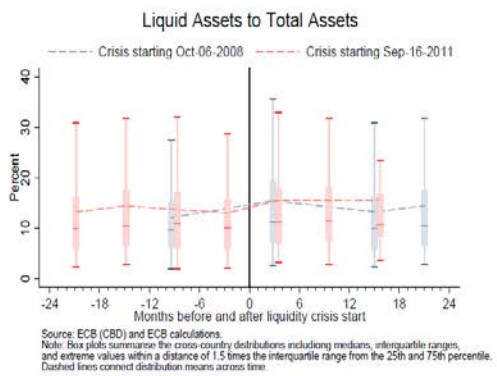
Sources: Thomson Reuters, Bloomberg and ECB calculations.

Chart 6



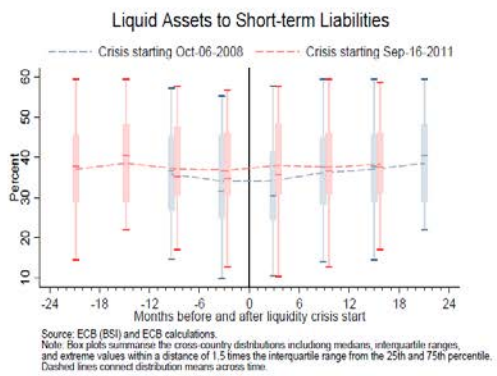
Sources: Thomson Reuters, Bloomberg and ECB calculations.
Note: Median of large EU banks, sample of 36 banks from the EBA.

Chart 7



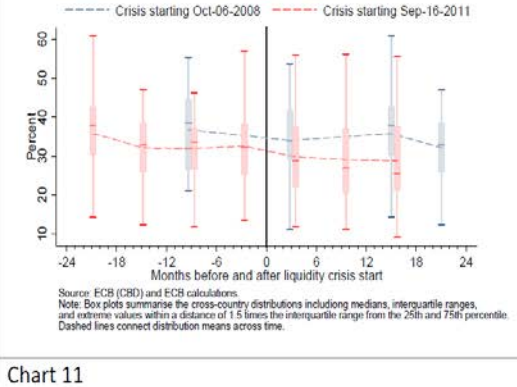
Source: ECB (CBD) and ECB calculations.
Note: Box plots summarise the cross-country distributions including medians, interquartile ranges, and extreme values within a distance of 1.5 times the interquartile range from the 25th and 75th percentile. Dashed lines connect distribution means across time.

Chart 8



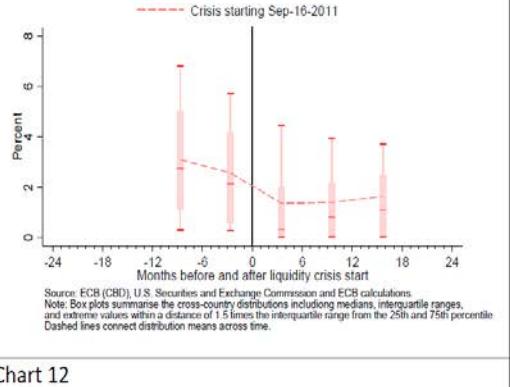
Source: ECB (BSI) and ECB calculations.
Note: Box plots summarise the cross-country distributions including medians, interquartile ranges, and extreme values within a distance of 1.5 times the interquartile range from the 25th and 75th percentile. Dashed lines connect distribution means across time.

Chart 9



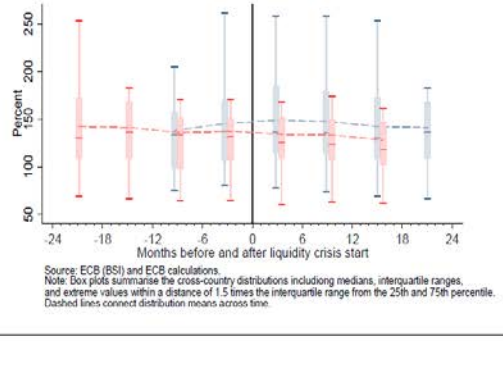
Source: ECB (CBD) and ECB calculations.
Note: Box plots summarise the cross-country distributions including medians, interquartile ranges, and extreme values within a distance of 1.5 times the interquartile range from the 25th and 75th percentile. Dashed lines connect distribution means across time.

Chart 10



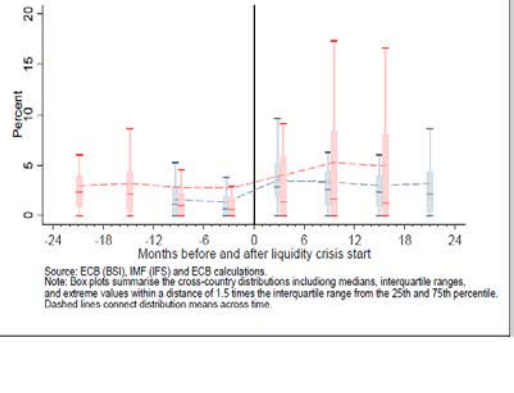
Source: ECB (CBD), U.S. Securities and Exchange Commission and ECB calculations.
Note: Box plots summarise the cross-country distributions including medians, interquartile ranges, and extreme values within a distance of 1.5 times the interquartile range from the 25th and 75th percentile. Dashed lines connect distribution means across time.

Chart 11



Source: ECB (BSI) and ECB calculations.
Note: Box plots summarise the cross-country distributions including medians, interquartile ranges, and extreme values within a distance of 1.5 times the interquartile range from the 25th and 75th percentile. Dashed lines connect distribution means across time.

Chart 12



Source: ECB (BSI), IMF (IFS) and ECB calculations.
Note: Box plots summarise the cross-country distributions including medians, interquartile ranges, and extreme values within a distance of 1.5 times the interquartile range from the 25th and 75th percentile. Dashed lines connect distribution means across time.

Annex 5.3
Review of evidence on the predictive value of liquidity indicators

For balance sheet data, longer time series are available for some countries. Recent analysis has focused especially on LTD ratios or the development of core funding, and evidence indicates that these measures can predict stress events.

In Italy, the Netherlands and Slovenia, LTD ratios increased in the decade prior to the recent global financial crisis, pointing to the accumulation of funding vulnerabilities in the financial system.[265] Similar developments were evident in many countries in the run-up to past financial crises, and not only the recent one. Bank of England (2013) and Aikman et al. (2013, Banco de España) provide an overview of different countries and stress episodes (Figure 1). Part of the increase in LTD ratios during the last decade may be related to the strong growth of repo funding, which is usually short term and fragile (Gorton and Metrick (2012)).

Bologna (2013) finds evidence that not only is the LTD ratio a significant factor in predicting bank failures in the United States, but also that it remains significant if tested with a higher number of lags. This seems to confirm the inertia in banks' balance sheets, meaning that focusing on the years immediately preceding the stress event may not reveal the same signal. Bologna (2013) also argues that the relevant policy messages stemming from his findings on the LTD can be extended to the banking stability impacts of the Basel III structural funding regulation.

A high and increasing dependence on wholesale short-term funding can also be observed in New Zealand, with the share of core funding in total funding falling in the years prior to the global financial crisis (Ha and Hodgetts (2011)). This induced the Reserve Bank of New Zealand to introduce a CFR to reduce banks' aggregate rollover risk and strained credit supply (Bloor et al. (2012)) (Figure 2, Ha and Hodgetts (2011); see also Annex 5.1).[266] [267]

Hahm, Shin and Shin (2012) provide empirical evidence showing that measures of non-core liabilities (i.e. liabilities which are not retail deposits) have significant predictive power for currency crises and credit crises. The non-core liability ratio remains significant even when including the credit-to-GDP ratio in the empirical specification, showing its independent prediction power over one of the main indicators of excessive credit growth.

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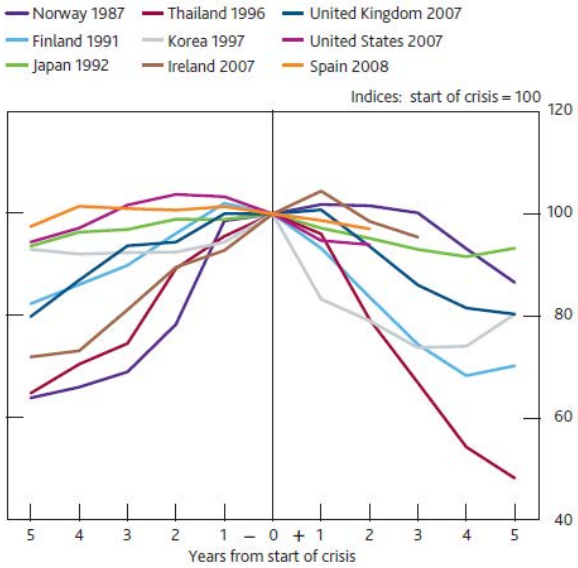
[265] Evidence based on data from national central banks. Some studies show that retail savings are a clear mitigating factor for liquidity stress and destabilising bank reactions. See, e.g. Cornett et al. (2011) and Loutskina (2011).

[266] The one-year core funding is defined as all funding with residual maturity longer than one year, and (i) 50%t of any tradable debt securities issued by the bank with original maturity of at least two years, and residual maturity (at the reporting date) between six months and one year, (ii) "non-market funding" that can be withdrawn at sight or with residual maturity up to one year, where the percentage to be included decreases with size band, and (iii) Tier 1 capital. See IMF (2013).

[267] Further, greater reliance on non-core funding may reflect excessive credit growth. Since retail deposits, the main part of banks' core liabilities, grow in line with the aggregate wealth of the private sector and thus are slow moving, the pool of retail deposits is not sufficient to fund the rapid credit expansion in a boom. Other sources of funding, non-core liabilities, must then be tapped to fund the expansion. See IMF (2011).

Figure 1

LTD ratios before and after major crises (a) (b)

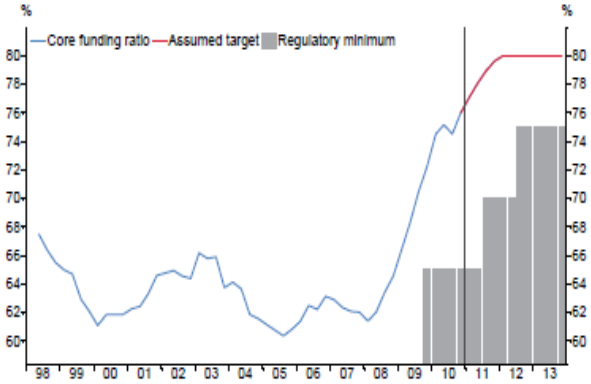


Sources: World Bank, published accounts and Bank calculations.

(a) The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).
(b) The UK measure is major UK banks' customer lending as a percentage of customer funding, where customer refers to all non-bank borrowers and depositors. Where disclosed, repurchase agreements are excluded from loans and deposits. The measure for all other countries is the 'Bank credit to bank deposits' series from the World Bank Global Financial Development database. In their measure of credit, the World Bank include the financial resources provided to the private sector by domestic money banks.

Figure 2

The core funding ratio of the banking system in New Zealand



Annex 5.4
Overview of the legal/institutional aspects of liquidity instruments

	Legal basis	Responsible authority	Procedural aspects	Reciprocity
(Time-varying) LCR	Article 458 of the CRR (in particular Article 458(2)(d), (v)) (national flexibility)	Competent or designated authority	See Chapter 7	Allowed
	Article 104(1)(k) and Article 103 of the CRD IV (Pillar 2)	Competent authority	- Notification to EBA - EBA to monitor supervisory practices and issue guidelines	Not expressly provided for
(Time-varying) NSFR	Article 458 of the CRR (in particular Article 458(2)(d), (v)) (national flexibility)	Competent or designated authority	See Chapter 7	Allowed
	Article 104(1)(k) and Article 103 of the CRD IV (Pillar 2)	Competent authority	- Notification to EBA - EBA to monitor supervisory practices and issue guidelines	Not expressly provided for
(Time-varying) LTD and LTSF limits	Outside scope of the CRD IV/CRR	National competence	- National competence - Prior notification of ESRB in the case of expected significant cross-border effects - Notification of ESRB/national macroprudential authorities where reciprocity is needed	National competence
	Article 104(1)(k) and Article 103 of the CRD IV (Pillar 2)	Competent authority	- Notification to EBA - EBA to monitor supervisory practices and issue guidelines	Not expressly provided for
General liquidity charge	Article 104(1)(k), Article 103 and Article 105 of the CRD IV (Pillar 2)	Competent authority	- Notification to EBA - EBA to monitor supervisory practices and issue guidelines	Not expressly provided for
Liquidity surcharge SIIs	Article 104(1)(k), Article 103 and Article 105 of the CRD IV (Pillar 2)	Competent authority	- Notification to EBA - EBA to monitor supervisory practices and issue guidelines	Not expressly provided for

Annex 7.1
How to construct the proposed indicators for measures under Article 458 of the CRR

Instrument	Indicator (ratio, level and/or growth rate)	Numerator	Denominator
Large exposures	Large exposures over total credit	Exposures to domestic borrowers exceeding 10% of capital	Total credit to domestic borrowers
	Sectoral exposure over capital	Banks' exposure to a sector of economic activity, e.g. commercial real estate	Bank capital
	Largest exposures to institutions (u.e.) over these institutions' (u.e.) equity	Banks' ten largest exposures to institutions (u.e.), aggregated by institutions (u.e.); then institutions (u.e.) are ranked and the top 10 are kept	Equity of these institutions (u.e.)
Intra-financial exposures	Financial corporate debt over GDP	Financial sector debt	Country's GDP
	Financial corporate debt over GDP *of which short term*	Short-term financial sector debt	Country's GDP
	Non-bank financial (NBFI) debt to GDP	Non-bank financial sector debt	Country's GDP
	Non-bank financial (NBFI) debt to GDP *of which short term*	Short-term non-bank financial sector debt	Country's GDP
	Activities in shadow banking sector	Issuance of securitized products (e.g. ABS, CDO and of other SBS products (e.g. synthetic ETF) and AuM of certain SBS entities (e.g. MMF and credit HF).	
	Banking sector size over domestic GDP broken into domestic banks versus foreign branches/subsidiaries (by country)	Banks' total assets (domestic banks/foreign subsidiaries)	Country's GDP
	OFI and MMFs assets under management over EU GDP (by country)	OFI + MMFs assets under management	EU GDP
	Intra-financial activity over banks' total banking book	Intra-financial exposures	Banks' total banking book
	Intra-financial activity over banks' total assets	Intra-financial exposures	Banks' total assets
	Intra-financial sector activity: Interbank lending	Loans to credit institutions	
	Intra-financial sector activity: Interbank borrowing	Deposits from credit institutions and debt securities	
	Intra-financial sector activity: Repo-style transactions	Reverse repurchase loans	
	Intra-financial sector activity: OTC derivatives	OTC derivatives	
	Intra-financial sector activity: Derivatives (notional amount)	Derivatives	
	Largest exposures to financial sector entities over the same entities' highest quality capital	Exposures to financial sector entities	CET1 capital
	Funding gap or Loan-to-deposit ratio (KRI 34)	Customers' loans and advances held for trading, designated at fair value through profit or loss, AFS, Loans and receivables, HTM	Customers' deposits other than from credit institutions and other forms of retail fundraising (such as retail bonds), held for trading, designated at fair value through profit or loss, measured at amortised cost.

(*) This approach consolidates data of resident financial institutions with those of their branches and subsidiaries (if any) resident in the domestic economy.

(**) This approach consolidates data of domestically controlled and incorporated financial institutions with their branches (domestic and foreign) and subsidiaries (domestic and foreign).

Notes: u.e. refers to unregulated entities; ABS refers to asset-backed securities; CDO refers to collateralised debt obligations; SBS refers to shadow banking sector, ETF refers to exchange-traded fund; AUM refers to assets under management; HF refers to hedge-fund; OFI refers to other financial intermediary; KRI refers to key risk indicator; AFS refers to available for sale; and HTM refers to held to maturity.

Annex 8.1
Key economic and legal features of macroprudential instruments[268]

Table 1

Key features of instruments aimed at mitigating and preventing excessive general credit growth and leverage

Instrument	CCyB (Article 130, 135-140 of the CRD IV)	SRB (Articles 133-134 of the CRD IV)	Own funds (Article 458 of the CRR)	Conserv. buffer (Article 458 of the CRR)	Leverage ratio (national law)
Nature of systemic risk	Cyclical	Structural	Cyclical or structural	Cyclical or structural	Cyclical or structural
Target population	All	All or subset	All or subset	All or subset	All or subset
Scope of application: all or subset of exposures	All domestic and/or third-country exposures	All exposures (within and/or outside Member State)[269]	All or subset of exposures	All or subset of exposures	All or subset of exposures
Caps on restrictions or requirements (proportionality)	No caps	Max 5% of RWA[270]	No caps	No caps	No caps
Reciprocity (limiting regulatory arbitrage)	Mandatory (up to 2.5% of RWA), then voluntary	Voluntary	Voluntary	Voluntary	Voluntary
Transparency (fostering market discipline)	High	High	Low	High	High
Legal/ procedural requirements	Low	Level dependent	Low	High	Low

[268] The tables in this annex omit the use of Pillar 2 for macroprudential purposes. The instruments available under Pillar 2 are numerous and can be applied in a flexible way, including to targeted exposures or assets (Chapter 6).

[269] The CRD IV does not specify whether an SRB can be applied to a sectoral subset of exposures.

[270] Member States can impose a higher SRB with prior authorisation from the European Council.

Table 2

Key features of instruments aimed at mitigating and preventing excessive sectoral credit growth and leverage

Instrument	Sectoral capital requirements (Article 124 of the CRR for real estate or Article 458 of the CRR)	Sectoral LGD floors (Article 164 of the for real estate or Article 458 of the CRR)	Sectoral LTV (national law)	Sectoral LTI or DSTI (national law)
Nature of systemic risk	Cyclical or structural	Cyclical or structural	Cyclical or structural	Cyclical or structural
Target population	All (Article 124); all or subset (Article 458)	All	All (Borrowers)	All (Borrowers)
Scope of application: all or subset of exposures	All or subset of domestic real estate exposures under SA (Article 124); all or subset of domestic real estate or intra-financial exposures (Article 458)	All or subset of domestic retail real estate exposures under IRB	All or subset of domestic real estate exposures	All or subset of domestic real estate exposures
Caps on restrictions or requirements (proportionality)	Up to 150% (Article 124) Over 150% (Article 458)	No caps	No caps	No caps
Reciprocity (limiting regulatory arbitrage)	Mandatory (Article 124) Voluntary (Article 458)	Mandatory	Voluntary	Voluntary
Transparency (fostering market discipline)	Medium	Medium	High	High
Legal/procedural requirements	Medium for Article 124 and high for Article 458 of the CRR.	Low	Low	Low

Table 3

Key features of instruments aimed at mitigating and preventing excessive maturity mismatch and market illiquidity

Instrument	Liquidity buffers (Article 458 of the CRR)	NSFR (Article 458 of the CRR)	Other stable funding (national law)	Liquidity charges (Article 105 of the CRD IV)	LTD (Article 103 of the CRD IV)
Nature of systemic risk	Cyclical or structural	Cyclical or structural	Cyclical or structural	Cyclical or structural	Cyclical or structural
Target population	All or subset	All or subset	All or subset	All or subset	All or subset
Scope of application: all or subset of exposures	All assets and liabilities	All assets and liabilities	All or subset of assets and liabilities	All assets and liabilities	All assets and liabilities
Caps on restrictions or requirements (proportionality)	No	No	No	No	No
Reciprocity (limiting regulatory arbitrage)	Voluntary	Voluntary	Voluntary	Voluntary	Voluntary
Transparency (fostering market discipline)	High	High	High	High	High
Legal/procedural requirements	High	High	Low	Low	Low

Table 4

Key features of instruments aimed at limiting direct and indirect exposure concentrations

Instrument	SRB (Articles 133-134 of the CRD IV)	Large exp. reqs. (Article 458 of the CRR)	Own funds (Article 458 of the CRR)	Measures for intra-fin. sector exps. (Article 458 of the CRR)
Nature of systemic risk	Structural	Structural	Cyclical or Structural	Cyclical or Structural
Target population	All or subset	All or subset	All or subset	All or subset
Scope of application: all or subset of exposures	All exposures (within and/or outside Member State)[271]	All or subset of exposures to individual or group of connected clients	All or subset of exposures	All or subset of intra-financial exposures
Caps on restrictions or requirements (proportionality)	Max 5% of RWA[272]	Max 15% below restriction in Art 395 of the CRR.	No caps	No caps
Reciprocity (limiting regulatory arbitrage)	Voluntary	Voluntary	Voluntary	Voluntary
Transparency (fostering market discipline)	High	Medium	Low	Medium/Low
Legal/procedural requirements	Level dependent	High	Low	Low

[271] The CRD IV does not specify whether an SRB can be applied to a sectoral subset of exposures.

[272] Member States can impose a higher SRB with prior authorisation from the European Council.

Table 5

Key features of instruments aimed at limiting the systemic impact of misaligned incentives with a view to reducing moral hazard

Instrument	G-SII buffer (Article 131 of the CRD IV)	O-SII buffer (Article 131 of the CRD IV)	SRB (Articles 133-134 of the CRD IV)	Own funds (Article 458 of the CRR)
Nature of systemic risk	Structural	Structural	Structural	Cyclical or Structural
Target population	Individual (G-SIIs)	Individual (O-SIIs)	All or subset	All or subset
Scope of application: all or subset of exposures	All exposures	All exposures	All exposures (within and/or outside Member State)[273]	All or subset of exposures
Caps on restrictions or requirements (proportionality)	Max 3.5% of RWA	Max 2% of RWA	Max 5% of RWA[274]	No caps
Reciprocity (limiting regulatory arbitrage)	Voluntary	Voluntary	Voluntary	Voluntary
Transparency (fostering market discipline)	High	High	High	Low
Legal/procedural requirements	Low	Medium (EBA guidance)	Level dependent	Low

[273] The CRD IV does not specify whether an SRB can be applied to a sectoral subset of exposures.

[274] Member States can impose a higher SRB with prior authorisation from the European Council.

Annex 9.1
Theoretical background on rules vs. discretion

Both the risk assessment and decisions on macroprudential instruments can be based on rules or on discretion, or a combination of both (guided discretion). When relying on rules, a (mechanical) rule indicates when to activate an instrument and how to set its level. When discretion guides the decisions, the authority bases its actions on subjective assessment and qualitative criteria. Both a rules-based approach and a discretion-based approach have their advantages and drawbacks (the arguments are summarised in the table below).

When macroprudential policy is based on rules, the policy can be made consistent, credible, accountable, as well as transparent and communicable to the public ex ante. Since the success of a policy intervention and the rationale for doing so are arguably difficult to assess even ex post (CGFS (2010)), a transparent and accountable rules-based element in macroprudential policy-making appears attractive. Furthermore, a clear rule-based approach can act to control the exercise of discretion and thus limit potential inaction bias). A policy rule can be built on economic theory and empirical evidence, and allow for a high degree of predictability. Predictability reduces uncertainty for market participants and thereby costs. The macroprudential authority can use a rules-based approach to build up a positive reputation.

Literature on monetary policy such as Kydland and Prescott (1977) points out that rules-based policy can help to overcome the time inconsistency of discretionary monetary policy when policy-makers are faced with the short-term costs and long-term benefits of policy action. In a similar vein, the main reason for introducing an element of rules in macroprudential policy-making would be to mitigate possible inaction bias arising from such a discrepancy between short-term costs and long-term gains. Borio (2010) states that the advantage of having rules is that case-by-case decisions and justifications are not needed. An argument in favour of a rules-based approach by Kowalik (2011) in his analysis of countercyclical capital requirements is that an authority would not be able to follow secondary goals (such as fostering short-term growth) when relying on rules.

Rules-based policies can be distinguished between “instrument rules” on the one hand and “target rules” on the other. The application of instruments under **instrument rules** is guided by indicators in a purely mechanical manner, thereby being relatively inflexible. **Target rules** are geared to an intermediate objective and therefore allow different instruments to be applied. In general, however, rules are inflexible whereas discretion allows policy-makers to react faster and in a more targeted way to changing circumstances.

Given the lack of knowledge about indicators and the transmission mechanism of macroprudential instruments at this early stage, flexibility would appear to be important as it allows policy-makers to develop knowledge further and react to the effects of policy over time. Discretionary policy also allows policy-makers to take qualitative information into account, e.g. market and supervisory intelligence.

Macroprudential policy based on rules/indicators may be subject to the Lucas critique as the data-generating process can change after a policy change. Thus, a variable can no longer serve as a reliable indicator for the underlying risks once it is targeted under regulation, thereby losing its

information content (Bank of England (2013), see also Goodhart's law[275]). An example of this might be an instrument that constitutes a cap or a lower bound on a variable (e.g. an LTV cap or minimum requirements for liquid assets), which would then truncate the distribution of the variable. Moreover, the behaviour of market participants may be influenced by other policy areas, such as fiscal policy or sector-specific structural policies, for which rules may not provide the optimal response.

The macroprudential authority also has to decide about the scope of the instrument, e.g. whether it is to be applied only to banks or also to non-bank institutes (Borio (2009)). Although this decision will in most cases be made in accordance with the underlying law, the authority may see scope for discretionary judgement.

Table 1
Advantages and disadvantages of rules vs. discretion

Rules	
Advantages	**Disadvantages**
Transparent	May be hard to design appropriate rules given inherent uncertainty
Predictable	Rather static concept
Easy to communicate	Allows no discretion (may only achieve second-best)
Relies on quantitative data	Little experience with macroprudential instruments (new experience may make it difficult to respect the rule)
Macroprudential authority can build up reputation (time consistency)	Data may not be available, or available too late; lack of experience on choosing indicators
Eases expectation formation	Indicators are influenced by policy areas other than macroprudential policy (e.g. fiscal policy)
Rules can act as automatic stabiliser	Difficult to measure success in achieving the ultimate objectives of macroprudential policy, including the prevention and mitigation of systemic risks
No need for continual justification or express decisions	
Discretion	
Advantages	**Disadvantages**
Flexible tool, can be tailored to current situation	Subjective judgement, less transparent
Can rely on qualitative data	Risk of inaction bias
Can allow decision-makers to learn from interactions between macroprudential policy, the financial system and the economy over time	Discretionary policy can be time inconsistent
	Can be open to pressure from outside
Ensures ability to react to unforeseen consequences	

[275] "Goodhart's law" states that when an indicator becomes a policy target, it loses its information value as an indicator.

Annex 10.1
Country experiences in macroprudential communication

Country	Subject	Content of communication	Form of communication	Timing of communication
Austria	Introduction of net new loan to local stable funding ratio (LLSFR)	Description, scope, level, aim, motivation and transmission of the instrument; reference to underlying empirical analysis Impact assessment	Press release Background notes	Consultation process with stakeholders After adoption of decision
	Introduction of capital surcharge for large banking groups	Timing and range of levels of the instrument Reference to G-SIBs framework	Press release Background notes	Consultation process with stakeholders After adoption of decision
Denmark	Establishment of Systemic Risk Council and its meetings	Tasks, composition, powers, meeting schedule, rules of procedure Topics discussed at the meetings	Website Press	After establishment of Council Following Council meetings
	Recommendation on the phasing-in of capital requirements	Description and motivation	Press release	After adoption of recommendation
Netherlands	LTV	Description, scope, level, timing, motivation of the instrument	Website	After adoption of decision
Norway	Activation of CCyB	Description, scope, aim, motivation and transmission of the instrument Governance of the CCyB framework Reference to four key indicators and potential additional indicators for the build-up phase Reference to potential release indicators Reference to methodology and performance of the indicators Interaction of CCyB with monetary policy and other capital requirements	Press release Speeches Background papers	Before activation
Sweden	Introduction of capital surcharge for large banking groups	Description, scope, level, timing, aim, motivation and transmission of the instrument	Press release Press conference Background note Q&A	After adoption of decision
	Introduction of mortgage cap (LTV)	Description, scope, level, timing, aim, motivation and transmission of the instrument Ex post impact assessments of the measure	Press release Press conference Background notes Regular risk assessments	After adoption of decision

Country	Subject	Content of communication	Form of communication	Timing of communication
	Introduction/increase of RW floor on mortgages	Description, scope, level, aim, motivation and transmission of the instrument	Press release Website Background notes Regular risk assessments Financial stability report Meeting minutes	Before activation Consultation with stakeholders After adoption of decision
	Introduction and disclosure of (currency-specific) LCR	Description, scope, level, timing, aim, motivation and transmission of the instrument	Website Regulatory proposal Background note Financial stability report Meeting minutes	Before activation Consultation with stakeholders After adoption of decision
Switzerland	No activation of CCyB	Motivation Period for which no activation was expected	Press release	After adoption of decision
	Introduction and activation of sectoral CCyB	Description, scope, level, timing, aim, motivation and transmission of the instrument Governance of the sectoral CCyB framework Reference to key indicators and additional indicators for the build-up Broad reference to release indicators Broad reference to methodology and performance of the indicators	Press release Extract of SNB proposal to Federal Council for CCyB activation Background note FAQ	After adoption of decision
United Kingdom	Establishment and functioning of Financial Policy Committee (FPC)	Objectives of macroprudential policy FPC mission, composition, governance, powers and instruments Description, aim, transmission and broad list of indicators for CCyB and sectoral capital requirements Outline of FPC's assessment on the outlook of systemic risk relevant to the UK and advised policy actions/responses	Policy statement Meeting record Discussion papers Financial stability report News releases Press conferences Speeches	After establishment of FPC Regular communication (after meetings and ad hoc)

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Aerdt Houben	De Nederlandsche Bank (Chair)
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Sergio Materazzi	Finanzmarktaufsicht
Stijn Ferrari	Nationale Bank van België/Banque Nationale de Belgique
Elisaveta Pravova	Българска народна банка (Bulgarian National Bank)
Sashka Asparouhova	Bulgarian Financial Supervision Commission
Joseph Theodorou	Central Bank of Cyprus
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Mads Peter Pilkær Harmsen	Danmarks Nationalbank
Emilio Hellmers	Finanstilsynet
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Juan Zschiesche Sánchez	European Insurance and Occupational Pensions Authority
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Anna Jernova	Prudential Regulation Authority
Francesco Mazzaferro	European Systemic Risk Board
Andrea Maechler	European Systemic Risk Board
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List of abbreviations

AUROC	area under receiver operating characteristic
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BSI	balance sheet items
CADA	competent or designated authority
CBS	consolidated banking statistics
CCyB	countercyclical capital buffer
CDS	credit default swap
CESEE	central, eastern and south-eastern Europe
CET1	Common Equity Tier 1
CFR	core funding ratio
CGFS	Committee on the Global Financial System
COM	European Commission
COREP	common reporting
CPI	Consumer Price Index
CRD IV	Capital Requirements Directive
CRE	commercial real estate
CRR	Capital Requirements Regulation
DSTI	debt-service to income
EBA	European Banking Authority
ECB	European Central Bank
EEA	European Economic Area
ESRB	European Systemic Risk Board
EU	European Union
FINREP	financial reporting
FMLI	financial market liquidity indicator
FPC	Financial Policy Committee
FSA	Financial Services Authority
FSB	Financial Stability Board
FSR	Financial Stability Report/Review
GDP	Gross Domestic Product
G-SIB	global systemically important bank
G-SII	global systemically important institution
HICP	Harmonised Index of Consumer Prices
HPI	housing price index
HQLA	high quality liquid assets
ICAAP	internal capital adequacy assessment process
IFRS	International Financial Reporting Standards

IMF	International Monetary Fund
IRB	internal ratings-based approach
ITS	implementing technical standard
IWG	Instruments Working Group
LCR	liquidity coverage ratio
LGD	loss given default
LIBOR	London interbank offered rate
LTD	loan-to-deposit
LTI	loan-to- income
LTSF	loan-to-stable funding
LTV	loan-to-value
MMF	money market fund
NACE	statistical classification of economic activities in the European Community
NCA	national competent authority
NDA	national designated authority
NFC	non-financial corporation
NPL	non-performing loan
NSFR	net stable funding ratio
OIS	overnight indexed swap
O-SII	other systemically important institution
OTC	over-the-counter
PD	probability of default
PNFS	private non-financial sector
PTI	payment-to-income
RDB	risk dashboard
ROC	receiver operating characteristic
RORWA	return on risk-weighted assets
RRE	residential real estate
RTS	regulatory technical standards
RW	risk weight
RWA	risk-weighted asset
SA	standardised approach
SF	stable funding
SII	systemically important institution
SRB	systemic risk buffer
SREP	supervisory review and evaluation process
SSM	Single Supervisory Mechanism

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