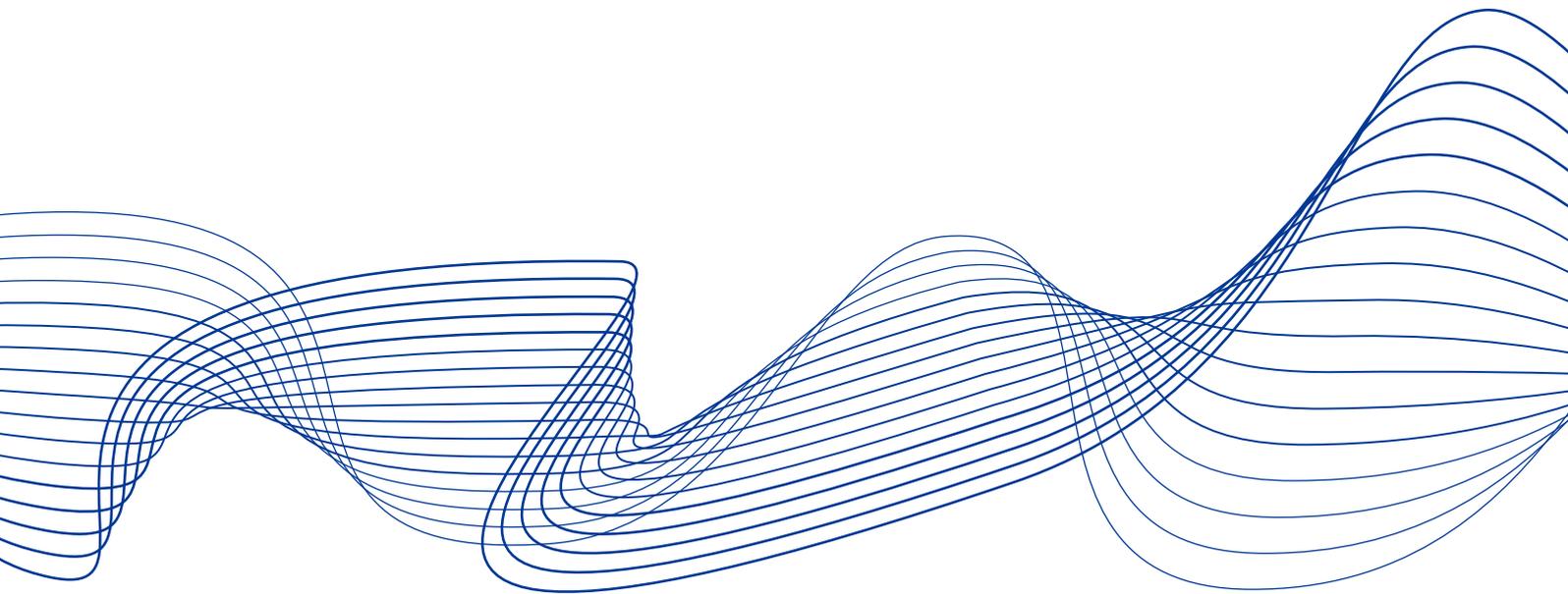


Features of a macroprudential stance: initial considerations

April 2019



ESRB
European Systemic Risk Board
European System of Financial Supervision

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Foreword

This report is a first step towards a common macroprudential stance framework. It reflects the initial results of the discussions by an expert group specifically set up by the ESRB's Instruments Working Group.

The experience with macroprudential policies is still at an early stage. Reflections in various ESRB fora over recent years have repeatedly highlighted the need to develop a conceptual framework to guide the discussion on macroprudential policies. In addition to promoting a common understanding, such a framework would facilitate communication on policy actions with market participants and help mitigate any potential inaction bias when financial stability risks build up.

The macroprudential stance establishes the link between macroprudential policies and the objective of financial stability. A well-established framework for the macroprudential stance would therefore help policymakers assess the effectiveness of their potential policy actions.

Developing such a framework is challenging and will take time. The framework for assessing the macroprudential stance set out in this report is one potential approach and will serve to stimulate further discussion. As the understanding of macroprudential policy and its transmission develops, the concepts contained within the report will be refined further.

The report and concepts presented have benefited considerably from in-depth discussions within the ESRB, including in the Advisory Scientific and Technical Committees, and have been endorsed by the ESRB's General Board.

Mario Draghi
ESRB Chair



Executive summary

In the aftermath of the global financial crisis, macroprudential policy has become increasingly important to address different types of risks in the financial system. Given the short history of macroprudential policies, national macroprudential authorities are left with a degree of discretion in implementing and calibrating policy instruments. While some national discretion is clearly welcomed and natural in light of country-specific features of financial cycles, financial systems, and institutional and legal frameworks, regular discussions within the ESRB have consistently highlighted the fact that a common framework for the discussion of the macroprudential stance would be helpful for policymakers in preparing decisions for using and calibrating macroprudential instruments.

This report provides a first step towards a common framework for the macroprudential stance which can support the decision-making process of macroprudential policymakers. A credible and reliable macroprudential stance framework would allow policymakers to assess whether current policy actions are appropriate and effective to meet the policy objective. The existence of a well-established stance concept could also help to mitigate a possible inaction bias on the part of macroprudential authorities and could facilitate communication on policy actions with market participants. However, given the early stage in the experience with and understanding of macroprudential policies, the development of a fully-fledged measure of the macroprudential stance will rely on the experience gained over the coming years. Furthermore, the stance assessment is complicated by the fact that there is no single definition of financial stability and the key variables for capturing systemic risk continue to evolve. In the meantime, any measure should not presume a depth of understanding of macroprudential policy effects which do not yet exist. This report outlines one potential conceptual approach to the macroprudential stance based on the discussions of the expert group. As academic research on and the understanding of the transmission channels of macroprudential policies grow, the concept of stance will further develop and evolve. Consequently, the framework for a macroprudential stance in this report reflects the progress made at this point in time on the factors that influence the macroprudential stance.

In order to be able to define a consistent concept of macroprudential stance, it is necessary to frame the objective of macroprudential policy. According to the ESRB handbook on operationalising macroprudential policy in the banking sector¹ (hereafter referred to as “the ESRB Handbook”), the ultimate objective of macroprudential policy is to contribute to financial stability by strengthening the resilience of the financial system and by decreasing the build-up of systemic risks. Considering this characterisation, the macroprudential policy stance is examined in this report using a “risk-resilience framework”. Within this framework, the macroprudential stance can be considered by assessing the balance between systemic risk and resilience relative to financial stability objectives given implemented macroprudential policies. The stance assessment takes place at a given point in time, but the stance components, particularly the risks, can vary over time.

Specifically, the risk-resilience framework for the assessment of the macroprudential stance has the following features:

¹ See *The ESRB handbook on operationalising macroprudential policy in the banking sector*, ESRB, 2017.



- **The systemic risk faced by the financial system and the economy is the outcome of the common exposures to exogenous sources of risk together with the endogenous mechanisms that generate systemic risk.** Systemic risks are endogenously generated through a number of externalities as identified in the academic literature (e.g. procyclicality and excess leverage, fire sales, interconnectedness, moral hazard and strategic complementarities). For the purposes of this report, the concept of gross systemic risk is initially considered when determining a macroprudential stance. Gross systemic risk includes a combination of macro-financial vulnerabilities or fragilities that may be a source of shock or systemic threat to the financial system.
- **Resilience reflects the ability of the financial system and the economy to absorb adverse shocks, while continuing to provide products and services to the real economy.** Components that determine resilience include institution-specific loss-absorption capacities, system-wide safety nets such as deposit insurance, and institutional features such as resolution funds.
- **An additional component of the framework is the set of implemented macroprudential policies.** These macroprudential policies can foster resilience, e.g. through capital or liquidity buffer requirements, and/or counter risks in the financial system by mitigating procyclicality and limiting common exposures.

Comparing systemic risk with the level of resilience in the system could provide an overall measure of the macroprudential stance or the residual level of systemic risk. A higher level of residual systemic risk indicates that systemic risks substantially exceed the prevailing resilience. The framework also introduces a concept of neutral level, considered to be the level of overall risks that the policymaker has tended to accept according to his/her preferences and which remains not covered by macroprudential policies.

If the residual systemic risk level exceeds the neutral level, it implies that the current macroprudential stance is loose; if the residual systemic risk is smaller than the neutral level, the stance is tight. By construction, the residual systemic risk level constitutes a relative concept, as it compares gross systemic risk with resilience. In this relative stance framework, it is thus equivalent to have either (i) a high level of gross systemic risk together with equally sized resilience, or (ii) a low level of gross systemic risk together with equally low resilience. As the different components of the framework may change over time, the level of residual systemic risk may also change, thus highlighting the need for a continuous reassessment of the stance over time.

The stance concept can be defined as either a positive (descriptive) assessment or can incorporate normative connotations. A purely positive stance requires a (historical) reference point reflecting the neutral level against which changes in the evolution of risks and policies are compared. A purely normative definition of stance evaluates whether macroprudential policy actions are achieving their objectives. In practice, the implementation of the stance is likely to be located somewhere in between the extreme ends of the positive-normative spectrum, although at the current juncture, any measure of the stance would likely include more positive than normative elements.

The assessment of the macroprudential stance is considered as part of a policymaker's two-tier decision-making process. If the policymaker comes to the conclusion that the current macroprudential policy stance is loose or tight (first stage), he/she enters into the second



stage focusing on policy action assessment. Here the policymaker addresses the question of whether the currently implemented macroprudential policies need to be adjusted. Important factors influencing the policy action assessment are short and long-term benefits and costs, the appropriateness and effectiveness of instruments, as well as the expected stance in other policy areas (e.g. fiscal and monetary policy). Depending on the result of the policy assessment, a policymaker will decide if and what action should be taken. This can lead to a situation where the policymaker chooses to tolerate a level of residual systemic risk diverging from the neutral level. Following any policy action, the macroprudential stance may change and would need to be reassessed. The two-tier decision process explicitly accommodates different risk preferences of policymakers which depend in particular on the costs and benefits of changing policies.

The aim of the macroprudential stance assessment as proposed in this report is to assess whether further policy action may be required. This framework does not necessarily attempt to identify an optimal target for macroprudential policy. Over time, however, as the conceptual elements of the macroprudential stance are further developed, it may be the case that the separate stance and policy action assessments would converge into a fully normative assessment of the stance so as to determine an optimal policy target.

The three components of systemic risk, resilience and policy are portrayed separately in this framework in an effort to distinguish contributions to the stance. Nevertheless, it is understood that such differentiation may not always be cleanly separated and may overlap in practice. In order to structure policy discussions in macroprudential fora, the stance framework treats these aspects separately, with the understanding that this is a simplification of reality.

In the risk-resilience framework, microprudential policy requirements are incorporated into the level of resilience and the level of systemic risk in the financial system and are thus considered when assessing the macroprudential stance. For the purposes of the stance assessment, it is the effectiveness of macroprudential instruments which is examined, but within the broader context of the resilience of the financial system. The framework thereby lends itself to being used for assessing the overall prudential stance, whereby the resulting policy implications focus on the macroprudential aspects.

The conceptual framework outlined in this report may be used to conduct multiple risk-resilience assessments at different levels of granularity, in which case the issue of aggregation of stances arises. The framework allows for the stance assessment to be carried out at different levels of granularity. Given the multi-faceted nature of financial stability and the multiplicity of macroprudential objectives and instruments, the framework could be used to conduct multiple risk-resilience assessments, by risk or by sector, in which case the issue of how to aggregate these multiple assessments arises. Aggregation of stances requires identifying overlaps across risks and instruments to avoid underestimating the impact of risks or duplicating the impact of measures.

While there are many challenges in operationalising the macroprudential stance framework, the report undertakes a first step in outlining the necessary elements for its practical implementation. One core issue in operationalising the macroprudential stance is how to measure its various components appropriately.



Both systemic risk and resilience are important elements in the stance framework and would therefore need to be captured quantitatively. Examples of systemic risk measures discussed in the report include macroeconomic indicators such as the credit-to-GDP gap, measures capturing the cross-sectional dimension of systemic risk through interconnectedness (e.g. network measures and CoVaR), and global measures such as the Growth-at-Risk concept which links current financial conditions to the distribution of future growth outcomes. As to resilience, the report focuses on two approaches to measure it: first, resilience can be quantified in terms of banks' ability to maintain credit supply after an adverse shock hits the banking system; second, resilience can be measured based on stress-testing methods which are able to identify the loss-absorption capacities of the banking system under different adverse scenarios.

Measuring the intensity of macroprudential policies is another precondition for operationalising the policy stance. Most of the existing literature uses indices to measure the intensity of prudential policy, but this approach has drawbacks when it comes to policy application which requires a higher precision of the level and the changes in policy stringency. As well as capturing instruments, it is also important for the stance framework to measure the pass-through of policy instruments to the economy. To this end, an overview of empirical research on the impact and transmission of macroprudential policies is provided.

Once the main elements of the stance (i.e. risks, resilience and policies) have been successfully identified, the report looks at how the neutral stance can be measured in practice. Specifically, the neutral stance corresponds to a state where the calibration of instruments fosters the level of systemic risk and resilience consistent with the policymaker's target levels. The targeted levels of systemic risk and resilience, in turn, can be inferred from historical evidence on policymakers' reaction to the risk environment.

Operationalising the macroprudential stance framework requires that the interactions between different types of systemic risk (e.g. between cyclical and structural risks), as well as those between different instruments (e.g. the complementary nature of debt-to-income (DTI) and loan-to-value (LTV) ratios), be taken into account.

Finally, it is discussed how the concept of stance can be used as a communication tool, thereby helping to explain policy actions (or inaction) and manage expectations.



1 Introduction

A stance establishes a relationship between actions and an objective one wants to achieve through these actions. In the case of the macroprudential stance, the relationship is between macroprudential actions by policymakers and the objective of financial stability, i.e. that macroprudential actions aim to prevent or mitigate systemic risk. A macroprudential stance assessment should therefore inform us about the extent to which macroprudential actions achieve the financial stability objective through these actions. The motivation for such a framework is outlined in Section 2.

The development of a framework for assessing the macroprudential stance is challenging. Macroprudential policy is multi-dimensional both in terms of intermediate objectives and instruments and it is difficult to identify clear and well-defined policy goals which are linked to metrics and potential target levels. Section 3 outlines the objectives of macroprudential policy and elaborates on how a macroprudential instrument is used as a policy lever by authorities for macroprudential purposes.

The objective of defining a macroprudential stance framework is to support Member States in preparing decisions for using and calibrating macroprudential instruments. Section 4 considers externalities and systemic risk, the key concepts of the risk-resilience framework, the relationship between the macroprudential stance and policy action, as well as factors to be taken into account when assessing the stance and in policy action assessments.

Although this report provides a conceptual framework for assessing the macroprudential stance, consideration has been given to what elements would be required in order to operationalise the framework in the future. In Section 5, the measurement of the stance, as well as the interactions and aggregation of the macroprudential stance components are discussed. The importance of communication is also considered.



2 Motivation

All EU Member States have taken some form of macroprudential policy action since the financial crisis. Policies have been used to address different dimensions of risk, ranging from excessive credit growth and leverage to risks stemming from institutions which are too big to fail due to interconnections and common exposures.

Although a common legal framework for the introduction of instruments exists under the Capital Requirements Directive and Regulation (CRD/CRR), there remains a great deal of discretion around the precise implementation and calibration of these instruments. Hence, the current regulatory framework of “constrained discretion” (Aikman et al., 2018)² sets multiple supervisory rules which provide the constraints within which policymakers exercise discretion. Moreover, many instruments are introduced under national frameworks, particularly instruments which address real estate. When examining the use of different instruments, it can be seen that there is much variation in how extensively they are used.³ For example, as of October 2018 positive countercyclical capital buffers (CCyBs) have been announced in nine of the 28 EU Member States, and 12 Member States have a systemic risk buffer (SRB) in place.

Differences in legal and institutional frameworks, and in the structure of national financial systems, means that some variation in how instruments are used is natural.

In addition, the understanding of how macroprudential policies and transmission channels operate is still under development. The early stage in the development of macroprudential policy may contribute to differences in implementing policies and usage of various instruments. Macroprudential policy is multi-dimensional both in terms of intermediate objectives and instruments, and it is difficult to identify clear and well-defined policy goals which are linked to metrics and potential target levels. The associated uncertainty with regard to defining policy goals, specifying intermediate objectives, and selecting and assessing policy instruments may lead to the risk of inaction bias as policymakers may prefer to conduct deeper analysis and collect more data before activating policy measures. Uncertainty may also increase the risk of choosing inadequate instruments or calibration.⁴

Given the challenges facing the measurement of the effectiveness of macroprudential policies, the analysis of a “macroprudential policy stance” is still in its infancy. Survey evidence from the Bank for International Settlements indicates that no consensus exists about the definition and measurement of a macroprudential policy stance.⁵ A thorough evaluation of macroprudential policies would take into account not only structural and cyclical factors, but also interactions with other prudential and economic policies and across countries. The short history of

² Aikman, D., Haldane, A. G., Hinterschweiger, M. and Kapadia, S., “Rethinking financial stability”, *Staff Working Paper Series*, No 712, Bank of England, 2018.

³ See *A Review of Macroprudential Policy in the EU in 2017*, ESRB, 2018.

⁴ Buch, C. M., Vogel, E. and Weigert, B., “Evaluating macroprudential policies”, *Working Paper Series*, No 76, ESRB, 2018.

⁵ Arslan, Y. and Upper, C., “Macroprudential frameworks: implementation and effectiveness”, *Working Paper Series*, No 94, Bank for International Settlements, 2017.



macroprudential policies further complicates the overall assessment of the macroprudential stance.⁶

Notwithstanding these challenges, the regular discussions on macroprudential policies within the ESRB have consistently highlighted the need to develop a conceptual framework for the macroprudential stance to support the discussion on macroprudential policy measures. The variation in policy actions taken across and even within countries makes it difficult to form a common understanding of macroprudential policy actions. Yet as policymakers begin to activate more instruments to address different risks, both structural and cyclical in nature and across different sectors, it becomes more difficult to consider these policies in aggregate and to compare the wide range of policies in place.

For these reasons, there is a strong need for a framework that provides orientation for macroprudential policymakers in their decision-making process. A credible stance framework would help inform policymakers about whether policy action is sufficient to meet the objective and whether it is well-targeted. Any stance framework developed should be useful to policymakers, effective in summarising policies and easily implementable. A stance framework should also be adaptable to the development of macroprudential policy beyond the banking sector and should not, in principle, be constrained to banking sector-related risks. As new tools are being developed to address risks in non-bank areas such as insurance and pension funds, the framework should be able to accommodate them.

An explicit framework for the macroprudential stance can contribute to reducing possible inaction bias by policymakers. Due to the multiplicity of policy objectives or to the interaction of macroprudential policy objectives with the objectives of other policies, an inaction bias might arise. By providing a clear orientation, the concept of stance can also contribute to mitigating this bias.

A credible stance concept can facilitate communication on consistent policy actions and anchor expectations. This is because the concept of stance conveys summary information on the use of policy instruments, on their adequacy to meet policy objectives given the identified risks, and on the required policy orientation. This could help anchor expectations and allow for a more effective transmission of policy.

Any definition of stance should be flexible and adjustable. Ultimately, a definition of stance should be able to withstand the test of time and be compatible with different countries' macroeconomic environments, policy goals (e.g. when defining the policy rule, countries should be allowed to have different degrees of risk tolerance in their reaction function) and portfolios of macroprudential instruments, to facilitate comparison between countries and over time.

The concept and definition of macroprudential stance will continue to develop as the understanding of macroprudential policies and their transmission grows. The report outlines one approach for considering the stance. As the academic research and evidence on the transmission channels of macroprudential policies grow, and as policy frameworks develop with increasing experience of these instruments, the concept of stance will further develop and adapt.

⁶ Some authors note that previously existing financial regulatory policy measures, such as limits to loan-to-value ratios, are reframed into macroprudential policy (see Elliott et al., "The History of Cyclical Macroprudential Policy in the United States", *Working Paper Series*, No 8, Office of Financial Research, 2013).



3 Macprudential policy objectives and instruments

In order to define a macroprudential stance, the first step is to outline the objective of macroprudential policy. The multidimensional nature of financial stability involves maintaining multiple objectives contemporaneously. The formulation of macroprudential policy objectives tends to differ across Member States, as some countries focus on limiting the build-up of systemic risks, while others emphasise adequate resilience in the financial and non-financial sectors. However, a number of high-level principles are common.

The ultimate objective of macroprudential policy is financial stability and comprises aspects of resilience building and systemic risk mitigation. The ESRB Handbook states that “the ultimate objective of macro-prudential policy is to contribute to the safeguarding of the stability of the financial system as a whole, including by strengthening the resilience of the financial system and decreasing the build-up of systemic risks, thereby ensuring a sustainable contribution of the financial sector to economic growth”. The ECB defines financial stability as “a state whereby the build-up of systemic risk is prevented”, where systemic risk is “the risk that the provision of necessary financial products and services by the financial system will be impaired to a point where economic growth and welfare may be materially affected”.⁷

There are two, related, aspects of the objective of financial stability: reduce the procyclicality of the financial system (arising from externalities related to strategic complementarities) and enhance resilience to shocks affecting the financial system. To the extent that risk-mitigating macroprudential policy measures can counter the build-up of risks and so reduce the procyclicality of the financial system, it reduces the amplitude of imbalances. If macroprudential policies permanently reduce the build-up of systemic risk, less resilience would be needed as the level of systemic risk would be contained before its potential materialisation. Countering the build-up of risks nevertheless requires clearly identifying the vulnerabilities and their sources and transmissions should they materialise. In turn, an increase in the resilience of the financial system also affects the response to shocks and might prevent the amplification of specific shocks, dampening thereby the amplitude of financial cycles. Policymakers may also adjust the resilience of the financial system in a cyclical manner (e.g. by activating and deactivating the CCyB).

These two aspects of the macroprudential policy objective can be related to efforts to reduce the probability and the severity of financial crises. Conceptually, a broad mapping would relate efforts to prevent the build-up of systemic risks to the probability of a crisis (probability of default), whereas measures to enhance resilience relate to the economic losses given a financial crisis (loss given default).⁸ Empirically, a clear-cut separation between the two concepts is not feasible given the relationship between resilience and procyclicality of the financial system. A more resilient financial system tends to have muted financial cycles, given that shocks are better absorbed and endogenous amplification mechanisms are dampened. For instance, the CCyB

⁷ **Financial stability and macroprudential policy**, www.ecb.europa.eu (accessed on 14 May 2018).

⁸ The concepts of probability of default (PD) and loss given default (LGD) are commonly used in stress-test environments when assessing the expected losses at default.



predominantly builds resilience for the banking sector whilst also reducing the procyclicality of credit growth.

Financial stability is a precondition for sustainable economic growth; thus macroprudential policy contributes to sustainable growth by maintaining financial stability. Macroprudential policy affects economic developments and is supposed to provide, by ensuring financial stability, a contribution to maintaining sustainable economic growth.⁹ Macroprudential policy is thereby not fundamentally distinct from other areas of public policy which aim at enhancing the welfare of society through a medium-term orientation towards sustainable developments.

There are differing views across policymakers regarding the role of economic growth in the objectives of macroprudential policy. Views differ across policymakers on the trade-off between financial stability and short-term economic growth which is normally taken into account in the cost-benefit assessment of further policy action.

For the purposes of this framework, a macroprudential instrument is a policy primarily used by authorities for macroprudential purposes. As macroprudential policy is relatively new, the set of instruments is evolving. Instruments available to policymakers differ across countries. It can also be difficult to define what constitutes a macroprudential measure. For these reasons, a broad approach is taken where any instrument used for macroprudential purposes is considered.¹⁰ This can include hard and soft instruments, an example of the latter being expectation guidance. In this framework, the use of other types of policies (e.g. fiscal) could be considered a macroprudential measure if used for macroprudential purposes. Nonetheless, those instruments tend not to be under the control of macroprudential authorities.

Macroprudential authorities are recommended to develop an overall policy strategy on the application of macroprudential instruments to foster decision-making, communication and accountability of macroprudential policy.¹¹ Whilst assessing the macroprudential stance is a point-in-time assessment and macroprudential strategy¹² is forward-looking, the former is a vital part of the latter and so they both play complementary roles in the conduct of an authority's macroprudential policy.

⁹ It is generally agreed that macroprudential policies should not be overburdened with potentially conflicting policy objectives in the macroeconomic management of the real economy.

¹⁰ See *A review of macroprudential policy in the EU one year after the introduction of the CRD/CRR*, ESRB, 2015, p. 6, for a discussion on other definitions of macroprudential instruments.

¹¹ Recommendation of the European Systemic Risk Board of 4 April 2013 on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1).

¹² See *The ESRB handbook on operationalising macroprudential policy in the banking sector*, ESRB, 2014, for an outline of what is considered to be necessary for an authority's macroprudential strategy.



4 A framework for the macroprudential policy stance

The macroprudential policy stance is considered in this report by assessing the balance between identified systemic risk and resilience relative to financial stability objectives given implemented macroprudential policies. This takes account of macroprudential policies that have been implemented in the past but may take some time before they become effective in countering risks or enhancing resilience. The assessment of the macroprudential stance itself is conducted at a given point in time and requires an understanding of the transmission and effectiveness of implemented policies over time.

The approach discussed in this report offers one potential macroprudential stance framework that, when operationalised, would aim to support policymakers in their assessment of risks, resilience and implemented policies. There are a number of approaches which could be taken when conceptually discussing the macroprudential stance. The risk-resilience framework (see Section 4.2.1) was chosen as the approach to the stance framework as one which fits in with the existing macroprudential policy strategies, which could be used to take into account the many facets of macroprudential policy and which could potentially be developed further.

4.1 Systemic risk

The fundamental rationale behind macroprudential policy relates to the existence of externalities and spillovers associated with the activities of the financial system which can contribute to procyclicality and lead to systemic risk. De Nicoló (2012) identifies three externalities giving rise to systemic risk and which provide a rationale for the use of macroprudential policy:¹³

- **Externalities related to strategic complementarities** that arise from the strategic interaction of financial institutions which result in procyclical behaviour;¹⁴
- **Externalities related to fire sales** that arise from a generalised sell-off of financial assets during the contractionary phase of a financial cycle causing a decline in asset prices and a deterioration in balance sheets;¹⁵ and
- **Externalities related to interconnectedness**, caused by the propagation of shocks from systemic institutions or through financial networks.

¹³ De Nicoló, M. G., Favara, G. and Ratnovski, L., "Externalities and Macroprudential Policy", IMF Staff Discussion Note No 12/05, International Monetary Fund, 2012. These externalities have been further adapted at the ECB; see "The ECB's macroprudential policy framework", **Macroprudential Bulletin**, Issue 1, ECB, 2016.

¹⁴ Landau, J.-P., "**Procyclicality: what it means and what could be done**", remarks at the Banco de España's conference on *Procyclicality and the Role of Financial Regulation*, Madrid, 4 May 2009.

¹⁵ Clerc, L., Giovannini, A., Langfield, S., Peltonen, T., Portes, R. and Scheicher, M., "Indirect contagion: the policy problem", *Occasional Paper Series*, No 9, ESRB, 2016.



Moreover, in relation to financial stability there is a distinction between uncertainty, risks and vulnerabilities.

Uncertainty refers to the fact that future economic outcomes are not known with certainty and may be more favourable or instead unfavourable compared with the original expectation when taking economic and financial decisions. Uncertainty in financial markets is strongly intertwined with asymmetric information, as the willingness of market participants to extend credit is linked to their confidence in the ability of borrowers to repay in the future. When market participants begin to question the credibility of financial commitments as a result of asymmetric information, uncertainty increases and markets react by adjusting their collective behaviour in an “individually rational” way. For example, the collapse of Lehman Brothers in September 2008 escalated the global financial crisis by triggering a general loss of confidence which led to a liquidity and credit crunch in which banks and other financial institutions preferred hoarding funds rather than lending them out.¹⁶

Risks relate to those situations that generate an economically adverse outcome compared with the originally envisaged one. These can be idiosyncratic risks that affect individual agents in the economy and systematic risks that can affect multiple agents jointly. Idiosyncratic and systematic risks form the basis on which systemic risk endogenously builds given the identified externalities (strategic complementarities, fire sales and interconnectedness). Systemic risk thus creates more adverse outcomes due to features of the financial system and behavioural responses by financial institutions. In the literature the concept of systemic risk is viewed as the outcome of complex non-linear interactions between shocks (idiosyncratic or systematic) and propagation mechanisms.¹⁷ For the purposes of this report, the concept of gross systemic risk is initially considered when determining a macroprudential stance. Gross systemic risk includes a combination of macro-financial vulnerabilities or fragilities that may be a source of shock or systemic threat to the financial system.

Vulnerabilities are the economic and financial conditions which would lead to amplifications should targeted shocks affect the vulnerable dimensions of economic agents.

4.2 Defining macroprudential stance

4.2.1 A risk-resilience framework

The risk-resilience framework covers the assessment of gross systemic risk, accounts for available resilience in the economy and the financial system and assesses the extent to which macroprudential instruments counter gross systemic risks or provide resilience. The relationship between systemic risk, resilience and macroprudential instruments can conceptually be depicted within a stylised risk-resilience framework (see Figure 1).

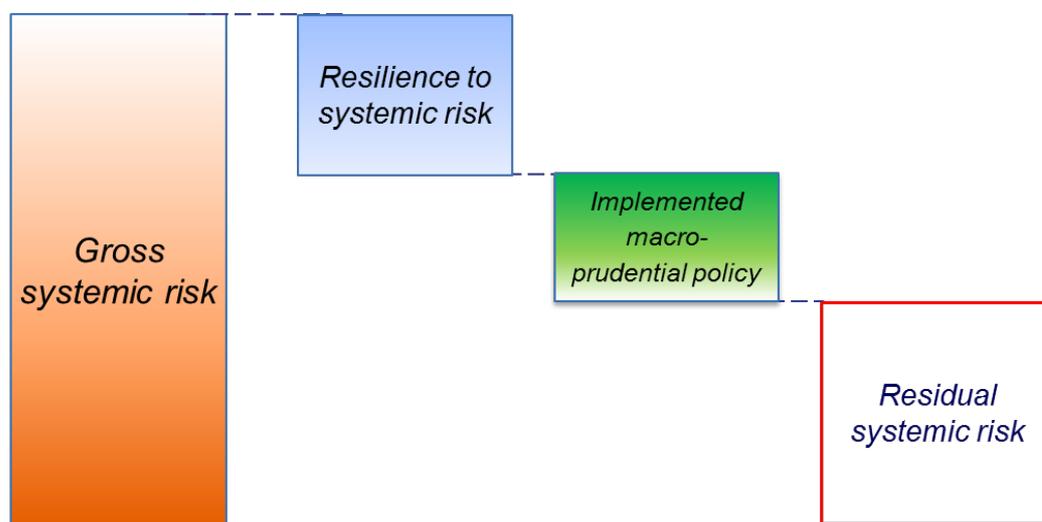
¹⁶ De Bandt, O., Hartmann, P. and Peydrò, J.-L., “Systemic Risk in Banking: An Update”, in Berger, A. N., Molyneux, P. and Wilson, J. S. (eds.), *The Oxford Handbook of Banking*, 2009.

¹⁷ De Bandt, O. and Hartmann, P., “Systemic risk: A survey”, *Working Paper Series*, No 35, ECB, 2000.



Figure 1

Risk-resilience framework for the assessment of the macroprudential stance



Source: Expert Group on Macroprudential Stance.

Note: This is a stylised example for illustrative purposes and the relative size of the boxes is not meant to indicate the relative importance of any of the risk-resilience components.

The left bar (in orange) represents the gross systemic risk faced by the financial system and the economy. These gross systemic risks are endogenously generated given the externalities of strategic complementarities, fire sales or contagion (see also Section 4.1) and should be the main focus of macroprudential policy. Gross systemic risk may vary over time, but as the stance assessment takes place at a given point in time, Figure 1 provides a snapshot in time. Gross systemic risk is the outcome of the exposures to exogenous sources of risk or external risk drivers facing the financial system together with an assessment of the endogenously generated systemic risks.

Resilience depicts the ability of the financial system and the economy to absorb the fallout when shocks and systemic risks materialise (bar in blue). In the context of the macroprudential stance framework, resilience is divided into aspects that are covered by other policy areas, including microprudential provisions, regulatory aspects or public safety nets (see Figure 2). As such, resilience to gross systemic risk includes institution-specific loss-absorption capacities also for systemic events and available safety nets (such as deposit insurance schemes or resolution funds) and can account for specific institutional features that provide contingent resilience to specific risk materialisations (see Box 1).

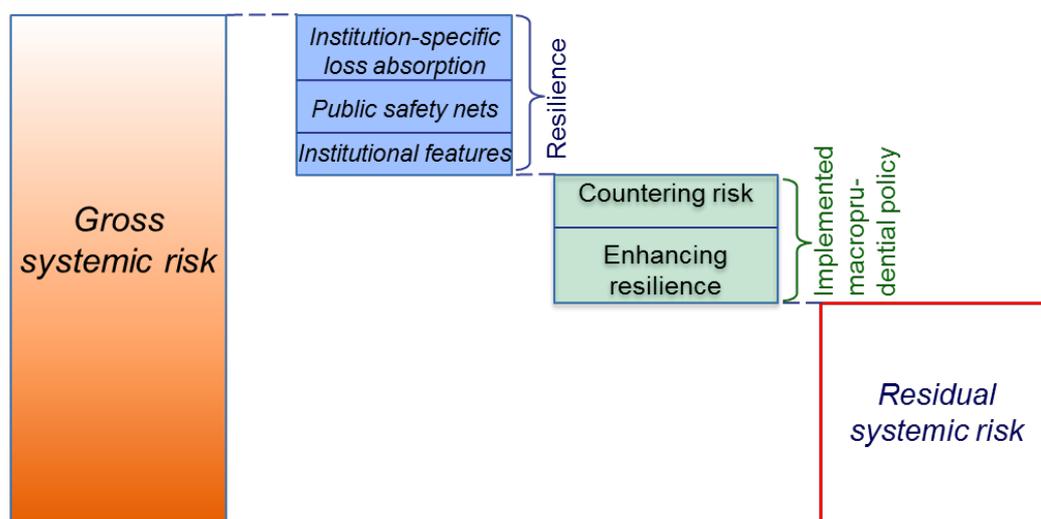
The third component of the risk-resilience framework is the contribution of implemented macroprudential policies to address the gross systemic risk and to raise resilience (green bar). These macroprudential policies can build resilience, e.g. in the form of capital or liquidity buffer requirements, or can mitigate risks by restricting exposures or lending conditions or by guiding behaviours and expectations.



Relating the amount of gross systemic risk to the available resilience in the system and the implemented macroprudential policies gives an indication of the level of residual endogenous systemic risk (“residual systemic risk” in Figures 1 and 2). The risk-resilience framework describes the relative size between the level of identified gross systemic risk and the availability of resilience within the economy and the financial system while accounting for the appropriateness and effectiveness of macroprudential policy. A larger amount of this net residual systemic risk indicates that the gross systemic risk exceeds the available resilience and the implemented policies to a larger extent. Instead, if the residual systemic risk is small it indicates that the system provides abundant resilience beyond those levels generally considered adequate (see Section 4.2.2).

The three components of gross risks, resilience and policy are portrayed separately in an effort to distinguish contributions to the stance. It is understood that such differentiation may not always be cleanly separated and may overlap in practice. However, in order to structure policy discussions in macroprudential fora, the framework treats the three components separately and portrays the residual systemic risk component as a linear function of the three components. It should be borne in mind that this conceptual simplification serves purely illustrative purposes which abstracts from the complex non-linear interactions observed in reality.

Figure 2
Detailed risk-resilience framework with stance



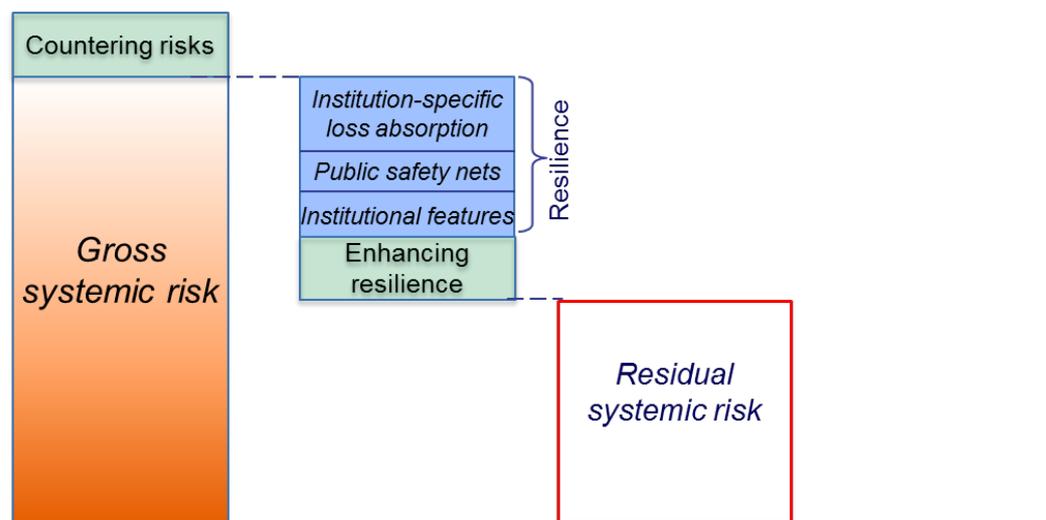
Source: Expert Group on Macroprudential Stance.
Notes: This decomposition keeps the effects of macroprudential policy separate from risks and resilience, i.e. it is in gross terms. Figure 3 nets the effect of macroprudential policy on risk and resilience. This is a stylised example for illustrative purposes and the relative size of the boxes is not meant to indicate the relative importance of any of the risk-resilience components.

Figures 1 and 2 separated the macroprudential component from the risk and resilience categories. Figure 3 provides an alternative illustration in which macroprudential policy is netted into the systemic risk and resilience parts. The macroprudential policies that predominantly counter systemic risks reduce the overall gross systemic risk in the system and



those policy instruments which enhance resilience are attributed to the resilience category. The overall size of the level of residual systemic risk remains unaffected.

Figure 3
Risk-resilience framework for the assessment of the macroprudential stance – risk and resilience net of macroprudential policy impact



Source: Expert Group on Macroprudential Stance.
 Note: This is a stylised example for illustrative purposes and the relative size of the boxes is not meant to indicate the relative importance of any of the risk-resilience components.

Box 1 **Components of resilience**

The risk-resilience concept relies on a broad definition of resilience involving several actors in the financial system, including public institutions, but also features of the structure of the economy.

Resilience is the capacity of the financial system to withstand shocks while continuing to provide its products and services to the real economy. This requires the ability to absorb shocks through buffers, to self-organise financial services across financial institutions and to innovate where needed. It thus involves adequate capital and liquidity buffers, sound infrastructure and resolution, combined with competitive structures that promote endogenous adjustments while retaining system functionality. The ultimate aim of resilience is to maintain the functionality of the financial system to support the real economy.

Macroeconomic resilience can accordingly be divided into two relevant horizons for which policy implications differ. On the one hand, short-term or instantaneous resilience refers to the loss-absorption capacity in terms of capital or liquidity to limit the magnitude of immediate asset or credit losses following a shock to the financial system. Dynamic resilience, on the other hand, pertains to the ability to reconstruct and recover from incurred losses. As the recovery to full operational functionality implies structural adjustments, dynamic resilience involves the ability of the financial



system to adjust through endogenous responses (such as the distribution and cleaning of losses), through competitive forces and through regulatory guidance.

In the context of the macroprudential stance assessment, resilience is divided into aspects that are covered by other policy areas, including microprudential provisions, regulatory aspects or public safety nets. Supervisory requirements contribute to resilience mainly through institution-specific loss-absorption abilities which relate exposures of financial institutions towards the financial system to institution-specific capital or liquidity requirements. Their focus is mainly to counteract the idiosyncratic component of risk. Institutional or public safety nets involve resilience mechanisms such as deposit insurance, fiscal backstops or efficient resolution; these are generally publicly provided or require coordination among market participants (e.g. sector-funded insurance schemes).

In addition to these two resilience factors, particular macroprudential policy instruments focus on resilience. Capital buffers such as the O-SII (other systemically important institution) or the G-SII (global systemically important institution) buffers are specifically designed to address the systemic footprint of individual financial institutions, whereas countercyclical capital or liquidity buffers provide resilience to time-varying systemic risks. Raising these macroprudential instruments reduces the level of residual systemic risk (see Figure 1).

Resilience is often unobservable and difficult to assess and the available resilience may not be known until a crisis hits. The effectiveness of specific resilience mechanisms may be affected by the size of the materialised risks. Resilience mechanisms may function well under limited shock sizes, but may become less efficient (and untested) when larger shocks affect the financial system. This creates an uncertainty about the available resilience and thus directly affects the level of residual systemic risk.

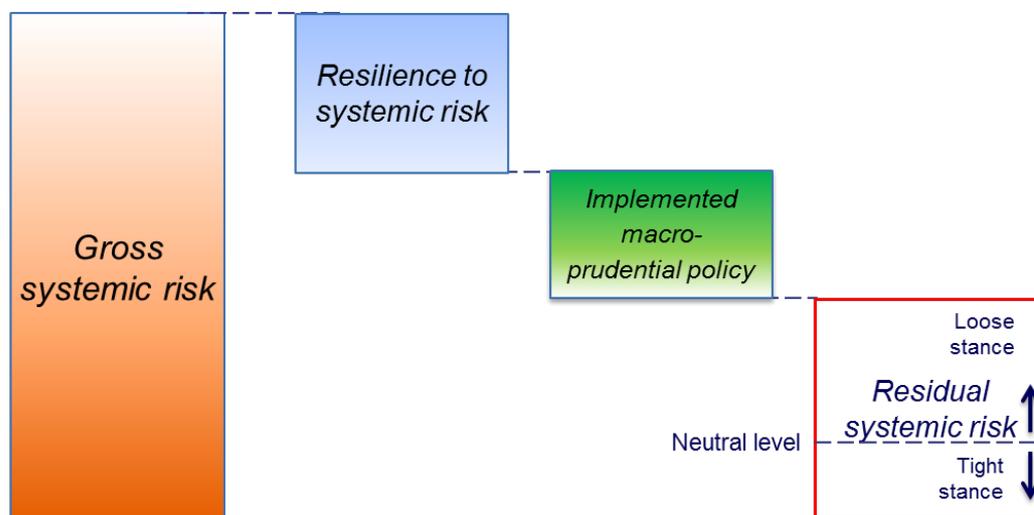
4.2.2 Assessing the macroprudential stance using the risk-resilience framework

The macroprudential stance is assessed in this framework as the difference between the observed level of residual systemic risk and a benchmark level of risk (the neutral level). If the observed level is higher than the neutral level, it implies that the macroprudential stance is loose (see Figure 4). Implementing macroprudential policies, either through risk-mitigation policies or resilience-building policies, would reduce the gap between risk and resilience and bring the macroprudential stance back towards the neutral level. If the level of residual systemic risk is lower than the neutral level, the stance would be considered tight. In the event of a tight macroprudential stance, the ability of the financial system to provide products and services to the real economy may be curtailed excessively in the considered economic and financial environment. In turn, once shocks materialise, the systemic risk component declines and the macroprudential resilience mechanisms absorb the fallout. In either case, the situations would warrant the release of macroprudential instruments.



Figure 4

Risk-resilience framework for the assessment of the macroprudential stance – tight and loose macroprudential stances



Source: Expert Group on Macroprudential Stance.

Note: This is a stylised example for illustrative purposes and the relative size of the boxes is not meant to indicate the relative importance of any of the risk-resilience components.

The neutral level of residual systemic risk for macroprudential considerations can incorporate a broad range of aspects of the financial system.

It also incorporates an assessment of the risks to be covered. The neutral level takes into account the level of residual systemic risk that policymakers have deemed acceptable in the long run and with which the financial system has learnt to operate.

In the absence of a clear change in policymaker preferences or a material revision in the quantification of risks or resilience, the neutral level should be highly persistent over time.

There is a risk that policymakers might adjust their assessment of acceptable risks to the residual systemic risk level, creating an inaction bias. Thus changes in the neutral level should be linked to clear changes in the assessment of risks or resilience. For example, when applied to stress-test contexts, the stress test may be formulated to cover 99% of future outcomes and the 1 percentage point between 99% and 100% would be considered a neutral level. If the economic and financial system is ready to cover risks only below 99%, then the stance can be defined as loose. In the case in which the system is ready to cover risks above 99% the stance can be defined as tight. In order to explain different neutral levels across countries, these differences would need to be linked to measurable structural features of the financial system and the economy in each country. This would reduce the potential inaction bias created by policymakers' assessment of the neutral levels.

A positive (or descriptive) stance assessment can relate the observed level of residual systemic risk to historical benchmarks and requires no information on policymakers' preferences.

A positive stance assessment implicitly assumes that a (historical) episode is used as the neutral level and defines changes in the stance as the relative evolution of risk and policies



compared with the chosen reference. It thus describes risk and policy changes but disregards whether policy settings are in line with objectives.

A normative stance assessment requires articulated objectives. A normative interpretation of the stance in this framework is defined as an assessment which explicitly or implicitly evaluates whether macroprudential policy actions or inaction are achieving their objectives given the risk and vulnerability environment. A normative measure thereby requires clearly articulated and quantified objectives. There could be different degrees of normative stance, which implies assessing if risks – in interaction with the implemented policies – are considered higher or lower than a reference value to achieve the objective.

It seems reasonable that assessments of stance at the current juncture would start by producing a positive stance measure to assess if residual systemic risk has been increasing (loose stance) or decreasing (tight stance) since the previous period. The effectiveness of this measure will depend on whether the stance is assessed to be neutral at the reference period or if it is considered tight or loose at that point in time. In turn, a more normative stance measure involves an assessment whether the implemented policies are sufficiently conducive to achieving the stated financial stability objectives.

The lack of knowledge about the transmission mechanisms from instruments to objectives makes it difficult to carry out an ex ante assessment of the necessary level of an instrument to achieve a neutral stance. A full understanding of the transmission channel of policy action to objectives allows for an assessment of whether current policy settings are sufficient to achieve the target for the following period. As knowledge of transmission channels of macroprudential policy develops, the stance assessment would evolve to take this into account.

The macroprudential stance can be assessed in qualitative or in quantitative terms. The multidimensional character of macroprudential policy objectives, risks and instruments makes their measurement particularly challenging, limiting the possibilities for quantitative assessments. This, in turn, requires relying at times on qualitative assessments while the methodological toolkit improves.

As research on and the understanding of macroprudential policy and its transmission channels develop so will the stance assessment. Assessments of stance are for now mostly qualitative and more positive than normative. Over time, with advances in the academic literature and the accumulation of macroprudential policy experience, these assessments should become more quantitative and incorporate further normative elements, not least through modelling frameworks. A credible measurement of the stance should not presume a depth of understanding of macroprudential policymaking effects which do not yet exist.

The multifaceted nature of financial stability means that the quantitative assessment of an overall level of residual systemic risk is challenging. This framework could require setting up multiple risk-resilience assessments in order to conduct quantitative assessments.

These assessments could be conducted for groups by risk or by sector, given the multiplicity of macroprudential objectives and instruments and the wide range of risks which can be addressed by macroprudential policy. The issue of aggregation of sectoral or risk-based stances is discussed further in Section 5.2.3.



Another challenge for a quantitative implementation of this framework relates to the uncertainty as to the effectiveness of resilience once risks materialise. This is especially true for contingent resilience mechanisms, such as debt-to-equity conversions or the timeliness of deposit insurance disbursements. Macroprudential policymakers would need to address this uncertainty with their stance assessment. As a result, the size of resilience may be affected by the policymakers' assessment on the interplay of the institutional mechanisms. Section 5 discusses some potential approaches to measuring resilience.

4.2.3 Risk-resilience as a relative concept

The level of residual systemic risk is a relative concept as it relates risks to resilience. The outcome does not assess the level of systemic risk alone, but takes the degree of resilience into account. For the assessment of stance, it is thus equivalent to either face high levels of gross systemic risk but with equally sized resilience or, instead, to have low levels of gross systemic risk and limited resilience. Consequently, an equally loose assessment of the macroprudential stance can be obtained in the presence of sizeable systemic risks if combined with sizeable levels of resilience or in the presence of limited gross systemic risks but with low resilience.

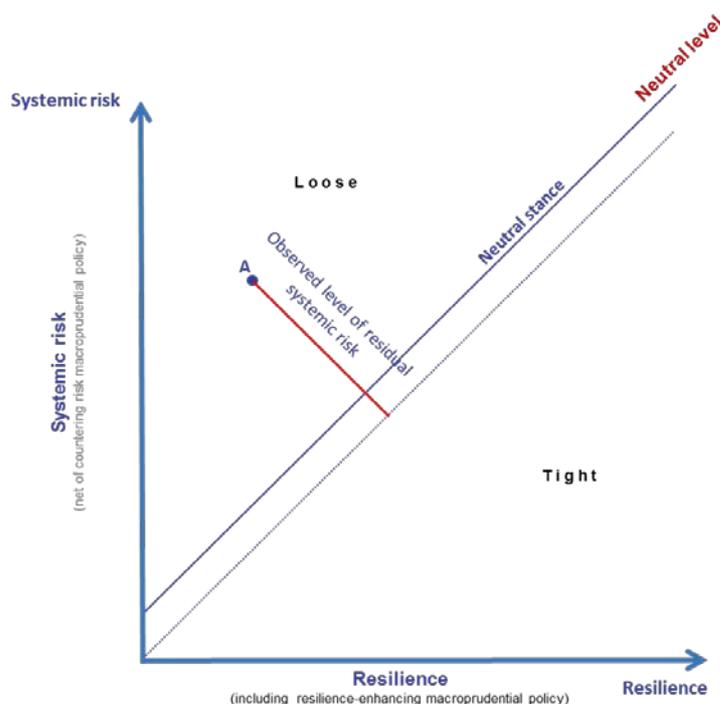
Figure 5 transposes the risk-resilience framework of Figure 4 after netting macroprudential policies into the risk and the resilience components, to illustrate how different combinations of systemic risk and resilience result in a macroprudential stance. The vertical axis in Figure 5 captures systemic risk, net of implemented macroprudential policies countering risk. The horizontal axis describes resilience including the effect of resilience-enhancing macroprudential policies. The neutral stance is a parallel shift from the 45-degree line and the shift is quantified by the neutral level. The area north-west of the neutral stance line describes combinations of systemic risk and resilience which imply a loose macroprudential stance. The area south-east of the neutral stance line characterises combinations of a tight stance which would call for an assessment of how to release macroprudential policy instruments.

In order to illustrate the macroprudential stance assessment, point A provides a situation with sizeable systemic risk and with limited resilience (even after accounting for potentially implemented macroprudential policy instruments). The situation illustrates a loose macroprudential stance and the level of residual systemic risk is measured perpendicular to the 45-degree line. Only the part to the north-west of the neutral stance line contributes to the loose assessment of the stance as the neutral level needs to be subtracted.



Figure 5

Risk-resilience framework for the assessment of the macroprudential stance



Source: Expert Group on Macroprudential Stance.

The relative concept between risks and resilience in the framework provides a degree of freedom to achieve a neutral stance. Multiple combinations of gross systemic risks and resilience can imply a neutral stance. Achieving a neutral stance does not simultaneously pin down the overall level of systemic risk, it rather pins down the relationship between risk and resilience (see Section 4.2.1).

4.3 Macroprudential stance and policy action

In this framework, the stance assessment of implemented policy measures is separated from the assessment of costs and benefits of potential adjustments to macroprudential policy.

The stance assessment is a point-in-time assessment which takes into account implemented policies. It is one step in a policy cycle which includes assessing risks and the need for policy action. The stance assessment informs the assessment of whether future policy action is necessary. Only with the information on the exposures to types of risk, the resilience across sectors and the effectiveness of macroprudential instruments in countering risks and enhancing resilience, can the policymaker assess which types of policies could alter (reduce or increase) the identified gap to its neutral level. This is a separate assessment to the cost-benefit assessment which takes



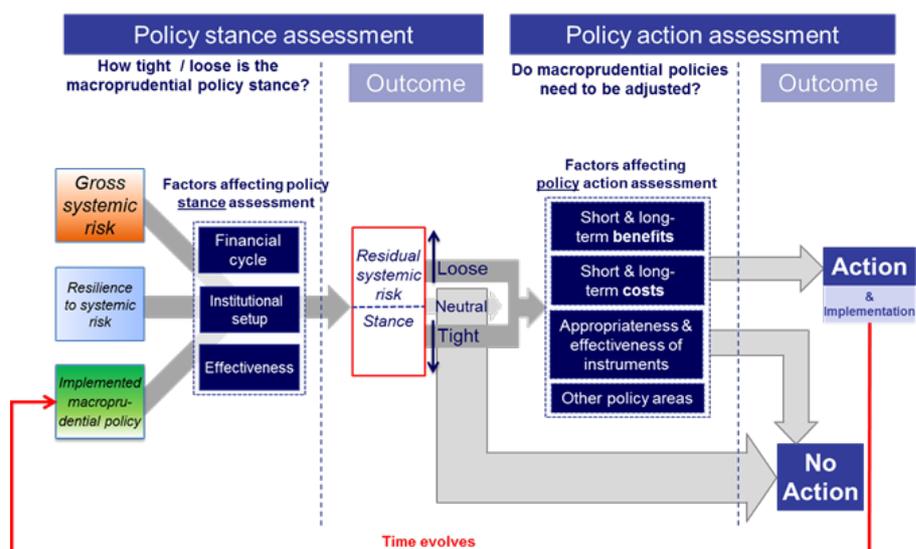
place when the introduction of a particular instrument is considered, but these assessments inform the macroprudential stance at a point in time. Once policy action has taken place, the stance will change and a new stance assessment can then be carried out in the future to include potential adjustments of the economy and the financial system.

Figure 6 provides an overview of the two stages of the stance and policy assessment and the factors entering the assessment. The macroprudential stance assessment addresses the question how tight or loose the macroprudential policy is and the policy assessment addresses the question whether policy adjustments will be made.

The stance assessment does not attempt to identify an optimal target for macroprudential policy, but aims to assess whether further policy action may be required. This lends itself to separate, and potentially more granular, stance and policy action assessments to identify the most appropriate policy and its calibration. As knowledge of macroprudential policy develops over time, the separate stance and policy action assessments could converge into a fully normative assessment of stance to determine the optimal policy target, which would then be a function of the costs and benefits associated with the available tools.¹⁸

Figure 6

The assessment of the macroprudential stance and policy action



Source: Expert Group on Macroprudential Stance.

The macroprudential stance assessment evaluates whether macroprudential policies are achieving their objectives given the risk and resilience environment. The macroprudential

¹⁸ In fact, from a conceptual point of view, a cost-benefit analysis is part of any policy stance assessment attempting to identify an optimal target for the policy and is inherent in each of the three components of the proposed risk-resilience framework (risks, resilience and implemented macroprudential policies). First, one of the main features of the macroprudential policy approach is the need to consider also possible second-round effects on risks. For resilience, this reflects the ability of the financial system and the economy to absorb adverse shocks while continuing to provide products and services to the real economy. Finally, implemented macroprudential policies take into account the cost-benefit analysis made at the time of implementation by the policymakers.



stance is conditional on the identified gross systemic risk and the features that provide resilience, as well as the effectiveness of macroprudential policy in countering risks and providing resilience.

The outcome of the stance assessment is categorised into a neutral, tight or loose macroprudential stance.

The stance assessment forms the basis for considering “policy action”. Figure 6 illustrates how the stance assessment serves as an input to the policy assessment. A neutral stance implies that the implemented policies are considered sufficient to pursue the macroprudential policy objectives and no further action is required (unless a sub-optimal mix of instruments and policies is in place; in this case, even a neutral stance could require a further policy action assessment). If, instead, the macroprudential stance is assessed to be tight or loose, further policy action could be considered. While the stance assessment itself aims to describe the environment as loose, neutral or tight, additional information on the nature of any change compared with a previous period may help to guide policy actions.

A policy action assessment would consider the costs and benefits in the short and long run of adjusting the calibration of macroprudential instruments, either in terms of a release or a further tightening, depending on the policy stance assessment outcome. In addition, the policy action assessment takes into account the appropriateness and relative effectiveness of individual instruments for reaching the specified macroprudential objective. In relation to other policies, macroprudential policy can, on the one hand, mitigate financial stability risks generated by other policies (e.g. low monetary policy rates increasing risk-taking, or the lack of a fiscal backstop) or, on the other hand, seek complementarities through coordination which may result in stronger or weaker calibrations for the macroprudential instruments.

The policy action assessment requires an assessment relating to the selection and calibration of an instrument which would be both efficient and effective in risk mitigation/reduction or resilience building.¹⁹ The efficiency of the instrument means its potential to achieve the objectives at a minimum cost. The effectiveness, on the other hand, refers to the transmission mechanism: the degree to which the instrument can address the risks, provide the resilience for specific risk materialisations and achieve the objectives of financial stability. The policies to be considered will depend on the specific nature of externalities operating as amplifiers for systemic risk.

Depending on the result of the policy assessment, a policymaker will decide if and what action should be taken. It is possible in this framework to have a loose macroprudential policy stance without additional policy action being taken if policymakers conclude that the overall costs of further action outweigh the benefits. Box 2 below provides an example of the interaction of stance and policy assessment with respect to real estate imbalances.

¹⁹ Recommendation of the European Systemic Risk Board of 4 April 2013 on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1).



Box 2

Real estate imbalances and potential macroprudential policies for maintaining financial stability

The interaction of stance and policy assessment can be considered in the context of the real estate sector. The stance assessment would identify specific risk factors that could affect the real estate market. These may be measures of house price overvaluation, or strong credit provision with loose lending standards and/or funded with short-term loans. These conditions can lead to amplifications should house price reversals or credit defaults occur. Potential resilience factors would be additional financial wealth in those households contracting loans (to hedge against house price reversals) or particular loss-absorbing buffers among financial institutions (to absorb credit losses). These buffers may have been required from formerly implemented macroprudential instruments. Similarly, lending quantities and conditions may have been affected by implemented borrower-based measures.

In order to assess the macroprudential stance, additional conditioning elements come into play. The assessment of the effectiveness of previously implemented measures clearly influences any stance outcome. Equally, specific institutional elements, such as the possibility of strategic defaults, or, instead, full-recourse mortgages affect the assessment. Finally, the specific position in the financial cycle affects the outlook. The assessment would be further affected if the financial cycle was still in its early stage, and developments point to short-term dynamics compared with a situation in which the developments have been protracted, exposures have become larger and self-reinforcing interactions may occur.

Once the stance assessment is complete, indicating either a larger amount of systemic risks compared with the available resilience or, instead, more than sufficient resilience, the policy action assessment would consider adjusting the calibration of macroprudential instruments. From a cost-benefit analysis perspective, considerations of systemic risks related to the flow of new loans (size, pricing and conditions) or the stocks of outstanding exposures become relevant. Measures such as LTV, DTI or DSTI (debt service-to-income) limits would affect primarily the conditions of new loans. Instead, capital buffers or risk weights would interact with the exposures on the balance sheets of financial intermediaries. Depending on the overall conditions, one or the other class of instruments may be considered more appropriate and effective for addressing financial stability conditions. Furthermore, policymakers may see strong interactions of the real conditions with fiscal policy (tax deductibility of debt) or with economic policies (e.g. building permits). These considerations all affect the decision by policymakers to adjust the calibration or rather not to take action even if the stance assessment indicated a non-neutral stance.



4.4 Factors affecting the stance and policy action assessments

4.4.1 The role of judgement and other factors

Policymakers' judgement of risks and resilience is a key feature of macroprudential policy frameworks and for the assessment of the macroprudential stance and the subsequent assessment of policy actions. The two-tier process explicitly allows for an assessment of a non-neutral stance that would indicate excessive gross systemic risks or excessive resilience, but with subsequent macroprudential policy actions that would not fully bring the residual systemic risk to its neutral level.

Multiple factors may lead to policymakers not taking policy action, even though the macroprudential stance assessment indicates a non-neutral stance. The key factors relate to a potential inaction bias and involve (i) a lack of instruments, (ii) uncertainty about the assessment of the stance, (iii) short-term costs to be overcome, (iv) uncertainty about the transmission of existing instruments and their benefits, or (v) unclear responsibilities among policy areas.

- i. **A clear assessment of the macroprudential stance does not lead to policy action if the appropriate macroprudential instrument is not in the toolkit.** The lack of an appropriate instrument, in the absence of adequate alternative instruments to address the identified risk, would lead to the absence of policy action even if the stance assessment indicates a non-neutral stance.
- ii. **The stance assessment requires a clear and detailed measurement of systemic risk and resilience for a high degree of certainty in the outcome.** While datasets for macroprudential purposes continue to be built up and data gaps are reduced, knowledge gaps persist regarding the extent of systemic risk and its transmission in the event of a shock. This lack of knowledge generates uncertainty for the overall stance assessment. A more uncertain stance assessment weakens the case for policy action as accountability requires that policymakers explain the need for such actions.
- iii. **The assessment of short-term costs and the tolerance to bear those before reaping benefits may delay or even impede policy actions. While the objective of macroprudential policy is financial stability, there is a trade-off between growth and risk as reducing systemic risk may have short-run costs in terms of lower economic growth (see Popov and Smets, 2011²⁰, and Behn et al., 2016²¹).** Since the benefits of macroprudential policy usually materialise later or are less obvious, while at the same time the costs have a more immediate visibility, short-term calculations of the net benefits can be difficult. A strong time preference for the present (as opposed to the future) may lead to the conclusion that macroprudential policy actions would create excessive costs when accounting for their overall discounted costs and benefits.

²⁰ Popov, A. and Smets, F., "On the trade-off between growth and stability: The role of financial markets", VoxEU.org, 3 November 2011.

²¹ Behn, M., Gross, M. and Peltonen, T., "Assessing the costs and benefits of capital-based macroprudential policy", *Working Paper Series*, No 1935, ECB, 2016.



- iv. **The effects from the time preference are exacerbated by uncertainty about the transmission and effectiveness of policy instruments.** While costs may occur in the short run and can be clearly allocated to existing stakeholders, the potential benefits of macroprudential action would tend to be in the medium term (sustainability of the financial system) and cannot be attributed to specific parts of society. This lack of clear and imminent benefits impedes the creation of a momentum for policy action. It is at the heart of the “inaction bias”.
- v. **The interaction of macroprudential policy with other policy areas could at times imply strategic burden shifting and generate inaction on the part of macroprudential authorities.** For example, excessive mortgage growth and house price increases may be driven by fiscal provisions incentivising debt over equity. At the same time, macroprudential policy would need to curtail the financial stability implications of such fiscal schemes. Macroprudential policymakers may also see the main culprit as the financial stability risks stemming from the fiscal incentives.

These factors relate to the assessment by macroprudential policymakers whether to take policy actions. The separation of the stance assessment from the assessment of policy action helps to overcome potential inaction by clearly distinguishing the two aspects so as to better understand if policy actions are not taken because the macroprudential stance is considered neutral, because cost-benefit considerations limit action, or because policymakers face an inaction bias.

Beyond the risk preferences of policymakers, the relative choice for selecting policies that address gross systemic risks or adjust resilience is influenced by the position of the financial cycle as this influences the relative costs and benefits of the policies in the short and medium term. This raises an important policy question about the timing and the interplay of these two types of macroprudential policies: those that aim at enhancing resilience and those that aim at moderating the financial cycle. For instance, a relevant question is whether greater resilience is needed when the amplitude of the financial cycle is large compared with a situation when it has been dampened by the effective activation of cycle-moderating macroprudential policy instruments. In addition, the emphasis on the two types of macroprudential policy instruments should vary over the financial cycle. In particular, resilience-enhancing macroprudential policies are likely to be most effective when losses in a crisis are expected to be large. For example, when household indebtedness is already high and banks are strongly exposed to the type of household borrowing, enhancing resilience may provide stronger improvements in financial stability than aiming to reduce indebtedness.

Even if limitations to action are overcome, the residual systemic risk level is a relative concept and provides policymakers with a choice between acting by addressing gross systemic risks or by adjusting resilience. The stance assessment itself does not identify the necessary course of action. A non-neutral macroprudential stance thus requires a separate assessment by policymakers on how best to address the level by targeting risks or/and by adjusting resilience.

The relative choice to reduce the level of residual systemic risk either by targeting gross systemic risk or by adjusting resilience is influenced by the relative effectiveness of policy



instruments as well as policymakers' preference as regards risk aversion. A policymaker with a high aversion towards gross systemic risk will try to address and counter the origination and amplification of gross systemic risk in the financial system. A policymaker with a greater tolerance for this risk would, instead, enhance resilience to ensure adequate absorption of the fallout should shocks materialise.

In the example of real estate imbalances, a policymaker which targets gross systemic risk would prefer tightening lending conditions or would curtail loan growth. Instead, policymakers focusing more on lender resilience would impose higher capital requirements for real estate lending so as to absorb credit losses in case shocks materialise.

In Figure 7, three adjustment sets are considered in turn: possible adjustments, efficient adjustments and preferred adjustments. Any of these combinations, if appropriately calibrated, result in a neutral stance. This illustrates that the concept of the residual systemic risk level constitutes a relative concept in that it relates gross systemic risk to the available resilience.

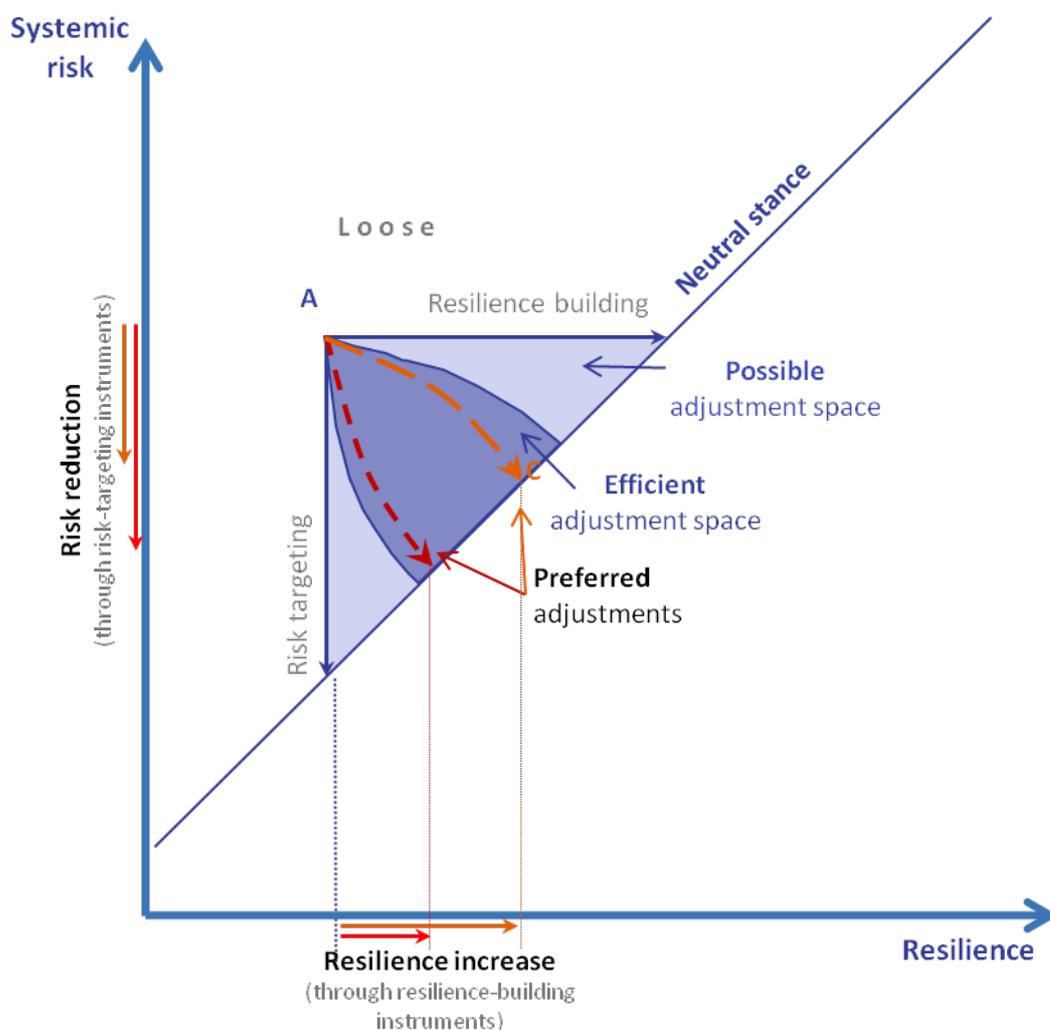
Possible adjustments are the widest set, in which a non-neutral macroprudential stance can be addressed by either reducing gross systemic risk or by building resilience. These two policy types span the light blue area in Figure 7 to reach a neutral stance.

The efficient adjustment stance takes into account the transmission mechanisms and circumvention possibilities of the policies (dark blue area). It is thus a subset of the possible set to account for the relative effectiveness of policy instruments given the structure of the economy. Efficient policies are policies that address gross systemic risk or enhance resilience with a minimum of side effects for other economic and financial developments. The transmission of these policies ensures that the risks are countered in a targeted manner and that the resilience is appropriate to cover the fallout should risks materialise. Research on the effectiveness of macroprudential instruments has been accumulating over the last years and the identification of the efficient set of instrument combinations builds on the evolving macroprudential research and can also draw on experiences from other ESRB work.

The preferred adjustment space takes account of policymakers' preferences with regard to how to adjust the non-neutral stance towards the neutral stance. A greater tolerance for gross systemic risks by policymakers implies that they would rather deploy the resilience-enhancing measures within the efficient set, whereas those that would like to contain gross systemic risks at their origination would target these more actively. The choice would also depend on the policymaker's assessment of the ability to address the risks and the confidence in the effectiveness of resilience measures. It may further depend on the position of the financial cycle and potential interactions with other policy areas.



Figure 7
Illustration of the adjustment of macroprudential policy



Source: Expert Group on Macroprudential Stance.

4.4.2 The role of policy preferences

Policy preferences matter for various elements of the macroprudential policy stance. One aspect in which policy preferences influence the assessment of stance is the horizon over which the target has to be met. Another aspect is policy preferences between the volatility of the instrument versus the target. Preferences also inform the hierarchy of different (intermediate) targets and the selection of instruments.

Policymakers should express preference regarding the maximum time horizon for achieving an appropriate stance. In general, these preferences are constrained by the time lag between the change in policy and its effect on financial stability, the nature and persistence of any shocks hitting



an economy, and the weight given by authorities to other targets aside from macroprudential. Regarding policy lag, Friedman (1948) described three types of lag: (1) the lag between a need for action and the recognition of this need (a recognition lag); (2) the lag between recognition of the need for action and the taking of action (an action lag); and (3) the lag between the action and its effects (an impact lag). Policy lags determine the time before policy measures become effective in countering risks or enhancing resilience. Longer policy lags mean that instruments have to be tightened or loosened more decisively to meet the same policy stance.

Kawata et al. (2013)²² recognise time lags as a serious challenge for macroprudential authorities. When overheating starts, economic conditions need to be observed for a certain period before deciding on a policy action. The length of the lag depends on the quality of early warning systems in place and the time needed for instrument development. Legislation sometimes prescribes a lag in the implementation of the measure in order to give institutions time to comply. In some cases, macroprudential authorities are not even responsible for the measures (often the case with borrower-based measures), but they have to “convince” other authorities (government or legislature) to introduce the measure, which might require additional time.

Due to the short history of macroprudential policy, its transmission mechanism and the time required for macroprudential policy to work (the impact lag) has not been fully investigated (see Section 5.1.3). In addition, the diversity of instruments means that there are different lags between the introduction of the measures and their effect on financial stability. Measures that are directed at new lending, like borrower-based measures, should achieve their objective faster than, for example, capital-based measures that only indirectly affect new lending. Consequently, it is difficult to foresee and plan the horizon over which the overall stance target has to be met.

Another aspect of policy preferences relates to policy tolerance toward the volatility of the instrument versus the target. For instance, the Bank of England explicitly stated that it aims to adjust the CCyB only gradually in an attempt to reduce economic cost of any increase in the buffer rate. This preference shapes the Bank’s policy strategy that assumes moving early in the financial cycle, before risks are elevated and takes into account policy lags. A gradual, staged approach to changing/implementing policy may be preferred also when the inherent uncertainty in assessing the degree of risk to bank capital is a key concern.

One further aspect is policy preferences between different (intermediate) targets. This can be seen from the example of the CCyB, which may be tasked with two policy objectives: (i) building resilience during the upswing of the financial cycle; and (ii) dampening the financial cycle. Some countries use the instrument to achieve both objectives.²³ However, it is largely agreed that the CCyB has only a small impact on credit growth and that the primary objective is that of building resilience. Overall, it can be concluded that constraining credit growth is not the primary objective for this instrument and should usually not be expected to guide its setting. The macroprudential stance is therefore biased to the primary objective. The rest of objective(s) may be considered as a positive side effect.

²² Kawata, H., Kurachi, Y., Nakamura, K. and Teranishi, Y., “Impact of Macroprudential Policy Measures on Economic Dynamics: Simulation Using a Financial Macro-Econometric Model”, *Working Paper Series*, No 13-E-3, Bank of Japan, 2013.

²³ See *A Review of Macroprudential Policy in the EU in 2017*, ESRB, 2018.



Several non-economic factors will likely determine the decisions of macroprudential authorities on the instruments used to address risks or to achieve higher resilience. These include legal obstacles and pecking order of instruments available in the legislation, availability of the tools to macroprudential authorities and public opinion considerations are among most relevant factors. One example of ex ante priorities given to certain type of instruments can be found in the strategic document of the Bank of Slovenia which states that dynamic, cyclical instruments are foreseen to have a more important role than structural instruments in Slovenia due to the pivotal role of the banking sector and consequently more pronounced cyclical instabilities. Macroprudential authorities may also prefer instruments that are under their direct control, rather than activating instruments that require the cooperation of the government or legislative body. Authorities might also prefer to use instruments that are accepted as less controversial.

4.4.3 Interaction with other policies

Instruments not directly controlled by the macroprudential authorities (fiscal space, monetary policy, structural policies, etc.) would enter the macroprudential stance only indirectly by affecting the risks and resilience in the system. They affect the financial stability objectives but macroprudential authorities can only influence effects from these policies on their respective objectives only in a limited way. Furthermore, the transmission channels by which the policies affect the objectives – i.e., the policies' effectiveness – can be strongly influenced by the condition of the financial sector (imbalances), the specific features of the economy (structure of the financial sector), and the institutional framework.

Macroprudential policy can interact with monetary policy. The macroprudential stance is thus affected by the level of interest rates and the liquidity conditions, as provided by monetary policy. To assess the macroprudential stance it is therefore important to take into account the implications for systemic risk of the overall conditions prevailing in the financial system. Both monetary policy and macroprudential policy have the capacity to influence both price and financial stability conditions. At the same time, monetary and macroprudential policy remain distinct and separate. The Mundell (1962)²⁴ principle of effective market classification implies that each policy should be paired with the objective it is most effective in achieving. In this vein, macroprudential policy instruments are therefore paired with financial stability objectives, and monetary policy instruments are paired with the price stability objective.²⁵ Furthermore, monetary policy and macroprudential policy can be seen as strategic complements. In addressing risks from financial imbalances, more active macroprudential policy can unburden monetary policy in leaning against the wind of financial imbalances and supports it in pursuing its price stability mandate.

Another important interaction is between macroprudential and microprudential policies.

Micro and macroprudential policies operate to a large extent through similar tools that impact on the same variables (capital, liquidity, limits to exposure concentration, etc.), and therefore benefit from being coordinated, especially since in some countries the micro and macroprudential authorities are

²⁴ See Mundell, R. A., "The appropriate use of monetary and fiscal policy for internal and external stability", *IMF Staff Papers*, Vol. 9, No 1, 1962, pp. 70-79.

²⁵ See for example Fahr, S. and Fell, J., "Macroprudential policy – closing the financial stability gap", *Journal of Financial Regulation and Compliance*, Vol. 25(4), 2017, pp. 334-359.



different institutions.²⁶ Accordingly, it is the overall level of macro- and microprudential requirements that may affect banks' capacity to finance the real economy, which is particularly relevant in economies that rely heavily on bank credit such as the euro area. The need to use a holistic approach was clearly recognised by the Basel Committee when it conducted its assessments of the macroeconomic impact of the Basel III reform package that introduced tighter capital and liquidity requirements.²⁷ It could therefore be useful to think in terms of an "overall prudential stance".

In the transition to the new CRD/CRR macro buffers, prudential authorities, especially when mustering both macro and micro powers, have often adopted a holistic view to avoid overlaps between micro and macroprudential measures. For example, in the UK, the CCyB and capital conservation buffer increase was accompanied by commensurate reductions in existing Prudential Regulation Authority buffers, following considerations of an "optimal level" of overall capital.²⁸

In the risk-resilience framework, the microprudential policy requirements are incorporated into the level of resilience and the level of gross systemic risk in the financial system and are thus considered when assessing the macroprudential stance (see Section 4.2). For the purposes of the stance assessment, it is the effectiveness of macroprudential instruments which is examined, but within the broader context of the resilience of the financial system. The framework thereby lends itself to be used for "overall prudential stance", whereby the resulting policy implications focus on the macroprudential aspects.

²⁶ See Alessandri, P. and Panetta, F., "Prudential policy at times of stagnation: a view from the trenches", *Occasional Paper Series*, No 300, Banca d'Italia, 2015.

²⁷ See Angelini, P., Clerc, L., Cúrdia, V., Gambacorta, L., Gerali, A., Locarno, A., Motto, R., Roeger, W., Van den Heuvel, S. and Vlček, J., "BASEL III: Long-term impact on economic performance and fluctuations", *Working Paper Series*, No 338, Bank for International Settlements, 2011.

²⁸ This approach can be found in the UK Financial Policy Committee's framework, which defined the appropriate baseline Tier 1 capital requirement for the UK banking system considering both micro requirements and macro structural buffers; see "The Financial Policy Committee's framework for the systemic risk buffer", May 2016, in particular Box 2. Additional references are a discussion paper by the Deutsche Bundesbank, as well as a stability report of Finansinspektionen: Tente, N., von Westernhagen, N. and Slopek, U., "M-Press-CreditRisk: A holistic micro- and macroprudential approach to capital requirements", *Discussion Paper Series*, No 15/2017, Deutsche Bundesbank, 2017; "Operations and Capital of the Banks", *Stability in the Financial System*, Finansinspektionen, 2016.



5 Operationalising the macroprudential policy stance

In order to take the conceptual elements of the macroprudential policy stance to the next stage, it is important to consider how it may actually work in practice. This requires looking initially at how various aspects of macroprudential policy are measured, including its objectives and instruments, risk and resilience and the actual impact of the policies.

5.1 Measurement of the macroprudential stance

The core challenges in operationalising the macroprudential stance relate to measuring: (i) macroprudential policy objectives; (ii) instruments; and (iii) the relationship between the two. Measurement of macroprudential policy objectives involves the quantification of systemic risks with a specific focus on externalities, contagion and amplification, and the measurement of resilience of the financial sector and the economy. Measurement of policy instruments involves a stocktake of which instruments enter the macroprudential policy toolbox and quantification of their calibration. Finally, the assessment of stance requires the measurement of the pass-through of macroprudential policy instruments into risks and resilience.

A number of lessons can be drawn from the evolution of measurement of stance for fiscal and monetary policy:

- The measurement of policy objectives may depend on the structure of the economy and model applied: in monetary policy, the objective of stable prices is commonly mapped into the target consumer price index annual inflation rate. However, in countries in which a high share of prices remains regulated, the target inflation rate may exclude the impact of regulated prices (which was the case in e.g. Brazil). The objective of fiscal sustainability is not easy to be mapped into one index (similar to the objective of macroprudential policy) and will alter with the modelling technique used.
- Policies often follow measurable indicators which relate to but differ from the policy objective (intermediate targets). These indicators are expected to change predictably with the use of policy instruments. Central banks have used a number of different indicators over time, including monetary growth, the federal funds rate, non-borrowed reserves, the overnight rate, and even the exchange rate.
- Indicators can have various levels of generality and complexity: some of the indicators of monetary policy are just values of the instrument; others are proxies that are linked to the instruments used (e.g. M1), others are more complex models which involve the combination of multiple indicators.

This section discusses the measurement of the macroprudential stance. It starts with the measurement of systemic risks and resilience, then moves to the measurement of instruments and their transmission, and next to the possible methods of measuring the neutral stance.



5.1.1 Measurement of systemic risk and resilience

The stance framework will require a measurement for both systemic risk and resilience. The literature provides many examples of the measurement of the intensity of systemic risks. These measures of systemic risk relate to the previously mentioned concept of “gross systemic risk” in Section 4. Most of these measures are, however, partial, i.e. referring to the specific sector or to a specific systemic risk, rather than general, i.e. assessing the intensity of all sources systemic risk in tandem. The literature provides very few examples of the measurement of system resilience. A selection of the measures, based mainly on the survey by Bisias et al. (2012)²⁹ and Di Cesare and Rogantini Picco (2018)³⁰ is provided in Table 1 below.

Table 1
Measures of systemic risk and resilience

Category	Example of an index	Resilience or systemic risk ³¹	Global or partial ³²	Construction
Macroeconomic measures	Credit gap indicators	Systemic risk	Partial	Credit-to-GDP ratio and the deviation from the long-term trend
Granular foundations and network measures	Network analysis and systemic financial linkages	Resilience and systemic risk	Global or partial	Analysis of gross exposures among financial institutions, simulation of shocks
Forward-looking risk measurement	Contingent claims analysis	Systemic risk	Partial	Comparison of default risk implied by CDS and Black-Scholes approach, measurement of expected losses by Black-Scholes
Cross-sectional measures	CoVaR	Systemic risk	Global	The CoVaR systemic risk measure is able to identify the risk on the system by individually “systemically important” institutions, which are so interconnected and large that they can cause negative risk spillover effects on others, as well as by smaller institutions that are “systemic” when acting as part of a herd
Measures of illiquidity and insolvency	Crowded trades in currency funds	Systemic risk	Partial	Measure the popularity or crowdedness of any trade with an identifiable time-series return

Note: Based on Bisias et al. (2012) and Di Cesare and Rogantini Picco (2018).

Another promising and relatively new approach for assessing the intensity of global systemic risks is Growth-at-Risk (GaR). The GaR links current financial conditions to the

²⁹ Bisias, D., Flood, M., Lo, A. W. and Valavanis, S., “A Survey of Systemic Risk Analytics”, *Working Paper Series*, No 12-01, Office of Financial Research, US Department of the Treasury, 2012.

³⁰ Di Cesare, A. and Rogantini Picco, A., “A survey of systemic risk indicators”, *Occasional Paper Series*, No 458, Banca d’Italia, 2018.

³¹ Categorisation of whether the measure is related to systemic risk and/or resilience is based on a qualitative assessment and an interpretation of indicators.

³² A global measure is a measure of risk or resilience for the whole financial system, while a partial measure refers to a certain sector (for example, commercial or residential real estate) or type of risk (for example credit or liquidity).



distribution of future growth outcomes. An important advantage of this approach is that it allows us to assess whether a tightening or an easing of financial conditions is on net macro-critical, and may therefore put financial stability and future growth at risk. It is a global measure as it can measure risk to the whole financial system and not just a risk to a specific sector or type of risk. Box 3 discusses GaR in more detail.

Box 3

Growth-at-Risk (GaR) and the macroprudential stance

The Growth-at-Risk model³³ summarises the expected maximum economic downturn over a target horizon at a given confidence level. GaR is essentially a value-at-risk of future GDP as a function of financial conditions prevailing now. It links current financial conditions to the distribution of future GDP growth outcomes. The financial conditions indicators that feed into the GaR model include a wide range of price-of-risk and leverage metrics for different countries, sectors and asset markets. The IMF found that the forecasts of the worst-case outcomes (at the 5th percentile of the future GDP growth distribution) are between three times (United States) and more than ten times (Australia) more sensitive to changes in Financial Cycle Indicators (FCIs) than the forecasts of the central tendency of economic growth.³⁴ Increasing leverage or credit growth point to higher downside risks at medium to longer time horizons.

An important advantage of GaR approach is that it allows for an assessment of whether a tightening or an easing of financial conditions (and, by proxy, of macroprudential policy) may put financial stability and future growth at risk. The forecast range of severely adverse outcomes (the 5th percentile of the distribution) provides a metric for assessing the degree of concern about the current level of financial vulnerabilities and their implications for the future GDP growth. When the loosening of financial conditions is associated with increasingly stretched asset valuations and with rising leverage, the GaR measures the extent to which increased financial vulnerabilities could dampen growth in the future if adverse shocks occur.³⁵

This approach also measures financial vulnerabilities in terms of GDP and illustrates the trade-off between short-term economic growth and systemic risk. Thus, GaR measures aggregate risk as well as (indirectly) costs and benefits of the macroprudential action in an understandable way. Additionally, the model's forecasts across time can be used to put the currently anticipated severely adverse outcomes in context to historical norms and GaR might provide an anchoring reference value for risks' side in the risk-resilience stance framework. On the other hand, the model's focus on GDP growth could lessen the focus of policymakers from the objective of financial stability.

Relating to resilience, two other approaches deserve special merit. First, resilience can be quantified in terms of potential credit (or GDP) losses which can be avoided by a policy or any structural change. This approach has been pursued by the ECB Task Force on Operationalising Macroprudential Research and is discussed in Box 4. Second, resilience can be assessed using

³³ Yao, Y. and Wang, Y., "Measuring Economic Downside Risk and Severity: Growth at Risk", *Policy Research Working Paper Series*, No 2674, World Bank, 2001.

³⁴ *Global Financial Stability Report*, International Monetary Fund, October 2017, pp. 96-97.

³⁵ Adrian, T., "The Growth-at-Risk Approach to Assessing Global Financial Stability", blogs.imf.org (accessed on 4 May 2018).



stress-testing methods (Box 5). Stress testing is a way to identify system vulnerabilities, i.e. combinations of external factors that can generate substantial losses and ultimately harm the good functioning of the financial system. A stress test typically draws its scenarios either from actual historical stress episodes or hypothesising them via expert opinion or other judgement. Their advantages include a clear focus on loss absorption, and the fact that the calibration of adverse scenarios can reveal policymakers' risk appetite.

Box 4 Model-based assessment of resilience

Banking system resilience can be seen and measured as banks' ability to withstand adverse shocks originating outside the banking system with a minimum impact on the supply of credit to the private sector. This avenue of measuring the resilience is followed by Budnik et al. (2018)³⁶ based on a structural factor-augmented vector autoregression (FAVAR).

The FAVAR ties together a rich set of individual bank-level data and macroeconomic aggregates, such as GDP, residential and commercial property prices. Combining micro- and macroeconomic data within one model framework allows for gauging both macroeconomic effects, i.e. how much total credit or GDP of a country is affected, and bank-level reactions to a structural shock or policy change. The analysis also informs about the distributional effects of shocks and policy actions. Banks' resilience is assessed in three steps. In the first step, a FAVAR model is used to describe the propagation of aggregate demand and real property price shocks into bank lending and credit risk. In the next step, the differences in banks' responses to structural shocks are linked to their capitalisation levels and other structural variables in a series of bank-level regressions. The regression estimates point to a moderating impact of higher capital buffers on the propagation of structural shocks.

The final step is the design of an adverse scenario against which the resilience of the system can be assessed. The difference between the reduction in credit by highly capitalised and lower capitalised banks in response to the adverse scenario will be a measure of resilience gains from holding higher capital buffers.

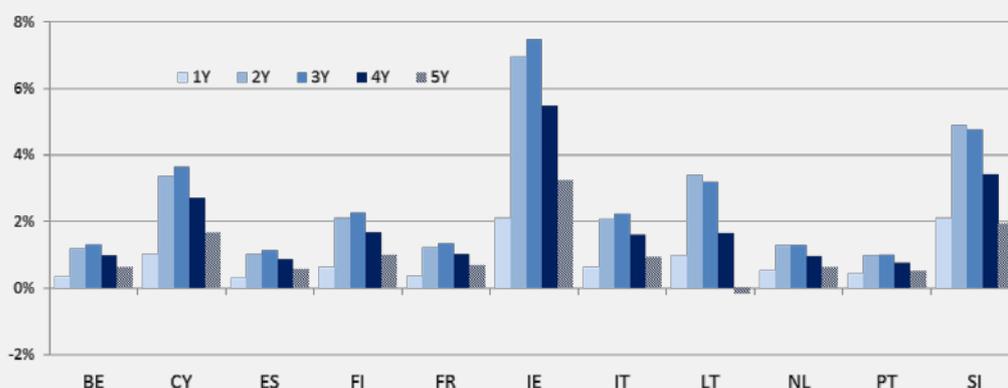
As a numerical example, one can consider the benefits related to building-up of capital buffers as in 2015, starting from the reference level of 8.5% of Tier 1 ratio as in Figure A below for selected European countries. For Slovenia, Lithuania and Cyprus, gains from the existing capital buffers are moderately higher (credit gains of 4.9%, 3.4% and 3.5% in the second year under an adverse scenario). For other countries, the benefits from having capital buffers above 8.5% are between 1-2% of credit to the non-financial private sector at the end of the second year of the adverse scenario. All these effects are substantial in relative terms, amounting to (at minimum) around 10% of the overall reduction in credit reported under the adverse scenario for Lithuania and Portugal, around 20% for Belgium and Finland, close to 40% for Spain, and over 50% for remaining countries.

³⁶ Budnik, K., Affinito, M., Barbic, G., Ben Hadj, S., Chretien, E., Dewachter, H., Gonzalez, C. I., Hu, J., Jantunen, L., Jimborean, R., Manninen, O., Martinho, R., Mencia, J., Mousarri, E., Naruševičius, L., Nicoletti, G., O'Grady, M., Ozsahin, S., Pereira, A. R., Rivera-Rozo, J., Trikoupis, C., Venditti, F. and Velasco, S., "The benefits and costs of adjusting bank capitalisation: evidence from euro area countries", *Working Paper Series*, ECB, forthcoming.



Figure A

The effect of Tier 1 capital buffers at the end of 2015 above the level of 8.5% on the outstanding credit to non-financial private sector under the adverse scenario (at the end of a year)



Source: Budnik et al. (2018).

Box 5

Stress testing and assessing resilience

A standard stress-testing toolkit consists of three main building blocks (Bennani et al., 2017³⁷, Dees et al., 2017³⁸). First, a macroeconomic model is used to generate the macroeconomic scenarios. Second, via the solvency or liquidity block, the macroeconomic dynamics affects the evolution of balance sheet variables of financial institutions (for example banks' capital ratios). These two blocks can be complemented with contagion models to study the amplification effects related to the presence of interconnections and overlapping portfolios among the agents.

Macroeconomic scenarios are usually produced in line with the risks identified. Consequently, the solvency or liquidity block of the stress test assesses the system resilience in case of materialisation of risks. Thanks to the micro-level dimensions and to the use of granular data, resilience can be assessed for a particular segment of exposures (e.g. households, non-financial corporates, real estate, etc.). From the evolution of the capital ratios it can be inferred to which extent a financial agent (e.g. a bank) is resilient conditional on a determinate macroeconomic scenario.

Contagion models can be used to assess whether the default or the stress of some agent can trigger a contagion effect in the rest of the financial sector. From the perspective of the

³⁷ Bennani, T., Couaillier, C., Devulder, A., Gabrieli, S., Idier, J., Lopez, P., Piquard, T. and Scalone, V., "An analytical framework to calibrate macroprudential policy", *Working Paper Series*, No 648, Banque de France, 2017.

³⁸ Dees, S., Henry, J. and Martin, R. (eds.), "STAMP€ Stress-Test Analytics for Macroprudential Purposes in the euro area", ECB, 2017.



macroprudential stance, the contagion models help to identify the risks that the solvency and liquidity issues concerning single agents propagate to the rest of the sector, amplifying the systemic risk and provide additional information on the resilience of the financial sector as a whole.

5.1.2 Measurement of policy instruments

Measuring the intensity (calibration) of macroprudential measures is the second precondition of measuring the policy stance. This poses a set of challenges of its own that relate to multi-dimensionality of most macroprudential instruments. For instance, an LTV limit can be imposed uniformly, or be differentiated for different segments of the market (first time home buyers and others). It can cover the overall population of borrowers, or allow financial intermediaries to exempt a share of their portfolio. Finally, the ratio may assume different definitions of the denominator. The multi-dimensionality obscures not only the comparability of policy instruments across jurisdictions, but also the measurement of changes in their calibration over time.

A vast majority of the empirical studies that measure macroprudential policies employs one of four large databases on bank regulation: (i) Bank Regulation and Supervision database introduced by Barth, Caprio and Levine (2008)³⁹ and carried out by the World Bank; (ii) the BIS database of information on macroprudential measures related to the housing market (introduced by Borio and Shim, 2007⁴⁰); (iii) the IMF database of macroprudential policies introduced by Lim et al. (2011)⁴¹; and (iv) a comprehensive dataset of macroprudential policies (MaPPED) has been recently developed and described by Budnik and Kleibl (2018)⁴².

Most of the literature uses simple indices to measure the intensity of financial regulation.

One group of researchers uses the binary coding scheme considering simply the presence of the instrument or a group. This is sometimes translated into an index representing the number of instruments of particular type e.g. in Budnik and Kleibl (2018). Other researchers have focused on quantifying the changes in macroprudential instruments. In these studies, macroprudential policies are measured with a set of discrete variables that take a value of 1 for quarters and countries when a tightening of a macroprudential measure has taken place, -1 for quarters and countries when a loosening of a macroprudential measure has taken place and 0 otherwise. Policy indices can be also constructed as the sum of all changes in that policy instrument recorded prior to and during the quarter of interest. For instance, Schmitz and Tirpak (2017)⁴³ construct an index of prudential stringency as a cumulative sum of prudential policy changes to capture the level of tightness, using it to test the effect on cross-border banking.

³⁹ Barth, J. R., Caprio, G. and Levine, R., "Bank regulations are changing: for better or worse?", *Comparative Economic Studies*, Vol. 50(4), 2008, pp. 537-563.

⁴⁰ Borio, C., and Shim, I., "What can (macro-)prudential policy do to support monetary policy?", *Working Paper Series*, No 242, Bank for International Settlements, 2007.

⁴¹ Lim, C., Columba, F., Costa, A., Kongsamut, P., Otani, A., Saiyid, M., Wezel, T. and Wu, X., "Macroprudential Policy: What Instruments and How to Use Them? Lessons from Country Experiences", *Working Paper Series*, No WP/11/238, International Monetary Fund, 2011.

⁴² Budnik, K. and Kleibl, J., "Macroprudential regulation in the European Union in 1995-2014: introducing a new data set on policy actions of a macroprudential nature", *Working Paper Series*, No 2123, ECB, 2018.

⁴³ Schmitz, M. and Tirpák, M., "Cross-border banking in the euro area since the crisis: what is driving the great retrenchment?", *Financial Stability Review*, ECB, November 2017, pp. 145-157.



None of these approaches satisfactorily captures the level or even changes in the policy stringency. They overcome the problem of heterogeneity of instruments and multi-dimensionality of their calibration. However, higher precision of the measurement seems necessary for policy application. For instance because of full homogenisation of CCyB policies across EU jurisdictions (they apply on the same type of exposures and require accumulation of the same type of capital) it is possible to compare policies across countries and over time by looking at the buffer level only. This in turn allows developing a stable mapping between instrument calibration and risk and resilience.

5.1.3 Measurement of policy pass-through

Empirical research on the impact and transmission of macroprudential policies is still limited (especially for advanced economies). This results from the scarcity of data and the short history of macroprudential policy. Selected empirical literature on the impact of different policy instruments on intermediate targets is summarised in a table in the Annex (Annex 7.2) (see also Galati and Moessner, 2018)⁴⁴ for a literature review.

A relatively large share of the existing literature focuses on the transmission of capital requirements. Empirical studies of Bridges et al. (2014)⁴⁵ and Noss and Toffano (2014)⁴⁶ consider the effects of tightening of capital requirements on banks' deleveraging and loan supply. Jimenez et al. (2017)⁴⁷ provide empirical insights on the effects of countercyclical buffers on credit cycles in Spain and find that dynamic provisioning mitigates credit supply cycles. In terms of mechanisms, the results suggest that capital saving is an important factor, as in times of crisis raising capital through bank profits and new shareholder funds is difficult due to their scarcity and costly. As well as empirical approaches, DSGE models are often used to examine the macroeconomic effects of capital-based measures (Lozej et al., 2017)⁴⁸.

Instrument transmission mechanisms for other instruments have usually been described and narrated rather than exactly measured (see in particular Grace et al., 2015⁴⁹). Exceptions include for instance Acharya et al. (2018)⁵⁰ which focuses on the effect of LTI (loan-to-income) and LTV limits on residential mortgages on residential mortgage credit, bank portfolio choice, financial stability and real estate prices. Low income households borrow less and banks reduce the rate charged to high income households who lever up taking out larger loans. The resulting credit

⁴⁴ Galati, G. and Moessner, R., "What do we know about the effects of macroprudential policy?", *Economica*, Vol. 85(340), 2018, pp. 735-770.

⁴⁵ Bridges, J., Gregory, D., Nielsen, M., Pezzini, S., Radia, A. and Spaltro, M., "The impact of capital requirements on bank lending", *Working Paper Series*, No 486, Bank of England, 2014.

⁴⁶ Noss, J. and Toffano, P., "Estimating the impact of changes in aggregate bank capital requirements during an upswing", *Working Paper Series*, No 494, Bank of England, 2014.

⁴⁷ Jiménez, G., Ongena, S., Peydró, J.-L. and Saurina, J., "Macroprudential policy, countercyclical bank capital buffers, and credit supply: evidence from the Spanish dynamic provisioning experiments", *Journal of Political Economy*, Vol. 125(6), 2017, pp. 2126-2177.

⁴⁸ Lozej, M., Onorante, L. and Rannenberg, A., "Countercyclical capital regulation in a small open economy DSGE model", mimeo, 2017.

⁴⁹ Grace, T., Hallissey, N. and Woods, M., "The Instruments of Macro-Prudential Policy", *Quarterly Bulletin*, Central Bank of Ireland, January 2015, pp. 90-105.

⁵⁰ Acharya, V. V., Bergant, K., Crosignani, M., Eisert, T. and McCann, F., "The anatomy of the transmission of macroprudential policies", mimeo, 2018.



reallocation is effective in slowing down the ongoing house price appreciation and causes banks to increase their risk-taking in both corporate credit and holdings of securities.

There is little empirical literature discussing the transmission lag. The evidence so far suggests that macroprudential policies transmit relatively rapidly to the economy. Regression analyses operating with lags of variables to measure policy transmission suggest that a horizon of between one quarter (Akinci and Olmstead-Rumsey, 2018) and one year (Cerutti et al., 2017, and Claessens et al., 2013) is sufficient for effective policy transmission. A VAR-based analysis by Budnik and Ruenstler (2018) confirms relatively quick reaction of credit to changes in capital-based macroprudential policies. However, the maximum effect on credit is observed after 2-3 years only. The effect on GDP and inflation is shorter-lasting, reaching the maximum after a year from the introduction of a measure.

5.1.4 Measuring neutral stance

The precondition for measuring partial (sector- or instrument-specific) stance is measuring all three elements and forming the corresponding definition of the neutral stance. The neutral stance corresponds with the calibration of instrument(s) that fosters the level of risks and resilience which is consistent with their targeted levels. These target levels will derive from the level of uncertainty that the authority considers acceptable in normal times, as well as on how the authority defines “the normal times”⁵¹. Both aspects will in turn depend on authorities’ preferences. Given this level, the deviations of instrument intensity from this target will be described as a tight or loose stance.

Targeted levels of risk and resilience can sometimes be indirectly identified. First, they can be assessed based on historical evidence on the response of authorities to the change of the risk indicators. The risk tolerance will be revealed through the relative intensity of the policy change to the risk change.⁵² Second, historical risk distributions could be used to assess the neutrality of the stance. In 2016 Banco de España (BdE) performed a backward-looking analysis encompassing the ESRB’s intermediate objectives, and found the risk indicators to be “consistent with a neutral stance in macroprudential policy”.⁵³ An assessment of systemic risks indicated a low level of alert,⁵⁴ with the thresholds calculated from the historical percentiles of the distribution. Deviations that cross the assigned thresholds potentially prompt a need for a change in the macroprudential stance, taking into account levels of resilience, to make it neutral given risk levels. The historical

⁵¹ The Lithuanian authorities characterise moderate risk environment as having (1) a not yet strong cyclical risk and (2) a sustainable economic growth. The UK’s Financial Policy Committee defines it as when the risks are neither elevated nor subdued, borrowers are neither fragile nor unusually extended, risk appetite measures are in line with historical averages, and asset prices do not consistently show signs of under/overvaluation.

⁵² A case in point is the reaction in the Netherlands to a high collateral stretch that has prompted the lowering of the maximum LTV ratio for first-time buyers in 2018. De Nederlandsche Bank referred to a cyclical fall in average house prices and a high share of underwater mortgages. One could argue that risk tolerance remained somewhat the same, but the calibration of the macroprudential instrument was no longer sufficient to counter the growing risk of household indebtedness. In 2017, the Czech National Bank (CNB) responded to a continued upward spiral between property prices and property purchase loans by calling for an assessment of loan applications with DSTI ratio above 40%. The latter is described as a threshold which indicates an increased probability of falling into arrears, effectively exposing financial sector to credit risk. This DSTI level could represent a neutral band beyond which risk exceeds tolerable amounts.

⁵³ Mencia, J. and Saurina, J., “Macroprudential Policy: Objectives, Instruments and Indicators”, *Occasional Paper Series*, No 1601, Banco de España, 2016.

⁵⁴ Possible levels of alert were the following: normal range, low level, medium, and high.



relationships also underlie empirical assessments such as those conducted through early warning systems.

Neutrality could be defined with respect to rules used to calibrate the instruments (rule-based definition), similar to the Taylor rule for monetary policy. Neutrality relative to a rule (or historical regularities indicating financial stability) requires an understanding on regularities of the transmission from indicators of risks to economic impact. In this case, the stance would be neutral when the instrument is at the level that allows us to reach a predetermined target (in the future). This approach is discussed in more depth in Box 6 and applies to some instruments which are more (although not fully) rule-based (CCyB, O-SII buffers), and less to instruments which are not associated with a precise rule.

In general, a neutral macroprudential stance is rarely defined relative to rules and is often subject to a considerable degree of discretion. Very few countries indicate anchoring levels for macroprudential instruments they invoke. Furthermore, the diverse set of instruments with potentially very different effects on financial risks constitutes a difficulty in painting an overall image. Authorities face difficulties in clearly defining relevant objectives, let alone observing how specific actions contribute to attaining them. Finally, the broad scope of frameworks hinders a cross-country comparison.⁵⁵

Box 6

Exploring information in national guidance and cross-country variation for instruments

The approach of the Czech National Bank (CNB) in calibrating the CCyB is particularly insightful for the discussion of operationalising the macroprudential stance. The CNB is very transparent in the communication of policy decisions and its CCyB rate decision-making process is largely formalised with clearly defined rules. Specifically, the CNB's main guidance for setting the CCyB is provided by a composite financial cycle indicator (FCI) which gives early warning signals (6-8 quarters ahead) by aggregating a wide range of country-specific financial risk factors (e.g. credit growth, property prices, lending conditions, etc.).⁵⁶

Based on the historical evolution of the composite financial cycle indicator, the CNB derived an indicative relationship between the values of the indicator and the CCyB rate, which can be regarded as a policy rule for the macroprudential policymaker. For example, the maximum value of the historical distribution of the indicator (observed before the outbreak of the financial crisis) is associated with a CCyB rate of 2.5%. Starting from this maximum value, a number of ranges are defined for values of the indicator based on which the corresponding intermediate CCyB rates are set.

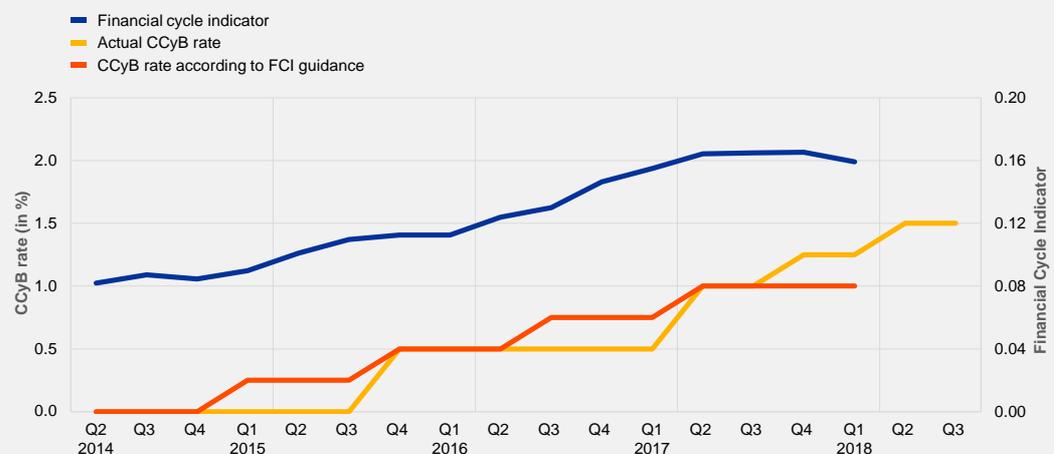
⁵⁵ "Macroprudential frameworks, implementation and relationship with other policies", *BIS Papers*, No 94, Bank for International Settlements, 2017.

⁵⁶ For a detailed description of the financial cycle indicator, see Plasil, M., Seidler, J. and Hlavac, P., "A New Measure of the Financial Cycle: Application to the Czech Republic", *Eastern European Economics*, Vol. 54, 2016, pp. 296-318. The main motivation for calculating their own financial cycle indicator (FCI) rather than using the credit-to-GDP gap as suggested by the Basel Committee on Banking Supervision (BCBS) is that the credit-to-GDP gap provided poor CCyB guidance for the Czech economy after 2011. The CNB therefore uses the credit-to-GDP gap only as an initial guide, while the proposed financial cycle indicator is regarded as the main tool.



Figure A illustrates the approach by mapping the indicator and the CCyB rate (both the actual rate and the rate proposed by the policy guidance). As can be seen, the CNB has announced a number of CCyB increases since 2015 to counter increasing risks in the financial sector signalled by the main indicator. While the CNB has been broadly following its own rule-based approach contained in its FCI guidance (red line in the chart), the actual policy (yellow line) deviated at several occasions from the FCI guidance. In particular, for the periods 2014Q4-2015Q3 and 2016Q2-2017Q2, actual CCyB rates were below the ones suggested by the policy rule, indicating that the overall CCyB stance of the CNB was loose in these periods.

Figure A
An illustration of the approach by the Czech National Bank



Besides looking at individual country’s strategies in policy calibration, a practical way of describing the neutral stance is to rely on cross-country variation in instrument calibration and risk intensity. Certain instruments address risks of a longer-term nature and less frequent changes in the intensity of risks and the calibration of instruments can be expected. The example below elaborates on stance detection in the case of risk related to misaligned incentives and O-SII calibration.

Many EU countries committed to following the EBA Guidelines⁵⁷ involving scores and ECB Guidance⁵⁸ on assigned buffer rates that follow the “EBA scores”. Consequently, results obtained by using EBA Guidelines-based scores and assigned buffer rates can serve as an illustration of a possible approach for the identification of the neutral stance. This common methodology could enable us to determine the neutral stance by using cross-country results. Caution is needed when interpreting this example as the neutral stance depends also on policy preferences and risk tolerance that are not the same across countries.

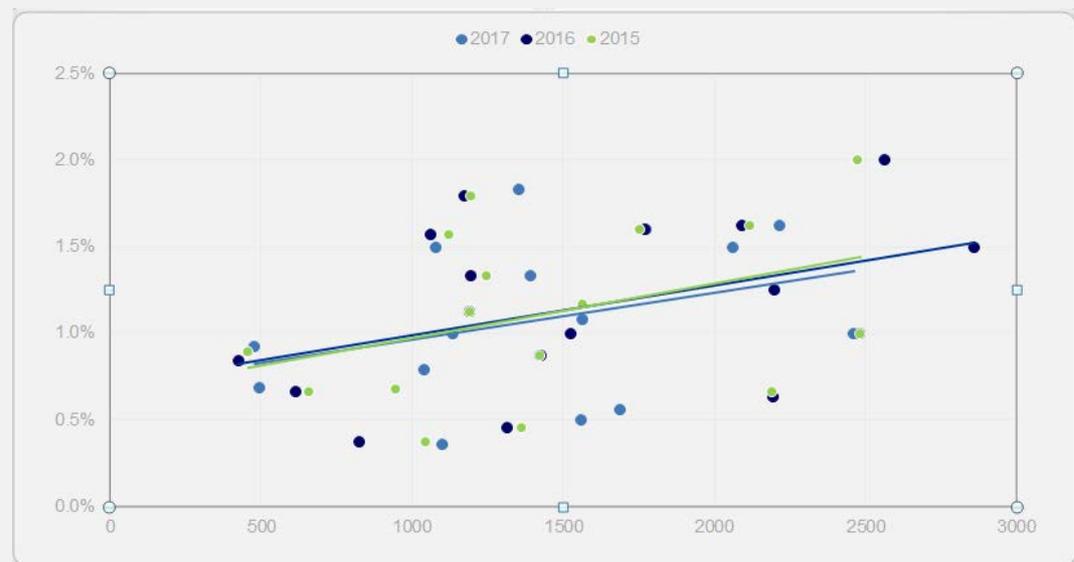
⁵⁷ Guidelines on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD) in relation to the assessment of other systemically important institutions (O-SIIs), European Banking Authority, EBA/GL/2014/10, 2014.

⁵⁸ “ECB floor methodology for setting the capital buffer for an identified Other Systemically Important Institution (O-SII)”, *Macprudential Bulletin*, Issue 3, ECB, 2017.



Linking the average EBA score in individual EA country and the average buffer rate in the same country (Figure B) one obtains the average stance for the EA. Deviations from that stance could be labelled as a tight (above the trend line) or loose (below the trend line) macroprudential policy stance. As it is visible from Figure B no significant changes occurred in the EA stance in the past three years, as expected for structural macroprudential instrument.

Figure B
Average scores based on the EBA Guidelines and average buffers for EA countries



5.2 Interactions and aggregation of stance components

Systemic risk and resilience have many dimensions, which can be addressed by different instruments. This multi-dimensionality of risks, resilience and instruments raises a question about the interactions between types of systemic risks and resilience or instruments and their effect on the overall stance. This subsection provides a literature-based example of the relevance of such interactions.

5.2.1 Interactions between risks

Two types of risks are commonly distinguished in policy practice (i) cyclical, or time-varying risks, and (ii) structural risks that relate to interconnectedness and common exposures of financial institutions and markets. While there are tools available for targeting both dimensions, the interactions between risks can support or impede the effectiveness of macroprudential policy.



Horvath and Wagner (2017)⁵⁹ show that macroprudential policies addressing the cyclical component of systemic risk can contradict the effectiveness of instruments targeting the structural dimension of systemic risk. Countercyclical bank regulation will insulate banks from sector-wide fluctuations, and (along with policy intentions) mitigate the impact of aggregate shocks on investment. However, this comes at the expense of banks taking more correlated risk exposures, which in turn increases the structural component of systemic risk.

In their model, a CCyB reduces banks' expected costs from exposures to aggregate risk relative to bank-specific exposures. A bank that invests in bank-specific activities faces the risk of receiving a negative bank-specific shock. When the CCyB is high, costs of the exposure to risks related to bank-specific activities increase. This boosts banks' incentives to invest in common exposures. This in turn, increases correlations of risks and exacerbates the problem of excessive interconnectedness in the financial system (i.e. the structural dimension of systemic risk). Taken together, procyclicality cannot be separated from the structural (cross-sectional) dimension of systemic risk and due to their interactions it is not possible to address the two dimensions of systemic risk in isolation.

The interactions between different risks and instruments make it difficult to describe the overall macroprudential policy stance as a simple sum of sectoral macroprudential stances.

In the model of Horvath and Wagner (2017), a tightening of instruments addressing cyclical risks translates into a tightening of the cyclical macroprudential stance, but it also spills over into an increase in structural risks. Accordingly, the structural macroprudential policy stance loosens. Ignoring the latter effect would lead to erroneous policy conclusions.

5.2.2 Interactions between instruments

The literature also provides examples of relationships between certain macroprudential instruments. Grodecka (2017)⁶⁰ shows that in the framework of a real business cycle model in an economy in which both LTV and DSTI measures are implemented and both measures are binding for borrowers, a tightening of LTV regulation will be ineffective in reducing household debt in the long run. The reason is that households' debt-to-GDP ratio is pinned down by a constant which is equivalent to the DSTI limit. The model thus shows that, in equilibrium, stricter LTV ratios do not affect debt ratios and may even increase house prices.

As shown by Shin (2011)⁶¹ and De Nicolò (2012)⁶², DTI and LTV ratios can be helpful complements for capital requirements, especially in boom periods. Capital requirements may become less effective in the expanding phase of the financial cycle when capital ratios increase due to high profitability and rising asset prices. Since DTI and LTV ratios represent direct quantity restrictions on banks' asset allocation, they can complement capital buffers to tackle procyclicality

⁵⁹ Horvath, B. L. and Wagner, W., "The Disturbing Interaction between Countercyclical Capital Requirements and Systemic Risk", *Review of Finance*, Vol. 21(4), 2017, pp. 1485-1511.

⁶⁰ Grodecka, A., "On the effectiveness of loan-to-value regulation in a multiconstraint framework", *Working Paper Series*, No 347, Sveriges Riksbank, 2017.

⁶¹ Shin, H. S., "Adapting macroprudential approaches to emerging and developing economies", report commissioned by the World Bank's Poverty Reduction and Economic Management (PREM) Network, 2011.

⁶² De Nicolò, M. G., Favara, G. and Ratnovski, L., "Externalities and Macroprudential Policy", IMF Staff Discussion Note No 12/05, International Monetary Fund, 2012.



in the boom period. In addition, unlike countercyclical capital requirements, DTI and LTV ratios can be specifically targeted at risky borrowers and asset classes that raise particular macroprudential concerns.

A DSGE model by Gerba et al. (2017)⁶³ notes that “as more measures are being enacted, the pressures they mutually exert and their joint impacts become crucial”. Finding overall that the welfare gains from the interaction are greater than the sum of the parts, authors conclude that the optimal CCyB rule depends on the level of capital. Optimising them together brings substantial welfare gains.

5.2.3 Aggregation of stances

The macroprudential stance can be assessed at different levels of granularity towards the ultimate objective of financial stability. The more granular intermediate objectives (different categories of risk and resilience) are considered, the easier it is to measure the stance. On the other hand, granularity raises the issue of how to combine the single stance assessments into an overall sectoral or country-level stance assessment.

A quantitative aggregation of partial stances requires identifying overlaps across risks and instruments precisely so as to avoid underestimating the impact of risks or duplicating the impact of measures. An aggregation of the macroprudential stance requires identifying the contribution to systemic risk from individual institutions and activities, their interaction on financial markets and towards the real economy. These measures imply assessing the clustering, contagion and amplification of risks which thus combines the direct effects of shocks and especially their indirect effects through propagations and feedback loops.

One step towards an overall stance could be an assessment that summarises the degree of coordination of macroprudential policies across sectors towards a sectoral/focused or a broad-based/overall action. For example, the overall stance could provide information on whether the policies expressed in the different sectoral (financial or economic sectors) stances are part of an integrated coordinated action (overall tightening), or whether they respond to imbalances which emerge at a purely “sectoral” level (focused tightening), in which case policies imply a potential rebalancing among sectors: a tightening of policy for the real estate sector with a particular focus on households without any action for non-financial corporate credit might imply an “overall tightening” of the stance but could imply a pure risk shifting across sectors which could result in an overall neutral change in stance.

Under this coordination-based approach, great care would need to be taken in the terminology to define the overall stance as it aims to illustrate a degree of coordination rather than a precise measurement of the stance. An “overall tightening/neutral/loosening stance” could express a common action across sectors whereas a “rebalancing stance” would indicate uncoordinated actions or those in different directions.

⁶³ Aguilar, P., Hurtado, S., Gerba, E. and Fahr, S., “Quest for robust optimal macroprudential policy”, mimeo, 2017.



Annex 7.3 contains further considerations regarding the aggregation of risks and instruments into a joint measure of stance.

This considers a general representation of a macroprudential policy stance which potentially allows for (i) interactions between elementary financial stability risks (e.g. cyclical and structural), and (ii) interactions between different macroprudential policy instruments. This could also allow for the derivation of the “optimal” stance assuming the policy preferences (and costs and benefits of implementation of different policy options) are known. Empirical operationalisation of the macroprudential stance poses many challenges. Trials run by the expert group revealed that to make such aggregation feasible and policy relevant, a consensus has first to be reached regarding the measurement of elementary stances.

As well as providing a potential measurement of resilience, a macroprudential stress test could also form the basis for an assessment of the overall stance.

It can illustrate the balance between risks, resilience and the calibration of macroprudential instruments and allows for multiplicity of risks and instruments. Box 7 discusses this application of macroprudential stress test in more detail.

Box 7

Application of stress testing to the measurement of overall policy stance

The design of a macroprudential stress-test scenario can cover a range of systemic risks. Depending on the complexity of models used, it allows the aggregation of sector-specific, segment-specific and global risks, endogenous (contagion) and exogenous (foreign demand) sources of disturbances.

The macroprudential stress-test toolbox often incorporates the pass-through and interactions between the macroprudential instruments in the financial sector and the real economy. For example, allowing banks to adjust their credit supply in response to shocks, and relating this decision to existing capital buffers, will allow for the identification of the consequences of a capital buffer. In addition, it defines whether the activation has heterogeneous effects (e.g. whether an increase in capital buffers is binding for the entire banking sector or just for few banks). As such, the macroprudential stress test can be used as a calibration tool to set macroprudential instruments. For example, capital buffers can be calibrated to offset the depletion in capital expected if some types of shocks materialise.

The outcome of a properly designed macroprudential stress test can then be interpreted as the measurement of the macroprudential stance. The evolution of credit and GDP under the adverse scenario rests on the calibration of macroprudential instruments. The deterioration of economic conditions in adverse but plausible circumstances as described by the stress test will be a measure of policy preferences regarding the targeted level of financial stability.

Last, especially for what concerns the solvency of banks, stress tests have been widely used as communication tool about the system resilience and over policy decisions (e.g. action or inaction for a certain measure).



5.3 The role of the macroprudential stance in policy communication

The communication of the macroprudential policy stance would help to explain policy action or inaction and manage expectations. Explaining policy action or inaction may increase the acceptability of policy decisions. It also allows market participants to learn about policymaker preferences, and to learn where the authority would like to see the financial system and the economy. High accountability and forward guidance can in turn increase effectiveness of the policy (affecting its transmission).

So far macroprudential communication has usually been conducted by instrument rather than by risks or resilience. For instance, selected authorities have published strategic papers providing a comprehensive framework for the implementation of one or more macroprudential instruments, and communication is strictly connected with these frameworks. The communication of the stance requires a shift toward the communication of risks and resilience. It necessitates putting emphasis on the overall level of residual systemic risk and linking this to policy actions.

The communication of the macroprudential policy stance may need to recognise the multi-dimensionality of macroprudential policies and systemic risks. In this regard, some simple rules could be followed. The communication could first focus on the state of the cycle and then explain the indicators of risk and the policy/resilience in place. It may also be clearer (and more useful for the different addresses) to have first a communication on sectoral stances (e.g. real estate sector), that could be then aggregated in order to give the broader picture of how the different systemic risks are interconnected and how the policies in place act together to address those risks, with a final statement on the overall stance.

Given its complexity, an even greater effort should be made to ensure effective communication of the macroprudential policy stance. As suggested by recent interviews with macroprudential policymakers (summarised in more detail in Annex 7.4) the communication of the stance may require a different language and a different emphasis for different audiences e.g. the public versus the banking sector. It may be also desirable to communicate the stance regularly e.g. quarterly/biannually and separate this communication from a particular instrument setting. Thus, the communication of the stance would become separated from any announcement of policy changes, following the point-in-time assessment of the stance itself (e.g. yearly, in view of fulfilling any reporting obligations to the Parliament/Government).

It is also important to consider the potential negative impact of communication on systemic risks: where the publication of a macroprudential stance assessment may jeopardise the stability of the financial system, the information provided regarding the justification for (re)setting macroprudential policy may not be included in the announcement.



6 Conclusions and next steps

This report presents some initial considerations on the development and use of a common framework for the macroprudential policy stance. Such a framework, if successfully implemented, could help support macroprudential policymakers in their decision-making process to ensure sufficient and appropriately targeted macroprudential policies.

The risk-resilience framework has been considered appropriate to utilise as the foundation for the macroprudential stance assessments. A policymaker can determine the overall level of the macroprudential stance by comparing the level of systemic risk with that of resilience in the system, whilst also accounting for the effectiveness of implemented macroprudential policies.

It has been proposed that the assessment of the macroprudential stance and policy action is a two-tier process, with the stance assessment of implemented policy measures being separate from the assessment of costs and benefits of potential adjustments to macroprudential policy. The macroprudential stance assessment addresses the question how tight or loose the macroprudential policy stance is at a given point in time and the policy assessment addresses the question whether policy adjustments are needed.

It is envisaged that the work on the conceptual aspects of the macroprudential stance framework would be further developed into an operational framework over the medium term. Macroprudential authorities could use such a framework when conducting their assessment of risk and resilience and analysing the appropriateness of their macroprudential responses. This would require the development of a quantitative concept which is transparent and flexible enough to allow and encourage implementation by national authorities.

The second phase of the work on the macroprudential stance may advance the concepts of the Growth-at-Risk model, the use of stress testing and the understanding of the aggregation of stances. In addition, as with all applications of policy, efficient and effective communication is critical to successful implementation and so further efforts could be made in determining the best approach to communicating decisions made after a macroprudential policy stance assessment.

This next step to further develop the concepts presented in this report requires cooperation among the ESRB membership and ESRB working groups. It is envisaged that the operationalisation of the macroprudential stance framework will have a significant positive impact on the progression and understanding of macroprudential policy across Europe.



Annex

A.1 Lessons from and comparisons with monetary and fiscal policy

The concept of stance in both monetary and fiscal policy is often only defined implicitly, and varies greatly across institutions and over time. Monetary policy stance has been used to refer to both the intentions of policymakers (ex ante) and the actual impact of policy on the real economy (ex post); fiscal stance has likewise been used to refer to the level of procyclicality, the degree of success in stabilising the economic cycle, the immediate intention of the policy to expand or contract policy, the appropriateness of the trade-off between spending and taxation, or the overall discretionary spending decisions of the various governments.

This variation is partly because a single concept of stance cannot incorporate a complete analysis of all relevant policies targeted towards the objective. Monetary policy stance, for example, rarely takes more than three category labels (“loose”, “neutral” or “tight”), or two directions (tighter, looser). These three options are clearly insufficient to describe the full complex range of monetary policy instruments or the impact that they can have on all real economic, financial and monetary variables. In the same way, fiscal policy stance can also take one of three labels: “expansionary”, “neutral” or “contractionary”. Each label summarises the net budget position. It neither outlines the exact form of spending or taxation, nor indicates whether policy is procyclical or countercyclical.

A more comprehensive understanding of monetary stance did not appear until after an indicator was identified. It was not until money supply began to be used as an indicator of policy that the term “stance” began to appear frequently in official documents. Furthermore, it was not until the move to monetary targeting in the mid-1970s that monetary “stance” was linked to any form of scale. The labels “restrictive” and “easy” were then repurposed to mean allowing and limiting money supply growth, respectively. The concept of stance is continuously evolving. For instance, interest rates have a lower bound, and consequently the monetary policy platform has had to expand to include liquidity injections, which do not fit with the existing policy rules.

The concept of monetary policy stance has become increasingly normative as the monetary policy rules linking indicators (e.g. the interest rate) to levels of the target variable (e.g. inflation) could be identified. These rules establish a feedback loop between the objective and the indicator, and provide suggestions as to the appropriate levels of the indicator given the level of the target. These rules also helped to establish the now largely consensus view that an inflation rate of around 2% for developed economies is considered to be optimal.

Indicators are not the same as target variables, or (usually) the level of the instruments. In monetary policy, inflation is not commonly used as the target variable, and fiscal stance is not usually measured based on GDP. Using indicators as target variables would mean that deviations



from the ideal values of the indicator are all attributed to the policymaker, with no room for exogenous factors. If some combination of the level of instruments is used, then the indicator is purely descriptive. Since the central bank has complete control over the monetary policy instruments, the instrument level simply summarises its actions. In practice, the summary indicator for monetary policy usually contains a stochastic or exogenous component as well.

Converting the values of the indicator into the measure of stance requires defining reference values, which can be a complex process. Reference values depend also to some degree on the objective: the San Francisco Fed defines a “neutral” monetary stance as monetary policy that neither speeds up nor slows down economic growth. In fiscal policy, reference values are adjusted if the indicator cannot separate structural and cyclical factors: fiscal stance is determined relative to structural factors and the neutral fiscal policy is adjusted to reflect the current point in the economic cycle.

Stance can support either a single objective, or multiple objectives. For example, the ECB has the single primary goal of maintaining price stability; the US Federal Reserve’s stance reflects the relative preference given to reducing inflation versus stimulating growth. Similarly, fiscal stance can be defined with respect to just one primary objective, such as long-term sustainable government debt, as per the Stability and Growth Pact. If the two objectives do not compete directly, then stance will need to be defined along two dimensions. For example, fiscal stance can be defined along the dimensions of sustainable-unsustainable and procyclical-countercyclical. There does not appear to be any precedent in either fiscal or monetary policy for a concept of stance that contains more than two objectives.

The objective may be cyclical and/or structural. In the case of monetary policy, stance is generally taken relative to the cycle – that is, in times when cyclical inflation is being targeted for reduction then policy is “tight”. Fiscal stance in contrast adjusts for cyclical factors (automatic stabilisers are often stripped out). However, cyclical and structural policies can affect one another non-linearly – in the case of fiscal policy, it has been argued that improving fiscal balances has led to a deterioration of budget compositions in the EU.

Ideally, the objectives should also be measurable. However, fiscal sustainability is not easily measurable. As a result, any assessment of the policy stance is subject to the modelling technique used. Furthermore, it places more reliance on the chosen indicator to operate as an intermediate target and hence drive policy decisions.

The relevant policies (for the purposes of defining stance) can be defined very broadly, due to interaction between different groups of policies. For example, monetary policy interest rates affect the rates at which governments can borrow for fiscal spending. Fiscal stance does not outline all the instruments used, but summarises net discretionary fiscal spending.

Stance also plays an important role in monetary policy in managing expectations, which are vital to the effective transmission of monetary policy. This role has been less important in fiscal policy as the result of political and ideological factors, lack of continuity (or certainty) in the tenure of decision-makers, etc.



Comparison with monetary and fiscal policy

The macroprudential stance framework can be compared with the frameworks commonly used for monetary policy and for fiscal policy (see Table A1). A simplified illustration of the monetary policy stance is an assessment of the implemented short-term interest rate with the one implied by a reference, e.g. the Taylor rule. In this example, the assessment would detect a tight monetary policy stance if the monetary policy rate is above the one implied by the Taylor rule. Conversely, it would be loose if the monetary policy rate would be below the one implied by the rule. Statistical and model uncertainty surrounding the specifications of the Taylor rule can generate a range of monetary policies that a stance assessment would consider neutral. The monetary policy stance assessment remains distinct from the assessment to adjust monetary policy. This is conducted in a second step. Indeed, following the global financial crisis, the effective lower bound on nominal interest rates may have created in numerous countries a situation in which monetary policy was to be considered tight (relative to a standard specification of the Taylor rule), even though nominal interest rates were at historically low levels. Notwithstanding such a tight stance, a policy action assessment has led central banks not to adopt further cuts in the monetary policy interest rates given the relative costs and benefits, although alternative policy measures were taken such as asset purchase programmes (or quantitative easing) to achieve their objective of price stability. Situations may therefore arise in which the macroprudential stance remains tight or loose and the assessment for policy action does not lead to policy changes given the instruments available to policymakers.

Table A.1
Comparison between monetary, macroprudential and fiscal policy stance

	Monetary policy	Macroprudential policy	Fiscal policy
Policy objective	Price stability	Financial stability	A combination of (short-term) stabilisation and (long-term) sustainability
Target variable/articulation of objective	Inflation	Potential level of the systemic risk	Output gap closure, debt-to-GDP ratio
Policy instruments	Short-term interest rate, QE	e.g. capital buffers, LTV/DTI limits, etc.	e.g. tax rates, spending level
Summary indicator of policy instruments	e.g. overnight rate	e.g. capital ratio	Net budget position
Measurement of stance	Deviation of r from the equilibrium real r	Residual systemic risk	e.g. summary of net discretionary fiscal spending
Evaluation of policy (separate to stance)	Evolution of HICP	Evolution of systemic risk	e.g. long-term sustainability of government debt



A.2 Literature on the impact of policy instruments on intermediate targets

Table A.2

Literature on the impact of policy instruments on intermediate targets

Type of instrument	Intermediate target/measure of systemic risk	Studies	Effect
Borrower-based measures	Overall credit growth	Lim et al. (2011); Cerutti et al. (2017) ⁶⁴ ; Akinci and Olmstead-Rumsey (2018) ⁶⁵ ; Budnik (2018); Budnik and Ruenstler (2018) ⁶⁶	LTV and DTI caps decrease credit growth, but the effect is in general less pronounced in advanced economies relative to emerging and developing countries
	Household credit growth	Cerutti et al. (2017); Budnik (2018)	Borrower based measures (LTV and DTI) curb HH credit growth
	House price growth	Kuttner and Shim (2016); Cerutti et al. (2017); Zhang and Zoli (2016) ⁶⁷	Decrease in LTV tends to be associated with lower house price growth
	Housing credit growth	Kuttner and Shim (2016)	Lowering DTI attenuates housing credit growth
	Bank leverage	Claessens et al. (2013) ⁶⁸	Both LTV and DTI caps reduce leverage, LTV by 0.75 percentage points and DTI by 1.1 percentage points.
Financial institution-based measures	Overall credit growth	Cerutti et al. (2017); Budnik (2018); Budnik and Ruenstler (2018)	Financial-institutions based measures as a group are significantly associated with lower credit growth in emerging economies, but not significantly in advanced economies
	Bank leverage	Lim et al. (2011); Claessens et al. (2013)	Ceilings on credit growth, caps on foreign currency lending and countercyclical capital requirements are found to be effective in reducing leverage.
	House price growth	Vandenbussche et al. (2015)	Marginal reserve requirements on foreign funding and marginal reserve requirements linked to credit growth have some impact on house price growth.
	Systemic liquidity	Lim et al. (2011)	Limits on maturity mismatch limit wholesale funding
	Capital inflows	Lim et al. (2011)	Limits on financial institutions' net open foreign currency position reduce exposure to foreign liabilities

⁶⁴ Cerutti, E., Claessens, S. and Laeven, L., "The use and effectiveness of macroprudential policies: New evidence", *Journal of Financial Stability*, Vol. 28, 2017, pp. 203-224.

⁶⁵ Akinci, O. and Olmstead-Rumsey, J., "How effective are macroprudential policies? An empirical investigation", *Journal of Financial Intermediation*, Vol. 33, 2018, pp. 33-57.

⁶⁶ Budnik, K. and Rünstler, G., "The dynamic effects of macroprudential policies in the euro area: Evidence from the Bayesian narrative panel VAR", mimeo, 2018.

⁶⁷ Zhang, L. and Zoli, E., "Leaning against the wind: Macroprudential policy in Asia", *Journal of Asian Economics*, Vol. 42, 2016, pp. 33-52.

⁶⁸ Claessens, S., Ghosh, S. R. and Mihet, R., "Macro-prudential policies to mitigate financial system vulnerabilities", *Journal of International Money and Finance*, Vol. 39, 2013, pp. 153-185.



A.3 Aggregation of the macroprudential stance

Consider a general representation of a macroprudential policy stance which potentially allows for (i) interactions between elementary financial stability risks (e.g. cyclical and structural), and (ii) interactions between different macroprudential policy instruments. This could also allow for the derivation of the “optimal” stance assuming the policy preferences (and costs and benefits of implementation of different policy options) are known. Empirical operationalisation of the macroprudential stance poses many challenges. Trials run by the expert group revealed that to make such aggregation feasible and policy relevant, the consensus has to first be reached regarding the measurement of elementary stances.

Given the challenges exemplified in Sections 5.2.1 and 5.2.2., a general representation of a macroprudential policy stance should address the following postulates:

- accommodate co-existence of many macroprudential instruments;
- allow describing financial stability as a function of financial stability risks, including insufficient system resilience;
- incorporate interactions between policy instruments, between elementary risks, and between policy instruments and risks; and
- “replicate” the Tinbergen principle⁶⁹.

The level of the macroprudential policy stance S^* can be (sufficiently generally) represented by a polynomial of degree 2 in elements of R (a vector of financial stability risks and insufficient resilience) and I (a vector of macroprudential instruments). This approach is a generalised form of the approaches used so far in monetary policy, for instance, regarding the real interest rate or MCI indicators that account also for foreign exchange component. For instance, for one instrument and one risk:

$$S^* = a_0 + a_1 R_1 + a_2 I_1 + a_3 R_1^2 + a_4 R_1 I_1 + a_5 I_1^2$$

The calibration of parameters of the polynomial will capture that policy stance becomes looser when a risk becomes more elevated and it tightens with an increase in a policy instrument. Second degree of the polynomial can capture also non-linear effects, i.e. state dependent effectiveness of instruments. For instance, the effectiveness of the instrument decreases when it is already calibrated at a high level. Financial stability deteriorates stronger with an increase of risks from an already elevated level, reflecting non-linear effect of risks, or when a risk becomes more elevated. Other useful characteristics that could be modelled in such a setup include the interactions between risks (e.g. positive feedback loop between bank risk-taking and household indebtedness) or between instruments (e.g. tightening of CCyB moderates risks relatively less when households are already subject to high LTV limits), as well as a comparative advantage of some instruments in targeting certain risks.

⁶⁹ Tinbergen divides variables between targets, i.e. those macroeconomic variables the policymaker wishes to influence, and instruments, i.e. the variables that the policymaker can control directly. Tinbergen emphasised that achieving the desired values of a certain number of targets requires the policymaker to control an equal number of instruments.



Such a representation has a few additional desirable properties. It is:

- suggestive: it narrows down the discussion on how to measure the stance to a closed set of parameters;
- universal: one can select subsets of instruments and risks, and experiment with sectoral or general stances;
- “additive”: one can also define the overall stance as a combination (weighted product) of sectoral stances;
- operational (indicates a way forward for empirical applications): instruments may be measured by instrument calibration (e.g. the size of a buffer), risks by simple or composite indicators (e.g. credit-to-GDP cap), coefficients may be sourced from existing (or developed) empirical literature or calibrated;
- encompassing: stance can be defined in positive and normative terms (if it accommodates the optimal level of target variables), it can keep track of existing trade-offs and complementarities between various policy targets by incorporating weight attributed to each one (i.e. the degree of risk tolerance).

The representation can also encompass the spillover effects by extending R vector for e.g. foreign variables, and forward-looking elements, by extending R vector for R in future periods.

A polynomial of degree 2 in elements of R and I has matrix representations. This eases notation and referencing, polynomial manipulation, as well as testing of the different properties of the stance. In addition to that, empirical implementation and later applications such as a decomposition of changes in stance into the contributions of single risks and instruments could be conceivable.

The core weakness of the approach is challenges posed by its operationalisation. These relate to the necessity to describe multiple elements of the macroprudential framework about which our knowledge is often relatively limited. As discussed at length in this chapter, the methods of measurement of risk, resilience or instruments are far from crystallised. The parameters of the polynomial would require concluding the discussion on the impact of diverse instruments on various systemic risk and resilience indicators and describing policy preferences.

A.4 Interviews with macroprudential policymakers

The interviews were conducted in August 2018. They involved 8 high-level officials at national authorities who are directly involved in macroprudential policy decision processes. The interviews were inspired but not limited to the following questions: (i) did you: (1) anticipate, (2) face communication challenges when communicating macroprudential actions (or inactions) over the last three years? Could you please describe these events? Did anticipated versus experienced challenges overlap? (ii) What were the key topics of public concern? Which messages were difficult to get across the public? (iii) How did you address these challenges? Which elements of policy framework did you emphasise? (iv) How did you communicate the overall framework, in particular the interaction with other macroprudential measures and their impact?



The following points summarise the main findings:

Communication challenges and solutions do not seem to differ between jurisdictions with different forms of macroprudential arrangements, i.e. multi-institutional or uni-institutional.

A relatively large share of authorities applied forward guidance about future policy directions. Forward guidance allows the industry to adjust their capital plans and may avert criticism of policy actions.

Many authorities start communication of policy decisions early in the process, i.e. they follow “progressive communication”. The communication process starts 1.5 to 2 years ahead of the decision. The communication gradually evolves involving more detailed assessments of risks and stronger language (e.g. if trends are confirmed, a measure will be introduced). Two reasons for progressive communication were named. Firstly, robust assessment takes time and forecasts need to be at least partially confirmed before deriving policy, which necessitates an early start. Second, communication to the public often requires much time and planning as the wider public is not very familiar with macroprudential policy and thus needs to be “educated” by authorities.

The core challenges of communication on macroprudential policies include (i) communicating the preventive role of macroprudential policies (policies are triggered by future unobserved risks, while the costs of policies have to be borne today), (ii) misinterpretation of preventive measures (a preventive policy may be perceived as a signal of stress), (iii) overcoming complacency with the current situation (difficult to alert the public about the low probability risks when the current situation is positive), (iv) introducing measures targeting resilience (the public better understands “smoothing the cycle” measures e.g. moderating credit growth and house price growth), (v) difficulty of acting early in the financial cycle, (vi) misinterpreting the design and exaggerating the effect of a measure, (vii) risks related to the political cycle (policies introduced ahead of elections may trigger heavier general discussions).

- Regarding the risk, a narrative-based communication is followed most often, and is often (but not always) supported by the selection of indicators. In respect of the latter, a suite of indicators (both for CCyB and borrower-based measures) is most common. Even authorities that published the methodology papers that (i) provide information on groups of indicators observed, (ii) provide a few methods for calibrating a measure (CCyB), emphasise the role of policy discretion.

The interest in and the response to different macroprudential measures varies: interest is lower for capital-based measures, especially O-SII or SRB, moderate for CCyB and high and broad for measures targeting real estate sector exposures. Also, the audiences differ: for capital-based measures it is mostly industry (bank associations, chief economists), for borrower-based measures (or other measures targeting real estate sector) it is the public, politicians, the construction sector (and workers) and the press.

Accordingly, good communication needs to reach to different audiences and inform them about macroprudential policies. For the public, the communication should not be too complex and involve a degree of education. For politicians, growth considerations may need to be emphasised more. Otherwise, communication may be stepped up by enlarging the number of channels (and frequency): working papers, statements, targeted seminars, meetings with the representatives of



the industry or members of parliament, press conferences, focused presentations to the public, e.g. on housing, topical evaluations, cross-country comparisons.

A.5 Glossary

This glossary is included to facilitate the reading of the report only. Given the preliminary nature of the stance, it is not intended to provide any new definitions over and above what has already been defined.

Appropriateness: conceptual suitability of an instrument given the nature and timing of risks.

Effectiveness: the transmission mechanism: a degree to which the instrument can address market failures and achieve the ultimate and intermediate objectives.

Efficiency: the potential of the instrument to achieve the objectives or a benefit at a minimum or proportionate cost.

Financial stability: a state whereby the build-up of systemic risk is prevented.

Indicator: a measure summarising the position of instruments of relevant policies, to a certain extent reflecting the impact of the macroprudential policy actions. For instance, bank capitalisation level is an indicator implying a certain level of resilience and predictably reflecting the policy measures (capital buffers, etc.).

Macroprudential instrument: a policy lever that is primarily used by authorities for macroprudential purposes. While it can be difficult to define exactly what constitutes a macroprudential measure, in the scope of the stance work, any instrument which is used for macroprudential purposes is considered.

Objective of macroprudential policy: “The ultimate objective of macro-prudential policy is to contribute to the safeguard of the stability of the financial system as a whole, including by strengthening the resilience of the financial system and decreasing the build-up of systemic risks, thereby ensuring a sustainable contribution of the financial sector to economic growth.” The ultimate objective of macroprudential policy is financial stability.

Resilience: the capacity of the financial system to withstand shocks, while continuing to provide its products and services to the real economy. The ultimate aim of resilience is to maintain the functionality of the financial system, reflected in a continued provision of its services to the real economy.

Risks: situations where the distribution of future outcomes is known and hence measurable, or in macroprudential policy, those risks for which an economic and financial transmission together with their likelihood can be formulated.

Sufficient policy: a policy expected to significantly mitigate, or reduce the build-up of, risks over an appropriate time horizon with a limited unintended impact on the general economy.



Systemic risk: the risk that the provision of necessary financial products and services by the financial system will be impaired to a point where economic growth and welfare may be materially affected.

Uncertainties: differing from risks in not being susceptible to measurement; hence, cannot be predicted.

Vulnerabilities: inability to withstand adverse events, reflecting weaknesses in balance sheet, operational and business processes.



Legal notice and acknowledgements

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The cut-off date for the data included in this report was September 2018.

ISBN 978-92-899-3839-6 (pdf)
DOI 10.2866/908854 (pdf)
EU catalogue No QB-02-19-199-EN-N (pdf)