

Strategic Framework for Macroprudential Policy at the Bank of Slovenia

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Introduction

The global financial crisis of 2007 and 2008 made it clear that previous economic policy was not enough to maintain financial stability. The bodies responsible for supervising the financial system lacked a proper mandate, and also the analytical tools and instruments to eliminate or mitigate systemic risks. It became evident that new macroprudential policy was needed to fill this gap. Macroprudential policy augments microprudential policy by reducing systemic risks and establishing resilience to systemic risks. In the event of conflicts between the two, it is the systemic macroprudential policy aspect, which must take precedence.

Macroprudential policy aims to identify, monitor and assess systemic risks to financial stability for the purpose of safeguarding the stability of the entire financial system, which includes strengthening the resilience of the financial system, and preventing and mitigating the build-up of systemic risks, thereby ensuring a sustained contribution to economic growth from the financial sector. However, merely defining a policy is not enough. A policy only becomes effective when it is made operational. Macroprudential authorities set out their macroprudential policy strategy in line with the Recommendation of the European Systemic Risk Board (ESRB) on the intermediate objectives and instruments of macroprudential policy (ESRB/2013/1). This strategy is crucial towards well-functioning policies.

With this document the Bank of Slovenia is putting in place a strategic framework for using macroprudential instruments under its direct control to meet the intermediate objectives of macroprudential policy. In accordance with Recommendation ESRB/2013/1, identifying the intermediate objectives of macroprudential policy is a key step, as it makes macroprudential policy more operational, transparent and accountable. It also provides the basis for the selection of instruments.

The process by which macroprudential policy is implemented has already been partly set out in legislation at the national level and at EU level. The Bank of Slovena's mandate to strive for financial stability in Slovenia by pursuing macroprudential policy is set out by the Bank of Slovenia Act (the ZBS-1¹), the Banking Act (the ZBan-3²) and the Macroprudential Supervision of the Financial System Act (the ZMbNFS³).

¹ Official Gazette of the Republic of Slovenia, No. 72/06 with amendments.

² Official Gazette of the Republic of Slovenia, No. 92/21 with amendments.

³ Official Gazette of the Republic of Slovenia, No. 100/13 with amendments.

Macroprudential policy is a policy for identifying, monitoring, assessing and reducing or preventing systemic risks to financial stability with the aim of preserving the stability of the entire financial system, thereby ensuring that the financial system makes a sustainable contribution to economic growth. This includes increasing the resilience of the financial system, and preventing and reducing the build-up of systemic risks, in part by using macroprudential measures. This will ensure that the financial sector makes a sustainable contribution to economic growth.⁴

Financial stability can be defined as a state when the financial system is able to carry out financial intermediation without disruption, thereby supporting sustainable economic growth.

Systemic risk is defined as the risk of disruptions in the financial system that could have serious adverse effects on the functioning of the financial system and the real economy. There are two dimensions to systemic risk: cyclical and structural. The cyclical dimension relates to the evolution of risks in the financial system over time, while the structural dimension relates to the distribution of risks across the financial system. Both dimensions of systemic risk demand a specific response from macroprudential policy.

The global financial crisis of 2007 and 2008 showed around the world that there was failure to detect emerging financial instability in timely fashion. Even where the problems were properly identified, the right tools for resolving them were not available. There was a general belief that threats to financial stability could be successfully managed by microprudential policy tools and monetary policy. However, this belief proved to be wrong, and the scale of the crisis demanded major changes: the introduction of macroprudential policy. This takes account of the risks to financial stability at the national level, as the attributes of financial systems and financial cycles vary from country to country. There are also mechanisms of international collaboration on macroprudential policy, particularly between euro area countries and EU Member States.

Macroprudential policy differs from other economic policies in:5

- the objective: to limit systemic (not individual) risks and to increase the resilience of the entire financial system to shocks (i.e. preserving the stability of the financial system);
- the scope: a focus on the financial system as a whole and its interactions with the real economy, in contrast to individual areas of other policy, which treat the rest of the system as exogenous;
- the set of powers and instruments.

Macroprudential policy may have side effects: the level of financial intermediation can be less than optimal, which could have an adverse impact on the real sector. This document presents the strategic framework used by the Bank of Slovenia to safeguard financial stability, while taking into account of the potential side effects. It endeavours to make sure that the long-term benefits of macroprudential policy prevail over the adverse side effects.

⁴ Article 2 of the ZMbNFS; ESRB: ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector, 2018 (the ESRB Handbook, 2018).

⁵ Financial Stability Board, IMF and BIS: Macroprudential policy tools and frameworks: update to G20 Finance Ministers and Central Bank Governors, 14 February 2011.

Institutional arrangements of macroprudential policy

The macroprudential mandate in Slovenia is regulated by the ZMbNFS. This defines the status, objectives, tasks, powers and operation of the Financial Stability Board (FSB), the way in which macroprudential supervision is conducted in Slovenia, and the tasks, powers, supervisory measures and instruments, and functioning of the supervisory authorities in the area of macroprudential supervision. Under the adopted legislative framework, the macroprudential authority is the FSB. Its task is to formulate macroprudential policy, which is then implemented in conjunction with the Bank of Slovenia, the Insurance Supervision Agency (ISA), and the Securities Market Agency (SMA).

Two representatives from each supervisory authority (Bank of Slovenia, ISA and SMA) and two representatives of the finance ministry sit on the FSB. Each member of the FSB has one vote, except the finance ministry representatives, who in keeping with the principle of safeguarding the independence of the FSB have no vote. The FSB meets at least four times each calendar year.

The Bank of Slovenia plays the lead role on the FSB, based on the ESRB Recommendation on the macroprudential mandate of national authorities (ESRB/2011/3), and in light of the banking sector's key role in the Slovenian financial system. The FSB is chaired by the Governor of the Bank of Slovenia.

Macroprudential supervision requires all of the aforementioned national authorities to work together closely, as it is they who supervise their own segments of the financial system, while risks inherent in one segment can spill over to the entire financial system if they are not identified quickly and effectively. The interconnectedness of financial institutions and markets means that risk monitoring and assessment need to be based on a broad set of macroeconomic and financial data.

The effectiveness of macroprudential policy also depends on the alignment between EU Member States with regard to the use of macroprudential instruments at the national level. The ZMbNFS requires the supervisory authorities and the FSB to work together to exchange data with the supervisory authorities of other EU Member States, the ESRB, the Single Supervisory Mechanism (SSM) and other international financial institutions, to the extent and in the ways set out by EU regulations. Their work to ensure the effectiveness of macroprudential supervision means that the Bank of Slovenia representatives are involved in the functioning of the Eurosystem, the European System of Central Banks (ESCB), the SSM, the European Banking Authority (EBA) and the ESRB.

The FSB may propose that a supervisory authority use supervisory measures and instruments in response to identified risks to financial stability. Its guidance can take three different forms (recommendations, warnings and instructions), depending on to the severity of the identified threats. The supervisory authorities respond according to the principle of "act or explain". The FSB decides on a case-by-case basis whether it will publish the guidance. Guidance may be issued as part of the ordinary process of identifying, monitoring and assessing systemic risks to financial stability carried out by the FSB, or in response to warnings and recommendations issued by the ESRB or the ECB. As the recipient of ESRB measures in the area of banking, the Bank of Slovenia reports on measures that have been adopted on the basis of ESRB warnings or recommendations.

The Bank of Slovenia periodically updates the European institutions with regard to any changes in macroprudential policy. The ECB may tighten macroprudential policy instruments at its own discretion; their introduction is prescribed by EU legislation.⁶

⁶ Directive 2013/36/EU, also known as the CRD.
Regulation (EU) No 575/2013, also known as the CRR.
Regulation (EU) No 1024/2013 of 29 October 2013.
Regulation (EU) No 468/2014 ECB of 16 April 2014 (ECB/2014/17).

Legal framework

The European legal framework for macroprudential policy consists of Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms (CRR),⁷ Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms (CRD),⁸ Regulation (EU) No 1024/2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions and guidelines issued by the ESRB, the ECB and the EBA. Under Regulation (EU) No 1024/2013, the ECB has the option of tight-ening measures adopted by national authorities that proceed from European legislation (the CRD or the CRR).

The ZBS-1 grants the Bank of Slovenia a general mandate to ensure financial stability, while upholding the principles of an open market economy and freedom of competition.

The legal framework for implementing macroprudential policy in Slovenia is set out by the ZMbNFS. This law sets out the general guidance for implementing macroprudential policy that applies to the financial system. The CRD IV (and its subsequent amendments) was transposed into Slovenian law by the ZBan-2,¹⁰ which was succeeded by the ZBan-3 in 2021, thereby providing a detailed legal framework for the Bank of Slovenia's macroprudential policy decisions.

The Bank of Slovenia issues general regulations and individual legal acts for implementing macroprudential policy in accordance with the ZMbNFS and the ZBan-3. The secondary legislation (general regulations) is approved by the Governing Board of the Bank of Slovenia, and is published in the Official Gazette of the Republic of Slovenia. The Governing Board also issues individual legal acts addressed to banks in accordance with the ZBan-3.

⁷ OJ EU L 176 of 27 June 2013.

⁸ OJ EU L 176 of 27 June 2013.

⁹ OJ EU L 287 of 29 October 2013.

¹⁰ Official Gazette of the Republic of Slovenia, No. 25/15 with amendments.

4.1 Microprudential and macroprudential policy

Microprudential and macroprudential policy are closely related, but their short-term objectives can be contradictory, although in the long term they complement each other. The interaction might be described thus: the health of individual financial institutions is a necessary but not sufficient condition for financial stability.¹¹ In any conflict between the two policies, it is macroprudential policy, with its systemic aspect, that must take precedence.

The objective of microprudential supervision is to ensure the safety and solidity of individual banks. Another objective of microprudential supervision is to limit the damage caused to depositors in the event of any bank ceasing to operate. The purpose and scope of the microprudential supervision conducted by the Bank of Slovenia are set out in the ZBan-3. Under this law banking supervision focuses on assessing the risks that banks are or might be exposed to in their operations. Microprudential supervisory activities also include checks on supervised entities' compliance with macroprudential measures.

The two policies encourage the build-up of capital and liquidity reserves in the upswing of the financial cycle, but differences may be evident in the timing of measures and the scale of the required reserves, given their divergent approaches to meeting their objectives. For example, microprudential policy requires a higher level of bank capitalisation when systemic risks materialise, while macroprudential policy tries to stabilise the system as a whole, and focuses on preventing excessive deleveraging pressures, e.g. by releasing capital buffers.

4.2 Monetary policy and macroprudential policy

Monetary policy and macroprudential policy overlap in several aspects, as they both affect the financial system via a similar transmission mechanism. Monetary policy is formulated at Eurosystem level for the entire euro area, while macroprudential policy mainly remains a national competence.

Monetary policy may have an impact on financial stability via its effect on:

- the level of interest rates, and thus on borrowing costs;
- the risk appetite of financial intermediaries;
- asset prices and exchange rates.

The Bank of Slovenia monitors the effects of monetary policy on financial stability, and takes them into account when deciding on its macroprudential policy stance.

¹¹ Osiński, J., Seal, K. and Hoogduin, L.: Macroprudential and Microprudential Policies: Towards Cohabitation, IMF Staff Discussion Note (SDN 13/05), June 2013.

Intermediate objectives of macroprudential policy

The purpose of the intermediate macroprudential policy objectives is to operationalise the ultimate objective of helping to preserve the stability of the entire financial system, thereby making a sustainable contribution to economic growth. In addition to improving operationalisation, they also help to increase the transparency and accountability of macroprudential policy.

The ESRB recommends that macroprudential authorities pursue intermediate objectives to help meet the ultimate objective of macroprudential policy: a stable and resilient financial system. In accordance with Recommendation ESRB/2013/1, identifying the intermediate macroprudential policy objectives makes macroprudential policy more operational, transparent and accountable, and provides a basis for the selection of instruments. Slovenia has introduced the following intermediate objectives in line with the recommendation:

- to mitigate and prevent excessive credit growth and excessive leverage;
- to mitigate and prevent excessive maturity mismatch and market illiquidity;
- to limit direct and indirect exposure concentrations;
- to limit the systemic impact of misaligned incentives with a view to reducing moral hazard;
- to strengthen the resilience of financial infrastructures and the operations of institutions.

The first two intermediate objectives primarily address cyclical systemic risks, while the last three cover the challenges of structural risks, which are mostly independent of the phase of the financial or business cycle.

5.1 Description of intermediate macroprudential policy objectives

5.1.1 Mitigate and prevent excessive credit growth and excessive leverage

This intermediate objective primarily addresses cyclical systemic risks. These are the result of the uncontrolled evolution of the financial cycle, to which banks also contribute via overly cyclical behaviour in the loan approval process. The duration and amplitude of the financial cycle often do not match the duration and amplitude of the business cycle, although they interact strongly. In addition to credit growth and real estate prices, prices of financial assets also depend on the evolution of the financial cycle, and are therefore an important additional indicator of the phase of the financial cycle. The course of the financial cycle can be described by the course of the credit cycle, and also by the evolution of other price and volume financial variables.

The banks' procyclical behaviour in the loan approval process strengthens the expansive phase of the financial cycle. Their procyclical behaviour is seen in the relative adjustment of loan terms, and in changes to the appetite for financial risk over the cycle. During times of economic expansion, business optimism increases the banks' appetite for taking up additional risk, while the chances of a larger volume of loans being approved increases at the same time (ESRB, 2013; FSB, 2011). This is particularly the case for business environments where bank loans are the prevailing form of financing in the economy. Excessive credit growth and leverage are significant indicators of a potential financial crisis (ESRB, 2013). Excessive credit growth and growth in leverage are also reflected in an increase in credit risk. This is the risk of loss resulting from the debtor's failure to perform their obligations to the lender, and derives from the debtor's inability to meet their financial liabilities on time because of illiquidity or insolvency.

Credit risk and the risk inherent in the real estate market are not the only cyclical systemic risks faced by the financial system. The take-up of excessive credit risk in the expansionary phase of the financial cycle subsequently leads to additional macrofinancial imbalances and a deterioration in the financing conditions for the real sector during the contraction phase of the financial cycle. These imbalances are reflected in substantial falls in prices of real estate and other forms of financial assets.

The take-up of excessive credit risks during a time of prosperity in the financial cycle and excessive business optimism is subsequently reflected in a deterioration in credit portfolio quality at banks at the systemic level. During a time of recession, the credit risk appetite declines sharply and rapidly. Credit rationing, which reduces excessive leverage on the part of banks, is a reflection of greater caution in their behaviour, and also of increased business uncertainty. Elevated systemic credit risk, rising leverage and cyclical credit growth are the most prominent procyclical behaviours by banks, and our aim is to limit or manage them through macroprudential policy instruments.

Macroprudential policy's significant contribution to stable financial intermediation and to sustainable economic growth is also evidenced in the attainment of more stable credit standards at banks throughout the financial cycle. A significant contribution to this objective can consequently also come from the use of structural instruments, such as caps on certain indicators of credit standards (LTV, DSTI).¹² Another factor in the banks' increased resilience to procyclical behaviour over the financial cycle is the concern for maintaining capital buffers at the right levels, and the need to proactively adjust them to be countercyclical. Maintaining bank solvency through the proper timing of capital buffers adjustments increases the financial system's resilience to adverse shocks from the real sector. The intermediate objective of mitigating and preventing excessive credit growth and leverage primarily addresses cyclical systemic risks, for which reason the parameters of the majority of macroprudential instruments under this intermediate objective are adjustable over time with regard to the phase of the financial cycle (ESRB, 2015). The described approach does not apply solely to the banking sector, but also to other debt financial intermediaries, for example leasing companies. By law the Bank of Slovenia is also responsible for implementing macroprudential policy in the leasing sector.

5.1.2 Mitigate and prevent excessive maturity mismatch and market illiquidity

Maturity mismatch is defined as the gap between the average maturity of banks' assets and of their liabilities, which can lead to illiquidity. The aim of the intermediate objective is to ensure that under normal circumstances and in stress situations banks have sufficient liquid assets to repay liabilities as they fall due. During stress events or in times of increased business uncertainty, a bank with a larger maturity gap can face an increase in requests to withdraw deposits or to call guarantees, which can cause illiquidity at the bank (The Bank of Slovenia, 2017). Liquidity difficulties at one or more banks can directly (direct bank-to-bank exposure) or indirectly (via the financial markets) cause a systemic liquidity problem. Meeting this intermediate objective by means of the

¹² For more, see Table 2.

appropriate regulation of liquidity is therefore vital in meeting the ultimate objective. Increasing the banks' resilience to unexpected changes in liquidity can make a significant contribution to maintaining confidence in the stability of financial intermediation.

The liquidity position of the banking system is reflected in the greater or lesser stability and predictability of changes in the stock of bank liabilities, which is related to funding risk, and in resilience to unanticipated outflows of liabilities by means of adequate liquid assets. The banks increase their resilience to the potential emergence of risks by holding an adequate stock of liquid assets that are readily convertible amid relatively small changes in market prices. One significant factor in the management of liquidity shocks in the banking system is therefore ensuring the normal functioning of the financial markets in liquid assets, which is reflected in increased or decreased market liquidity risk. This risk is therefore specific to the financial markets, while funding risk derives primarily from an improper or imbalanced maturity structure in bank funding or excessive concentration of particular types of funding. Funding risk and market liquidity risk can be correlated, and can strengthen each other in a feedback loop. Stresses of this kind can seriously disrupt the financial intermediation process, and consequently can have a negative impact on lending to the real sector or even deepen a recession.

The objective of liquidity-based macroprudential policy is to avoid stresses of this kind by reducing funding risk and by strengthening the liquidity resilience of financial institutions (ESRB, 2015). From the perspective of financial institutions, an effective response to market liquidity risk and funding risk can be put in place through increased resilience by adjusting the asset structure with regard to the type of financial instruments, their maturities, etc. The main macroprudential instruments helping to mitigate the consequences of risks of this kind are strengthened liquidity buffers, which the banks can deploy in crisis situations.

Managing excessive maturity mismatch at banks is also a factor in the adequate management of other systemic risks, such as interest rate risk. Mismatches in the repricing of assets and liabilities give rise to the structural interest rate risk of a sudden rise or fall in interest rates, which is reflected in a decline in net interest income. Maintaining an adequate repricing gap is also an important factor in limiting systemic risks in the event of sudden external shocks affecting interest rates, or during changes in monetary policy interest rates conditioned by the management of the business cycle and inflation.

Pursuing the intermediate objective of mitigating and preventing excessive maturity mismatch and market illiquidity helps to reduce the likelihood of the realisation of the cyclical and structural aspects of funding risk and market liquidity risk, and of other systemic risks, interest rate risk for example, that are determined by the structure of financial institutions' assets and liabilities and by imbalances on the financial markets. There also needs to be recognition of the importance of efforts to maintain the banking system's resilience to external shocks, which, despite apparently manageable maturity gaps at individual institutions, can lead to illiquidity in certain asset segments at a systemic level on account of the use of collateral in the form of marketable instruments, or to major price fluctuations in such assets. The banking system's resilience to external shocks can be increased through the use of adequate liquidity and capital buffers, and by limiting the size of gaps.

5.1.3 Limit direct and indirect exposure concentrations

The aim of the intermediate objective of limiting direct and indirect exposure concentrations is to prevent excessive exposures making the financial system vulnerable, which might be evidenced during stress events either directly through balance sheet effects, or indirectly through asset fire sales and contagion between banks (ESRB, 2015). Direct concentration risks arise from large exposures to specific sectors (e.g. the real estate sector), geographical areas, or individual asset classes (e.g. assetbacked securities, government securities). Indirect concentration risks arise when a stress event weakens banks through contagion channels, such as the interconnectedness of financial institutions via assets of the same class and form, or the same segments of the financial market. In this case we can speak of the risk of contagion between financial institutions.

Direct or indirect concentration can increase over the financial cycle or business cycle. It thus gains a structural nature, which is maintained until the risks are realised and the concentration consequently decreases. Direct or indirect concentration risk can arise in several forms. Increased concentration can arise on the asset side or on the funding side, and also on the part of exposure to service providers (e.g. providers of information and communication services).

One example of increased concentration on the asset side is a reliance on funding via household sight deposits. The risk of increased exposure in the case of funding concentration may be realised as a loss of funding, which the banks have to compensate for by selling liquid assets. One example of an increase in exposure concentration on the asset side is the banking system's high exposure to assets of the same class, e.g. debt securities of a particular issuer, or loans to the same economic sectors.

Climate risks also pose a threat to the attainment of this intermediate objective. By their very nature climate risks are an additional factor of systemic risk, as their realisation adversely affects the majority of economic sectors. They are treated as predominantly structural risks with certain elements of cyclicality, and are mostly exogenous to the financial sector. The elements of cyclicality reflect the evolution of national and EU environmental policy, and not necessarily the actual economic cycle.

One feature of climate risks is the long horizon of materialisation, which can encompass several business cycles and crisis episodes, for which reason they are predominantly structural in nature. In addition, certain key factors in climate risks, such as the irregular frequency of physical risks and innovation as a prerequisite for the green technological recovery of the economy, are not dependent on the phase of the financial cycle or the business cycle. Transition and physical climate risks alike are structural in nature.

Exposure concentration with regard to transition risks is monitored mainly with regard to similar climate-sensitive or carbon-intensive sectors, while geographical attributes are a key factor accompanying physical risks.

In this context we should also highlight the component of systemic cyber risks that relates to an excessive increase in concentration of exposure to providers of information and telecommunications support, which might prove to be particularly high-risk in the event of cyberattacks. In this event external institutions such as providers of information and telecommunications services might become systemically important to the functioning of the financial system.

5.1.4 Limit the systemic impact of misaligned incentives with a view to reducing moral hazard

The scale of financial globalisation, which over past decades has increased the scope and number of ownership interconnections between financial institutions, has expanded cross-border lending and investment activity by banks. Numerous financial institutions became too big to fail, and also too complex to resolve. Given the motivation to achieve economies of scale, this problem can be pronounced in small economies, which are home to comparatively small banks. The existence of financial institutions that are too big to fail leads to moral hazard, as when making business decisions the leadership of these institutions can pursue the short-term objective of generating higher profits and increasing market share while taking up excessive risk, all the while counting on an implicit or explicit government guarantee or aid in any resolution (IMF, 2013).

Misaligned incentives give rise to increased moral hazard between particular financial institutions. This behaviour causes systemic risks that are generally structural in nature, which means that they do not change depending on the phase of the financial cycle, but mostly depend on the structure of the financial system. Risks of this kind are usually associated with systemically important financial institutions. Misaligned incentives can be caused by regulations privileging individual groups of investors and protecting certain groups of depositors, a missing or inadequate system for the resolution of financial institutions or financial infrastructure entities, or a lack of supervision of certain sectors (FSC, 2016).

Pursuing the objective of limiting the systemic impact of misaligned incentives with a view to reducing moral hazard preventively reduces the perception that certain financial institutions are too big to fail. Additional capital and liquidity requests for systemically important institutions should reflect the increased potential risks to the entire financial system that such institutions pose through the scale of and approach to their financial operations.

Excessive moral hazard on the part of financial institutions can lead indirectly to elevated income risk. This is reflected in the willingness of institutions, banks for example, to take up greater risks or to exploit their commercial power in the market with the aim of generating disproportionate income. Income risk is also reflected in the risk to sufficient income generation at banks, which is based on developments in individual components of income generation and cost control in more economically challenging circumstances. Elevated income risk does not allow banks to attain a stable income performance over the longer term without giving rise to excessive risks to the stability of financial intermediation.

5.1.5 Strengthen the resilience of financial infrastructures and the operations of institutions¹³

Strengthening the resilience of financial infrastructure and strengthening the resilience of institutions' operations is one of the key tasks of supervisory authorities in ensuring the undisrupted functioning of the financial system. Here financial infrastructure refers to payments infrastructure and market infrastructure, and also to other infrastructural systems that allow for the smooth provision of financial services (e.g. settlement systems, capital markets, cash supply). The cybersecurity of these systems has recently

¹³ These are financial institutions and those non-financial institutions that provide the former with services that are vital to their business (e.g. institutions active in the area of information and communication technology).

gained great importance. The resilience of institutions' operations refers to the maintenance of the business activities of institutions that are important to the smooth provision of financial services in the economy. Generally these are financial institutions and those non-financial institutions that provide the former with services that are vital to their business (e.g. information and communication technology). This objective aims to ensure stability in the operations of financial intermediaries, which allows for economic growth while minimising adverse shocks and uncertainties.

Financial infrastructure represents the core of the financial system, and is the first condition for its effective functioning. Financial infrastructure consists of technical systems that allow for the provision of financial services (e.g. payment and settlement services, and management of related systems). Financial infrastructure allows economic stakeholders such as households, financial corporations and non-financial corporations to access or provide access to financial services safely, effectively and at low cost.

Users of financial infrastructure are financial institutions, and also individuals and other legal entities. One special feature of financial infrastructure is that all stakeholders are in general exposed to the same systems, which are small in number. To a certain extent this interconnectedness entails co-dependence between the individual financial institution and the financial system, and problems can arise when the financial infrastructure is not functioning optimally. It is therefore vital to financial stability that financial infrastructure is resilient to any shocks resulting from the materialisation of risks. Acting preventively to avert the realisation of risks is also of particular importance in these cases.

Systemic cyber risks, a sub-category of operational risk, are highlighted as an important factor in the resilience of financial infrastructure and institutions' operations. Systemic cyber risk is defined as the combination of the probability of cyber incidents with their potential impact on the operations of banks, other institutions or financial infrastructure. This is an additional risk factor in the creation of systemic risks. The key trigger of a systemic cyber event is a cyber incident, which can threaten the cybersecurity of the information system and breaches the financial institution's security policy. Cyber resilience is therefore vital in the management of cyber risks. Cyber resilience is the capacity of a bank or any other institution to realise its mission statement through the anticipation and management of cyber risks, and fast recovery from cyber incidents.

The intermediate objective of strengthening the resilience of financial infrastructures and the operations of institutions addresses the sources of systemic risk that cannot be captured within other intermediate macroprudential policy objectives. Because the financial infrastructure itself can contribute to systemic risk in the form of the provision of critical services for which no alternative exists, from the perspective of providing these services in the event of the materialisation of systemic risks it is vital to have a security plan in place.

* * *

The Bank of Slovenia has developed a set of indicators to monitor the evolution of systemic risks as part of the process of meeting the five intermediate objectives cited, and to guide decisions in connection with the activation, deactivation and calibration of macroprudential instruments. The indicators make it possible to identify deviations from selected intermediate macroprudential policy objectives. Some of the indicators are listed in Table 1.

Table 1: List of potential indicators used by the Bank of Slovenia to assess the attainment of individual intermediate objectives

1. Mitigate and prevent excessive credit growth and excessive leverage

Year-on-year growth in net lending to the non-banking sector

Credit-to-GDP gap

Leverage ratio

Real estate prices

2. Mitigate and prevent excessive maturity mismatch and market illiquidity

Repricing gap

Ratio of liquid assets to total assets

Share of total deposits by the non-banking sector accounted for by sight deposits

3. Limit direct and indirect exposure concentrations

Number of banks potentially exposed to contagion risk

Ratio of investments in government securities to total assets

Share of deposits accounted for by the 30 largest depositors

Weighted carbon intensity of the banking system (sectoral contribution to emissions)

4. Limit the systemic impact of misaligned incentives with a view to reducing moral hazard

Return on equity

Net interest margin

Ratio of the banking system's total assets to GDP

Market share of the five largest banks

Market concentration of external providers of IT services

5. Strengthen the resilience of financial infrastructures and the operations of institutions

Year-on-year growth in the value and number of customers' payment transactions

Net issued currency in circulation

Share of all cyber incidents in Slovenia accounted for by banking

Estimated value of direct financial damage of cyber incidents

Source: The Bank of Slovenia

Note: The set of indicators is illustrative in nature, and will be expanded or modified over time with regard to the systemic risks identified and the evolution of the financial system (i.e. financial entities, markets, instruments). The Bank of Slovenia will not publish the indicator threshold levels that guide decisions in connection with the introduction, deactivation and calibration of macroprudential instruments.

5.2 Transmission mechanism of macroprudential instruments

One of the most important metrics for evaluating the potential performance of instruments is their expected transmission mechanism. This section gives a general overview of the transmission mechanism for the three main groups of macroprudential instruments: liquidity-based measures, capital-based measures and borrower-based measures.

Capital-based measures address externalities arising from strategic complementarity (e.g. the external adverse effects that result from similar behaviour by financial institutions and relate to similar exposure to credit risk or liquidity risk [ECB, 2019]). The use of these instruments reduces risks, and provides credit institutions with buffers that can be used (released) during the financial downcycle.

Borrower-based measures set quantitative constraints. Like capital-based measures, they are designed to tackle the externalities caused by strategic complementarity, although they are addressed to borrowers and not lenders. Borrower-based measures include LTV, LTI, DSTI and, in part, large exposures restrictions.

Capital-based and borrower-based measures can also be used to reduce externalities caused by interconnectedness. They include sectoral capital requirements, the systemic risk buffer, the O-SII buffer and large exposures restrictions.

Liquidity-based measures aim to reduce banks' vulnerabilities arising from (excessive) exposure to unstable funding, and to reduce the probability of shocks on the funding side. Examples of liquidity-based measures include the liquidity coverage ratio (LCR), the net stable funding ratio (NSFR), additional liquidity requirements, the unweighted limit on less-stable funding (LTD ratio), GLTDF and constraints on excessive growth in interest rates on deposits.

Figure 1 illustrates the pathways by which the tightening of three types of macroprudential instrument can affect the credit cycle or increase resilience directly or indirectly via the credit pathway. Because the Slovenian financial system is dominated by banks, it is the bank responses (green fields) that have greater prominence. A release phase follows a downturn in the financial cycle, with the aim of averting procyclicality. Release differs in crisis periods and non-crisis periods. When there is no crisis, the transmission mechanism is similar to the phase of buffer build-up, except that it is in the opposite direction. The ideal scenario in crisis times would be for buffers to absorb losses and encourage countercyclical behaviour. In reality their effect might be limited, as financial institutions' increased risk aversion encourages them to increase voluntary buffers, instead of reducing them as policymakers intend.

Capital tools that are (potentially) cyclically flexible include the countercyclical capital buffer, sectoral capital requirements, and adjustments to leverage.

Figure 1: Transmission map for capital-based instruments, liquidity-based instruments and borrower-based instruments (taken from CGFS: Operationalising the selection and application of macroprudential instruments, CGFS Papers No 48, December 2012)



Stages in the macroprudential policy decisionmaking process

The macroprudential policy decision-making process takes place over a cycle of four stages:¹⁴

- identification and assessment of systemic risks;
- selection and formulation (calibration) of macroprudential instruments;
- implementation of macroprudential instruments;
- evaluation of macroprudential policy and instruments.

The stages of the macroprudential policy cycle are illustrated in Figure 2. In practice they are closely linked, and cannot be considered in isolation. Each of the four stages of the macroprudential policy cycle is described in detail below.



Figure 2: Macroprudential policy cycle

Source: ESRB Handbook, 2018

¹⁴ Taken from the ESRB Handbook, 2018.

The Bank of Slovenia has put in place a process for identifying systemic risks. The results of this process are published in the Bank of Slovenia's regular publications, including the Financial Stability Review¹⁵ the Report on bank performance with commentary and the Monthly report on bank performance.¹⁶ Several tools are used at the Bank of Slovenia to identify systemic risks, including:

The risk dashboard provides for a link between individual systemic risks and their indicators, and the intermediate macroprudential policy objectives. It is a starting point for the decision on whether to introduce macroprudential measures. The risk dashboard gives an assessment of the level of risks in the Slovenian financial system, and its resilience to those risks. Both assessments are based on an extensive set of indicators. They are classified into groups that reflect the evolution of systemic risks and resilience over time, and warn of various levels of threat to individual intermediate macroprudential policy objectives. The final assessment also takes account of expert judgment. The risks are illustrated by means of a four-level scale: green (low risk), yellow (moderate risk), orange (elevated risk) and red (high risk). The same applies to resilience, where green entails high resilience, yellow medium resilience, orange low resilience and red very low resilience.

Macro stress tests, which take a top-down approach, are one of the tools used to identify potential systemic risks. The Bank of Slovenia uses them to assess the impact of baseline and adverse macroeconomic scenarios on the banking system's balance sheet items, profitability and solvency over a three-year forecasting horizon. Based on the macro stress tests, an assessment can be made of the potential impact and the consequences for the stability of the banking system if the unlikely but plausible systemic risks assumed under the macroeconomic scenario are realised.

The Bank of Slovenia has also put in place a model framework to identify systemic risks and to evaluate the impact of the economic policy response, macroprudential policy in particular.

The growth-at-risk model is a tool for analysing financial stability, as it flexibly captures the nonlinear interaction between shocks, financial conditions, and economic outcomes, and offers support in the pursuit of macroprudential policy.

The 3D DSGE model allows for assessment of the impact of various financial and macroeconomic shocks on the simulated economy, while also allowing for an examination of the economic policy response, macroprudential policy in particular.

The probability of a financial crisis over the next 12 months is assessed by an early warning system (EWS) model based on past relationships between macroeconomic risk indicators and systemic crises in a sample of euro area countries. The EWS-FAVAR model is used to assess various scenarios that illustrate the evolution of simulated macrofinancial variables after the onset of various economic shocks.

A diagnostic tool for growth in loans to non-financial corporations based on an econometric approach is used to assess the components of growth in loans to NFCs on the basis of supply and demand. The tool assesses the impact on the real economy at

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¹⁵ Financial Stability Review (bsi.si)

¹⁶ Monthly report on bank performance (bsi.si)

sector level and at firm level from loan supply shocks that can arise as a result of disruption at banks.

The Bank of Slovenia has also developed a neutral environment indicator, which determines the stance of the positive neutral countercyclical capital buffer rate. The indicator is based on a multivariate structural time series model methodology, which distinguishes the trend, cyclical and exogenous components influencing the dynamics of a particular time series.

The development of the aforementioned and numerous other structural tools needed for implementing macroprudential policy, conducting stress tests and regular analysis, and calibrating instruments is the fruit of systematic R&D activity using innovative tools and approaches. The models used are continually upgraded and augmented from an economic, econometric and statistical perspective.

The Bank of Slovenia formulates its macroprudential policy on the basis of an assessment of risks in the financial system. It tailors the selection of macroprudential instruments to the type of risk identified (cyclical or structural).

8.1 Toolkit of instruments

Based on the identified level of systemic risks and the resilience of the banking system, the Bank of Slovenia selects suitable macroprudential instruments from the available toolkit to mitigate and prevent the further build-up of systemic risks, and to strengthen the resilience of the banking system. The macroprudential instruments are classified into three main groups: liquidity-based measures, capital-based measures and borrower-based measures. They are also linked to the corresponding intermediate objectives in the table below (see Table 2).

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Table 2: List of macroprudential instruments that the Bank of Slovenia can use in connection with intermediate macroprudential policy objectives

| INTERMEDIATE OBJECTIVE | INSTRUMENT | TYPE OF INSTRUMENT |
|---|---|-------------------------|
| | Cap on LTD ratio | Liquidity-based measure |
| | Countercyclical capital buffer | Capital-based measure |
| 1. Mitigate and prevent excessive credit growth and excessive leverage | Sectoral capital requirements | Capital-based measure |
| | Macroprudential leverage ratio | Capital-based measure |
| | Loan-to-value ratio (LTV) | Borrower-based measure |
| | Debt-service-to-income ratio (DSTI) | Borrower-based measure |
| | Loan-service-to-income ratio (LSTI) | Borrower-based measure |
| | Loan-to-income ratio (LTI) | Borrower-based measure |
| | Debt-to-income ratio (DTI) | Borrower-based measure |
| | Systemic risk buffer | Capital-based measure |
| | Gross loans to deposits flows (GLTDF)* | Liquidity-based measure |
| | First-bucket and second-bucket liquidity ratios (LR1 and LR2)* | Liquidity-based measure |
| 2. Mitigate and prevent excessive maturity mismatch and market | Liquidity coverage ratio (LCR) | Liquidity-based measure |
| illiquidity | Net stable funding ratio (NSFR) | Liquidity-based measure |
| | Additional liquidity requirements | Liquidity-based measure |
| | Macroprudential unweighted limit on less-stable funding (LTD ratio) | Liquidity-based measure |
| 3. Limit direct and indirect exposure | Large exposures restrictions | |
| concentrations | Systemic risk buffer / sectoral systemic risk buffer | Capital-based measure |
| | Limits on deposit rates ¹⁷ | Liquidity-based measure |
| 4. Limit the systemic impact of misaligned incentives with a view to | Restrictions on profit distributions by banks and leasing companies | Liquidity-based measure |
| reducing moral hazard | Capital buffer for systemically important financial institutions (O-SII buffer) | Capital-based measure |
| 5. Strengthen the resilience of financial infrastructures and the operations of | Increased disclosure | |

institutions

Note: The Bank of Slovenia will update the list of intermediate objectives and instruments as necessary after introducing new intermediate objectives or instruments. Additional macroprudential instruments will be selected on the basis of their effectiveness and efficiency in addressing risks in the financial system. Source: The Bank of Slovenia

The macroprudential policy instruments currently in force are described on the <u>Bank of</u> Slovenia website.

8.2 Principles of instrument selection and calibration

The Bank of Slovenia strives to uphold the following principles in selecting and calibrating macroprudential instruments:

• Effectiveness: the extent to which the instrument is able to rectify market deficiencies, and to contribute towards achieving the ultimate and intermediate macroprudential policy objectives;

¹⁷ The Bank of Slovenia macroprudential instruments in force before October 2021.

- Efficiency: the ability of the instrument to achieve the ultimate and intermediate macroprudential objectives at minimal cost while minimising side effects;
- **Proportionality**: the ability of the instrument to burden an individual institution only to a level proportionate to its contribution to systemic risk, while taking account of the systemic importance of the individual institution;
- **Simplicity**: the simpler the definition of the instrument and the external communications in connection with it, the better is the understanding of its definition;
- Avoidance of regulatory arbitrage:¹⁸ in the selection, calibration and introduction of the instrument, the ability to avoid its effects inside the domestic financial system and at EU level is minimal;
- Avoidance of negative cross-border spillovers: negative cross-border effects are assessed and minimised in the selection, calibration, introduction and deactivation of macroprudential instruments;
- **Consideration of national attributes:** the attributes of the Slovenian banking system are taken into account in the selection and calibration of macroprudential instruments.

¹⁸ Regulatory arbitrage consists of "those financial transactions designed specifically to reduce costs or capture profit opportunities created by differential regulations or laws." Partnoy, F. (1997). Financial Derivatives and the Costs of Regulatory Arbitrage. Journal of Corporation Law, 22, 211.

The Bank of Slovenia uses a guided discretion approach in the implementation of macroprudential policy. It strives to uphold the principles of effective macroprudential policy as appropriate, and devotes particular attention to communicating with stake-holders about macroprudential measures.

9.1 Guided discretion approach

The Bank of Slovenia takes a guided discretion approach in its identification of risks and its selection and calibration of macroprudential instruments, which allows for the use of discretion within predefined frameworks. The guided discretion approach largely combines the strengths of a discretionary approach with those of a rules-based approach (see Table 3).

Table 3: Strengths and weaknesses of rules-based and discretionary approaches to macroprudential policy

| | Strengths | Weaknesses |
|------------|---|--|
| Rules | transparent predictable easy to communicate relies on quantitative data macroprudential authority can build up reputation (time consistency) eases expectation formation rules can act as automatic stabiliser no need for continual justification or express decisions limits the effect of inaction | may be hard to design appropriate rules given inherent uncertainty rather static concept allows no discretion little experience with macroprudential instruments new experience may make it difficult to respect the rule the requisite data may be unavailable or available too late (in terms of assessment of rules) lack of experience of choosing indicators indicators are influenced by policy areas other than macroprudential policy (e.g. fiscal policy, monetary policy) difficult to measure success in achieving the ultimate objectives of macroprudential policy (with regard to predetermined rules for administering policy), including the prevention and mitigation of systemic risks a variable can no longer be a reliable indicator of underlying risks when it becomes a target of regulation (the Lucas critique) |
| Discretion | flexible tool, can be tailored to current situation can rely on qualitative data can allow decision-makers to learn from interactions between macroprudential policy, the financial system and the economy over time ensures ability to react to unforeseen consequences | subjective judgement, less transparent risk of inaction bias risk of inconsistency can be open to pressure from outside |

Source: ESRB Handbook, 2018

9.2 Principles of effective macroprudential policy

The Bank of Slovenia strives to abide by the following principles in its implementation of instruments and its formulation of macroprudential policy:

• Independence of macroprudential policy: the short-term side effects of macroprudential policy are often more evident and easier to measure than its long-term benefits. Macroprudential policy can come under pressure from other economic

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policymakers because of its countercyclical action, and therefore its independence is vital.

- **Transparent communications** improve the understanding of macroprudential policy within the profession, and among the general public. It is important that macroprudential policy decisions are published and explained, except when publication would cause risks to financial stability.
- Accountability is the Bank of Slovenia's legal and political commitment to explaining its decisions and presenting its arguments to the people of Slovenia and their elected representatives. It is closely linked to transparency, which is an economic category, while accountability is a legal category.
- **Overcoming inaction** entails a proactive role in designing and conducting macroprudential supervision.
- The **guided discretion approach** allows for the use of discretion within predefined frameworks.
- **Flexibility:** macroprudential policy must have an adequate toolkit of macroprudential instruments to be able to limit or prevent the build-up of systemic risks.
- Creation of an adequate legal framework: macroprudential policy needs a clear legal framework that allows it to be effective, and so the Bank of Slovenia will work to build it and upgrade it.
- **Coordination** with microprudential policy and monetary policy and with the relevant international institutions helps to make the implementation of macroprudential policy more effective.

9.3 Communication with stakeholders

Communications cover all four stages of macroprudential policymaking. They include communications with stakeholders such as the direct targets of measures (credit institutions), EU institutions, the banking and finance profession at large, and the general public.

In the process of communicating with the targets of measures, the Bank of Slovenia will strive for proper informing and consultation about the purposes and objectives of the macroprudential policy instruments used, with the aim of ensuring the best possible understanding of the actions that it is taking in the area of macroprudential policy. This should aim at ensuring the increased efficiency of macroprudential policy, and should contribute to a better understanding of individual measures.

Communications with the profession and the general public also aim to increase transparency in the implementation of macroprudential policy. An assessment of systemic risks and the resilience of the financial system is published in the Bank of Slovenia's regular reports and publications. Key findings about the evolution of risks and the macroprudential instruments used are presented in the Financial Stability Review, whose publication is accompanied by communications with the profession and the general public. Banks and others in the profession are also kept updated on developments at conferences and seminars. Answers to FAQs are published online by the Bank of Slovenia as necessary. The approach to communication and the level of the content are tailored to the target audience.

Evaluation of macroprudential policy and instruments

The evaluation of macroprudential policy encompasses evaluations of the individual instruments, and of macroprudential policy as a whole. The Bank of Slovenia endeavours to examine these aspects:

- **Suitability of the instrument**: whether the activated instrument is able to address the identified systemic risk.
- Effectiveness of the instrument: the extent to which the activated instrument has addressed the identified systemic risk, and has contributed to achieving intermediate macroprudential policy objectives.
- Efficiency of the instrument: the extent to which the long-term benefits of the measure outweigh its short-term side effects. Efficiency is of particular relevance in the assessment of cyclical measures.
- **Proportionality**: the extent to which the effect of the measure on the individual institution is in keeping with its contribution to systemic risk. The systemic importance of the individual institutions is taken into account.
- Avoidance of regulatory arbitrage: the extent to which the opportunity for regulatory arbitrage has been limited.
- Avoidance of negative cross-border spillovers: the extent to which the macroprudential measure might produce negative cross-border effects, and how they are managed.

Bank recovery and resolution, and deposit guarantee scheme

Macroprudential policy can reduce the likelihood of future financial crises occurring, but cannot eliminate them entirely, and it is therefore vital that crisis management mechanisms be put in place first. Properly designed bank recovery and resolution systems can support macroprudential policy objectives. Effective and credible recovery and resolution approaches can strengthen market discipline, and also reduce incentives to take up excessive risk, thereby reducing the need for macroprudential interventions.

To strengthen the economic and monetary union, and financial stability, a banking union has been established at EU level, with three pillars: the Single Supervisory Mechanism (SSM), the Single Resolution Mechanism (SRM¹⁹) and a standardised approach to deposit guarantee schemes (DGSD).²⁰

The anticipated changes to financial security networks in the EU and in Slovenia will place greater emphasis on strengthening crisis readiness and on crisis management, to prevent or mitigate the macroeconomic, intersectoral or fiscal consequences of potential crises. These changes are expected to have a positive impact on financial stability.

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¹⁹ Regulation (EU) No 806/2014, OJ L 225.

²⁰ Directive 2014/49/EU, OJ L 173.

Abbreviations

| CRD IV | Directive 2013/36/EU on access to the activity of credit institutions and the prudential |
|--------|--|
| CDD | Supervision of creat institutions and investment times |
| CKK | firms and amending Regulation (EU) No 6/8/2012 |
| DGS | |
| | Deposit Guarantee Schemes Directive |
| | Debt-service-strong ratio |
| | Debt-service-to-income ratio |
| EBA | European Banking Authority |
| EC | European Commission |
| ECB | European Central Bank |
| ESCB | European System of Central Banks |
| ESRB | European Systemic Risk Board |
| FU | |
| EWS | Early warning system |
| FIMSIS | Einancial market stress index for Slovenia |
| FSB | Financial Stability Board |
| GDP | Gross domestic product |
| GLTDF | Gross loans to deposits flows |
| ISA | Insurance Supervision Agency |
| LCR | Liquidity coverage ratio |
| LGD | Loss given default |
| LR | Liquidity ratio |
| LSTI | Loan-service-to-income ratio |
| LTD | Loan-to-deposit ratio |
| LTI | Loan-to-income ratio |
| LTV | Loan-to-value ratio |
| NFCs | Non-financial corporations |
| NSFR | Net stable funding ratio |
| OGRS | Official Gazette of the Republic of Slovenia |
| OJ EU | Official Journal of the European Union |
| O-SIIs | Other systemically important institutions |
| PD | Probability of default |
| SMA | Securities Market Agency |
| SSM | Single Supervisory Mechanism |
| ZBan | Banking Act |
| ZBS | Bank of Slovenia Act |
| ZMbNFS | Macroprudential Supervision of the Financial System Act |

The Strategic Framework for Macroprudential Policy will be updated at least every five years.