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# A Brief Introduction to the World of Macroprudential Policy

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Mirna Dumičić

Zagreb, August 2015





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## Abstract

Notwithstanding the rapid growth in the popularity of and the increasing number of research papers on macroprudential policy, the general public still has a relatively unclear perception of this concept. The main purpose of this paper is to explain briefly the most important concepts related to macroprudential policy and describe its objectives. Emphasis is put on explaining the main stages of a macroprudential cycle, the relationship between macroprudential policy and other economic policies and the costs and benefits of macroprudential regulations.

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macroprudential policy, financial stability, systemic risks

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# 1 Introduction

To enable effective prevention, mitigation and avoidance of systemic risks and strengthen the financial system's resilience to potential shocks, significant efforts have been made in recent years to establish an effective macroprudential policy (MPP) framework. This process has been driven largely by the significant economic and social costs of crisis episodes and the recognition of deficiencies in the contemporary regulatory framework, which proved to be insufficient to prevent such events.

Notwithstanding the rapid growth in the popularity of the topic and the increasing number of research papers that directly or indirectly deal with MPP, the general public still has an unclear perception of this subject and related concepts, such as financial stability and systemic risks. This is partly because these are extremely complex concepts, which are not yet uniformly defined, despite the significant progress made in recent years. This overview is based on a synthesis of the knowledge obtained by research papers dealing with MPP and financial stability in theory and practice, and its main objective is to raise the level of awareness of the importance of MPP

and of maintaining the system's financial stability. Special emphasis is placed on explaining the main stages of a macroprudential cycle, the relationship between MPP and other economic policies as well as the costs and benefits of macroprudential regulations.

The paper is divided into seven sections. Following the introduction is an overview of different definitions of MPP, financial stability and systemic risks, which serves as a basis for understanding the concepts and purpose of MPP. The third section provides a brief presentation of causes and events that have illustrated the importance of a macroprudential approach to analysing financial systems. The fourth section describes the stages of a macroprudential policy cycle, the fifth section analyses the relationship between MPP and other economic policies, and the sixth section views MPP from the standpoint of the costs and benefits of its implementation. The paper ends with a conclusion, which summarises the main features of MPP, stresses the importance of maintaining financial stability, and points to some open issues that could serve as a basis for further research.

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## 2 Definition of the main concepts

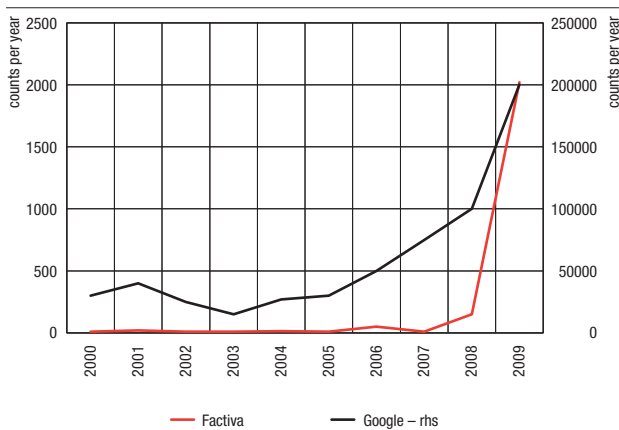
As the first step to understanding the importance of a macroprudential approach to the process of maintaining the stability of the financial system as a whole, this chapter presents the most frequent definitions of *macroprudential policy* and of the concepts closely related to it – *financial stability* and *systemic risks*.

### 2.1 Macroprudential policy

Although MPP is a very hot topic, addressed by all leading world institutions, the theoretical basis of this area is still in its infancy, when compared with monetary or fiscal policy (Bini Smaghi, 2011). Though the term

*macroprudential policy* originated in the late 1970s, it came into wider use only in the wake of the recent global financial crisis in mid-2007 (Clement, 2010). This is confirmed by the data on the number of academic publications in which it is mentioned and the number of entries of this term in Internet search engines (Figure 1). As originally defined, the term *macroprudential* meant an orientation of regulatory and supervisory arrangements towards systemic risks and stability of the financial system as a whole (Borio, 2010), which stresses the fact that drivers of systemic risks depend on the collective behaviour of financial institutions.

Figure 1 Usage of the term “macroprudential” in Internet search engines and academic publications



Source: Galati and Moessler (2011).

As the financial system’s functioning strongly depends on macroeconomic developments, it is also necessary to understand the interconnectedness of financial institutions and markets with the real sector (Rodríguez-Moreno and Pena, 2011). In addition, the financial system can multiply adverse shocks in the real or financial sector, in the form of a credit crunch, directly reducing investment and employment, with consequences for the entire real economy. The potential need to sell assets and obtain liquidity in a short period of time can also result in transactions executed at below market prices, further weakening balance sheets and increasing the cost of credit (IMF, 2013).

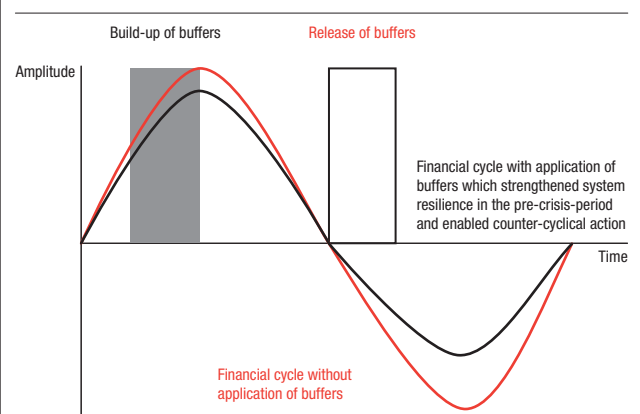
MPP generally deals with the financial system and studies the relationship between financial institutions and the non-financial segment of the private sector in the process of mobilising and allocating financial resources through financial markets and the capacity of these sectors to service their liabilities (Johnston, 2011a). The Bank of England states that the main

objective of MPP is to ensure the resilience of the financial system as a whole in order to maintain a stable supply of financial intermediation services across the credit cycle. In other words, this policy is aimed at preventing systemic risks and reducing the probability of systemic events related to financial institutions, markets, infrastructure and instruments that might threaten financial system stability.

The macroprudential approach therefore serves to identify weaknesses in the financial system and entails the supervision and measurement of a range of indicators in order to obtain a broader picture of the degree of financial stability and to detect in good time the risks that could threaten it in the future. According to the risks identified, measures and instruments are defined for their mitigation, while the potential effects of their materialisation are assessed.

To achieve MPP objectives, different measures and instruments may be applied, as well as instruments commonly used for some other policies, such as microprudential or monetary policies, which also influence financial stability. Macroprudential instruments are used to increase the resilience of the system to shocks, i.e. to reduce vulnerabilities associated with excessive credit growth, sectoral vulnerabilities to asset prices, exchange rates and interest rates, and overexposure to funding shocks (IMF, 2013). The problems in systemic risk monitoring arising from the interconnectedness of financial institutions can be mitigated by stricter capital requirements, various sectoral instruments, such as risk weights or limits on large exposures, as well as instruments influencing liquidity or market infrastructures (IMF, 2013).

Figure 2 Stylised transmission of buffers over the financial cycle



Source: European Systemic Risk Board (2014).

There are three important dimensions of MPP – *structural, time and regulatory*. The structural dimension relates to systemic risks arising in an institution or a group of institutions due to externalities such as interconnectedness or a high concentration of individual financial services (Johnston, 2011b). The time dimension is used to determine risks from the standpoint of the phase of the economic and financial cycle. In the expansionary phase of the economic cycle, MPP should be oriented towards the building up of capital and liquidity buffers thereby to strengthen the system's resilience to potential shocks and mitigate this phase of the cycle. This also enables a counter-cyclical effect during a recession (Figure 2). Establishment of a firm regulatory framework is aimed at reducing the possibility of regulatory arbitrage and transfer of operations to less regulated parts of the financial system.

## 2.2 Financial stability

The economic importance of financial system stability arises from its key role in capital allocation, i.e. the transfer of financial resources from entities with surplus funds to entities with deficit funds. Financial stability is therefore the basic precondition for sustainable growth of an economy as a whole. Financial stability is not easy to define or measure, given the interdependence and complex interactions of different elements of the financial system among themselves and with the real economy.

The simplest definition of financial stability is a negation, i.e. it is the absence of financial instability. Apart from its brevity, the main deficiency of such a definition is that it does not reflect properly the importance of financial stability for the financial system and the economy in general. In the narrower sense, financial stability implies the absence of crisis episodes, disturbances or excessive volatility in the financial system. However, this definition is also deficient as it fails to capture the positive contribution of a well-functioning financial system to overall economic performance, which is essential to understand the importance of its maintenance (Gadanecz and Jayaram, 2009). For this reason, a broader definition has been used in recent years, one that describes financial stability as a condition characterised by the smooth and efficient functioning of all financial system segments (financial institutions, financial markets and financial infrastructure) in the resource allocation process, risk assessment and management, payments

execution, as well as the resilience of the system to sudden shocks (Houben, Kakes and Schinasi, 2004). At the EU level, commonly used is the definition by the European Central Bank (ECB), which states that financial stability is a condition in which the financial system is capable of withstanding shocks and the unravelling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process. Similarly, the German central bank describes financial stability as a steady state in which the financial system efficiently performs its key economic functions, such as allocating resources and spreading risk as well as settling payments, and is able to do so even in the event of shocks, stress situations and periods of profound structural change.

One may conclude from the above definitions that key elements of financial stability are financial intermediaries, financial markets, financial infrastructure and their smooth functioning, which ensures efficient allocation of resources from savers to investors. In this context, Schinasi (2004) and Spicka (2009) particularly underline the role of financial stability in adequate identification, assessment and management of risks and absorption of financial and real shocks caused by external factors or internal imbalances.

Three pillars are needed to defend financial stability; preventive action, increase in system resilience to shocks and crisis management are required to ensure the successful prevention of systemic risks and minimise the social costs of crisis episodes (Žugić and Fabris, 2010). Different measures of the first pillar serve to mitigate or prevent the emergence and accumulation of systemic risks. Early recognition of the process of systemic risk accumulation may be crucial to averting crisis episodes; it allows regulators and the financial sector sufficient time to accumulate capital and liquidity buffers and increase system resilience by using adequate tools and instruments (IMF, 2011). The second pillar follows the first one as the system's resilience to financial shocks is in practice strengthened simultaneously with preventive measures. If systemic risks materialise and result in a crisis episode despite the actions taken, the third pillar of defence is activated. Efficient crisis management requires the existence of a body responsible for coordinating activities and minimising the potential damage of crisis episodes.

## 2.3 Systemic risk

The term *systemic risk* was coined at the onset of the Latin American debt crisis of the early 1980s by the economist William Cline (Ozgöde, 2011). According to his definition, systemic risk is a threat that disturbances in the financial system will have serious adverse effects on the entire financial market and the real economy.

It is highly likely that a certain level of risk will be accumulated in the financial system over time, which may disrupt its stability and threaten the process of financial intermediation. The materialisation of such a risk is referred to as a *systemic event*, an acute episode of financial instability (BIS, 2012). De Bandt and Hartmann (2000) distinguish between systemic events in the narrow and broad sense. A systemic event in the narrow sense is an event, where “bad news” about a financial institution, financial market segment or financial infrastructure lead in a sequential fashion to considerable adverse effects on one or several other financial institutions or markets. Systemic events in the broad sense also include simultaneous adverse effects on a large number of institutions or markets as a consequence of severe and widespread (systematic) shocks. *Systemic risk* is thus defined as the risk of systemic events with strong adverse effects being experienced, which may through various channels disrupt the process of providing financial services or lead to a strong increase in their prices, impair the well-functioning of a large part of the financial system, and prevent effective financial intermediation.

Potential systemic risks are associated with different instruments, institutions and markets, in particular those that are poorly regulated or outside the scope of regulations. The sources of systemic risks are both inside and outside the financial system. Endogenous risks include institutional risks, such as operational or financial risks, market risks and infrastructure risks that can relate to the clearing, payment or settlement system, while exogenous risks include macroeconomic disturbances that can be associated with the environment or global imbalances and risks of unexpected events, such as weather disasters, terrorist attacks or political events (Schaller, 2007).

Generally speaking, the main sources of systemic risk are credit risk, market risk, operational risk, liquidity risk, infrastructure risk and contagion risk. *Credit risk*, which is the most important risk in banking, is associated with potential bank losses due to the inability of debtors to repay their loans. The amount of the loss

depends on the existence and value of the collateral that a debtor pledges with the bank. *Market risk* is associated with developments and conditions in financial markets. If global risk aversion is high at the moment a potential crisis event emerges, even temporary shocks may strongly affect financial markets and result in systemic events (IMF, 2009). Losses in financial institutions can then materialise due to changes in the prices of securities, exchange rates or other forms of financial assets, as well as due to decreases in prices of non-financial assets that may serve as the underlying assets of financial derivatives, such as real estate. *Liquidity risk* has become increasingly important due to the heavier reliance of banks on financing through financial markets. An extreme case of illiquidity in the interbank money market may result in a substantial fall in turnover, protection against risk may become too expensive or even impossible, while the prices of various forms of financial assets might plummet, being left without any backing in real indicators. *Contagion risk* implies the danger of the spillover of shocks across financial institutions, market segments or countries. *Operational risk* refers to potential disturbances in the work processes, inadequate management and organisational structures and potential technical and information system difficulties. In addition to business processes within financial institutions, operational risk is closely related to *infrastructure risk*, in particular in payment and clearing systems that ensure technical support in financial market transactions. Depending on their organisation, they also determine the scope of financial shocks and the degree of spillover of such shocks across financial institutions (De Bandt and Hartmann, 2000). This primarily refers to information technology, in particular when dealing with sophisticated instruments.

Systemic risks are observed in terms of the *time* and the *structural dimension*. As a rule, they are accumulated during a certain period in the correlation between the financial sector and households, corporations and the government and, simultaneously, in the correlations with foreign financial institutions (IMF, 2013). Households are primarily affected by the interactions with the domestic financial sector, while corporations and the government are, in addition to domestic movements, influenced by developments in other financial institutions and international financial markets. The structural dimension of systemic risks influences their scale and the speed at which they spread. Important channels of contagion are relations among financial institutions, while the speed is proportional to the level of

information asymmetries and uncertainty (IMF, 2009). The interbank money market is one of the main channels of contagion because problems in one institution may rapidly trigger considerable losses in all institutions associated with the institution through that market. The

complexity of interrelations between different types of financial institutions further hampers the monitoring of the process of systemic risk accumulation and identification.

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### 3 Importance of macroprudential policy

In the recent decades, the global financial system has been characterised by the processes of financial liberalisation and integration and accelerating technological development. However, financial liberalisation has also become one of the major sources of systemic risk, financial integration has broadened the extent of crisis episodes, while technological development and sophisticated financial products have strongly accelerated their propagation (Haldane, 2006). A survey conducted on a sample of 21 countries showed that there was only one banking crisis in the 25 years from 1945 to 1970, while there were as many as 19 crisis episodes in the following 30 years (Bordo et al., 2001). Some of them hit individual countries and some spread to entire regions, but they all resulted in substantial financial and social costs, as described in more detail in the sixth chapter.

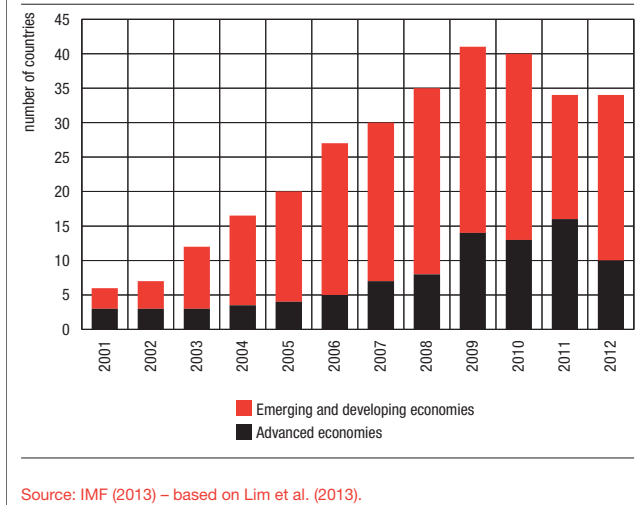
The Asian financial crisis of the 1990s triggered a number of discussions on the necessity of reforming the global financial architecture and the market's inability to prevent collapses in financial markets (Crockett, 1994). Apart from the Asian crisis, the strong credit growth in Central and Eastern European countries in the mid-2000s also confirmed that a classic combination of macroeconomic and microprudential instruments was not effective in preventing macroeconomic imbalances and financial vulnerabilities, and that the maintenance of the stability of the entire financial system requires different measures and instruments. Intensively analysed were the relationship between price stability and financial stability (Bordo and Wheelock, 1998; Bernanke and Gertler, 2001) and the microprudential and macroprudential dimensions of financial stability (Crockett, 2000). However, although the professional public discussed various aspects of macroprudential policy and was aware of the necessity to view the system as a whole, no significant progress was made in the establishment and formalisation of a macroprudential framework until the onset of the global financial crisis in late 2008. In most countries, the relations between microprudential and

macroprudential supervision were until recently weak or non-existent and the prevailing opinion was that financial markets were capable of addressing possible imbalances alone and that market participants were able to avoid risks.

Recent discussions suggest that a “regulatory gap”, in which no one was explicitly in charge of monitoring systemic risk, contributed strongly to the financial crisis. It was also observed that supervision of individual institutions was insufficient to maintain stability of the entire financial system and traditional microprudential regulations were inefficient in identifying vulnerabilities of the overall financial system (Cheang and Choy, 2011), while risks to financial stability may also arise from behaviour of the system as a whole (Angelini, Neri and Panetta, 2011). It was shown that the former regulatory framework was procyclical and added to the intensity of cycles. Also, conditions conducive to crisis were further aggravated by the fact that in many countries different segments of the financial system were the responsibility of various institutions, whose actions often lacked coordination because of the absence of a formal framework, which further blurred the perception of the whole picture and total risks.

While a macroprudential approach implies supervision of all financial institutions, markets and infrastructure, in the past it usually related to banking sector regulation, particularly in the financial systems of European emerging markets, which are dominated by banks. The rapid increase in banks' financial market activities has heightened their exposure to market risks, while the greater links between banks and non-bank financial institutions may have increased the likelihood that shocks emanating from this, as a rule, less regulated, segment of the financial market, will spread to the banking sector (Mörttinen et al., 2005). Changes in banks' funding patterns, liquidity conditions in money and other financial markets, and contagion risks may threaten the liquidity and stability of the financial system more than

Figure 3 Introduction/changes of macroprudential tools



traditional liquidity crises due to bank runs (Mörttinen et al., 2005). The recent financial crisis highlighted the importance of the maturity transformation mechanism that lies at the heart of banking. In normal times, banks fund themselves with short-term liquid contracts and invest in illiquid credit instruments with longer maturity duration (BIS, 2012).

IMF data show that the number of countries applying macroprudential measures and instruments grew strongly at the beginning of the last decade (Lim et al., 2013). Throughout most of the period under review, MPP was primarily used by emerging economies, while the implementation of MPP in advanced economies intensified only after the escalation of the global financial crisis (Figure 3).

The importance of MPP is also visible in the activity of the leading global organizations, such as the G-20 group of the world's most advanced economies, its Financial Stability Board, EU institutions and the Bank for International Settlements (BIS), as well as the Basel Committee on Banking Supervision (BCBS). They share an orientation towards establishing an effective framework for MPP implementation and the development of measures necessary to regulate systemically important financial institutions, macroprudential supervision and strengthening the supervision of "the shadow banking system" (Financial Stability Board, IMF and BIS, 2011).

At the same time, intensive work is in progress to develop and analyse a set of instruments that may be useful for the attainment of MPP objectives.

The European Systemic Risk Board (ESRB) was established in 2010 to put in place an effective MPP framework, which would enable prevention, mitigation and avoidance of systemic risks at the EU level and the strengthening of system resilience to financial shocks, while financial stability was seen as the main prerequisite for ensuring employment and economic growth. The ESRB is responsible for monitoring and assessing systemic risk in normal times to prevent and mitigate any future disturbance in the financial system that could have serious negative consequences for both the financial system and the real economy, as well as to enhance the financial system's resilience to sudden shocks.<sup>1</sup>

To align macroprudential policy at the EU level and reduce the likelihood of cross-border spill-overs of systemic risks, the ESRB issued the Recommendation on the macro-prudential mandate of national authorities (ESRB/2011/3) in November 2011, which encouraged national regulatory authorities to enhance their capacities, identify the main sources of systemic risks and adopt the measures necessary to maintain financial stability. Under that recommendation, the member states are responsible for setting out a framework for the implementation of macroprudential policy and for assigning relevant powers to an institution (or institutions) responsible for the maintenance of financial stability.

The Financial Stability Council (FSC) is responsible for the formulation of MPP in the Republic of Croatia. This is an inter-institutional body, which consists of the representatives of the CNB, HANFA, the Ministry of Finance and the State Agency for Deposit Insurance and Bank Resolution. Under the Act on the Financial Stability Council, the most important tasks of the Council are to participate in the design of the macroprudential policy of the Republic of Croatia; analyse systemic risks and ensure cooperation and exchange of information between the competent authorities; and take actions related to ESRB warnings and recommendations. The most important power of the FSC is to issue warnings and recommendations related to systemic risks and financial stability.

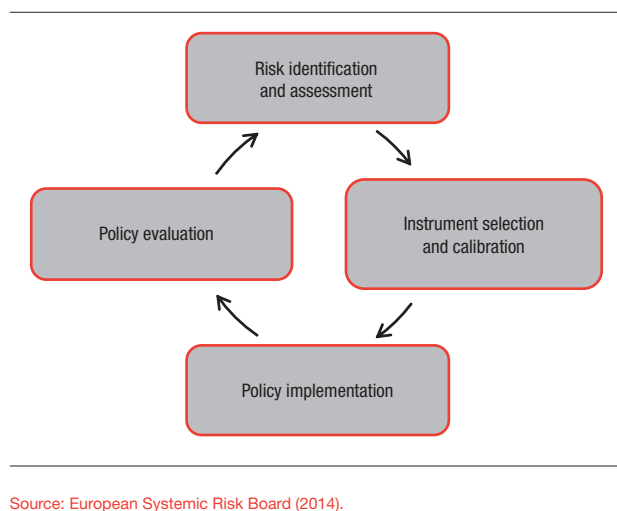
<sup>1</sup> <http://www.esrb.europa.eu/about/background/html/index.en.html>.

## 4 Macprudential policy cycle

An MPP cycle may be divided into four stages that are crucial for the successful maintenance of financial stability (European Systemic Risk Board, 2014; Figure 4). To detect in good time the build-up of the vulnerabilities associated with a certain type of financial instruments, market segment, institutions or infrastructure and assess the likelihood of a systemic event and its consequences, this cycle should begin with systemic risk identification and assessment. Various analytical tools may be used for that purpose, in particular stress tests and early warning models.

If risks that threaten the smooth functioning of the financial system increase, it is necessary to define and use a set of measures and instruments for their mitigation and build up additional buffers that enhance the system's resilience, and thus reduce the procyclicality of behaviour of financial institutions (IMF, 2011). In the final stage of the cycle, the effectiveness of individual measures and instruments and of overall MPP in the attainment of the set objectives is assessed.

Figure 4 Four stages of macroprudential policy cycle



## 5 Relationship between macroprudential policy and other economic policies

In addition to MPP, financial stability is strongly affected by other policies, such as microprudential, monetary and fiscal policies. As each of them influences both financial and real developments and the financial system as a whole, their interrelation also determines the choice of MPP instruments. The objectives of these policies may sometimes be at odds, which additionally stresses the importance of establishing an effective national and international institutional framework for macroprudential policy implementation to resolve successfully any possible conflicts (Nier et al., 2011). The text below provides an overview of the most important policies from the standpoint of macroeconomic policy.

### 5.1 Relationship between macroprudential and microprudential policy

Macroprudential and microprudential policies differ in objective, focus, approach, view of risks, and in their calibration of tools (Schou-Zibell, Albert and Song, 2010; Table 1). The microprudential dimension focuses on the conditions, risks and management in individual financial institutions and on protection of investors and depositors. The focus on individual institutions often does not enable the detection of risks at the system level, and the identification of correlations between financial institutions or their potential systemic importance. Therefore, it often leads to neglect of adverse effects that potential institutions or parts of the financial system may have on other parts of that system.

By contrast, the macroprudential approach analyses the financial and banking systems as a whole. Unlike

**Table 1 Comparison between macroprudential and microprudential monitoring**

	Macroprudential	Microprudential
Objective	Limit the likelihood of financial-system-wide distress and avoid significant losses in real output	Limit the likelihood of failure of individual institutions and protect consumers
Focus	Financial system as a whole	Individual institutions
View of risk	Endogenous (risk is seen as dependent on collective actions)	Exogenous (risk is seen as independent of individual actions)
Calibration of prudential tools	Top-down (calibrated with respect to cross-sectional and time dimensional risks)	Bottom-up (calibrated with respect to risks incurred by individual institutions)

Source: Schou-Zibell, Albert and Song (2010).

the microprudential, which assumes risk to be exogenous since individual institutions will generally have little impact on the economy, the macroprudential approach considers risk to be endogenous, since financial institutions can collectively affect economic transactions so that total risk in the financial system may be larger than the sum of risks in individual institutions (Schou-Zibell, Albert and Song, 2010).

A list of macroprudential instruments also includes some microprudential instruments that may also reduce systemic risks and enhance financial stability. However, despite their complementarity, macroprudential measures cannot be a substitute for microprudential measures and vice versa.

## 5.2 Relationship between macroprudential and monetary policy

The main objective of monetary policy in most countries is the maintenance of price stability of goods and services, which may be coupled with high employment, economic growth, interest rate stability, exchange rate stability, etc (Bofinger, 2001). According to objectives defined in this way, central banks are responsible for providing a stable macroeconomic environment, which contributes to sustainable economic growth. At the same time, the task of MPP is to contribute to the maintenance of the stability of the financial system as a whole by enhancing the system's resilience and preventing and mitigating systemic risks, thus supporting the financial system's contribution to economic growth.

The maintenance of financial system stability is important on both the national and the international level, particularly bearing in mind the macroeconomic costs of an unstable financial system and its importance for the effectiveness of monetary policy. This is the reason why, notwithstanding the absence of a formal basis, central banks have often addressed MPP in practice. In addition

to standard and unconventional monetary policy measures and instruments, central banks have also used macroprudential instruments and carried out macroprudential analysis, identified and monitored systemic risks, assessed the vulnerability of individual segments of the economy and published financial stability reports (Kogar, 2006). They have in addition maintained financial stability by acting as lenders of last resort, providing and supervising financial infrastructure and supervising systemically important financial institutions. They have also been involved in managing crisis situations and, in some instances, maintaining international financial stability (Windischbauer, 2007). They were able to perform these tasks thanks to their professional capacities and their thorough understanding of financial system functioning and macroeconomic developments.

Nevertheless, the relationship between financial stability and monetary policy has often been oversimplified in the past. It was assumed that if developed and efficient financial markets existed, price stability would be sufficient to maintain financial stability, and an independent central bank responsible for price stability would be sufficient to preserve monetary stability. The crisis showed that such views were too narrow (Caruana, 2011). Today, a sound and functional financial system is seen as a prerequisite for an effective monetary policy, while an effective monetary policy is a prerequisite for maintaining financial stability successfully (Borio and Shim, 2007). In addition to maintaining price stability, in recent years an increasing number of central banks have been mandated by law to implement MPP and are directly responsible for achieving and maintaining financial stability. According to the IMF's analysis, central banks are directly or indirectly involved in MPP implementation in 89% of European countries, while this share exceeds 93% in other parts of the world (Brockmeijer, 2014).

While monetary and macroprudential policy objectives are complementary in some segments, this is not



always the case and these policies can act in opposite directions (Beau, Clerc and Mojon, 2012). Price stability contributes to financial stability by eliminating market distortions, lowering the interest rate risk premium, enhancing transparency and reducing moral hazard (Kogor, 2006). However, even monetary policy that is successful in maintaining stable and low inflation may have an adverse impact on financial stability. For example, the low reference interest rates of central banks may encourage credit growth as well as excessive risk-taking and the emergence of price bubbles, thus setting the stage for the next financial crisis (Dell’Ariccia, Laeven and Suarez, 2013). In small, open economies, an increase in interest rates, which may be necessary to contain inflationary pressures, may attract capital inflows and spur the accumulation of systemic risks and external imbalances (IMF, 2013). Inversely, a reduction in interest rates to push up domestic demand may lead to capital outflows and threaten financial stability.

As a rule, the emergence of conflicts between monetary and macroprudential policies depends on the synchronisation of business and financial cycles. If these cycles are aligned, monetary policy may further reinforce macroprudential measures and instruments and vice versa. When a central bank tightens financial conditions because it assesses economic activity to be above an optimum level at the time when macroprudential measures to curb rapid credit growth are already in effect, these measures will strengthen each other. In contrast, the effects of monetary and macroprudential policy may act in opposite directions if a central bank strives to stimulate the economy when the financial cycle is already in expansion.

The relationship between macroprudential and monetary policy is explained in recent literature by very complex models, such as a DSGE model (Beau, Clerc and Mojon, 2012; Benigno et al., 2012; Borio and Shim, 2007), but Clouse (2013) stresses that the connections between monetary policy and financial stability and their implications for economic policymakers are extremely complex even in simplified models. However, the synergistic effects of these two policies still outweigh their potential conflicts (IMF, 2013).

### 5.3 Relationship between macroprudential and other policies

In addition to monetary and microprudential policy, MPP is closely related to other policies, such as fiscal

policy, competition policy and crisis management policy (IMF, 2013).

Coordination of macroprudential and fiscal policies, a joint analysis of risk and aligned actions reduce the likelihood of crisis episodes. A responsible fiscal and tax policy may prevent or slow down the systemic risk accumulation process and enable the build-up of system-wide buffers against potential shocks and vice versa. For example, a fiscal policy that through tax policy encourages the purchase of real estate during the upswing of the cycle, which is coupled with an upsurge in real estate prices, additionally intensifies the cycle and increases the probability of systemic risks in the downswing of the cycle. Coordinated action is particularly important in periods of abundant capital inflows when fiscal policy is often pro-cyclical, which is an additional source of imbalances and adds pressures on other policies, especially monetary and macroprudential policies (Watson, 2010), and reduces their room for manoeuvre that would facilitate efficient action. In addition, the time horizon of political structures is generally shorter as it is most often determined by the phase of the election cycle, which makes coordination between these two policies even more difficult.

A higher level of competitiveness may induce financial institutions to take more risks, which strongly increases the system’s vulnerability to potential shocks. For example, in efforts to gain a larger market share and secure a position in a particular market segment, financial institutions may intentionally apply less strict or even completely inappropriate lending standards. Such behavioural patterns are typical for upswings of the cycle. In market competition one should also take account of institutions that are perceived as too big (too important) to fail, which is an argument in favour of the inclusion of macroprudential policymakers in decision-making processes regarding mergers and acquisitions that may result in institutions whose size might present a threat to the entire financial system (IMF, 2013). The problem of institutions that may threaten the system’s stability because of their size, importance or interconnectedness with the rest of the financial system is prominent at both national and international levels, and is often associated with moral hazard and the implicit assumption of the management structures of such institutions that they would receive government support should difficulties arise.

Crisis management and resolution policies are also important for the maintenance of financial stability. For that purpose, it is necessary to establish an appropriate

framework for cooperation among relevant institutions in order to prepare the joint solutions and activities needed to manage potentially adverse effects of the financial crisis. It is necessary to ensure timely exchange of key information, which serves as a basis for deciding

on potential fiscal support. Proper design of this framework can additionally support the objectives of MPP, strengthen market discipline, reduce incentives to take excessive risks, and mitigate the need for macroprudential intervention (IMF, 2013).

## 6 Costs of crisis episodes in relation to the costs of using macroprudential policy

Regardless of their triggers, financial crises most often result in high costs, which may amount to a double-digit share in GDP and which appear to be larger in emerging market economies than in developed ones (Hoggarth, Reis and Saporta, 2002, Table 2). In the period from 1970 to 2011, the median increase in public debt associated with banking crises amounted to about 17% of GDP, while the direct fiscal costs of crisis episodes stood at around 7% of GDP (IMF, 2015).

It should be noted that the economic and social consequences of financial crises much outweigh the financial costs and more comprehensive than fiscal and quasi-fiscal expenses alone, i.e. the costs of bailing out financial institutions, particularly taking into account output losses and unproductive use of savings and resource allocation, which ultimately lowers the level of wealth. In their analysis of a hundred financial crisis episodes, Reinhart and Rogoff (2014) show that these costs are often materialised in the form of sluggish economic recovery as, on average, countries return to a pre-crisis income level eight years after a crisis episode. The costs of the recent financial crisis measured in terms of output loss, which are estimated at close to 0.5 billion euros, are still increasing, so that the final figure will be higher (European Systemic Risk Board, 2014).

As a rule, the consequences of systemic events affect all sectors, but they are often more significant for

the society than for individual institutions. Market participants are primarily motivated to protect themselves, but they are not directly motivated to protect the system as a whole, (Schwartz, 2011), which is why financial institutions' managements are often prone to assume a higher level of risks than would be socially optimal (De Bandt and Hartmann, 2000). These facts further confirm the importance of timely action by a regulatory authority, which takes account of system-wide risks and prescribes measures to reduce the probability of crisis episodes.

However, like most other forms of regulations, MPP implies certain costs, so that the benefits of such regulations should be compared with the costs of their implementation. Costs for the system are most often manifested in slower economic growth and a stalled and more expensive process of financial intermediation (IMF, 2011). Stricter regulations also cause indirect costs associated with stifled innovation and competitiveness (Schwartz, 2011). Overall, the broader the reach of the macroprudential tool and the tighter its setting, the more costly its application is likely to be, favouring more targeted interventions (Committee on the Global Financial System, 2012). The goal is therefore to select tools that contribute to long-term sustainable growth, and simultaneously prevent systemic risk accumulation.

In view of the consequences of the materialisation

Table 2 Fiscal costs of 24 crisis episodes

	Duration (years)	Non-performing loans (% of total loans)	Fiscal costs (% of GDP)
All crisis episodes	4.2	22	15.5
Twin crises	4.1	26	22
Banking crises	4.3	18	4
Medium and low-income countries	3.7	28	17
High-income countries	5.5	14	11.5

Source: Hoggarth, Reis and Saporta (2002).

of systemic risks and costs of crisis episodes, one may conclude that the use of preventive measures and instruments aimed at maintaining macroeconomic and financial stability is most often justified. This is confirmed by available research, which shows that, notwithstanding the high costs of individual macroprudential instruments, their benefits may considerably outweigh costs, as illustrated by high capital requirements (Committee on the Global Financial System, 2012).

As the costs of the application of MPP are more easily quantified and rapidly materialised than their potential benefits, the understanding of MPP costs and benefits is important to raise the awareness about the importance of preventive action, operationalisation of instruments, macroprudential policy implementation and avoidance of the inaction bias inherent in macroprudential policymaking (European Systemic Risk Board, 2014).

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## 7 Conclusion

The increased focus on financial stability and MPP is closely correlated with the expansion, liberalisation, integration and globalisation of the financial system, i.e. processes that enhance the strength, range and speed in which events unfold that could cause financial instability on a large scale. High costs of crisis episodes have additionally spurred the development of macroprudential analysis, so that issues in the area of financial stability have started to dominate academic debates and decision-making of economic policymakers.

The main objective of this paper was to enhance the understanding of macroprudential policy and its relationship with other policies and thereby facilitate its implementation in practice. In particular, one of the preconditions for the successful maintenance of financial stability is efficient communication of MPP policymakers with the professional and general public in all phases of a macroprudential cycle so as to provide timely warning of systemic risks and explain the rationale for introducing macroprudential measures, the method of their implementation and the expected effects and mechanisms of these measures on the systemic risks detected. This is particularly important in situations in which

these measures are seen as adverse by part of the general public or when MPP objectives are in conflict with the objectives of other policies. In this sense, apart from MPP operationalisation, a broader understanding of the MPP concept and its costs and benefits is extremely important in reducing the risks of inaction on the part of macroprudential policymakers.

However, although the theoretical framework of macroprudential policy is being constructed relatively fast and is becoming increasingly strong, many uncertainties remain regarding its implementation, in particular its interaction with other economic policies. Recent developments associated with the construction of the institutional framework for the implementation of macroeconomic policy in the EU, stimulated by the recommendation of the ESRB mentioned, have opened room for the search for formal solutions in various countries, while in time it will be possible to research into the way in which cooperation of economic policymakers functions in practice with regard to the achievement of macroprudential policy objectives. Particularly challenging in this regard will be the issue of preserving MPP independence.

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