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How Do Monetary, Micro- and
Macroprudential Policies Interact?
OeNB Workshop

December 2, 2019

The issues of the “Workshops – Proceedings of OeNB Workshops” comprise papers presented at the OeNB workshops at which national and international experts – including economists, researchers, politicians and journalists – discuss monetary and economic policy issues. One of the purposes of publishing theoretical and empirical studies in the Workshop series is to stimulate comments and suggestions prior to possible publication in academic journals.

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Editorial

*Robert Holzmann*¹

Oesterreichische Nationalbank

This volume comprises papers presented at the workshop “*How do monetary, micro- and macroprudential policies interact?*”, which took place on December 2, 2019. The main idea of this workshop was to discuss the changing role of central banks in Europe, fueled by the insights into the optimal interaction of monetary, micro- and macroprudential policies which we have gained so far. The starting point is that the period on which we can base our findings is relatively short. For example, macroprudential policy making is still in its infancy, as are bank resolution schemes. Our insights are therefore bound to be vague and sometimes only anecdotal. And – not surprisingly – the topic tends to spark controversy among academics, central bankers and supervisors.

During the last decade, we have witnessed a redefinition of the role of central banks. In the decades before the global financial crisis (GFC), financial stability had increasingly been viewed as separable from monetary policy. Banking theory focused on the micro level, while finance celebrated the efficient market hypothesis within an increasingly deregulated financial environment. This narrowed down the scope for central banking. A new “consensus view” emerged that saw independent central banks as guardians of monetary stability, preferably as *inflation targeters*. In parallel, we witnessed a trend towards setting up equally independent guardians of financial stability in the form of supervisory authorities separate from central banks.

It was Charles Goodhart who pointed out that this narrowing-down of the central bank’s scope in the pre-crisis period was historically abnormal and short-lived. And it ended with a crisis when it became apparent that macroeconomic stability together with the Great Moderation plus the illusion of efficient markets was no guarantee for financial stability.

Today, central banks are again searching for a consensus view. The scope of central banking has broadened considerably since the onset of the global financial crisis. With the interdependence between monetary and financial stability having been re-acknowledged, numerous central banks have also become responsible for micro- and macroprudential regulation. By definition, these functions are of a complementary nature. That is, they constitute a layer of tasks on top of central

¹ The Editorial is based on the opening address for the OeNB workshop “*How do monetary, micro- and macroprudential policies interact?*”, December 2, 2019.

banks' traditional monetary policy tasks. Maintaining price stability continues to be central banks' primary objective.

The broadening of central banks' responsibilities was particularly significant in the case of the Eurosystem. Apart from setting a single monetary policy for the euro area, the ECB is today also responsible for supervising all euro area banks, some directly and some indirectly. Regarding centralized versus decentralized supervision, a hybrid structure has emerged. Centralization and strong coordination in supervising significant institutions ensures a level playing field, consistency and equal treatment among financial institutions. Ultimately, all national central banks (NCBs) are involved in microprudential supervision via the Single Supervisory Mechanism (SSM), which was set up under the auspices of the ECB and in which many NCBs act as the national competent authority.

Under the new governance framework for macroprudential policies, all NCBs are also involved in macroprudential supervision through the European Systemic Risk Board, with the ECB having been assigned top-up powers. Several NCBs act as the national designated authority and/or macroprudential authority.

There may be two opposing views on such a setup.

On the one hand, putting monetary policy, banking supervision and macroprudential policy under one roof may prove beneficial. The literature identifies numerous and complex interactions among these policy areas and each interaction has spillover effects on the other areas by affecting the behavior of banks and financial markets. One example is the effect that unconventional monetary policies may have on risk-taking behavior and the "search for yield." Conversely, prudential policies may indirectly affect the business cycle, and hence, monetary policy objectives. Such interactions seem to substantiate the view that having these policy areas under one roof allows for internalizing the spillovers mentioned above. An improved flow of information may be another argument: central banks, for instance, benefit from supervisory information when they assess monetary policy decisions or when they execute the lender of last resort function.

On the other hand, consolidating these policy areas in one institution may give rise to conflicts of interest as well as reputational risks. For example, the reputation of a central bank could suffer in the case of a bank failure. One serious concern with regard to potential conflicts of interest is that monetary policy decisions could be distorted, in the sense that attempts to preserve the stability of financial institutions could have a detrimental effect on monetary policy objectives.

The contributions in this volume give a comprehensive overview of the precise nature of the various interactions of monetary, micro- and macroprudential policies as well as the trade-offs and conflicts of interest that are involved. This should inform and help us in assessing alternative models of central bank governance. In addition, it is examined what the new responsibilities might entail for central banks' independence and legitimacy, which have traditionally formed a cornerstone of the Eurosystem.

Politicians, Central Banks and Macroprudential Supervision

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Bocconi University

1 Introduction

By the early 2000s, many countries had adopted a well-defined central bank framework in which the central bank was independent and accountable for achieving monetary policy goals, while its traditional responsibilities for pursuing financial stability had become less important. Essentially, central banks were designed as monetary policy actors. The economic rationale was well-known, and the theoretical bottom line can be summarized as follows: for various reasons, policymakers tend to adopt a short-term perspective when using monetary tools. They use these tools to smooth out macroeconomic shocks and to exploit the trade-offs between real gains and nominal costs. However, the more markets are efficient and rational, the greater the risk that short-sighted monetary policy will generate negative macroeconomic distortions. Therefore, banning the use of monetary policy for myopic purposes became a social goal and the institutional setting gained momentum, with the aim of separating the central bank from the government and from all fiscal and banking responsibilities.

The fundamental effect was that the supervisory role of central banks generally decreased. However, following the 2008-2009 Global Financial Crisis (GFC), central banks in many countries again became involved in supervision, suggesting a sort of “Great Reversal” towards prudential supervision in the hands of central banks.

The GFC highlighted the need for financial stability. In numerous countries, reforms of financial regulations were motivated by the fact that a focus solely on monetary stability and microprudential supervision (i.e., the stability of individual institutions and markets) could not guarantee the safety and soundness of the financial sector.

How can the role played by central banks in financial stability be explained? From the perspective of traditional economics, the extension of central bank influence into this field has both pros and cons. In other words, this perspective does not provide a clear answer as to whether assigning a supervisory role to central banks or

other independent institutions is socially optimal. Two conflicting views can be found regarding the merging of monetary and supervisory functions within the central bank: the integration view and the separation view.¹ The integration view underscores the informational advantages and economies of scale derived from bringing all functions under the authority of the central bank. In contrast, the separation argument suggests a higher risk of policy failure if central banks have supervisory responsibilities, as financial stability concerns might reduce the effectiveness of monetary policy action. The extant empirical research on the relative merits of putting banking sector supervision in the hands of central banks provides mixed results.

Therefore, policymakers must address a series of possible trade-offs between the expected benefits and costs of allowing the monetary authority to have more or less influence on macroprudential strategies. Consequently, the political economy perspective becomes relevant, as arguments supporting either the integration view or the separation view can be more or less important in the minds of those who design and implement the supervisory regime. In other words, we have to focus on the agent responsible for the institutional setting – the policymaker. Consequently, the question that arises is genuinely empirical: Is it possible to identify common drivers that explain political choices concerning central bank involvement in supervision?

The aim of this article is to illustrate how empirical analyses can shed light on the political drivers that might explain the central bank's involvement as a supervisor. To do so, this paper examines two cases. The article proceeds as follows. Section 2 illustrates the theoretical background. Section 3 highlights the empirical drivers that may explain central bank involvement in the macroprudential perimeter using a cross-country analysis. Section 4 adds a temporal dimension and discusses the possible role of financial crises. Section 5 concludes.

2 Central banks as macroprudential supervisors: A political economy perspective

The political economy framework is based on two key assumptions. First, the gains and losses of a given central bank setting are variables computed by the incumbent policymaker, who maintains or reforms the supervisory regime based on his or her own preferences. Second, policymakers are politicians and, as such, voters hold them accountable during elections. All politicians are career-oriented agents motivated by the goal of pleasing voters in order to win elections. The main differences among various types of politicians stem from differences in the segments of the electorate they wish to please.

¹ The taxonomy was introduced in Masciandaro and Quintyn (2015).

Let us describe the delegation framework between society and policymakers². The society cares about the effectiveness of the central bank involvement in macroprudential supervision (CBIS) according to a classic well-behaved concave function $U = U(\Omega)$ in which social welfare increases with Ω , which is the CBIS optimal level. The social function takes into account all the economic gains and losses of a given macroprudential regime, including the role that has to be assigned to the central bank, which has been summarized in the above-mentioned debate (integration vs separation). Finding the optimal CBIS level is not a trivial task, given that both social benefits and costs must be weighted. Linear preferences are used:

$$U(\Omega) = \Omega. \quad (1)$$

The policymaker's reward is based on how she carries out her job. Our policymaker is a politician: we assume that the policymaker wishes to please the citizens. Alternatively, we could also assume that the policymaker aims to please specific constituencies (e.g. the lobbies). Nevertheless, we adopt the *helping hand view* of the policymaker's type - she wishes to please citizens rather than a particular constituency or lobby (*grabbing hand view*). This assumption allows us to show the conditions under which the final regime – the actual level of Ω – can be different from the social optimal one despite the policymaker's desire to please the citizens.

The level of Ω is determined by the policymaker's ability, Φ , and by her effort, a :

$$\Omega = a + \phi. \quad (2)$$

The sequence of events is as follows: a) society chooses to delegate the task of designing the CBIS regime to the policymaker; b) the policymaker chooses her effort, a , before knowing her ability, Φ , with regard to implementing this particular task (building up a CBIS regime is not a usual task); the policymaker establishes the regime, thereby revealing her ability, and d) citizens observe the regime but not the relationship between effort and ability, as they cannot distinguish innate talent from contingent effort. They then reward the policymaker.

The policymaker's utility function, denoted by $P = P(R, C)$, is defined as:

$$P = R(U) - C(a), \quad (3)$$

where $R(U)$ is the reward function and $C(a)$ is the cost function. Intuitively, the policymaker evaluates any decision against the status quo. The policymaker evaluates every task assignment while taking the political rewards and costs of doing so into account. Let us describe the three crucial features of the policymaker:

- i) Ability: The ability of the policymaker is a random variable with a normal distribution, where we denote the mean by Φ_{AV} ;

- ii) Political reward: The incumbent policymaker wishes to be re-elected. The policymaker therefore needs to provide the majority of voters with enough utility. As such, her utility function is associated with the social welfare function $U = U(\mathcal{Q})$.

In general, the policymaker wishes to please voters and her goal is the alignment of her interest with those of the citizens. Each delegated task (i.e. each specific alignment) can be more or less convenient in terms of political gains from the policymaker's point of view. We denote the political value she assigns to fulfil the specific task of monetary regime designing - by β_p , with $0 \leq \beta_p \leq 1$. Therefore:

$$R(U) = \beta_p U . \quad (4)$$

The alignment of incentives between the policymaker and the citizens is a necessary and sufficient condition for finding the policymaker's optimal behavior. The political reward is different from the social reward as long as $\beta_p \neq 1$. One more step is necessary to find the effective political reward. The reward will be useful if the citizens' utility exceeds the minimum threshold of utility W that they expect from an incumbent policymaker. This is the political competition condition. Citizens compare the policymaker's performance with the expected performance of other politicians. The political competition condition can be defined as follows:

$$R_p = \beta_p Pr(U \geq W). \quad (5)$$

The usefulness of the political reward will depend on this condition.

- iii) Political costs: The policymaker takes into account also the political costs of such specific task. The policymaker knows that a higher CBIS level implies a more powerful central bank. The political role of the central bank as an independent authority gains momentum. A leading role of the central bank as macro-supervisor is likely to increase its overall powers, and the politicians can fear to create an overly powerful independent bureaucracy. From the policymaker's point of view, the political costs of establishing a given level of CBIS depends on her expectations of facing a too powerful central bank (conflict events). Therefore, the policymaker's cost function can assume the following specification:

$$C(a) = c_p a^2 = [c_o + c_E probE] a^2, \quad (6)$$

Where $0 \leq [probE] \leq 1$ represents the probability that a conflict event E occurs. A two-step process is required to establish the CBIS regime. First, the policymaker defines her optimal effort. Second, the citizens evaluated the CBIS level, and the final political reward can be calculated. It follows that the policymaker maximizes

social welfare net of costs of executing the task and taking into accounting her political reward:

$$\max P = R(U) - C(a) = \beta_P U - c_P(a_P) = \beta_P(a_P + \Phi) - c_P a_P^2 \quad (7)$$

From the first-order condition, the optimal effort will be:

$$\frac{\partial L}{\partial a_P} = \beta_P - 2c_P a_P = 0,$$

which implies that:

$$a_P = \frac{\beta_P}{2c_P}. \quad (8)$$

Given the above-mentioned political competition condition (5), the CBIS equilibrium level will be determined by the lawmaker's ability and effort:

$$\Omega_P = a_P + \Phi_P = \frac{\beta_P}{2c_P} + \Phi_P. \quad (9)$$

Given the ability, the shape of the macroprudential setting will depend on the political preferences. On one hand, the CBIS level depends on the extent to which it is politically relevant for the policymaker to build up supervisory institutions that please the society. In other words, the policymaker's perception of the relevance of the supervisory setting matters. On the other hand, the policymaker takes into account her own political costs of having an even more powerful central bank.

Notably, the parameter c_P can easily be used to show the conditions under which the actual CBIS level can differ from the socially optimal level. In fact, we can assume that the citizens also recognize the need to avoid a too powerful bureaucracy inside the institutional setting. We can proxy such social sensibility assuming that the corresponding value of the parameter c_S is different from zero. Therefore, it will be generally true that:

$$\text{If } c_P \neq c_S \text{ then } \Omega_P \neq \Omega_S. \quad (10)$$

Consequently, we find that exploring the policymaker's preferences can be essential for understanding how the prudential institutions are designed.

3 Politicians, central banks and macroprudential governance

Is it possible to identify common drivers that explain political decisions regarding central bank involvement in macroprudential governance? In a recent econometric

cross-sectional analysis of the determinants of central bank involvement in this area, Masciandaro and Volpicella (2016) test different assumptions made in the theoretical and institutional literature. In general, the empirical results indicate that a) central banks acting as micro-supervisors of the banking industry are more likely to be given more macroprudential powers, b) higher central bank political independence is associated with lower involvement in macroprudential supervision and c) central banks pursuing specific price stability objectives are more likely to be endowed with macro-supervisory responsibilities. These results can be interpreted using a political economy perspective.

The political economy perspective differs from the extant literature in two main respects. First, while interactions between macroprudential policies and monetary policies have been studied, no research has examined the drivers of governance arrangements. Second, this perspective enriches research focusing on the effects of statutory central bank independence (CBI). Since it emerged in the 1990s, CBI has been viewed as a major determinant of macroeconomic performance. In this paper, the broader picture is enriched by exploring the relationship between CBI and an important institutional feature – macroprudential supervision. The results suggest that CBI is relevant not only owing to its beneficial effects on macroeconomic variables but also because it influences policymakers' decisions.

The empirical analysis is based on data available in 2013 covering 31 countries that are heterogeneous in terms of their institutional frameworks and stages of economic development. In order to shed light on the drivers that influence the development of macroprudential settings, qualitative information must first be transformed into quantitative variables. Two main indicators can be used to measure the key features of the central bank's role in financial supervision. The central bank's involvement in macroprudential supervision is our dependent variable in the econometric tests, while the central bank's role as a micro-supervisor serves as a proxy for its role as the leading authority in microprudential supervision, as discussed above.

The macroprudential index³ (MAPP) was used to measure central bank involvement in macroprudential supervision and the CBBA index⁴ was applied to measure central bank involvement in microprudential supervision of the banking industry. The latter index is a dummy variable that takes a value of one if the central bank is the main banking supervisory authority, and zero otherwise. In addition, I use an index of involvement for central banks' microprudential supervision of the financial system as a whole (i.e., banking, securities and insurance). To do so, I adopt a two-step procedure that starts from the Financial Supervision Herfindahl Hirschman (FSHH) Index. The FSHH measures the extent to which supervisory powers are consolidated

³ Lim et al. (2013).

⁴ Masciandaro and Volpicella (2016). See also Masciandaro (2019).

using the classical index proposed by Herfindahl and Hirschman.⁵ In the second stage, the methodology can be used to build an index of central bank involvement in microprudential supervision: the Central Bank Supervisor Share (CBSS) Index.⁶ As a result, we have two alternative indexes that measure the impact of the central bank's role as micro-supervisor. The expected sign of both variables is undetermined: higher levels of either the CBBA or the CBSS are likely to be associated with higher MAPP levels if the information-gain effect prevails. The opposite is true if the capture-risk effect dominates.

In addition, it is necessary to measure two potential shortcomings that politicians may associate with deep central bank involvement in macroprudential supervision: too much bureaucratic independence in the institutional setting and excessive discretion in defining monetary policy. A proxy for CBI with respect to the monetary policy function can be found in the extant literature. Acknowledging that *de facto* independence can sometimes lead to a different framework than *de jure* independence – especially in emerging and developing countries⁷ – our analysis focuses on the legal features of independence. This choice is justified by the fact that CBI cannot be ensured without proper legal provisions.

In terms of determining the most relevant index for capturing either the political or operational dimensions of CBI among those proposed in the literature,⁸ this study uses the GMT index⁹ mainly owing to its robustness. In fact, the literature on CBI generally uses two different strategies to capture the degree of CBI: a) indices based on central bank legislation (*de jure*) or b) indices on the turnover rate of central bank governors (*de facto*).

De jure indices are more likely to capture the extent of CBI for several reasons. First, turnover rates relate the independence of central banks to the autonomy of their governors. While extensively used, this approach has been shown to be less robust in empirical estimations than the GMT index of legal independence. Second, the legal measures associated with CBI are more likely to reflect the true relationships among the central bank, the policymakers and the bankers, especially in countries where the rule of law is strongly embedded in the political culture, as in many developed economies.¹⁰ Third, it is currently most relevant to capture changes in the extent of CBI after 2008. Given that many post-crisis reforms revolved around

⁵ Masciandaro and Quintyn (2011).

⁶ Masciandaro and Quintyn (2011).

⁷ Cukierman (2008).

⁸ For surveys, see Alesina and Stella (2010), Reis (2013), Masciandaro and Romelli (2015), and de Haan and Eijffinger (2016).

⁹ Grilli et al. (1991) developed the index, which was updated by Arnone et al. (2009).

¹⁰ de Haan et al. (2008).

central bank involvement in supervision, it is more efficient to restrict our attention to *de jure* indices that can capture such changes.¹¹

Given this overall setting, we can frame the results regarding the drivers of central bank involvement in macroprudential supervision. The empirical results show that: a) central banks acting as micro-supervisors of the banking industry are more likely to be given more extensive macroprudential powers, b) higher central bank political independence is associated with lower involvement in macroprudential supervision and c) central banks pursuing specific price stability objectives are more likely to be endowed with macro-supervisory responsibilities.

What is the political economy interpretation of these results? First, the empirical analysis suggests that the central bank's role as a micro-supervisor of the banking industry can be a key driver of its macroprudential involvement. In other words, micro-supervisory powers serve as a proxy for the information advantages available to the central bank and politicians seem to appreciate this feature, with the argument that goes as follows: the central bank can do effectively her role as macro-supervisor if she is also responsible for the supervision of the institutions that make up the banking system. Second, from the politicians' perspective, greater central bank independence, which increases the risk of an overly powerful monetary authority, seems to imply fewer macro-supervisory powers. However, it is worth noting that the potential risks of having too much power in the hands of unelected central banker when independence is combined with supervisory involvement could be addressed – at least theoretically - with a proper accountability design.

Finally, rule-based monetary policy focused on inflation targeting, which reduces the central bank's discretion, weakly increases the odds of a central bank being involved in macroprudential supervision. Politicians seem to dislike situations in which central bankers have too much discretion. At the same time, regarding the potential goal conflicts - inflation targeting versus banking stability – that may arise, it is worth recalling that such conflicts can arise in any institutional structure and – if we assume that the probability of conflict is exogenous – the issue becomes whether it is more efficient to resolve these conflicts internally within the central bank or between agencies if a different agency is responsible for bank supervision.

All in all, politicians appear to be wary of placing too much power in the hands of independent and/or discretionary central banks, although it is worth noting that independence seems to be the more relevant characteristic.

¹¹ Masciandaro and Romelli (2018b).

4 Politicians and supervisory central banks: Do crises matter?

The stability and generalizability of the above-mentioned results regarding politicians' incentives must be checked in future research. At the same time, other assumptions regarding what drives politicians to modify supervisory architectures over time should be tested in the field of macroprudential supervision. Recently, Masciandaro and Romelli (2018a) undertook an empirical analysis of 105 countries over the period 1996 to 2013. Their results suggest the existence of two main drivers of reforms. First, systemic banking crises significantly increase the probability that a country will change its supervisory structure. Second, an equally important “bandwagon” effect seems to matter – countries are more likely to change their supervisory architectures when the share of countries undertaking reforms around the world or on the same continent is high.

In their empirical analysis, the dependent variable is CBISit, which measures the degree of central bank involvement in supervision in country i in year t . Given the discrete, ordinal nature of the index, the baseline estimation uses an ordered probit model, which allows for multiple discrete outcomes to be ranked. The objects of interest are the determinants of the financial supervision architecture and, in particular, the question of whether financial crises and central bank design play an important role in influencing central bank involvement in supervision.

Masciandaro and Romelli's (2018a) results show that the number of financial crises previously experienced by a country positively influences the incentives to increase central bank involvement in supervision. Moreover, they show a negative effect of independence on the degree of central bank involvement in financial supervision. These findings further support the idea that the greater the independence of the supervisor, the greater the fear of powerful institutions or bureaucratic misconduct. This suggests that in countries characterized by more independent central banks, politicians are less likely to put financial sector supervision in the central bank's hands, as they fear the creation of a super-powerful bureaucratic institution.

It is also possible to analyze the extent of central bank involvement in macroprudential policy. In fact, it has been suggested¹² that supervision reforms are more important in countries undertaking macroprudential policies. Hence, we might expect countries in which central banks are more involved in macroprudential policies to also have central banks with greater overall supervisory powers. The positive and statistically significant coefficient provides strong support for this argument. Among the other explanatory variables, the negative sign for the civil law dummy and the country's latitude signal that countries with a civil legal system and coun-

¹² Blanchard et al. (2010).

tries characterized by higher latitudes tend to have financial services supervision responsibilities outside the central bank.

All in all, we find evidence that the extent to which supervision is concentrated in the hands of the central bank is influenced by a cumulative index of past financial crises, the degree of CBI, real GDP per capita, openness and financial sector development. The positive relationship between the number of previous financial crises and the CBIS index suggests that countries that experienced more financial turmoil in the past two decades are more likely to put their supervisory architecture in the hands of the central bank.

5 Conclusion

Since the GFC, financial stability has been a general priority. When thinking about ways to prevent financial disasters in the future, it has been natural to reconsider the relationship between central banks and financial stability. Some researchers claim¹³ that central bank independence, inflation targeting, and financial stability represent the major changes in the monetary policy landscape in recent decades.

The crucial point is that traditional economics offers two main and contradictory results that can be summarized as opposing answers to the following question: Given two policies – monetary policy and macroprudential policy – with their own macro goals, what is the optimal degree of involvement for the monetary agent (i.e. the central bank) in supervisory responsibilities? Thus far, two answers have been offered: the integration view and the separation view.

This article highlighted the potential usefulness of adding another perspective: the political economy view. The political economy view is based on the fact that the player who decides to maintain or reform a supervisory regime is the politician in charge. This politician follows his or her own preferences when weighing the arguments of the integration and separation views. In this perspective, the central bank's involvement in supervision is an endogenous variable. In other words, the optimal institutional setting *does not* exist per se. Moreover, the central bank's involvement is likely to change over time based on political preferences favoring the delegation of more (or less) supervisory power to the monetary authority. Today, this consideration deserves even more attention given the role of a “special” kind of politician – the populists. Populist policies revolve around presenting solutions that are welfare enhancing in the short run for a majority of the population but costly in the long run for the overall population. Given this definition, the narratives of central bankers seem to highlight them as a natural target for populist policies. Some researchers have argued that the rise of populism may negatively affect the consensus in favor of

¹³ Reis (2018).

CBI evident from the late 1980s until the GFC.¹⁴ The same arguments could be tested when exploring the role of central banks as supervisors.

In addition, politicians are generally viewed as “Econs” – rational players in the sense of the traditional economic mainstream. Future research could explore the behavioral perspective and investigate the consequences of the fact that politicians are “humans”, as behavioral biases might distort their decisions. In general, politicians are subject to the same sources of behavioral bias that all individuals face. In the presence of behavioral biases, the outcomes of different information sets and/or governance rules can differ. At the same time, governance rules are based on the assumptions that central bankers are bureaucrats and that bureaucrats are rational players. Recent research¹⁵ has shown how the perspectives associated with modern economics, political economy and behavioral economics can serve as fruitful and complementary tools when analyzing the design and implementation of monetary policy.

Finally, while we have highlighted possible political determinants of the supervision setting, we have not discussed whether a different degree of central bank involvement in supervision might influence the stability or efficiency of the financial sector. Notably, economic and econometric analyses of the relative merits of assigning the central bank a leading role in macroprudential governance are rare.¹⁶ More generally, future research could be directed towards understanding the macroeconomic effects of alternative institutional architectures of the central bank’s supervisory role.¹⁷

References

- Alesina, A. and Stella, A., (2010), The Politics of Monetary Policy, in *Handbook of Monetary Economics*, p.1001-1054.
- Alesina, A. and Tabellini, G., (2007), Bureaucrats or Politician? Part I: A Single Policy Task, *American Economic Review*, 97(1), 169-179.
- Ampudia M., Beck, T., Beyer A., Colliard J., Leonello A., Maddaloni A. and Marques-Ibanez, D., (2019), The Architecture of Supervision, ECB Working Paper Series, n.2287.
- Blanchard O., Dell’Ariccia, G. and Mauro, P. (2010), Rethinking Macroeconomic Policy, *Journal of Money, Credit and Banking*, Vol. 42(s1), Blackwell Publishing, pp. 199-215.

¹⁴ Buiter (2014), de Haan and Eijffinger (2017), Goodhart and Lastra (2017), Rajan (2017), Rodrik (2018), Masciandaro and Passarelli (2020).

¹⁵ Favaretto and Masciandaro (2016).

¹⁶ Borio and Shim (2007), Lima et al. (2016).

¹⁷ Ampudia et al. (2019).

- Borio, C. and Shim, I., (2007), What Can (Macro)prudential Policy Do to Support Monetary Policy?, *BIS Working Papers*, 242.
- Buiter W.H., (2014), Central Banks: *Powerful, Political and Unaccountable*, CEPR Discussion Paper Series, n. 10223.
- Cukierman A. (2008), Central Bank Independence and Monetary Policymaking Institutions: Past, Present and Future, *European Journal of Political Economy*, Vol. 24(4), 722-736.
- de Haan J., Masciandaro, D. and Quintyn, M. (2008), Does Central Bank Independence Still Matter? *European Journal of Political Economy*, Vol. 24(4), pp. 717-721.
- de Haan, J. and Eijffinger, S., (2016), The Politics of Central Bank Independence, *DNP Working Papers*, n.539; (2016). 399-410.
- de Haan J. and Eijffinger S., (2017), *Central Bank Independence under Threat?*, CEPR Policy Insight, n.87.
- Favaretto, F. and Masciandaro, D., (2016), Doves, Hawks and Pigeons: Behavioral Monetary Policy and Interest Rate Inertia, *Journal of Financial Stability*, 27, 50-58.
- Goodhart C.A. and Lastra R., (2017), *Populism and Central Bank Independence*, CEPR Discussion Paper Series, n. 2017.
- Lim C.H., Columba, A. Costa, P. Kongsamut P, Otani A., Saiyid M, Wezel T. and Wu X. (2013), Macroprudential Policy: What Instruments and How to Use Them? *IMF Working Paper Series*, International Monetary Fund, n. 238.
- Lima, D., Lazopoulos, I. and Gabriel, V., (2016), *The Effect of Financial Regulation Mandate on Inflation Bias: A Dynamic Panel Approach*, University of Surrey, Discussion Paper in Economics, n.6.
- Masciandaro, D., (2009), Politicians and Financial Supervision outside the Central Bank: Why Do They Do it?, *Journal of Financial Stability*, 5(2), 124-147.
- Masciandaro, D., (2019), Central Banks as Macroprudential Authorities: Economics and Politics, in D.W. Arner, E. Avgouleas, D. Busch and S.L. Schwarcz, (Eds.), *Systemic Risk in the Financial Sector: Ten Years after the Global Financial Crisis*, Mc Gill-Queen's University Press, Chapter 9, 151-164.
- Masciandaro, D. and Passarelli, F., (2020), Populism, Political Pressure and Central Bank (In)dependence, *Open Economies Review*, forthcoming.
- Masciandaro, D. and Quintyn M., (2015), The Governance of Bank Supervision: Recent Developments, *Journal of Economic Surveys*, .29, 1-25.
- Masciandaro, D. and Romelli, D., (2015), Ups and Downs of Central Bank Independence from the Great Inflation to the Great Recession: Theory, Institutions and Empirics, *Financial History Review*, 22(3), 259-289.
- Masciandaro, D. and Romelli, D., (2018a), Central Bankers as Supervisors: Do Crises Matter?, *European Journal of Political Economy*, 52, 120-140.

- Masciandaro, D. and Romelli, D. (2018b). Peaks and Troughs: Economics and Political Economy of Central Bank Independence Cycles. In D. Mayes, P.L. Siklos and J.E. Sturm (eds.), *Oxford Handbook of the Economics of Central Banking*, Oxford University Press, New York.
- Masciandaro, D. and Volpicella, A. (2016), Macro Prudential Governance and Central Banks: Facts and Drivers, *Journal of International Money and Finance*, 61, 101-119.
- Reis, R., (2013), Central Bank Design, *Journal of Economic Perspectives*, 27(4), 17-44.
- Reis, R., (2018), Is Something Really Wrong with Macroeconomics?, *Oxford Review of Economic Policy*, 34(1-2), 132-155.
- Rajan R., (2017), *Central Banks' Year of Reckoning*, Project Syndicate, December 21st, mimeo.
- Rodrik D., (2018), *In Defence of Economic Populism*, Project Syndicate, January, 8th.

The Architecture of Supervision¹

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Introduction

The *architecture of supervision* is defined by the allocation of supervisory powers to different policy institutions. This allocation has implications for policy conduct and for the economic and financial environment in which the policies are implemented. This article addresses two main issues related to the architecture of supervision. First, it analyses the implications arising from an integrated model of the functions of central banking and prudential supervision. Afterwards, the consequences of centralized supervision, as opposed to national supervision are also examined. The implications are also broadly discussed in the euro area context and in relation to the design of the Single Supervisory Mechanism (SSM).

1 Central banking and supervision: Integrated or separated functions

This section outlines the pros and cons of having the same institution – a central bank- in charge of both central banking and supervisory functions. Then it explicitly addresses how monetary and prudential policies interact and show the results of some cross-country analysis suggesting that there might be important synergies to leverage on.

¹ This article is based on a presentation given at the workshop “How do monetary, micro- and macroprudential policies interact?” organized by the Oesterreichische Nationalbank on 2 December 2019. The content of the presentation is based on the ECB Discussion Paper No. 2287 “The architecture of supervision” by Ampudia et al., published in May 2019, <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2287~0e83935ee0.en.pdf>.

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A cost benefit analysis

When analyzing the costs and benefits of having an integrated or separated model for the architecture of supervision, the possible consequences that the setup has on the reputation and the independence of the central bank are central to the debate.

In terms of benefits, in an integrated structure supervisors can benefit from the independence and reputation of the central bank, thus limiting the risks of political pressure and regulatory capture. The proximity of supervisors to national authorities, local stakeholders and special interest groups can influence their decisions and result in them being too lenient. In the euro area the advantages of an integrated model may be significant because of the monetary union setup and the high degree of independency granted to the European Central Bank.

At the same time, an integrated model entails risks to reputation for both functions, which are then more strictly linked. For example, bad reputation of supervisors stemming from a bank failure can transfer to the central banking function, affecting its credibility and effectiveness in implementing monetary policy. However, it is not clear that a separated structure would shield the central bank from this risk, especially when a crisis erupts and the central bank is the lender of last resort (LOLR).³

An integrated structure may foster better coordination of policies aimed at price and financial stability. Indeed consolidated responsibilities can help avoid coordination failure and account for the interdependencies of the two policies. Central bank and supervisory authority residing in different institutions may not fully internalize the spillovers existing between their own policies and objectives (*push-me/pull-you* conduct). The resulting non-cooperative allocation entails a welfare loss.

But coordination may also be difficult since price stability and financial stability may be conflicting objectives. In these cases policy makers may deviate from the optimal path of monetary policy in an attempt to preserve the stability of the financial institutions (*financial dominance*). Central banks in charge of both monetary policy and prudential supervision may have therefore an inflation bias (see for example Di Noia and Di Giorgio (1999); Copelovitch and Singer (2008)). Similarly, supervisors may be more lenient (*excessive forbearance*) in order to reduce possible losses to central banks arising from exposure towards the banking sector for example.

Another important dimension to consider when evaluating different setup for the architecture of supervision is the impact that this may have on the easiness of transferring information. Easier transfer of information is beneficial for supervisors

³ A recent example on this is offered by the UK experience in the context of the failure of the bank Northern Rock. In the UK, after 1997, supervisory powers were assigned to the Financial Service Authority (FSA). However, the Bank of England (BoE) still retained the lender of last resort function. On this basis, the BoE was considered largely responsible for the bankruptcy of Northern Rock, lacking a swift intervention of the central bank in providing emergency liquidity when needed.

and monetary policy makers. Central banks can benefit from supervisory information when assessing the impact of monetary policy decisions. Better knowledge of the banking sector improves information on financial conditions prevailing in the economy. Supervisors benefit from central banking knowledge of the economic and financial environment. LOLR interventions are also more effective and conducive to financial stability if the central bank has better information on the state of the financial sector.

There is also evidence that monetary policy can benefit from access to *aggregate supervisory information*, including soft information in the form of supervisory assessment. Evidence based on US data shows that an aggregate index calculated using individual supervisory information (including supervisory assessment) improve the forecasting of inflation and unemployment (Peek, Rosengren and Tootell (1999)). Similar information also *significantly improves the fit of a policy rule explaining short term rates* (Peek, Rosengren and Tootell (2016)). A similar indicator constructed for the euro area provides suggestive evidence in the same direction. A Financial Stress Indicator (FSI) constructed aggregating supervisory information on euro area banks helps to improve the statistical and out-of-sample forecast properties of a Taylor rule, compared with an estimated benchmark rule.⁴

Interaction of policies

As already described in the previous section, researchers have suggested that an integrated model of a central bank in charge of both monetary policy and supervision may be more conducive to price and financial instability. An empirical analysis using data from 98 countries worldwide during the period 1999–2012 sheds some light on this topic.⁵ The analysis investigates the link between the institutional structure of supervision and the economic growth and inflation performances across countries. It also looks at the likelihood that a credit boom turns into a full financial crisis. Based on different fixed and random effects models, including control variables such as corruption control index, log(GDP/capita) and time fixed effects, results point to no evidence that an integrated structure is related to a worse growth performance. Similarly, there is no evidence that in countries where the integrated model is prevailing there are higher deviations from the inflation target, therefore providing no support to the notion that an integrated structure is associated to an *inflation bias*.

Turning to the impact on financial stability, the analysis suggests that in countries where bank supervision is outside the central bank there is a higher probability of a credit boom turning into a banking crisis. In countries and years where bank super-

⁴ See Box 1 of the ECB Discussion Paper No. 2287, “The architecture of supervision.”

⁵ For detailed results on this analysis see the Annex of Ampudia et al., ECB Discussion Paper No. 2287, “The Architecture of Supervision.”

vision is in the central bank, there is a higher likelihood that *loan-to-value* ratios are used as macroprudential tools during credit booms and that credit booms are less likely to turn into a crisis. Thus, there seems to be no evidence that an integrated structure is associated with more financial instability or inaction bias.

This suggestive cross-country evidence therefore does not support arguments against unifying responsibilities for monetary and financial stability into one institution. At the same time, the analysis is mostly inconclusive on the optimal structure, but it suggests that monetary policy and supervision integrated in the same structure may result in benefits arising from better information flow and policy coordination, which could result in potential financial stability gains.

The setup in the euro area

The choice whether to separate bank supervision and central banking functions involves a complicated trade-off between different objectives. The design chosen in the euro area represents a compromise between a model of full separation and full integration. The model for the euro area is not fully integrated. Supervisory responsibilities are carried out by the SSM which is part of the ECB. However, to prevent conflicts of interest between the monetary policy and supervisory functions, legislators introduced a *separation principle*, which translates in certain legal and administrative barriers (separation of objectives, decision-making and tasks) and strict separation of the Governing Council's meetings.

In the previous section, it has been argued that in an integrated structure the information may be channeled in a more efficient and transparent way. It is important to stress that in the euro area setting, much of this information can still be collected while respecting the separation principle.

Concerning the supervisory function, there is a unique model of supervision for significant and less significant financial institutions. However, the SSM performs direct centralized supervision only of significant institutions, while the supervision of less significant institutions is a responsibility of the national supervisors based on a common rule book. The following section will address the likely implications of this setup.

2 Centralized and decentralized supervision

The occurrence of the Great Financial Crisis induced important changes in the architecture of supervision around the world. In the euro area in particular, this translated into the implementation of the Banking Union, with the centralization of the supervisory powers to the ECB, which directly supervises the significant banks of the euro area. In the next sections, a conceptual discussion between the difference between local and central supervisors is outlined and the reactions that can be

expected from the financial sector – banks in particular - when changes to the structure occur.

Local and central supervisors

Local and central supervisors are subject to different incentives and possibly conflicts of interest. First, they have different costs in acquiring the important information from the banks that they are supervising. Academic literature has shown that geographical proximity matters for the effectiveness of supervision (Delis and Staikouras,(2011); Quintyn and Taylor (2002); Gopalan, Kalda, and Manela (2017)). One of the main factors explaining this result could be the easiness of information acquisition, coupled with higher specialization and cultural closeness of local supervisors, which improves knowledge of local credit markets and their specificities.

Empirical evidence on the effectiveness of supervision also supports the importance of resources for supervisors (see Rezende (2011)), for example a large budget that allows a higher number of onsite visits but also more staff to supervise large, more complex banks. While local supervisors may have an advantage in onsite inspections, they are often more budget constrained and may have less resources than central supervisors.

In general, there are important economies of scale to be reaped in banking supervision, including a better sense of macroeconomic conditions and how these affect the banking sector as a whole, which support the move towards centralized supervision. Central supervisors have more resources, have a better macro view on the state of the financial sector and can use more peer comparisons. Related to resource constraints, supervisory institutions entirely financed with fees may induce distorted incentives. Centralization of supervision limits this incentives distortion.

Apart from resource constraints and differences in cost of information acquisitions, local and central supervisors are also facing different incentives, stemming from different responsibilities and objectives. Generally, centralized supervisors face lower costs in taking an intervention and liquidation decision (Repullo (2018)). However, removing decision power from the local supervisors may lead to worse information collection and possibly more leniency (Carletti et al. (2016)).

Bringing supervision at the supranational level aligns incentives of supervisors vis-à-vis domestic and foreign shareholders and creditors, overall resulting in tougher supervision (remove bias against foreign creditors).

Moving towards centralized supervision

Changing the ways in which supervision is organized and performed in a region will also change the way in which the supervised institutions behave.

Academic literature suggests that banks expect central supervisors to be generally tougher compared to local supervisors. For example, in the US, where there is a system of supervision in which banks change their supervisors between federal and state, it has been shown that federal supervisors tend to be stricter (Agarwal, Lucca, Seru and Trebbi (2014)).

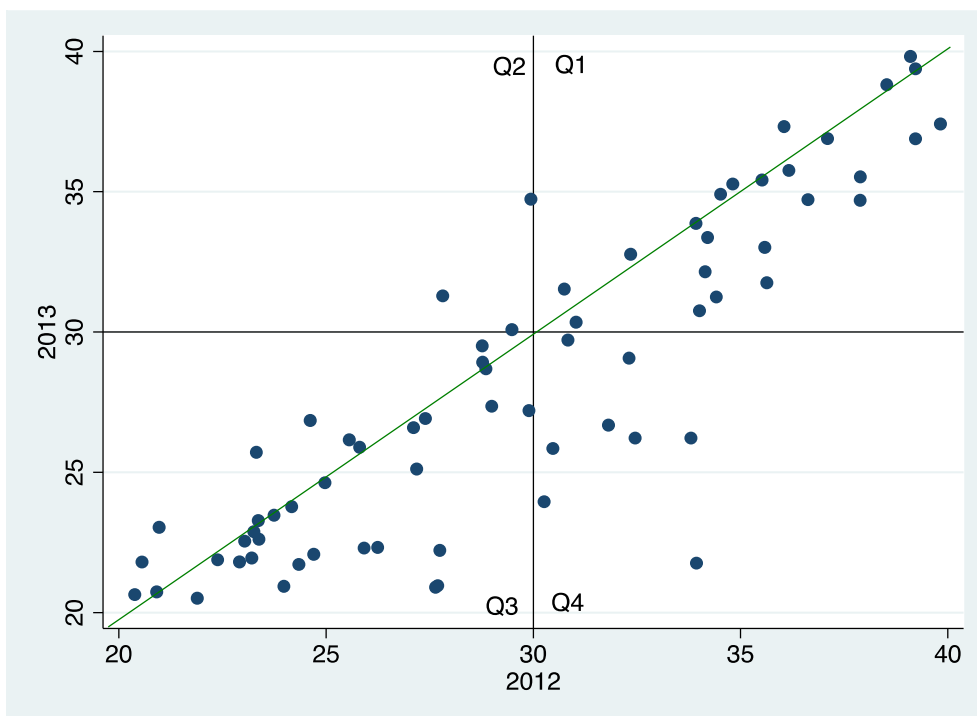
The move towards the implementation of the SSM in the euro area provides some evidence pointing in the same direction. Banks expected the SSM's supervision to be tougher than national competent authorities. In the run-up to the SSM the most significant banks reduced their lending (Fiordelisi, Ricci and Lopes (2016)). SSM banks also reduced their asset size and reliance on wholesale debt (Eber and Minoiu (2016)).

Banks under SSM surveillance reported higher risk weights, higher probability of default and lower collateral to loan ratios for exposures to the same firm as compared to banks under national supervision (Haselmann et al. (2019)).

During the period preceding the implementation of the SSM, 30% of the banks around the threshold strategically reduced size to avoid SSM supervision (see Chart 1): Compared to peers, banks with strategic behavior had worse asset quality and liquidity position.

Centralized supervision is likely to have an impact also on financial integration. The central supervisor is less nationally oriented. Centralized supervision removes the bias against foreign creditors and therefore may allow banks to borrow more easily and at lower rates internationally. Banks that are supervised by a central supervisor may enjoy a positive signaling effect which overall lower their cost of funding. Indeed, banks supervised by the SSM pay lower deposit rates to their customers – both households and non-financial corporations (Barbiero, Colliard and Popov (2017)). They also have partly changed the composition of their liabilities, reducing reliance on deposits and increasing securities issuance, which is consistent with positive market signaling effect arising from the SSM “certification” (Barbiero, Colliard and Popov (2017)).

Chart 1: Change in banks' size during the implementation of the SSM



Source: Ben-David et al. (2018).

Note: Dots in this Chart depict euro area banks with the total assets ranging from 20 to 40 billion EUR. For each bank, the Y axis shows its total assets in 2013 while the X axis represents its total assets in 2012.

Central supervision can have additional effects on financial integration through the structure of multinational banks (MNBs), which have subsidiaries and branches in different countries. A supranational supervisor would optimally exert more monitoring than a local supervisor to the foreign unit (subsidiaries) of a bank (monitoring externality). Centralization of supervision may create incentives to expand abroad through cross-border branches. In turn, the shift from subsidiaries to branches would increase the burden on the deposit insurance fund of countries that host more headquarters. Recent developments in the euro area suggest that changes in the structure of big banking groups are limited (see Chart 2).

Chart 2: Cross-border branches and subsidiaries in the euro area

Source: ECB, *Banking Structural Financial Indicators*

3 Concluding remarks

The introduction of the SSM is the largest change in recent years in supervisory architecture in developed countries. The current setup reflects, at least to some extent, the economics of supervisory architecture and the many trade-offs that have to be taken into account. It reflects a compromise between models of integration versus separation of bank supervision and monetary policy functions. It also reflects a middle ground in the choice between local versus central supervision and centralization versus delegation of information collection versus decision-making and rule-setting.

References

- Agarwal, S., Lucca, D., Seru, A. and Trebbi, F. (2014): “Inconsistent regulators: Evidence from banking”, *Quarterly Journal of Economics*, 129(2).
- Ampudia, M., T. Beck, A. Beyer, J.-E. Colliard, A. Leonello, A. Maddaloni, D. Marques-Ibanez: “The Architecture of Supervision”, ECB Discussion Paper No. 2287, May 2019.
- Barbiero, F., Colliard, J.E. and Popov, A. (2017): “Prudential Supervision and Bank Funding: Evidence from the Implementation of the SSM”, work in progress.

- Ben-David, I., G. Cerulli, F. Fiordelisi and D. Marques-Ibanez (2018): “The Burden of Bank Supervision”, work in progress.
- Carletti, E., Dell’Ariccia, G. and Marquez, R. (2016): “Supervisory incentives in a banking union”, International Monetary Fund. Working Paper No. 16/186.
- Copelovitch, M.S. and Singer, D.A. (2008): “Financial Regulation, Monetary Policy, and Inflation in the Industrialized World”, *The Journal of Politics*, 70(3), 663–680.
- Delis, M.D. and Staikouras, P.K. (2011): “Supervisory effectiveness and bank risk”, *Review of Finance*, 15(3), 511-543.
- Di Noia, C. and Di Giorgio, G. (1999): “Should banking supervision and monetary policy tasks be given to different agencies?”, *International Finance*, 2, 361-378.
- Eber, M. and Minoiu, C. (2016): “How do banks adjust to stricter supervision?”, Working paper.
- Fiordelisi, F., Ricci, O. and Lopes, F.S.S. (2017): “The unintended consequences of the launch of the single supervisory mechanism in Europe”, *Journal of Financial and Quantitative Analysis*, 52(6), 2809-2836.
- Gopalan, Y., Kalda A. and Manela, A. (2017): “Hub-and-spoke regulation and bank leverage”, Working Paper.
- Haselmann, R., S. Singla and V. Vig (forthcoming): “Supra(National) Supervision,” Working Paper.
- Peek, J., Rosengren, E.S. and Tootell, G.M.B. (1999): “Is Bank Supervision Central to Central Banking?”, *Quarterly Journal of Economics*, 114(2), 629-653.
- Peek, J., Rosengren, E.S. and Tootell, G. (2016): “Does Fed policy reveal a ternary mandate?”, Working Papers, 16-11, Federal Reserve Bank of Boston.
- Quintyn, M. and Taylor, M.W. (2003): “Regulatory and supervisory independence and financial stability”, *CESifo Economic Studies*, 49(2), 259-294.
- Repullo, R. (2018), “Hierarchical Bank Supervision,” *SERIEs – Journal of the Spanish Economic Association*, 9 (2018), pp. 1-26.
- Rezende, M. (2011): “How do joint supervisors examine financial institutions? The case of state banks”, *Handbook of Central Banking, Financial Regulation and Supervision – After the Financial Crisis*, ed. by Eijffinger, S. and Masciandaro, D., Edward Elgar.

Issues in the Governance of Monetary, Microprudential and Macroprudential Policy

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1 Introduction

This section collects essays related to the governance of monetary, microprudential, and macroprudential policy. The essays are based on the presentations delivered at the Workshop “How do monetary, micro- and macroprudential policies interact?”, hosted by the Oesterreichische Nationalbank hosted on December 2, 2019, but have been expanded and nuanced based on the discussions at that event.

The Global Financial Crisis (GFC) and its aftermath led to major changes in monetary and financial sector policies, and to the governance arrangements for those policies. The GFC was seen at least in part as representing a failure on the part of the authorities to identify and address the build-up of systemic risk in the financial sector. In response, existing (micro)prudential regulations, supervisory, and crisis management practices were strengthened. In parallel, macroprudential policies and decision-making procedures gained prominence, and were strengthened and formalized.^{1,2} Monetary policy was redirected to cushion the immediate effects of the crisis and then to promote recovery, often with the use of innovative instruments (such as quantitative easing, negative interest rates, or US Dollar funding facilities). These changes in policies necessitated changes in institutional arrangements, the old structures having lost credibility due to perceived failures before and during the GFC.

¹ Macroprudential policies had been deployed before, for example, to dampen rapid credit growth and reverse currency substitution in emerging market and transition countries, but the term was not in widespread use.

² See for example Bolton et al (2019); Calvo et al (2018); Khan (2017); and Masciandaro and Quintyn (2016).

Two of the most important changes in the governance of financial sector policies relate to macroprudential policy and financial crisis management. At the country level, a mandate for macroprudential policy action was legislated, and a mechanism to coordinate among relevant agencies was established. The European Systemic Risk Board was set up at the European level, and at the global level institutions such as the Financial Stability Board are meant to promote communication on, and coordination of macroprudential analysis and actions. A parallel development can be seen in the development of mechanisms for crisis management, with the designation of national resolution authorities but also the establishment of national coordinating mechanisms; the establishment of the Single Resolution Mechanism in Europe; and the activation of resolution colleges for cross-border banking groups.

These changes provoked new thinking about the coordination of the relevant policies — microprudential and macroprudential policies are clearly closely linked, and their interactions with monetary policy are strong and complex — and how that coordination can be accommodated in decision-making and accountability mechanisms. Countries have introduced various governance arrangements to this end. Yet so far in the post-GFC period these arrangements have not been put to a severe test, and the optimal structure is still subject to debate.

To introduce this set of essays, the next section summarizes elements of governance as applicable to public policy, what makes for good governance, and some challenges. Several specific issues of topical importance will be set out in the last section.

2 Concepts of governance for the public sector

2.1 The concept of governance

The term “governance” is generally taken to cover the rules, structures and practices by which decisions are made and their implementation overseen.³ Elements may include, for example, the overall mandate of the institution concerned; the decision-making and review responsibilities of various officials and committees; reporting requirements; provisions to avoid conflicts of interest; and provisions for

³ The G20/OECD (2015) “Principles of Corporate Governance” states that “Corporate governance involves a set of relationships between a company’s management, its board, its shareholders and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined.” (p. 9). The Basel Committee on Banking Supervision in Bank for International Settlements (2015) define corporate governance as “[a] set of relationships between a company’s management, its board, its shareholders and other stakeholders which provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance. It helps define the way authority and responsibility are allocated and how corporate decisions are made.”

stakeholders to intervene. A distinction is often made between internal governance provisions, such as the respective roles of the Board and the Supervisory Board, and external governance provisions, such as requirements to publish audited results.

Good governance helps ensure that decisions are reliably taken and effectively carried out in a deliberate manner, based on adequate information, in pursuit of the institution's mandate. Promoting the pursuit of the institution's mandate, rather than, say, the personal interest of managers or some unstated political goal, is the central element of good governance. This end is served by mechanisms to prevent conflicts of interest from arising, and those to effect ex post accountability. But good governance also involves decision making that is considered and effective in practice; being well-intentioned is not enough. Hence, good governance involves also ensuring that relevant information and analysis are taken into account and that decision makers have available adequate instruments. Moreover, good governance arrangements have to be robust across circumstances, so that decision making continues to function well even as outside shocks and diverse forces impact the institution.

Governance for the public sectors is broadly similar to that for the private sector, but has certain distinctive features.⁴ A public sector institution such as a central bank or a prudential regulator typically has defined management and Board responsibilities, decision making procedures, and accountability mechanisms, which are functionally similar to their private sector counterparts. The controlling interests of any institution, be it public or private, will seek to ensure that the institution is not "highjacked" by others for their own purposes, and to this end will put in place both ex ante and ex post controls. Accounting and audit rules are broadly similar in the public and private sectors.

2.2 Governance of public policy authorities

A distinctive feature of the governance in public sector is that it is subject to a special legal regime. Including in the areas of monetary, microprudential, and macroprudential policy, many of the high-level governance arrangements are set by law, and indeed the agencies are typically public law bodies rather than, say, corporations. The central bank law normally defines the central bank's monetary mandate (at least in broad terms); its powers (e.g., to gather information or to use certain instruments); decision-making arrangements; and reporting requirements. Similar provisions apply to microprudential and macroprudential policy-making and implementation. Moreover, in the public sector, provisions for funding and those for the appointment and dismissal of officials constitute important elements of the gover-

⁴ See for example Almqvist et al (2012); Bertelli (2012); and International Federation of Accountants (2001).

nance arrangements that differ from those typically seen in the private sector. Public sector officials often enjoy special protection from legal liability for official actions taken in good faith, and in many jurisdictions the state can override other interests for compelling “*raisons d'état*.” The decision-maker regarding legal provisions on public sector governance, and regarding most high-level appointments, is the government itself, as representative of the stakeholders, that is, the polity as a whole.

Moreover, a public sector institution faces exceptional challenges in measuring effectiveness and linking effects to particular actions, which challenges complicate the design of governance arrangements. The ultimate purpose of a public institution relates to general welfare over the medium term, which is not readily measurable or closely linked to specific decisions. Therefore, the public sector typically establishes intermediary goals, or a hierarchy of intermediary goals. A high-level goal might be “price stability.” Even that has to be translated into something more specific and near term, such as “CPI inflation close to 2 percent over the next two years.”

For the discussion here, it is worth noting that inflation targets are easier to define, and their achievement easier to measure on a timely basis, than objectives related to financial stability. For microprudential policy, “success” consists of individual financial institutions acting prudently, but still some institutions will fail.⁵ Another part of “success” consists of handling exits with a minimum of disruption or other externalities. For macroprudential policy, “success” consists in limiting risks to the system as a whole, and in building buffers to mitigate risks that cannot be eliminated. Prudent behavior, resolvability, systemic risks, and systemic robustness are not readily measurable or aggregatable. For both micro- and macroprudential policy, successful policies may be characterized by the absence of major events for prolonged periods, while policy errors may become evident only many years after decisions are made.

In this connection, accountability is complicated by the distributional issues that arise in public policy matters more than in the private sector. It is generally thought that public policy should yield actions that are equitable, in terms of benefits and costs. Monetary policy regarding interest rates, acting on a macro level, may affect the broad classes of borrowers and savers in opposite ways. Macroprudential policy may create more narrowly-defined winners and losers (or those who think of themselves that way). A tightening of housing finance rules is likely to be opposed by builders, first time buyers, etc. even if the measure is designed to preempt a market crash that would harm them severely. Microprudential policies tend to affect the most narrowly defined groups, such as “shareholders of banks” or even “sharehold-

⁵ Commercial banks’ own governance arrangements are subject to regulation and supervision for both prudential and market conduct reasons (see BIS (op. cit.); Dermine (2013); and Litan et al (2004)).

ers of bank X.” The distributional implications of prudential policies, combined with the challenges in measuring their success, make it more difficult to apply the distinction between “goal independence” and “instrument independence” in these areas compared to in the monetary policy area. In addition, the different distributional aspects of the policies under consideration need to be taken into account in governance arrangements, if only because they all face some risk of regulatory capture.

Regulatory capture in the narrow sense refers to a regulatory agency being “captured” by the entities that it is meant to oversee and therefore to act sometimes in their interest rather than the public interest.⁶ Regulatory capture in the wider sense refers to a regulatory agency being “captured” by a special interest group, such as the party of government or the agency’s own staff. This definition allows for the possibility that “capture” is a matter of degree and complicated by competition between interest groups. For example, large and small banks may differ in the prudential policies that they would like to see, and savers and borrowers may differ in the monetary policy stance that they favor. The government of the day may want an agency to support one of its favored policies, even in contradiction to the agency’s mandate (e.g., to be more expansionary than warranted by concerns over inflation or financial stability). However, the career staff of the agency may put up resistance because they value their status and independence, and demand a quid pro quo (perhaps some desired legislation, or more autonomy in setting their budget and salaries).

Related to the possibility of regulatory capture in the wider sense is the widespread tendency towards “blame avoidance.” Officials (and politicians) may be very concerned to avoid being held responsible for bad outcomes, or even for outcomes that are the best available but hurt certain powerful groups. “Blame avoidance” is a common phenomenon in institutions. It may take the form, for example, of delaying decisions, of strictly following precedent or of ensuring that laws and regulations are followed to the letter (notably with regards to the sharing of information).

There is a large literature on the governance of monetary and prudential policy, generally concerned with how to achieve and preserve the right degree of independence and far-sightedness in the face of “political” pressures.⁷ In addition to the possibility of regulatory capture, a major concern is time inconsistency and the commitment problem: in monetary policy, it may be tempting to convince economic agents that inflation will be low, and then surprise them with higher inflation in order to induce higher output. Since economic agents anticipate this possibility, expected inflation will remain high and reducing inflation will be costly. Likewise in

⁶ An extensive review of the literature is provided in Mitnick (1980) and Wilson (1980).

⁷ See for example Cuikerman (1992); Arnone et al (2007); Eijffinger and Masciandaro (2014, 2018); Financial Stability Institute (2007); Goodhart and Lastra (2017); and Meade (2012).

prudential policy one may want agents to expect strict enforcement of rules and no bail outs, but then exercise forbearance or provide bail outs after an adverse shock. The proposed solution is to give the monetary or prudential authority a mandate to pursue longer term objective(s) rather than the short-term gains mentioned, and to insulate it from contrary political and other forces. This independence must, however, be matched with accountability in order to remain legitimate and guard against misuse by the authority itself. That credo, on which there is a wide-spread consensus, is embedded in most modern central bank laws (Issing, 2018). These mechanisms are incorporated also, for example, into Principle 2 and also Principles 1 and 3 of the Basel Core Principles for Effective Supervision (BCBS 2012).

A closely related literature looks at how to balance clarity of mandates against the need for coordination in what are acknowledged as closely related and interacting policies.⁸ Monetary policy has stability implications, and micro- and macroprudential policies affect monetary policy transmissions and macroeconomic conditions generally. Hence, one would want positive or negative spill-overs to be taken into account, and often choices about trade-offs must be made. Yet, it is impractical to decide everything in a fully integrated manner. Moreover, such integration, with non-commensurable objectives over different time horizons, would make accountability hard to achieve, and may be politically unacceptable.

3 Current issues

These general principles for the good governance of public policy, and the threats to it, are fully applicable to the sphere of monetary and prudential policy in the post-GFC world, with some added complications and peculiarities. On the one hand, events over the past decade or more have underscored the importance of international cooperation in dealing with truly systemic disruptions and vulnerabilities. That cooperation might be bilateral, regional or European, or global. On the other hand, the traditional dichotomy between monetary and prudential regulation and supervision has become the trichotomy of monetary, microprudential, and macroprudential policy. These policies are not separable from policies in the area of bank resolution, and others.

The interactions are bi-directional and often involve feedback loops. For example, unconventional monetary measures may affect the interaction between monetary

⁸ Tucker (2016) provides an overview of recent thinking and practice. European Systemic Risk Board (2014) addresses the allocation of macroprudential powers in relation to other policy areas. See also for example Claessens and Valencia (2013); Danielson and Macrea (2018); Della Pellegrine et al (2010); Edge and Liang (2017); Koetter et al (2014); Martinez-Miera and Repullo (2019); Masciandaro and Quintyn (2009); Masciandaro and Romelli (2019); and Vilmunen (2008).

and macroprudential policies.⁹ The unconventional measures work in part by lowering yields, i.e., raising asset prices, which may have more effect in certain sectors rather than other. Plausibly, commercial and residential real estate prices are stimulated quite quickly by the easy monetary conditions. To some extent that is desirable, but the process may risk getting out of hand, while a broader-based recovery lags behind. Therefore, macroprudential policy may have to be applied, say, through borrower-based measures, but in a way that does not vitiate the monetary stimulus.

Also the novelty of the current situation, with many relatively new institutions untested over many complete cycles, raises issues of how one establishes credibility and autonomy. Newer authorities can sometimes helpfully “borrow” reputation and autonomy from more established authorities. In particular, there has been discussion of macroprudential policy “borrowing” gravitas from monetary policy.¹⁰ Central banks are among the most stable institutions in the polity even of new countries. They tend to be well funded, well connected domestically and internationally, and well protected by special legal provisions. Hence, it is suggested that central bank involvement in, and a degree of responsibility for macroprudential policy will promote resistance to capture by special interests, and more long-sighted, bold decisions. The downside is that the central bank’s own reputation is thereby at stake: first, it might have to make decisions trading off financial stability against inflation, so that its monetary policy credibility is weakened.¹¹ Second, it might come under criticism both when macro-financial risks are realized, and when risks are not realized and the measures are seen as unduly onerous.

In this context, the following questions related to the optimal governance of policies are worth addressing:

- New competencies in the area of micro- and macroprudential supervision might challenge the traditional views on the independence of central banks and supervisors. For example, supervisory intervention might affect property rights, require the imposition of sanctions, or even motivate public bail-outs, and thus require introducing a fiscal component and important distributional consequences. What is needed in terms of enhancing communication, transparency, and accountability of central banks and other agencies? What are the limits of the independence of central banks and prudential supervisors? What are the biggest institutional challenges for central banks and supervisors in terms of credibility?
- One key aspect is the availability of data, information and analytical capacity to fulfill the various mandates. As banks play a major role in the financial system, information and expertise on individual banks are a prerequisite for financial stability analysis, especially in crisis situations. How can one maximize synergies

⁹ Ferrero et al (2018) provides an example.

¹⁰ See for example Chwiero and Danielsson (2013).

¹¹ See for example Dalla Pellegrina, Masciandaro, and Pansini (2010).

among monetary, micro- and macroprudential policies while protecting confidential information?

- A major element of the European response to the GFC was the creation of the Banking Union, which should eventually have three pillars (the Single Supervisory Mechanism, SSM; the Single Resolution Mechanism, SRM; and the European Deposit Insurance System, EDIS). This remarkable achievement does, however, bring with it new complexities. These complexities are both internal and also in relation to national structures and other European institutions, notably the ECB in its capacity as monetary and SSM authority. How can the relevant governance structures be made fully effective and even streamlined? What challenges remain and how can they be addressed?

References

- Almqvist, R., Grossi, G., G.J. van Helden, and C. Reichard (2012), “Public Sector Governance and Accountability,” *Critical Perspectives on Accounting*, Vol. 24, No. 7-8, pp. 479-487.
- Arnone, M., S.M. Darbar, and A. Gambini, (2007), “Banking Supervision: Quality and Governance,” International Monetary Fund Working Paper WP/07/82.
- Bank for International Settlements (2011), “Central bank governance and financial stability,” report by a Study Group; Chair: Stefan Ingves.
- Bank for International Settlements (2015), *Corporate governance principles for banks*.
- Basel Committee on Banking Supervision (2012), *Core Principles for Effective Banking Supervision*.
- Bertelli, Anthony M. (2012), *The political economy of public sector governance*, Cambridge University Press.
- Bolton, P., S. Cecchetti, J. P. Danthine and Xavier Vives (2019), “Sound at Last? Assessing a Decade of Financial Regulation,” *The Future of Banking 1*, CEPR Press.
- Calvo, D., J. C. Crisanto, S. Hohl and O. Pascual (2018), “Financial supervisory architecture: What has changed after the crisis?” Financial Stability Institute papers 8, Bank for International Settlements.
- Chwieroth, J. and J. Danielsson (2013), „Political challenges of the macroprudential agenda,” VoxEU.org, 6 September.
- Claessens, Stijn and Fabián Valencia (2013), „The interaction between monetary and macroprudential policies,” VoxEU.org, 14 March.
- Cukierman, Alex (1992), *Central Bank Strategy, Credibility, and Independence: Theory and Evidence*, Cambridge, MA: MIT Press.
- Danielsson, Jon, and Robert Macrae (2018), “The hierarchy of financial policies,” VoxEU.org, 12 September.

- Dalla Pellegrina, Lucia, Donato Masciandaro, and Rosaria Pansini (2010), "Governments, central bankers, and banking supervision reforms: Does independence matter?" VoxEU.org, 12 September 2010.
- Dermine, Jean (2013), "Bank corporate governance, beyond the global banking crisis," *Financial Markets, Institutions & Instruments*, 22(5), pp.259-281.
- Diamond, Douglas W., and Raghuram G. Rajan (2009), "The Credit Crisis: Conjectures about Causes and Remedies." *American Economic Review*, 99 (2): 606-10.
- Edge, Rochelle M., and Nellie Liang (2017), "New Financial Stability Governance Structures and Central Banks," Hutchins Center Working Paper #32.
- Eijffinger, Sylvester C. W., and Donato Masciandaro (eds.) (2014), *Modern Monetary Policy and Central Bank Governance*, Edward Elgar Publishing.
- Eijffinger, Sylvester C. W., and Donato Masciandaro (eds.) (2018), *Hawks and Doves: Deeds and Words - Economics and Politics of Monetary Policymaking*, VoxEU eBook.
- European Systemic Risk Board (2014), *Reports of the Advisory Scientific Committee: Allocating macro-prudential powers*, November.
- Ferrero, Andrea, Richard Harrison, and Benjamin Nelson (2018), "House Price Dynamics, Optimal LTV Limits and the Liquidity Trap," London, Centre for Economic Policy Research.
- Financial Stability Institute (2007), "Institutional arrangements for financial sector supervision: Results of the 2006 FSI survey", Occasional Paper 7.
- G20/OECD (2015), *Principles of Corporate Governance*. <https://www.oecd.org/daf/ca/Corporate-Governance-Principles-ENG.pdf>.
- International Federation of Accountants (2001), "Governance in the Public Sector: A Governing Body Perspective,".
- Khan, Ashraf (2017), "Central Bank Legal Frameworks in the Aftermath of the Global Financial Crisis," International Monetary Fund Working Paper WP/17/101.
- Koetter, Michael, Kasper Roszbach, and Giancarlo Spagnolo (2014), "Financial Stability and Central Bank Governance," *International Journal of Central Banking*, Vol. 10 No. 4, December, pp. 3167.
- Litan, Robert E., Michael Pomerleano, and Vasudevan Sundararajan (eds.) (2004), *Financial Sector Governance: the roles of the public and private sectors*, Brookings Institution Press.
- Martinez-Miera, David, and Rafael Repullo (2019), "Monetary Policy, Macroprudential Policy, and Financial Stability," CEPR Discussion Paper no. 13530.
- Masciandaro, Donato, Maria Nieto, and Henriette Prast, (2007), "Financial governance of banking supervision." Banco de España Research Paper No. WP-0725.
- Masciandaro, Donato, and Marc Quintyn (2009), "Reforming Financial Supervision and the Role of the Central Banks: a Review of Global Trends, Causes and Effects (1998-2008)," CEPR Policy Insight 30, 1-11.

- Masciandaro, Donato, and Marc Quintyn (2016), “The governance of financial supervision: recent developments,” *Journal of Economic Surveys*, 30(5), pp.982-1006.
- Masciandaro, Donato, and Davide Romelli (2019), “Twin Peaks and Central Banks: economic, political economy, and comparative analysis,” Unpublished memo.
- Meade, Ellen E. (2012), “The Governance Of Central Banks,” in Levi-Faur, David (Ed.) *The Oxford Handbook of Governance*, Oxford University Press.
- Mitnick, Barry M. (1980), *The political economy of regulation: creating, designing, and removing regulatory forms*, New York : Columbia University Press.
- Smets, Frank (2014), “Financial Stability and Monetary Policy: How Closely Inter-linked?” *International Journal of Central Banking*, 10, 263-300.
- Tucker, Paul (2016), “The Design and Governance of Financial Stability Regimes: A Common-resource Problem That Challenges Technical Know-How, Democratic Accountability and International Coordination,” *CIGI Essays on International Finance*, Volume 3: September.
- Vilmunen, Jouko (2008), “Financial instability, supervision and central banks: An introduction,” *Journal of Financial Stability* 4 (2008) 165–167.
- Wilson, James Q. (1980), *The Politics of Regulation*, New York: Basic Books.

The Governance of Monetary and Prudential Policy in Good Times and Bad

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1 Introduction

The theme of this paper is how economic and especially financial conditions may affect the efficiency and effectiveness of governance arrangements for monetary, microprudential, and macroprudential policies. Some negative factors threatening good governance may be very acute in certain circumstances, and others may be chronic in other circumstances.

One implication is that desirable governance arrangements should be resistant to the full range of negative factors. These arrangements are not easy to change and so they should be designed for the medium term, giving reasonably good results across diverse circumstances and challenges. Moreover, it will be suggested that governance arrangements should be designed to be especially resistant to threats that intensify during stress periods, and specifically banking crises. This asymmetry arises because the decisions that have to be taken in the difficult circumstances of a crisis may have major impacts, for example, on the distribution of losses and the future structure of the financial system. Uncertainty is elevated, and the downside risks are unusually large. Moreover, crisis action may be very difficult to adjust later, let alone to reverse, whereas an action taken in “peacetime” can often be revised once the consequences can be seen. Every country with a significant financial system is potentially vulnerable to booms and busts, so the question of how to build governance arrangements that work effectively in a crisis is widely relevant.

The paper is thus normative in intent, but is informed by evidence from many countries during the run-up to the Global Financial Crisis (GFC), the GFC itself, and the subsequent period of slow growth and normalization. It also reflects experience of other cycles of boom, bust and recovery, in advanced countries and elsewhere. Governance issues related to monetary, microprudential, and macroprudential

policies that arise in those different phases of the macro-financial cycle will be expanded upon in the concluding section.

2 Governance challenges and macro-financial conditions

Many of the factors that can affect the achievement of good governance in monetary, microprudential, and macroprudential policy can best be seen if one considers experience across a range of macro-financial conditions. The demands placed on these policies, the difficulties of decision making and implementation, the interaction among these policies, and the forces of regulatory capture will differ across the scenarios.

The three scenarios considered here are (a) a period when risks are building up, perhaps in the form of rapid credit growth or rising asset prices, and possibly over an extended period; (b) an acute crisis period, when a major portion of the banking system is threatened with failure; and (c) an extended recovery period characterized by a “balance sheet recession” similar to that seen post-GFC. The scenarios, based on the large literature on financial stability and crises, are stylized versions of what has been witnessed in many countries and periods.¹ The GFC had certain distinct features, and is especially relevant today because its after-effects have been especially long-lasting and profound. Other features were similar to what was seen in other crises, at least in kind.

For the purposes of this exercise, it is useful to assume that there are distinct monetary, microprudential, and macroprudential authorities. They may all be housed in one legal entity, but they have separate mandates and powers, and at least potentially could have separate chains of command, accountability mechanisms, and information systems. It will be necessary to refer also to other public sector institutions, especially the Ministry of Finance.

2.1 Governance in the lead-up to a crisis

Probably the most common situation faced by monetary and financial sector policymakers is when the economy is performing reasonably well and vulnerabilities are not pronounced, but some potential threats to monetary and financial stability may be becoming apparent. Perhaps consumer price inflation is moderate, and the balance of payments and the government indebtedness are not of great concern.

¹ See for example Bayoumi (2017); or Claessens et al (2010) on the GFC. See Borio and Lowe (2002); Diamond and Rajan (2009); Drees and Pazarbasioglu (1998); Goldstein (1998); Laeven (2011); Laeven and Valencia (2013); and Reinhart and Rogoff (2013) on crises in other regions and periods.

However, in these favorable conditions, there may be relatively rapid expansion in credit or asset price increases.

In such circumstances, the interaction between macroprudential and microprudential policy making will be relatively intense. Macro- and microprudential policies share many of the same instruments (e.g., capital requirements) and indeed data sources (e.g., bank balance sheets). The focus of their analysis may be well-aligned; both macro- and microprudential authorities will want to track credit supply conditions, probabilities of default, loan to value ratios, etc. The macroprudential authority will need microprudential data in order to conduct stress tests. Also, the microprudential authorities have a role in monitoring compliance with any macroprudential measures and their effectiveness. If, for example, the macroprudential authority imposes a higher risk weight on bank lending to the residential real estate sector, it is the microprudential authority who is in a position to observe whether or not banks are actually altering their risk weights and their lending behavior. The microprudential authority is also probably best placed to notice whether or not the measure is somehow being circumvented, perhaps through disintermediation via nonbanks. Hence, there is a strong need for coordination, information flows in both directions, and shared analysis.

Meanwhile, macroprudential and monetary policy making will interact and possibly be complementary. Macroprudential-monetary connections and the extent to which these policies are substitutes have been much discussed. Macroprudential policies can be targeted at particular sector and markets, which is their strength and their weakness. In contrast, monetary policy is a “blunt instrument,” but it also “gets into all the cracks” and is therefore less vulnerable to being circumvented. Policies in the two areas affect the effectiveness of the respective tools. For example, higher risk weights on residential mortgages may tighten the availability of credit for home buyers and those seeking a home equity loan, and therefore lead to more saving and ultimately an altered response to monetary impulses. In the other direction, monetary policy decisions related to domestic interest rates and stabilization of the exchange rate may affect the impact of macroprudential measures aimed at reducing currency substitution. Hence, there is a strong need for coordination, information flows in both directions, and shared analysis.

However, microprudential and monetary policy making will have less direct connection in relatively benign circumstances. The microprudential authority needs to know the macro conditions in which banks operate (overall growth rate, slope and level of the yield curve, etc.) but have little concern over shifts in the monetary policy stance over the short to medium term. Likewise the monetary authority is not concerned about the condition of individual banks or even sub-sections of the banking industry. Funding markets are functioning normally, credit is flowing, savings are accumulating in accounts. Even the exit of a major bank, if handled well, is not of macro-financial importance.

Perhaps the main governance concern in such a scenario is a form of regulatory capture that favors inaction bias and the maintenance of accommodative policies in all three areas. In the financial sector, the successful firms that are leading the expansion in credit — by value and number of transactions — will lobby against tightening. These firms are likely to have the resources and the positive public image to make this lobbying effective. Other firms may be more cautious, but they have little motivation to expend resources on preventing what they perceive as the foolishness of their rivals. At the political level, supporting the continuation of good times and the expansion in the class of beneficiaries may be conducive to electoral success. The government of the day may have other objectives, such as developing the financial system and attracting international banks, which may have to be weighed against micro- or macroprudential objectives. Within the authorities, officials may see opportunities to expand their resources and autonomy, instead of contesting the dominant narrative.

One feature contributing to these tendencies is the fact that public and parliamentary scrutiny of policies in all three areas may be light so long as no major difficulties arise. Considerable deference is usually shown towards acknowledged experts in often arcane matters. Prudential regulations are complex, and supervisory practice hard to monitor. Monetary policy gets more media coverage, but here too non-specialists cannot match the analysis based on an immense information set that a central bank can claim in support of its decisions. As mentioned, the consequences of monetary or prudential policy actions appear mostly in the medium-term, so only the financial sector, with the most direct interest, has the incentive to examine them closely.

Monetary and prudential authorities with clear mandates and committed staff will resist these pressures. To play on Keynes' remark, nobody is eager to take away the punch bowl once the party gets going, but some authorities may take pride in maintaining a degree of sobriety. Institutions are guided by their mandate and culture. In this, it is helpful if the institution has a long memory, especially of past difficulties, and a long forward time horizon, so that it remains vigilant about medium-term risks. Those perspectives require autonomy and institutional stability that extends beyond the political and even the macro-financial cycle; the authority needs to believe that it will have responsibilities and be held accountable when eventually something goes wrong.

Another helpful tendency is for cooperation and communication links to strengthen over time. In normal conditions, different authorities and their staff are engaged in repeated interaction. They learn the tasks on which they need to cooperate, and how to cooperate. Committees and working groups are set up, and routines become established. The legally permissible degree of cooperation and information sharing is defined. Individual officials get to know one another, and, in this repeated game, are concerned about their reputations for being well-informed,

technically able, cooperative, etc. Being helpful to colleagues in another authority may even be rewarded eventually with a post in that authority — a kind of inter-agency capture can occur.

2.2 Governance during a crisis

The forces at work change abruptly when a crisis breaks out. The policy questions, the time available for decision making, the magnitude of individual decisions, and the immediacy of effects are all transformed. Established patterns of behavior and relationships can all be swept away. A number of phenomena seen during a crisis are worth highlighting:

- The financial consequences of decisions can be very large. The authorities will have to determine the provision of liquidity support; capital injections, possibly in connection with nationalization; perhaps quasi-fiscal support for various stakeholders; and the restructuring and eventually the liquidation of large institutions. The costs to the public sector, or to other claimants, might amount to a significant share of GDP.
- Moreover, the consequences are often irreversible. Especially declaring a bank “failing or likely to fail” and then initiating resolution or liquidation precludes a return to the status quo ante. Others will avoid doing business with the bank until it is somehow resolved and demonstrably returned to health. Once assets are purchased and liabilities assumed, they cannot be restored. In contrast, most “normal” policy decisions such as adjusting a discount rate or a capitalization requirement can be reviewed and adjusted as needed.
- Decisions have to be taken quickly. It is well-established that delay in taking action can greatly increase the cost of a banking crisis and the arbitrariness of outcomes, either by allowing time for some creditors to flee and for assets to be stripped, or by allowing transition into a worse regime, such as outright default and systemic contagion.
- Moreover, these decisions have to be taken on the basis of very imperfect information. The authorities are likely not to have full information on the true value of a bank’s assets; its liquid assets and liabilities; its off-balance sheet commitments; and its direct and indirect connections to other institutions. Price signals may lose their information content or become very volatile. Furthermore, decisions should to the extent possible be contingent on hard to predict factors such as market reactions to any intervention; the scope for reviving the failing bank’s business; and the chance that other institutions will have to be intervened.
- The banking system is likely to become segmented. Some banks will enter a vicious circle, but others will enjoy safe haven status. Certain funding markets may shrink; some players may be excluded altogether or have to pay a high and

variable premium. Hence, aggregates and benchmarks may become misleading, and monetary policy transmission disrupted.

Under such circumstances, monetary and microprudential policies (including bank resolution) may become closely intertwined. For example, the central bank may be called upon to provide emergency liquidity support to banks, but it should do so only to viable banks and on the basis of adequate collateral. The microprudential authority would normally have much more of the relevant information and capacity to assess the viability of a bank than would a monetary authority, and the microprudential authority might also be much better placed to assess the value of collateral (e.g., if it consists of securitized loans). In the other direction, the monetary authority would normally be well informed about short term market developments, such as segmentation and rising risk premia, because it is constantly involved in these markets. It is also aware of flows in the large value payment system and excess reserve balances. Such information is crucial in the microprudential determination of “failing or likely to fail” and of possible contagion effects.

Macroprudential policy, with its medium-term orientation, is of less importance in the midst of a crisis. Macroprudential policy is about defusing vulnerabilities and building buffers. Once a shock impacts, the macroprudential authority has to make sure that the buffers are usable and some measures are suitably reversed (for example, a counter-cyclical buffer might be eliminated, but a systemic risk buffer may still be warranted). Hence, coordination of macroprudential with either monetary or microprudential policy becomes less important during the relatively brief period of intense crisis.

The direction, intensity, and sources of regulatory capture will shift with the onset of crisis. Those who are at risk of major losses will have the greatest interest in influencing policy, that is, the conflict will focus on the distribution of the eventual burden. Agents may try to exert this influence on the monetary authority (for example, to provide emergency liquidity on more generous terms), the microprudential authority (for example, to delay intervention so that some claimants can extract their assets), or the government (for example, to limit the bailing in of claimants once intervention takes place, perhaps even by changing legislation). Because the financial stakes are high, many agents will be prepared to expend considerable resources in these efforts. And whereas in good times bank management and owners have among the strongest incentives to attempt regulatory capture, in crisis times claimants on banks, and also distressed borrowers may be determined to minimize their exposure to potential losses. Also, some sections of the financial industry that favored relatively tight prudential regulation during good times, as means of supporting clients’ trust in the industry and protecting themselves from competition from less well-capitalized rivals, may switch to favoring forbearance once they themselves come under pressure (Hardy, 2006).

Meanwhile, the incentives for officials may change abruptly in ways that favor “blame avoidance.” The tendency may become more acute during a crisis because of the possibility of very large costs being incurred. In addition, the reputational, accountability-related, and even juridical consequences are magnified. The staff of the authorities concerned will wish to protect their professional reputations among their peers and thereby their career prospects. They will be aware that a financial crisis will provoke intensified oversight, for example, in the form of parliamentary inquiries and investigations by the media. One possible consequence is the abolition or radical reform of the institution for which they work and which offers them career prospects. Furthermore, crises and especially bank interventions normally give rise to numerous and drawn-out court cases as interested parties seek to unload burdens. These cases may mostly be directed at the relevant authorities, but even individual officials may be sued for negligence, acting *ultra vires*, or misfeasance. In sum, a crisis is likely to incentivize interest groups to lobby to have rules bent to their benefit, while incentivizing officials to obey rules more strictly.

“Blame avoidance” is just one factor likely to interfere with cross-authority cooperation during a crisis. Another factor is that a crisis is *per se* not a routine event, so authorities cannot be very practiced in using relevant procedures for cooperation and information sharing. Moreover, crisis management involves other agencies that are normally not so involved in the business of prudential and even monetary policy. A crisis entails the activation of the resolution authority, possibly the deposit insurance fund, and, in cross-border cases, resolution colleges. The government in the form of the Ministry of Finance typically plays a crucial role, especially if resolution funding is needed. However, the relevant ministerial departments may include those concerned, for example, with debt management, rather than those that deal with fiscal-monetary coordination or financial sector regulation and are the habitual counterparts of the monetary and prudential authorities. Finally, bank intervention may involve competition authorities and the courts, who normally operate in a separate policy space with quite different objectives. Therefore, routines are absent, and cooperation is not supported by a “repeated game.”

2.3 Governance after a crisis

Recovery after acute financial crises tends to be slow because various sectors have to rebuild their balance sheet strength. As we have seen post-GFC, sluggish growth with weak investment and low consumer price and wage inflation can be very persistent. Central banks over the last decade have responded with unconventional measures, including quantitative easing (large scale purchase and retention of government and other securities), long-term refinancing, and negative policy rates. “Cleaning up” the financial sector can take a long time as NPLs are slowly worked

off; weak existing institutions survive in the low interest rate environment; and even stronger institutions focus on organic growth rather than consolidating the sector.

Post-crisis conditions may imply that monetary and microprudential policies need to be coordinated relatively closely. The structural changes occasioned by a crisis, and especially those following the GFC, imply that the banking system is not as homogeneous as in the pre-crisis period. For example, some banks may retain substantial excess liquidity while others are dependent on central bank refinancing, or some banks still with substantial NPLs or high-risk weighted assets may be unresponsive to stimulus measures. Monetary transmission is affected by this fracturing, and therefore the monetary authority would benefit from access to microprudential analysis of market segmentation.² For the microprudential authority, an important factor in analyzing banks' soundness and identifying supervisory priorities is the time line for normalization of monetary policy, for example, by returning to positive rates.

Slow recovery from a banking crisis-induced recession may prompt calls for more easing of micro- and macroprudential policies, but over the last decade national authorities seem to have been vigorous in strengthening both. In particular, concern over "inaction bias" in macroprudential policy has so far proven to be unfounded (see International Monetary Fund (2018), and European Systemic Risk Board (2019)).³ On the one hand, memory of the crisis is still vivid, so tough measures are accepted by a broad range of stakeholders. On the other, the relatively new macroprudential authorities may wish to establish precedent and reputation for being pro-active and unbending to sectoral pressures.

3 Summary and conclusions

The challenges to good governance in the areas of monetary, microprudential, and macroprudential policy vary greatly according to external circumstances. Those challenges are likely to be greatest and most consequential during times of crisis, when momentous decisions have to be taken quickly and with patchy information; the distribution of burdens will be intensely contested; informal mechanisms based on reputation and repeated cooperation are weakened; and when success can be measured only against more dire counterfactuals.

One would want to establish governance structures and practices that yield satisfactory results across a full range of possible situations, and in particular favor the avoidance of very severe outcomes. Those mechanisms should help ensure that

² Monetary policy transmission may be enhanced by microprudential measures to strengthen the banking system.

³ This assertion is based on evidence from a post-crisis period only, rather than from a complete cycle.

decision makers have as much relevant information as possible and adequate tools, but also that their incentives are aligned with the longer-term public interest. Accountability and transparency are important, not only to align incentives, but also to lend decision-makers legitimacy; preserving autonomy requires demonstrating that tools are being used sensibly in pursuit of the assigned goals. Specifically in the three policy areas being considered here, governance mechanisms need to trade off the advantages of narrow mandates (better accountability, perhaps more decisiveness) against the need for taking spill-overs into account.

These considerations suggest certain elements should be incorporated, including:

- Well-defined and narrowly assigned responsibilities for making decisions in crisis management. The careful procedures and ex ante checks and balances that can be used in normal times may prove very costly when immediate action is needed. It should be clear what is a decision of government (about fiscal or distributional matters), and what is a decision of the microprudential or resolution authority. In this connection, the accountability mechanism should allow for the need to decide quickly under conditions of uncertainty.
- An explicit legal obligation to engage in cooperation, coordination, and information exchange across the authorities, insofar as compatible with confidentiality commitments. The fulfillment of this obligation would itself be a subject of accountability and transparency. In particular the close connection during crisis times between microprudential/ resolution policy and monetary policy should be anticipated. Thus, decision-making responsibilities maybe divided by “Chinese walls,” but these walls should have windows.
- Strong protection for authorities responsible for crisis management in terms of security of tenure and limited legal liability. Analogous protections seem to have helped central banks be more autonomous and adopt a medium-term perspective. They cannot be afforded to government itself, but they can help stiffen an authority’s resistance to short-term pressures from special interests.

At a high level it is difficult to go beyond these recommendations, in part because connections to other policies have not been considered. Microprudential policy is closely bound up with policy in such areas as consumer protection, market conduct, and anti-money laundering. There are linkages also to the payment system and debt sustainability, for example.

Different country circumstances warrant different approaches to governance of policy in these three areas, and in particular a country’s international situation will help determine what governance arrangements are appropriate and feasible. Membership of a monetary and banking union is one crucial factor. But some of the various and variable challenges to governance that arise at the national level are very apparent at the regional and multinational level.

References

- Bayoumi, Tamim (2017), *Unfinished Business: The Unexplored Causes of the Financial Crisis and the Lessons Yet to be Learned*, Yale University Press.
- Borio, Claudio, and Philip Lowe (2002), “Assessing the risk of banking crises,” *BIS Quarterly Review*, December.
- Claessens, Stijn , Giovanni Dell’Ariccia, Deniz Igan, Luc Laeven (2010), “Cross-country experiences and policy implications from the global financial crisis,” *Economic Policy*, Volume 25, Issue 62, April, Pages 267–293.
- Claessens, Stijn and Fabián Valencia (2013), „The interaction between monetary and macroprudential policies,” VoxEU.org, 14 March.
- Cukierman, Alex (1992), *Central Bank Strategy, Credibility, and Independence: Theory and Evidence*, Cambridge, MA: MIT Press.
- Danielsson, Jon, and Robert Macrae (2018), “The hierarchy of financial policies,” VoxEU.org, 12 September.
- Diamond, Douglas W., and Raghuram G. Rajan (2009), „The Credit Crisis: Conjectures about Causes and Remedies.“ *American Economic Review*, 99 (2): 606-10.
- Drees, Burkhard , and Ceyla Pazarbasioglu (1998), *The Nordic Banking Crisis: Pitfalls in Financial Liberalization*, IMF Occasional Paper 161.
- European Systemic Risk Board (2019), *A Review of Macroprudential Policy in the EU in 2018*, April.
- Goldstein, Morris (1998), “The Asian Financial Crisis: Causes, Cures, and Systemic Implications,” Petersen Institute.
- Goodhart, Charles and Rosa María Lastra (2017), “Populism and Central Bank Independence”, *Open Economies Review*.
- International Monetary Fund (2018), *The IMF’s Annual Macroprudential Policy Survey— Objectives, Design, and Country Responses*, April.
- Issing, Otmar (2018), “The uncertain future of central bank independence,” VoxEU.org, 2 April.
- Hardy, Daniel (2006), “Regulatory Capture in Banking,” IMF Working Paper WP/06/34, February.
- Laeven, Luc (2011), “Banking Crises: A Review,” *Annual Review of Financial Economics*, Vol. 3:17-40.
- Martinez-Miera, David, and Rafael Repullo (2019), “Monetary Policy, Macroprudential Policy, and Financial Stability,” CEPR Discussion Paper no. 13530.
- Reinhart, Carmen M., and Kenneth S.Rogoff (2013), “Banking crises: An equal opportunity menace,” *Journal of Banking & Finance*, Volume 37, Issue 11, November, pp. 4557-4573.
- Vilmunen, Jouko (2008), “Financial instability, supervision and central banks: An introduction,” *Journal of Financial Stability* 4 (2008) 165–167.

Central Banks and Financial Stability: A Reflection after the Covid-19 Outbreak¹

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Abstract

How should policy objectives be assigned between different authorities? Traditionally, this question has revolved around identifying conflicts and complementarities between their various remits. Equally important, however, is the question of whether specific policy instruments can be neatly assigned to specific objectives. When a specific policy instrument can significantly influence more than one objective, the case for assigning each of those objectives to a different agency weakens. Following this line of thought, and based on the experience with Covid-19 policy response, there would seem to be a clear case for assigning the financial stability mandate to central banks and an even stronger one for including both macro- and microprudential responsibilities in that mandate.

1 Introduction

Financial sector oversight involves a number of policy functions aiming at ensuring adequate market functioning and the stability and integrity of the financial system as a whole. Those functions include the monitoring of the solvency and conduct of business of different types of financial institution.

The design of institutional arrangements for financial sector oversight requires these different functions to be assigned to specific agencies. Decisions need be made on how best to group the functions, assuming that each of the agencies involved would normally be responsible for more than one function. Traditionally, this kind of decision-making has emphasized two different sets of criteria when comparing

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the alternatives: (i) whether the various functions conflict with or complement each other and (ii) political economy considerations related to the distribution of power between agencies, and between agencies and the government.

On the first criterion, possible conflicts across public policy objectives (e.g. between price and financial stability, or between bank solvency and consumer protection) have been used to justify assigning the corresponding functions to different agencies. On the second criterion, functions have been assigned to different agencies in order to prevent an excessive accumulation of power by any single agency, particularly when such agencies operate with autonomy from elected governments.

Both sets of arguments have been heard, over the last two decades, in the debate on whether central banks should take on, in addition to their monetary policy functions, a responsibility for financial stability and, in particular, the microprudential supervision of financial institutions.

So far this discussion has often ignored the fact that possible conflicts between the objectives of two different functions does not rule out assigning those two functions to the same agency.

This would only be the case if, by assigning the two functions to two different agencies, the final outcome would likely be superior in social welfare terms. That might be the case when the intersection of the sets of relevant policy instruments for the two functions is not significant. In that case, the agencies are more likely to achieve the desired objectives if they specialize in different functions. However, if policy tools assigned to one authority have a significant impact on the objectives of another authority, the benefits of separation over integration are less clear-cut. At a minimum, the need for strong coordination across agencies with different but potentially conflicting objectives can hardly be questioned.

This has become even more relevant to the discussion of central banks' responsibilities after macroprudential policy frameworks were widely adopted after the Great Financial Crisis (GFC). The aim of the new function is to bolster financial stability by mitigating the risks stemming from macro-financial imbalances and the destabilizing interaction across financial institutions and markets. But this aim may not always be consistent with the main price stability objective of central banks or with efforts to shore up individual financial institutions. Indeed, macroprudential actions often influence the financial and economic factors that affect consumer prices and the resilience of financial institutions. As a consequence, the macroprudential policy role does alter the terms of the debate on how best to allocate financial oversight functions to different agencies, including central banks.

The policy response to the economic impact of the Covid-19 pandemic highlights some possible complementarities across policy domains. For the first time, prudential policies have explicitly assumed an economic and financial stabilization role that complements the one performed by standard macroeconomic policies. The

parallel moves by monetary policymakers and macro- and microprudential authorities help to illuminate the debate on the institutional design of policy frameworks.

This paper reviews the debate on central banks' involvement with financial oversight in the light of recent developments and the evolution of policy frameworks worldwide. The focus is on the interplay between objectives and instruments across different policy domains. Section 2 covers the evolution of institutional arrangements since the GFC, building on work by the BIS Financial Stability Institute (FSI). Section 3 discusses the case for assigning a financial stability role to central banks. Section 4 analyses the links between the micro- and the macroprudential functions. Finally, section 5 concludes.

2 Recent developments on institutional arrangements

Some information on the evolution of institutional arrangements for financial sector oversight after the GFC can be found in Calvo et al (2018).

Table 1 shows the allocation of microprudential responsibilities for banks to different types of agency in a sample of 82 jurisdictions. In approximately two thirds of these countries, the main supervisory authority is the central bank. Moreover, although the number of institutional reforms after the GFC is limited (seven cases), in all but one case the reforms have entailed the transfer of this responsibility to the central bank when it was previously assigned to a different agency.

Table 1: Changes in the primary microprudential authority for banking supervision

		Current		Total pre-GFC
		Central bank	Separate supervisory agency	
To	From			
	Central bank	48	1	49
Pre-GFC	Separate supervisory agency	5	27	32
	Government department	1	0	1
	Total current	54	28	82
	Total changes		7	

Note: changes are highlighted/shaded.

Source: Calvo et al (2018).

Table 2 focuses on the allocation of macroprudential responsibilities. The data show that the microprudential authority for banks has assumed a macroprudential function in most cases (58%), and particularly so when the microprudential authority is the central bank (78%). The most common alternative structure is to assign the macroprudential function to a dedicated inter-agency committee in which the central bank typically also plays an important part.

From this, it can be concluded that, despite the creation of separate supervisory agencies in some countries, mainly in the early 2000s, central banks remain the main authority responsible for financial stability in most jurisdictions. The GFC and the introduction of macroprudential policy frameworks have further strengthened their role. The following sections provide some conceptual arguments that could help rationalize those developments.

Table 2: Primary authority responsible for macroprudential policy

Primary banking supervisor	Entity responsible for macroprudential policy	Recommendation only	Activation only	Recommendation and activation	Total
Central bank	Central bank	0	18	17	35
	Dedicated committee	5	0	5	10
Separate supervisory agency	Central bank	1	1	3	5
	Dedicated committee	7	1	3	11
	Separate supervisory agency	0	4	2	6
	Government department	0	2	2	4
Total		13	26	32	71

Source: Calvo et al (2018).

3 Monetary policy and financial stability

Although this is sometimes forgotten in the modern debate on what role monetary authorities should play in financial oversight, central banks were created with a mandate that embedded a financial stability dimension, if not always explicitly.

Their original function – as it emerged during the two centuries ending in the early 1900s – was usually to hold the monopoly on the issuance of legal tender. Central bank money soon became the natural means of settlement for interbank transactions. So that settlement could proceed smoothly, liquidity injection facilities had to

be created for the provision of the funds required in both normal and emergency situations. At the same time, money issued by commercial banks (deposits) was increasingly used in transactions, although its intrinsic value depended on the issuing bank's solvency. As a consequence, to avoid the emergence of exchange rates across commercial banks' money, and to preserve the integrity of the monetary system, sufficient assurance had to be provided on the soundness of deposit-taking institutions, even before deposit insurance schemes were established. Therefore, as commercial banks became counterparts of central banks, and issued a large part of the money supply, the need arose for central banks to monitor banks' solvency. As a policy objective, therefore, monetary stability became intrinsically linked to financial stability.²

The question whether there might be drawbacks to involving central banks in financial stability has arisen rather recently. This essentially coincides with the adoption by central banks – mostly in the last two decades of the 20th century – of price-stability mandates accompanied by statutory independence from governments and parliaments (Padoa-Schioppa (2002)).

The main argument against giving central banks any sort of responsibility in the area of financial stability is that the latter objective would not always be aligned with the primary price stability objective, thereby leading to socially suboptimal monetary policy. To counter that argument, it is often stressed that financial stability and price stability do not conflict with each other and that, on the contrary, one cannot be achieved without the other (Schwartz (1988) and Bordo et al (2000)).

Yet, over the regular horizon of monetary policy actions, some conflicts can and often do occur. The most obvious example is where consumer prices remain broadly stable but overstretched asset valuations or excessive credit growth loom, threatening financial stability. This was seen, for example, during the Great Moderation before the GFC (IMF (2015)). It is obvious that, in this situation, financial stability considerations would induce central banks to raise rates above what would be justified solely on the basis of inflation projections. This would require the central bank to accept a downward deviation from the inflation target, with a possible impact on economic activity and employment (Svensson (2017)).

Interestingly, by asking central banks to stick to a narrowly defined price stability mandate and allocating financial stability responsibilities (such as bank supervision) to a different agency, it cannot be guaranteed that a better social outcome – combining both price and financial stability – would be achieved. Although credit and asset prices could be growing fast, banks may not face any pressure on their income and capital positions. Before the creation of macroprudential policy frameworks,

² As an example, the Federal Reserve Act of 1913 established the Federal Reserve System as the central bank of the United States to provide the nation with a safer, more flexible and more stable monetary and financial system.

supervisory authorities normally had neither the incentives nor the instruments to contain emerging macro-financial risks. In that situation, central banks should not only embrace a financial stability mandate but also, it could be argued, they should incorporate financial stability into their monetary policy reaction function (Borio and Lowe (2002)).

The macroprudential policy concept has changed the discussion in a significant way. Macroprudential instruments are supposed to (i) dampen the financial cycle by preventing large credit expansions and contractions (Borio (2013))³ and (ii) help financial institutions to cope with the materialization of those macro-financial risks. In doing so, macroprudential policies would appear to be, at least theoretically, a powerful instrument for addressing financial stability risks.

It could then be argued that the macroprudential policy function weakens the case for central banks to adopt an explicit financial stability mandate. Instead, a specific macroprudential authority could be envisaged, which would work with a set of instruments such as capital add-ons, exposure limits or caps on loans-to-value or debt service-to-income ratios, to achieve a financial stability objective. The creation of this dedicated macroprudential authority would let monetary policy focus unambiguously on delivering price stability. Those institutional arrangements, based on concrete and transparent mandates, would certainly clarify the accountability of the authorities involved.

However, the case for an institutional separation does not depend only on whether each of the two objectives can be achieved by applying two distinct sets of instruments. It also requires that the instruments designed to achieve one objective have no significant effect on the other objective. Otherwise, the system of objectives and instruments becomes a set of simultaneous equations that cannot be resolved recursively (Restoy (2018) and Carstens (2019)). In more game-theoretical terms, the non-cooperative equilibrium (each authority pursuing its own objective independently of the other) is likely to become socially suboptimal (Cao and Cholletec (2017)).

It is clear that the standard monetary policy instruments directly affect credit developments, asset prices and banks' margins. Thus they have an impact on the prospects for financial stability. Likewise, macroprudential instruments, such as capital requirements or restrictions on credit availability, directly affect financial conditions, which in turn affect consumption and investment decisions and hence the prospects for economic stability.

It has been argued that the cross-objective effects of each policy instrument are substantially less pronounced than their own-objective effects (Svensson (2018)). This would certainly help to make the separation model work in practice. Yet, it is hard to identify episodes of severe macro-financial imbalances signaling financial stability risks that have occurred in the absence of overly favorable monetary conditions.

³ For some, this first objective could be overly ambitious. See Tucker (2014).

Moreover, it seems difficult to envisage how macroprudential actions could succeed in moderating the credit cycle without affecting economic activity and, therefore, price developments, via the credit channel.

The regulatory response to the Covid-19 pandemic shows how the macroprudential approach is supposed to work. Prudential authorities worldwide have relaxed capital and other requirements and they have done this with the purpose of supporting the real economy during the pandemic.⁴ This is the first crisis episode in which regulatory adjustments have been explicitly presented as part of a package of policy actions undertaken to contain an exogenous shock on the real economy. That is a clear recognition of how macroprudential tools do matter, for both financial stability and economic stability.

These arguments imply that financial stability and macroprudential policies should not be conducted by separate institutions unless there are sufficiently effective coordination mechanisms in place. Whether the above reasoning could also be used to justify the assumption of microprudential responsibilities by central banks depends very much on the links between the microprudential and macroprudential functions. These links are explored in the next section.

4 Macroprudential and microprudential functions

In theory, the distinction between the remits of microprudential and macroprudential policies is relatively well established. The former aims at ensuring the safety and soundness of individual financial institutions while the latter focuses on addressing macro-financial risks emerging from the interactions across financial institutions and markets (IMF (2013) and Constâncio et al (2019)).

Those definitions suggest that micro- and macroprudential policies share the same objective: namely, to preserve financial stability. But they approach this common objective from two different perspectives: either entity by entity (microprudential) or system-wide (macroprudential).

In principle, those two perspectives can work together effectively. This is particularly the case in cyclical upturns. The accumulation of macro-financial imbalances would require macroprudential policy actions to contain risk-taking by financial institutions. Those measures would then complement microprudential requirements and entity-by-entity supervision to address financial stability risks.

Yet, while the conflicts between monetary and financial stability are normally more significant in upturns, it is more likely that the micro perspective could occasionally clash with the macro approach in downturns. It is in downturns where risks for banks become more evident, as reflected in deteriorating asset quality indicators

⁴ See e.g. press releases by the ECB Banking Supervision of 12 March and the joint statement by the US Supervisory Agencies of 27 March 2020.

and profits. This typically leads to enhanced supervisory scrutiny and downward revisions to supervisory ratings. At the same time, it is in downturns that there could be a risk of coordination failures in the credit market that could lead to a tightening in bank lending, thereby exacerbating any credit crunch and downturn in activity and employment. That would in principle call for supportive macroprudential policies to be adopted together with a restrictive microprudential policy stance, with the aim of ensuring sufficient loss absorption at banks.

The potential frictions between macroprudential and microprudential could argue for assigning these two functions to different agencies. Yet, as discussed in relation to the separation of monetary policy and macroprudential policy, that approach could only work well if the instrument sets needed to achieve the respective aims of each agency could be neatly differentiated. But this kind of demarcation is difficult or impossible to make, given the close connection between the objectives of the macroprudential and microprudential functions and the broad overlaps between their respective toolboxes.

Note first that, even if the priority of microprudential authorities is the safety and soundness of financial institutions, there is no micro-supervisory authority that would aim to avoid each and any bank failure. There is always a systemic dimension to microprudential actions. Similarly, no macroprudential authority would interpret its role as taking no account of the soundness of individual institutions, particularly systemic ones. The difference, therefore, lies on the different weights attached to – specific but interrelated – aspects of the same public policy objective.

As for policy tools, the common ground is also large, given that standard macroprudential instruments take the form of requirements or constraints imposed on regulated financial institutions.

Within Basel III, the macroprudential dimension takes the form of an overlay on the micro-oriented risk-based framework (FSB, IMF and BIS (2011), FSI (2017)). The main macroprudential component is the countercyclical capital buffer (CCyB). This is calibrated as a function of risk-weighted assets (RWA) (in the 0–2.5% range according to the economy’s phase within the financial cycle; it therefore helps to mitigate the procyclicality of banks’ behavior. In addition,⁵ the capital conservation buffer (CCoB), is also designed to play a countercyclical function, or at least partially so, as it permits the absorption of losses (up to 2.5% of RWA) in bad times,

⁵ Additional buffers are established for global or domestic systemically important banks (G-SIBs and D-SIBs). These are also considered part of the macroprudential framework. They are established to strengthen the loss absorption of systemic institutions on a permanent basis and thus have no countercyclical role.

thereby reducing the need to cut credit exposures to meet minimum capital requirements.⁶

Hence, the macroprudential instruments in Basel III take the shape of capital buffers that interact with standard Pillar 1 and Pillar 2 requirements established as part of the microprudential framework. While Pillar 1 requirements are normally fixed, Pillar 2 capital add-ons are decided year by year and institution by institution by the microprudential authorities. In defining those add-ons, supervisors typically take into account the level of capital that would allow banks to absorb losses in a stress test without breaching minimum (Pillar 1) capital requirements. Moreover, the CCoB, although also playing a macroprudential function, is established by microprudential regulators even in countries with a dedicated macroprudential authority.

It is therefore not possible to rationalize all supervisory tools within a purely static microprudential logic. Supervisory authorities increasingly interpret banks' capital adequacy as ensuring sufficient loss absorption capacity in adverse situations, hence interfering with the objectives of the macroprudential framework.

A corollary is that microprudential authorities would normally have the means to adjust capital requirements to the level they consider adequate, regardless of the CCyB's level. That means that any conflict between the microprudential and the macroprudential objectives could be resolved only if the responsible officials were to agree on the average level of capital that the system requires. Otherwise, microprudential supervisors would be the ones establishing the effective capital constraints.

Some jurisdictions have expanded the macroprudential toolkit by adding non-capital based instruments such as limits on credit levels or credit growth or restrictions for household loans (e.g. caps on loan-to-value, debt service-to-income ratios), foreign currency lending, maturity mismatches etc (Lim et al (2011) and Claessens (2014)). Such instruments allow macroprudential policy some autonomy with respect to the microprudential policy stance. Yet, experience shows that the scrutiny of banks' risk management and the communication of supervisory expectations allow supervisors to steer banks' credit policies without the need for formal restrictions.⁷ Those supervisory measures could well complement macroprudential decisions effectively. At the same time, macro- and microprudential actions could also neutralize each other.

⁶ Yet, banks making use of the CCoB are subject to automatic restrictions on dividends and other payouts. Moreover, there is typically no clarity on the timing and the conditions that supervisors will establish for the replenishment of the CCoB. Those elements, together with the stigma effect that the use of the CCoB may generate, are likely to limit its countercyclical potential (Borio and Restoy (2020)).

⁷ A case in point is Australia. The microprudential regulator (APRA) was able to contain the large credit and housing price growth of the last decade by closely monitoring banks' practices and persuading them to tighten their lending standards. See IMF (2019).

It is therefore clear that an effective macroprudential framework requires, at the very least, a close coordination between both prudential policy functions. This coordination does not necessarily require the integration of both functions within the same agency. A good example is the parallel moves by both microprudential and macroprudential authorities to alleviate banks' capital requirements soon after the outbreak of the Covid-19 crisis, with the aim of shoring up bank lending. That coordination across separate agencies may become more challenging when deciding how rapidly prudential requirements should be normalized. Normally, one could expect that, as economic conditions weaken, supervisors with a microprudential mandate would sooner or later start feeling uneasy with the looming erosion of banks' asset quality and loss-absorbing capacity. Measures then taken to strengthen banks' balance sheets – e.g. by speeding up the rebuilding of banks' microprudential buffers – could prevent macroprudential actions from keeping up the credit supply. Normally, the longer it takes for the economy to recover its normal pace of activity, the more likely such frictions are to arise across functions.

On these grounds, the case for allocating the microprudential and the macroprudential functions to a single agency appears even stronger than the one for central banks to take on macroprudential policy responsibilities. As both functions share the same ultimate objective and much of their respective toolkits, the option to house them in separate agencies is unlikely to be preferable from a social point of view.

5 Concluding remarks

The Covid-19 crisis has already shown how different policy instruments could be activated in parallel by different agencies with the aim of stabilizing the economy and the financial system. Yet, this episode has also shown the difficulty of making clear distinctions between actions aiming at addressing deflationary risks (and economic instability more generally) and those targeting the availability of credit to the real economy. Moreover, the measures taken reveal that the latter objective cannot be achieved by purely macroeconomic or macroprudential measures without adjusting the microprudential policy stance.

The impact of various policy instruments on differing social objectives constitutes a challenge for the adequate functioning of institutional arrangements based on allocating monetary, macroprudential and microprudential responsibilities to different agencies. During a crisis, agencies may naturally agree on the need to adopt extraordinary measures. On the other hand, the challenges of a coordinated policy response may become more severe as authorities decide on the pace of normalization based on their own remit but using instruments that may also affect the other objectives of the other agencies.

This paper shows that there is a reasonably sound argument for assigning a financial stability function to central banks. The paper also puts forward the view that the

financial stability function should encompass both macroprudential and microprudential responsibilities. Those two tasks should ideally be combined within a single policy framework comprising the instruments that would allow the authority to address all the different dimensions (entity-by-entity, systemic) of the financial stability objective.

Although this lies outside the scope of this paper, political economy considerations could, of course, be equally important for an adequate institutional design. The accumulation of responsibilities by independent authorities, such as central banks, raises issues of democratic legitimacy and accountability. These need to be satisfactorily managed if the chosen formula is to be socially acceptable and, hence, sustainable.

References

- Bordo, M, M Ducker and D Wheelock (2000): “Aggregate Price Shocks and Financial Instability: A Historical Analysis”, Federal Reserve Bank of St Louis, working paper no 2000-005B.
- Borio, C (2013): “Macroprudential policy and the financial cycle. Some stylised facts and policy suggestions”, Rethinking macro policy II: first steps and early lessons, April.
- Borio, C and P Lowe (2002): “Asset prices, financial and monetary stability: exploring the nexus”.
- Borio, C and F Restoy (2020): “Reflections on regulatory responses to the Covid-19 pandemic”, FSI Briefs, no 1, April.
- Calvo, D, J C Crisanto, S Hohl and O P Gutiérrez (2018): “Financial supervisory architecture: what has changed after the crisis?”, FSI Insights on policy implementation, no 8, April.
- Cao, J and L Cholleter (2017): “Monetary policy and financial stability in the long run: a simple game-theoretic approach”, Journal of Financial Stability, vol 28, February, pp 125–42.
- Carstens, A (2019): “The new role of central banks”, speech at the Financial Stability Institute's 20th anniversary conference, “A cross-sectoral reflection on the past, and looking ahead to the future”, Basel, 12 March.
- Claessens, S (2014): “An Overview of macroprudential policy Tools”, IMF Working paper, no 14/2014.
- Constâncio, C (editor), I Cabral, C Detken, J Fell, J Henry, P Hiebert, Sujit Kapadia, S Nicoletti Altamari, F Pires, C Salleo (2019): “Macroprudential policy at the ECB: Institutional framework, strategy, analytical tools and policies”, ECB Occasional Paper, no 227, July.

- Financial Stability Board, International Monetary Fund and Bank for International Settlements (2011): “Macroprudential policy tools and frameworks”. Update to G20 finance ministers and central bank governors, October.
- Financial Stability Institute (2017): “Overview of Basel III and related post-crisis reforms”, Executive Summary, June.
- International Monetary Fund (2013): “Key Aspects of Macroprudential Policy”; IMF Policy Paper, June.
- International Monetary Fund (2015): “Monetary Policy and Financial Stability”, Washington, D.C.
- International Monetary Fund (2019): “Australia: Financial System Stability Assessment”, February.
- Lim, C, F Columba, A Costa, P Kongsamut, A Otani, M Saiyid, T Wezel, and X Wu (2011): “Macroprudential Policy: What Instruments and How to Use Them? Lessons from Country Experiences”, IMF Working Paper, October.
- Padoa-Schioppa, T (2002): “Central banks and financial stability: exploring the land in between”, Second ECB Central Banking Conference, October.
- Restoy, F (2015): “Monetary policy and financial stability”, Speech at Universidad Internacional Menéndez Pelayo, Santander, June.
- Restoy, F (2018): “Central banks and financial oversight”, Speech at the Fundación Ramón Areces, Madrid, Spain, 4 June 2018.
- Schwartz, A (1988): “Financial stability and the federal safety net”, in W Haraf and R Kushneider (eds), *Restructuring Banking and Financial Services in America*, American Enterprise Institute.
- Svensson, L (2017): “The Relationship between monetary policy and financial stability policy”. *Monetary Policy and Financial Stability: Transmission Mechanisms and Policy Implications*, Central Bank of Chile, 2017.
- Svensson, L (2018): “Monetary policy and macroprudential policy: different and separate?”, *Canadian Journal of Economics/Revue canadienne d'économique*, vol 51, issue 3, pp 802–27.
- Tucker, P (2014): “The political economy of macroprudential regimes”, in D Schoenmaker (ed), *Macroprudentialism*, Centre for Economic Policy Research, London, pp. 61–72.

Can Macroprudential Tools Ensure Financial Stability?

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1 The current consensus: monetary policy is in charge of price stability, while macroprudential policy is in charge of financial stability

In 2019 more and more European countries, within or outside the eurozone, have implemented macroprudential measures to try to tame the credit cycle in their economy. According to data published by the European Systemic Risk Board (ESRB), by late November 2019, eleven countries had introduced Counter Cyclical Buffers (CCyB) that increased capital requirements for banks; twenty countries implemented a maximum Loan to Value Ratio (Max LTV) that limits the size of a mortgage loan; and 15 countries implemented other borrower based macroprudential measures that limit the capacity of households to borrow (Debt Service to Income – DSTI; Debt to Income – DTI; Loan to Income – LTI). At the same time, monetary policy remains accommodative: monetary policy rates are low, and central banks, notably the ECB, continue their asset purchase programs.

The consensus on which these policies are implemented rests on the idea that there is a clear separation between the goal of monetary and macroprudential policies. Monetary policy is in charge of price stability while macroprudential policy is in charge of financial stability. This consensus results from lessons of the 2008 – 2009 Global Financial Crisis (GFC) and departs from the pre-crisis consensus.

1.1 The pre-2008 consensus

Before the GFC, most economists and central bankers agreed that the interest rate was too blunt a tool to deal with stock market bubbles. This was for example reflected in the academic work by Bernanke and Gertler (2001) as well as in several speeches by Bernanke when he was Governor at the Federal Reserve Bank (Bernanke (2002)). This consensus also had some roots in the “natural experiment” of the US

in 1929, when the stock market crash followed the successive increases in the federal funds rate in 1928¹. Finally, and probably more importantly, before the GFC there was a general trust regarding the ability of financial markets to self-regulate.

This pre-2008 consensus does not imply that the central bank was not concerned with financial stability, but rather that the goal of financial stability had to be achieved with other tools than the policy rate (the then standard monetary policy tool), namely regulation, supervision and last resort lending (Bernanke, 2002). In 1996, when Alan Greenspan, then Chair of the US Federal Reserve, spoke of irrational exuberance to describe what was happening in the US financial markets, he was trying to warn investors about dot.com asset valuations that he believed were much too high. However, in accordance with the doctrine of the Federal Reserve and the consensus of the time, the course of monetary policy was unaffected, with the central bank remaining committed to its dual mandate: price stability and low unemployment. After the dot.com bubble burst in 2001, the Federal Reserve lowered its interest rate: the damage to the real economy was limited and the post-crash economic slowdown relatively short.

1.2 Empirical research after the 2008 financial crisis has changed the view regarding the causes of financial crises: credit cycles are potentially more damaging than stock market bubbles

The financial crisis has spurred a long list of theoretical and empirical analyses that tried to challenge each part of the pre-crisis consensus. A first set of empirical work aims at identifying the specific characteristics of financial cycles that result in financial crises compared to other financial cycles. Schularik and Taylor (2012), Dell'Arricia and al. (2017) conclude that the threat to financial stability comes more from large credit expansions rather than from booming stock markets or property bubbles.

One focus of post-2008 empirical research has been on better describing past financial crises and developments in financial markets, indebtedness and the economy before, during and after the financial crises. An article by Schularick and Taylor (2012) focused on the outbreaks of financial crises in 14 economies that took place from 1870 to 2008. It provides a wealth of information about financial crises that simply cannot be summarized here. With respect to the role of monetary policy before and / or after financial booms, their main conclusions are: a) after the Second World War, central banks were more inclined to intervene following financial crises. As a result, the post-crisis periods were less often characterized by deflation and a

¹ Whether these federal funds rate increases actually caused the stock market collapse is a related but slightly different question.

tightening of credit conditions in the economy, but (b) the post-war crises were nevertheless more costly in terms of activity and unemployment. They also note (c) that the pace of credit growth is a good predictor of the imminence of a financial crisis, and that the probability of a financial crisis is greater when debt levels are high. Finally, Schularik and Taylor conclude (d) that a rise in the price of financial assets in the pre-crisis years does not help to predict financial crises. Financial crises are therefore rather episodes of credit booms going bad than episodes of runaway financial markets alone, a hypothesis that had been prevalent before but which was difficult to validate empirically for developed countries due to the relative rarity of financial crises. Expanding on this work using long historical data, Jorda, Schularick, and Taylor (2013) showed that the severity of a crisis is linked to the expansion of credit in the pre-crisis period, which had already been shown by Cerra and Saxena (2008) and Reinhart and Rogoff (2009) on shorter samples.

These empirical studies, which are very useful for understanding the genesis and consequences of crises, also provide orders of magnitude for quantifying the macroeconomic gains associated with financial stability. Above all, they help to rethink the hierarchy of effects: it is the surge in credit to individuals (in particular household debt) that, in the past, has been the main trigger of financial crises. Spectacular as they are, record levels reached by the stock market indices and the bursting of the bubbles that sometimes follow them are far from being so devastating. The threat to financial stability comes more from large credit expansions than from bursting stock market or property bubbles.

1.3 Whose job is it to tame the credit cycle?

If debt and credit cycles are dangerous for financial stability, the question is then: is it the job of monetary policy or that of macroprudential policy to tame credit cycles? To answer this question, we can hardly rely on real life experiments. Rather researchers have built models to simulate policy experiments. They then compare the net gain associated with “preventive” monetary policy actions – the increase in the policy interest rate above what is needed to maintain price stability reduces both the amplitude of the credit cycle and the probability of a burst at the cost of reducing economic activity today – to the net gain associated with “reactive” monetary policy consisting in lowering the policy interest rate only after the credit cycle has turned and hurt the economy. These types of experiments help answer the question whether monetary policy should be on the front line to ensure financial stability. It appears that across a large range of macroeconomic models² – from a 3-equation-new-

² See for example Woodford (2012), Ajello et al. (2016), and Gourio et al. (2016), and Epaulard (2018) for a review.

keynesian model to more sophisticated DSGE³ models – it is difficult to identify occurrences where a preventive monetary policy action is welfare improving.

In addition to these model simulations, an interesting episode of preventive monetary policy took place in Sweden in 2010 – 2011. Worried by the potential consequences of household debt and property price developments in Sweden, the Sveriges Riskbank increased its policy rate from 0.25% to 2% in a succession of 25 basis point hikes. At the time of these interest rate hikes, Swedish inflation was on target and did not require any monetary policy actions. The consequences of these hikes have been documented by Lars Svenson (2016): inflation plummeted, unemployment stayed at high levels compared to other developed economies, and neither property prices nor household debt decreased. In 2012, because of the damage to the real economy, the Sveriges Riskbank reversed its monetary policy and became one of the first central banks to implement negative interest rates.

All these studies and policy experiments led to the conviction that interest rate was not the right policy tool to deal with rampant credit cycles. But if standard monetary policy tool is not available to ensure financial stability, whose job is it to ensure financial stability? All the hopes are with macroprudential policies. And this is the new consensus: monetary policy is in charge of price stability while macroprudential policy is in charge of financial stability⁴.

2 How comfortable are we with this consensus?

One of the appeals of macroprudential instruments is that they look sufficiently granular to target a given market, institution or behavior and deal with any glaring imbalances in specific markets. And this is precisely this granular characteristic that the monetary policy rate lacks. Still, we do not know that much about the actual ability of these tools to have a significant impact on specific market dynamics or behaviors.

2.1 Our knowledge regarding the efficiency of macroprudential policies to tame the credit cycle is still imperfect

Central banks can rely on a large body of empirical results regarding the size of the impact of changes in policy rates on the economy. By contrast, we do not know much about the effectiveness of most macroprudential tools. There are many reasons for this ignorance. First of all, there are many different instruments: some of them

³ DSGE models, which stand for Dynamic Stochastic General Equilibrium models, are the now standard tools to analyze responses of economies to policy shocks.

⁴ Collard, F., Dellas, H., Bida, B. and Loisel O. (2017) propose a macroeconomic model that illustrates this divide between monetary policy and macroprudential policy.

target banks (for example the CCBy) other target borrowers (Debt Service to Income – DSTI; Debt to Income – DTI; Loan to Income – LTI). In addition, data are scarce because these instruments were rarely used in the past. When we do have data, they mostly cover emerging economies, not developed economies. Finally, the empirical methodology to measure the implementation of these tools and their effectiveness needs to be improved. For example, most empirical papers are just counting the number of macroprudential measures in place (no matter their intensity) and/or the overall stance of the policy (tightening vs. loosening). Another concern about the results of these empirical papers is that they are showing correlations and not causalities.

2.1.1 Macroprudential instruments appear capable of reducing the debt cycle

Already before the outbreak of the GFC, Borio and Shim (2007) studied the implementation of prudential measures to limit credit growth and rising real estate prices across fifteen countries. Based on an event study, they found that these measures reduce credit growth and property prices rapidly after being introduced. On a broader panel of 49 developed and emerging economies observed from 1990 to 2011, Lim et al. (2011) identified 53 episodes where at least one macroprudential tool was used. Only nine countries in the sample did not use any macroprudential tool over the period. They concluded that a number of macroprudential instruments are effective at reducing the procyclicality of credit, regardless of the country's exchange rate regime or the size of its financial sector. This is the case of limits on debt relative either to the value of the property it finances, the Loan to Value Ratio (LTV), or to income, the Loan to Income Ratio (LTI), banks' reserve requirement ratio, counter-cyclical capital requirements and dynamic provisioning (provisions grow more than proportionally to assets). Using an even more extensive database in terms of both the number of countries (57) and years (from 1980 to 2011), Kuttner and Shim (2016) showed that the Debt Service to Income ratio (DSTI) is the most universally effective instrument for reducing the rise in mortgages. On the other hand, this tool does not seem to have any effect on the dynamics of real estate prices, which rather tend to respond to the taxation of real estate property. These results are consistent with what has been estimated for Hong Kong (He (2014)) and in emerging economies (Jacome and Mitra (2015)) where the use of LTV limits succeeded in containing household debt but had a limited impact on the rise in real estate prices, which are held down instead by higher transaction taxes.

Again, it is worth noting the coarse nature of these impact assessments, which do not shed much light on the appropriate mix of macroprudential instruments. In most impact studies, policies are represented by discrete variables (e.g. 0 if no action is taken, +1 if the macroprudential tool is introduced or its intensity increased, and -1 if the use of the macroprudential tool is relaxed, as is the case in the analysis of

Kuttner and Shim (2016), with the intensity of the macroprudential measure itself not being taken into account.

2.1.2 There are even fewer empirical results regarding the impact of macroprudential measures on the risks taken by banks

Claessens et al. (2013) analysed the use of macroprudential policies aimed at reducing vulnerabilities in banks. From a sample of 2,300 banks observed over the period 2000-2010, they concluded that debt limits (LTV and DSTI) are effective in reducing the banks' debt ratio and the growth of their debt in boom periods. Once again, the variable representing the use of the macroprudential tool is binary (0 or 1) and does not take into account the intensity with which the macroprudential policy is applied.

2.1.3 The cost of macroprudential policies

It is one thing to show that macroprudential tools do have an impact on the behaviour they target, another is to evaluate whether or not these measures have spillovers that are costly to the rest of the economy. Richter et al. (2019) try to quantify the effects of changes in maximum LTV ratios on output and inflation. They show that there are, indeed, some spillovers from these macroprudential measures. According to their empirical results, a 10-point decrease in the maximum LTV ratio (a tightening of the macroprudential policy) generates a 1.1% loss in output, more or less the same impact as a 25 basis point increase in the monetary policy rate.

2.2 We are learning fast

2.2.1 More data, better methodologies

As more and more European countries are implementing macroprudential measures, more data is becoming available for empirical research to assess their effectiveness. Meanwhile, policy makers are in the difficult situation where they have to implement measures without clear knowledge regarding their impact. At the same time, empirical methodologies are refined. For example, Richter and al. (2019) are able to use the intensity of the macroprudential policy in place and not only its pace. Also, they try to come up with a strategy to confirm the causal relationship from maximum LTV ratios to output losses and property prices.

2.2.2 The long list of questions waiting for answers

To be comfortable with the current consensus – that macroprudential policies can achieve financial stability and monetary policy keeps its narrow objective of price stability – we need to have answers to a quite long list of questions.

First of all, we need to know better what type of credit booms call for a macroprudential response. As shown by Asriyan et al. (2019), not all credit booms are alike and those that are relying on extensive use of collateral are more likely to shake financial stability than those that are fuelled by productivity shocks. Only the credit booms of the first type are calling for a macroprudential response.

Secondly, we need to know whether macroprudential measures once in place gradually lose their effectiveness. After the introduction of a macroprudential measure economic agents might (will) be tempted to find ways to circumvent them either by regulatory trade-offs or by creative financial engineering (Aiyar et al., 2012; Jeanne and Korinek, 2014), especially when policies are not coordinated at the international level. This is the argument often made by advocates of the use of monetary policy rather than macroprudential tools for ensuring financial stability. For example, Borio and Drehmann (2009), Cecchetti and Kohler (2012), and Stein (2014) argue that since the interest rate is a universal price, it hits regulated sectors and non-regulated sectors alike (including shadow banking).

Thirdly, the question of coordination of macroprudential policies within the euro area needs to be examined. On the one hand, the granularity of macroprudential tools make them particularly suitable to deal with local conditions – to the point where they are sometimes implemented with different intensity within a given country. That is a reason not to coordinate within the euro area. However, in the case of a common situation within the euro area, research shows that there would be benefits from coordinated actions (Rubio and Carraso-Gallego (2016)) while others conclude there is no need for it (Poutineau and Vermandel (2017)).

Finally, one limitation of the use of macroprudential tools lies in the difficulty in using them. Direct intervention in specific markets can have a high political cost, especially when it affects specific interest groups. The limits on household debt (limits on LTV ratios, DTIs or DSTIs) that do appear effective when they are used are also largely unpopular, especially as they are likely to affect the poorest households more. This question should be addressed by economists.

References

- Aiyar S., C. W. Calomiris and T. Wieladek, 2014, “Does Macroprudential Leak: Evidence from a UK Policy Experiment”, *Journal of Money, Credit and Banking*, 46(1).
- Ajello A., T. Laubach J. D. Lopez-Salido, T. Nakata, 2016, “Financial Stability and Optimal Interest-Rate Policy”, *Finance and Economics Discussion Series*, 2016-067, Board of Governors of the Federal Reserve System (U.S.).
- Asriyan V., L. Laeven and A. Martin, 2019, “Collateral Booms and Information Depletion”, *ECB Working Paper no. 2266*.
- Bernanke B. S. and M. Gertler, 2001, “Should Central Banks Respond to Movements in Asset Prices?“, *American Economic Review*, 91(2): 253-257.
- Bernanke B. S., 2002, “Asset-Price ‘Bubbles’ and Monetary Policy”, remarks before the New York Chapter of the National Association for Business Economics, Federal Reserve, 15 October 2002.
- Borio C. and M. Drehmann, 2009, “Assessing the Risk of Banking Crises – Revisited”, *BIS Quarterly Review*, March, pp. 29-44.
- Borio C. and I. Shim, 2007, “What can (Macro-)Prudential Policy Do to Support Monetary Policy”, *BIS Working Paper*, no. 242.
- Cecchetti S. and M. Kohler, 2012, “When Capital Adequacy and Interest Rate Policy are Substitutes (And When They are Not)”, *BIS Working Paper*, no. 379.
- Cerra V. and S. C. Saxena, 2008, “Growth Dynamics: The Myth of Economic Recovery”, *American Economic Review*, 98(1): 439-457.
- Claessens S., S. R. Ghosh and R. Mihet, 2013, “Macroprudential Policies to Mitigate Financial system Vulnerabilities”, *Journal of International Money and Finance*, Vol 39(4): 1661-1707, December.
- Collard F., H. Dellas, B. Diba and O. Loisel, 2017, “Optimal Monetary and Prudential Policies”, *American Economic Journal: Macroeconomics*, 9(1): 40-87.
- Dell’Ariccia G, L. Laeven and G. Suarez, 2017, “Bank leverage and monetary policy’s risk-taking channel: Evidence from the United States”, *Journal of Finance*, Volume 72 (2): 613-654.
- Epaulard A., 2018, “What Should Monetary Policy do in the Face of Soaring Asset Prices and Rampant Credit Growth?”, *Revue de l’OFCE*, no. 157.
- Gourio F, A. K. Kashyap and J. Sim, 2016, “The Tradeoffs in Leaning against the Wind”, *Federal Reserve Bank of Chicago, NBER WP*, no. 23658.
- He D., 2014, “Les effets de la politique macro-prudentielle sur les risques du marché de l’immobilier résidentiel: le cas de Hong Kong”, *Banque de France, Revue de la stabilité financière*, no. 18: 115-130.
- Jacome L. I. and S. Mitra, 2015, “LTV and DTI Limits – Going Granular”, *IMF Working paper*, no. 15/154.
- Jorda O., M. Schularick and A. M. Taylor, 2013, “When Credit Bites Back”, *Journal of Money Credit and Banking*, 45(2): 3-28.

- Jeanne O. and A. Korinek, 2014, “Macroprudential Policy beyond Banking Regulation. Macroprudential policies: implementation and interactions”, Banque de France, *Financial Stability Review*, no. 18: 163-171.
- Kuttner K. N. and I. Shim, 2016, “Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies”, *Journal of Financial Stability*, vol. 26: 31-44.
- Lim C. H., A. Costa, F. Columba, P. Kongsamut, A. Otani, M. Saiyid, T. Wezel and X. Wu, 2011, “Macroprudential Policy. What Instruments and How to Use them? Lessons from Country Experiences”, IMF Working Papers, 11/238, International Monetary Fund.
- Poutineau J.C., G. Vermandel, 2017, “Global Banking and the Conduct of Macroprudential Policy in a Monetary Union”, *Journal of Macroeconomics* 54, 306 – 331.
- Reinhart C. M. and K. S. Rogoff, 2009, “This Time Is Different: Eight Centuries of Financial Folly”, Princeton University Press.
- Richter B., M. Schularick and I. Shim, 2019, “The Costs of Macroprudential Policy”, *Journal of International Economics*, 118, 263 – 282.
- Rubio M., J.A. Carrasco-Gallego, 2016, “Coordinating Macroprudential Policies within the Euro Area: The Case of Spain”, *Economic Modelling*, 59, 570 – 582.
- Schularick M. and A. M. Taylor, 2012, “Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008”, *American Economic Review*, 102(2): 1029-61.
- Stein J. C., 2014, “Incorporating Financial Stability Considerations into a Monetary Policy Framework”, Speech delivered at the International Forum on Monetary Policy, Washington D.C., March.
- Svensson L. E., 2016, “Cost-Benefit Analysis of Leaning against the Wind: Are Costs Larger Also with Less Effective Macroprudential Policy?“, IMF Working Papers, no. 16/3.
- Woodford M., 2012, “Inflation Targeting and Financial Stability”, NBER Working Paper, no. 17967.

The Interaction of Monetary and Financial Tasks in Different Central Bank Structures

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1 Introduction

In response to the Great Financial Crisis (GFC), central banks substantially expanded their monetary and financial policy toolkits. Monetary tasks – here defined as monetary policy and the lender of last resort (LOLR) function – have been supplemented by unconventional tools, such as asset purchases and long-term refinancing operations for banks. Moreover, non-monetary policy areas – which may, but do not have to be a central bank responsibility – have been extended. Microprudential banking supervision has been strengthened by a tightening of capital and liquidity requirements. Macroprudential policy and banking resolution have been developed as new areas with specific policy mandates and designated authorities. These extensions have enhanced the financial sector’s resilience and increased the scope for stabilization policy and crisis resolution. At the same time, they have made the interaction between policy instruments more challenging.

This article describes how the institutional set-up of these policies differs across Europe and discusses central bank involvement. In some jurisdictions (like Austria) the central bank continues to focus on its core monetary tasks, whereas in other jurisdictions (like the Netherlands) the central bank also plays a prominent role in non-monetary financial policy fields. The purpose of this article is to i) map out how traditional and new policy tools are organized across Europe, ii) discuss how these policy instruments interact, iii) review the pros and cons of central bank involvement, and iv) discuss how the organization of policies – particularly the role of the central bank – may be related to country-specific features (like the importance of large, systemic banks).

¹ The views expressed in this paper are those of the authors and do not necessarily reflect the position of De Nederlandsche Bank.

2 How are non-monetary tasks organized across Europe?

The current institutional set-up of regulatory policies was established in the aftermath of the 2008-2009 GFC. Following a recommendation by the European Systemic Risk Board (ESRB, 2011), European Union jurisdictions established designated authorities that would become responsible for setting macroprudential policy tools. Similarly, the Banking Resolution and Recovery Directive, adopted in 2014, requires European Union member states to establish national resolution authorities. Some countries also changed the set-up of microprudential supervision, for instance by moving to a twin-peaks model in which the central bank is made responsible for banking supervision (Belgium, United Kingdom) or to an integrated supervisor for banks and non-banks outside the central bank (Finland).²

The involvement of central banks with non-monetary tasks differs across jurisdictions, but is most prominent for macroprudential policy. In the vast majority of cases, the central bank is directly responsible for macroprudential policy or chairs a committee that sets macroprudential instruments (Table A1 in Annex A). In many cases, central banks are also responsible for microprudential supervision and resolution, but several jurisdictions have designated these tasks to a separate regulator or resolution authority. In the case of resolution, some jurisdictions have given this task to existing bodies that were already responsible for elements of resolution, such as a deposit guarantee fund. There are also jurisdictions with two or more resolution authorities, with specific responsibilities for e.g. the deposit guarantee scheme or resolution planning versus execution.

In practice, these differences are not clear-cut due to cooperation and coordination between central banks and other authorities. In countries with an independent regulator, central banks often provide operational and analytical support through data collection, performing off-site analyses and participating in on-site inspections. In countries where macroprudential instruments are set by the regulator, central banks often have an advisory role and publish financial stability reports. Cooperation and coordination is also promoted by international bodies in which central banks, regulators and other authorities are represented. Examples at the global level are the Financial Stability Board and standard setters such as the Basel Committee for Banking Supervision, and at the regional level the European Systemic Risk Board. Finally, with the launch of the Banking Union in Europe, the ECB has been given responsibilities as a microprudential supervisor as well as a macroprudential authority. The ECB performs these tasks in close cooperation with

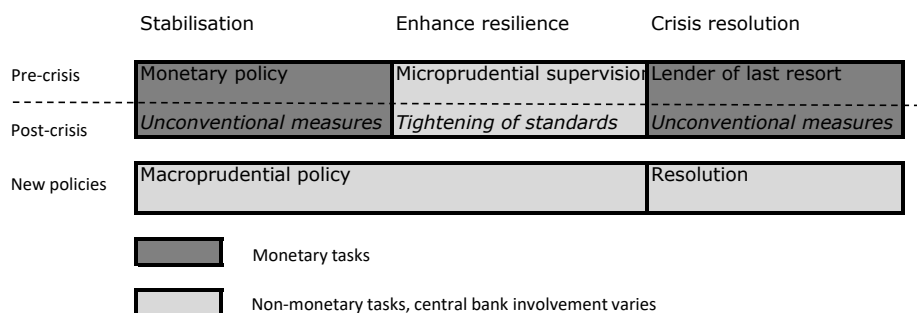
² This article focuses on microprudential banking supervision and does not discuss conduct of business supervision. Both are sometimes combined (integrated supervision model) or explicitly separated (twin peaks model).

national authorities, thereby ensuring a significant degree of central bank involvement in these non-monetary areas.

3 How do policies interact?

The different monetary and financial sector policy areas tend to be aligned in normal times, but may work against each other in specific circumstances. Chart 1 illustrates how conventional policies (upper bar) and new policies (lower bar) are related. Monetary policy promotes stable and non-inflationary economic growth; microprudential supervision increases financial institutions’ resilience; and the lender of last resort function provides a safety net to contain a financial crisis. When asset prices, economic growth and inflationary pressures move in the same direction, these policy fields tend to be closely aligned. There are circumstances, however, in which policy goals may be inconsistent. For instance, when consumer price inflation is low while financial imbalances are growing, monetary policy aimed at price stability may further exacerbate these imbalances. And when vulnerabilities develop only in a single country – for instance a house price bubble – monetary policy formulated at the euro area level cannot be used to counter such developments. In such circumstances, pursuing different policy goals involves trade-offs and some goals may be compromised.

Chart 1: Financial policy framework



The extension of policy instruments and new policy fields, however, has enhanced the scope to pursue different policy goals simultaneously. According to the Tinbergen rule, policymakers need to control as least as many instruments as they have different policy goals. In this context, macroprudential policies can help to counter imbalances and increase the financial system’s resilience, also in situations where monetary and microprudential instruments cannot be fully deployed for that goal. On top of that, resolution can help to deal with a crisis in situations where

prudential policies and the LOLR function are insufficient to safeguard financial stability.

Central bank involvement with new policy fields facilitates better oversight and coordination, but may also have disadvantages (Table 1).³ Combining tasks in a single institution makes it easier to exploit synergies, for instance through more efficient use of resources and more effective coordination. Central banks’ relatively independent position and long-term orientation also provide incentives to set instruments without being biased by short-term considerations. Potential disadvantages of combining tasks are conflicts of interest, concentration of power and greater reputation risks. To weigh these trade-offs, the rest of this section discusses how monetary policy and the LOLR function interact with the non-monetary tasks.

Table 1: Pros and cons of central bank involvement with non-monetary tasks

	Advantages	Disadvantages
Microprudential supervision	Better understanding of bank lending channel (monetary policy)	Conflict of interests
	Better understanding of funding needs (LOLR)	Reputation risk
Macroprudential policy	Macro-orientation	Conflict of interests
	Independence & long-term orientation	
	Coordination with monetary stance	
Resolution	More effective crisis management (LOLR)	Conflict of interest (LOLR)
<i>Bundling of all tasks</i>	<i>Operational synergies, better oversight and scope for policy coordination</i>	<i>Conflicts of interests</i>
		<i>Concentration of power</i>
		<i>Reputation risk</i>

3.1 Interaction between monetary and prudential policies

Monetary policy can be used to pursue financial stability, but that must be weighed against the overriding goal of price stability. More than other policy tools, such as macroprudential instruments, monetary policy “gets into all the

cracks” of the financial system (Stein, 2013). Containing financial imbalances would support the microprudential and macroprudential tasks. Several authors have therefore argued that monetary policy should explicitly incorporate financial stability considerations, or – put differently – to “lean against the wind”.⁴ In this manner, policy rates may be set higher or lower for financial stability purposes than would be justified by inflation targeting alone. The Eurosystem’s overriding price stability objective does not preclude other goals as long as these are not inconsistent with price stability. Moreover, price stability is defined as a medium-term objective, which leaves scope to pursue other goals in the short term. And in the long term, financial stability risks may be assumed to create risks to price stability. Leaning against the wind policies are, however, controversial and the literature has not reached a consensus about the balance between costs (reduced scope to pursue price stability and support economic activity) and benefits (reducing the probability of a crisis).⁵

Macroprudential policy instruments may then supplement monetary policy by focusing on financial resilience at the national level. Macroprudential instruments are typically aimed at strengthening the resilience of financial institutions and households. Examples are systemic and countercyclical capital buffers that are imposed as an add-on to microprudential requirements, and loan-to-value and loan-to-income limits for residential mortgages. Even though such macroprudential instruments may not fully counter the build-up of macro-financial imbalances, especially in an environment where monetary policy stimulates such imbalances, the accumulation of additional capital buffers will contribute to greater resilience in the targeted parts of the financial sector.⁶ In this respect, macroprudential policy is close to central banking with its traditional systemic orientation and focus on financial cycles.⁷ Finally, macroprudential policy tools are set at the national level, which is particularly relevant in a currency union where monetary policy cannot take into account country-specific vulnerabilities. Hence, although the scope to counteract imbalances at the national level may be limited, macroprudential policy can mitigate a country’s vulnerability to such imbalances and thereby improve the functioning of the currency union.⁸

Combining monetary policy and microprudential supervision within the central bank may enhance the understanding of monetary transmission but also brings potential conflicts of interests. With more detailed information on the banking sector, the central bank will have a better insight in the way its policies are

⁴ See Borio and White (2004), Borio (2013).

⁵ See Galati and Moessner (2013), Svensson (2017).

⁶ However, the almost exclusive focus of macroprudential instruments on banks implies a potential for risk-shifting beyond the banking sector (Cizel et al., 2019).

⁷ See Ingves et al. (2011), De Haan et al. (2012).

⁸ Houben and Kakes (2013).

transmitted through the bank lending channel. This is particularly important for European economies, which have predominantly bank-oriented financial structures. At the same time, however, conflicts of interest may arise as supervisory considerations may affect incentives for the monetary policymaker. In particular, the central bank may be inclined to let its decision on monetary stance be influenced by the impact on banks' financial position. Related to this point, bank failures may have adverse consequences for the central bank's reputation, which would also affect the central bank's credibility in conducting effective monetary policy.

3.2 Interaction between LOLR financing and microprudential supervision and resolution

The LOLR function involves a trade-off between providing a safety net and the risk that banks may be prone to moral hazard and rely too much on central bank operations. In periods of systemic liquidity stress, an increasing intermediary role of the central bank as LOLR is generally warranted.⁹ At the same time, the availability of this safety net may stimulate moral hazard behavior and undermine market discipline. Traditionally, therefore, LOLR support is provided only temporarily to illiquid but solvent banks against backstop rates and good collateral. As part of the Eurosystem's unconventional measures, however, bank refinancing operations have expanded in terms of volumes and duration with attractive pricing and a loosening of collateral requirements. A relevant question, in this context, is to what extent central bank liquidity provision should be arranged *ex ante* (which may prevent market stress) or *ex post* (to contain moral hazard).

Central bank involvement with non-monetary tasks helps to exploit synergies, but may have adverse consequences for market discipline and may create conflicts of interest. Assessments of a bank's soundness and viability are facilitated by close cooperation between the central bank, the supervisor and the resolution authority. This is particularly the case when a bank's financial position significantly deteriorates and regular liquidity provision may have to be suspended or replaced by Emergency Liquidity Assistance (ELA). Indeed, the trade-offs surrounding a central bank's role as LOLR liquidity provider (safety net vs moral hazard) become increasingly complex if these also involve the considerations of the resolution authority (resolving a bank as soon as it is no longer considered viable) and a potential supervisory preference to allow forbearance (to buy time for a bank to recover). In all, the trade-off may be summarized as, on the one hand, improving information flows and allowing inclusive decision-making (by combining tasks) and, on the other hand, avoiding potential conflicts of interests (by separating tasks).

⁹ See Bats et al. (2018) for an extensive analysis of the LOLR function in the context of the global financial crisis and its aftermath.

4 Determinants of central bank involvement

Recent decisions on non-monetary tasks exhibit path dependency and a growing role of central banks. Most jurisdictions have avoided an institutional overhaul and build on their existing approach with supervision either inside or outside the central bank (Table A2 in Annex A).¹⁰ However, four jurisdictions (Belgium, Hungary, Ireland and the United Kingdom) moved microprudential banking supervision to the central bank while there was no move in the opposite direction. For the new tasks – macroprudential policy and resolution – most euro area jurisdictions have followed a pragmatic approach by combining them with existing entities. The microprudential supervisor – either the central bank or an independent supervisor – has been made responsible for macroprudential policy in all but four jurisdictions and for resolution in all but seven cases.¹¹ Outside the euro area, new tasks – particularly resolution – have often been given to other institutions than central banks or regulators, such as independent resolution authorities. The latter also reflects path dependency, as institutions that were already responsible for specific resolution tasks – such as running the deposit guarantee scheme – often had their responsibilities extended to become resolution authorities.

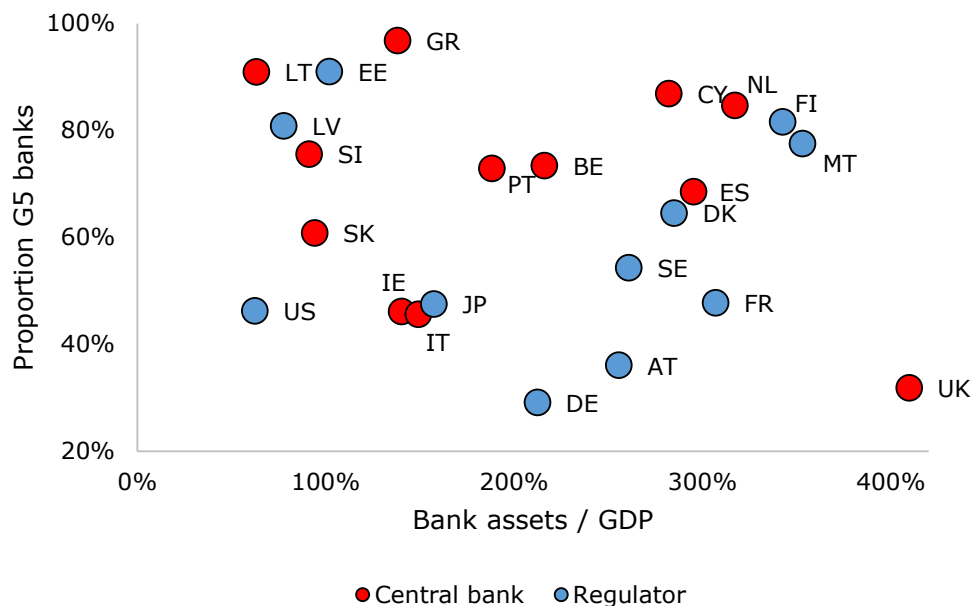
Another determinant of the institutional set-up may be the size and concentration of the financial sector. Systemic risk is particularly relevant in the euro area, as bank-based financial systems are associated with higher systemic risk than market-based systems (Bats and Houben, 2020). Especially in jurisdictions with a large and concentrated banking sector, there is a strong case for a prominent role of central banks in the supervision of banks, to ensure a macro-financial perspective. Indeed, in some of the European jurisdictions with the largest (United Kingdom) and most concentrated (Greece, Netherlands) banking systems, the central bank is also responsible for prudential policies and resolution. The institutional structures in the UK and the Netherlands were explicitly motivated by their concentrated

¹⁰ Calvo et al. (2018) find a similar trend in a survey on institutional changes in 82 jurisdictions.

¹¹ This follows the ESRB (2011) recommendation that central banks should play a leading role in macroprudential policy, particularly if they are also responsible for microprudential supervision. Moreover, the enhanced microprudential and macroprudential role of the European Central Bank since the start of the Banking Union has further contributed to the role of central banks in non-monetary tasks.

banking systems.¹² But, surprisingly, there seems to be no systemic relationship between financial structure and central bank involvement (Chart 2).

Chart 2: Microprudential authority vs size and concentration banking sector



Source: ECB, World Bank Bank Regulation and Supervision Survey.

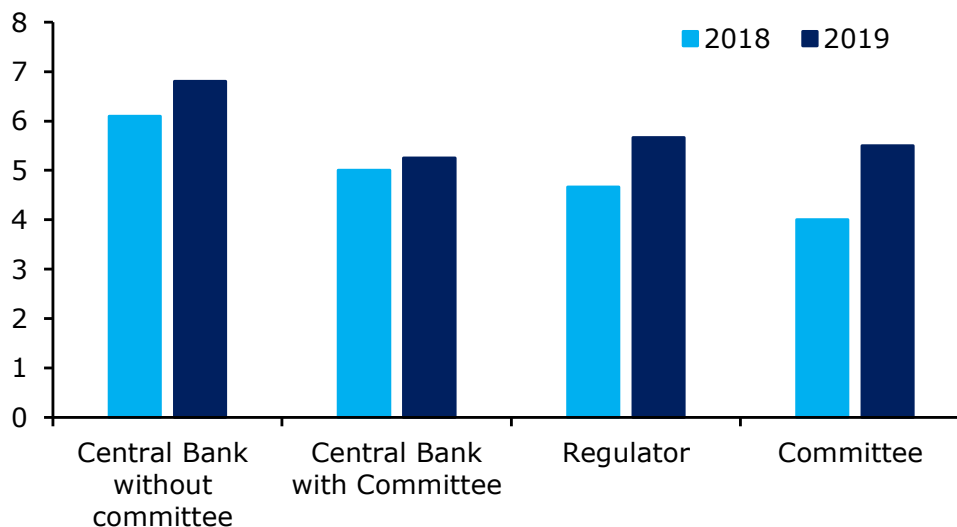
A further consideration is that authorities should be able to effectively respond to structural changes. The financial system continuously evolves, driven by macro trends (internationalization, demographics etc.) and innovation. Authorities need to be aware of such trends and implications for their tasks, which also involves the interaction with other authorities. An example in recent years is the emergence of non-

¹² Chancellor Osborne (2010) motivated the bank of England’s new prudential tasks by pointing to the fact that in the concentrated UK banking system the boundaries between micro and macro are hard to define, and to the independence and macroeconomic orientation of central banks and to the synergy with the LOLR function. Similarly, in the Netherlands the move towards a twin peaks model with a supervisory role for the central bank in 2002 was motivated by a conviction that in a concentrated financial system with systemically important financial institutions, financial system stability and microprudential stability are closely linked (Kremers and Schoenmaker, 2010).

banks on credit markets, which has implications for the design of bank and non-bank regulation but also for monetary transmission and the design of monetary operations. Relatively new systemically important players, such as central counterparties (CCPs), may initiate discussions about the desirability of such institutions' access to ELA and, hence, central banks' role in supervision and crisis management. An integrated supervisor is more likely to incorporate cross-sector trends in its supervisory practices, whereas a central bank is more likely to oversee broader systemic aspects.

Finally, a central bank role may contribute to dealing with inaction bias as financial vulnerabilities are building up. Inaction bias is the tendency to postpone desirable policy action when this involves accepting certain, visible, short-term costs on account of uncertain, invisible long-term benefits. While many forces will resist a tightening of prudential measures, few will reward a crisis that never occurred. Inaction bias can be mitigated through an institutional design that stimulates timely action. Given the length of financial cycles and the low frequency of financial crises, inaction bias seems particularly relevant for macroprudential policy. This raises the question whether central banks, who are designated as macroprudential authorities in most jurisdictions, are better able to deal with inaction bias than other institutions. Although it is premature to draw strong conclusions at this stage, Chart 3 presents some very preliminary evidence that, among macroprudential authorities in Europe, central banks have taken on average more macroprudential measures than non-central bank authorities. In the euro area, the ECB's macroprudential mandate has been specifically tailored to counter inaction bias. In particular, the ECB is only allowed to tighten (i.e. not to loosen) national macroprudential policies. This reflects the presumption that national authorities will not delay when loosening their macroprudential policy stance, but may tend to postpone any tightening.

Chart 3: Average number of macroprudential tools activated in EU jurisdictions



Note: This graph should be interpreted cautiously given i) the limited observations (i.e. only two committees are national designated authority) and ii) the relatively short time span considered.

Source: ESRB (2019, 2020)

5 Concluding remarks

Central bank involvement with non-monetary tasks differs across jurisdictions, but has increased since the Global Financial Crisis. Central banks play a prominent role in macroprudential policy, but their involvement with microprudential supervision and crisis resolution has also grown. At the same time, differences across Europe remain substantial as most jurisdictions have chosen to build on their pre-crisis institutional frameworks. Most jurisdictions stuck to their initial choices to have the banking supervisor either inside or outside the central bank, and designated new policies to that supervisor. But the exceptions generally moved more regulatory powers to central banks.

Combining monetary and regulatory tasks improves operational synergies, oversight and policy coordination but may also involve conflicts of interests, concentration of power and reputation risk. The extension of policy instruments has increased the scope to pursue different policy goals simultaneously. Moreover, macroprudential policies in Europe are set at the national level, which increases the

scope to address country-specific financial imbalances and improve the functioning of the internal market. The benefits of better policy coordination and oversight can be best exploited by bundling all regulatory policies and monetary instruments into the central bank. In practice, however, this means that the central bank may have to deal with conflicts of interest between different policies and reputation risk. In addition, the combination of many policies in one institution leads to a significant concentration of power.

In the Corona crisis, current institutional arrangements are being tested for the first time since the GFC. This article has been written in May 2020, about two months after the start of the Corona lockdown in most jurisdictions. As a response to the crisis, there have been a myriad of policy adjustments in monetary operations, macroprudential tools, and microprudential and resolution requirements. Some of the policy interactions are already visible – for instance, monetary measures to prevent a tightening of financial conditions and facilitate access to central bank liquidity, together with prudential measures allowing financial firms to draw down capital buffers. Presumably, central banks involved with supervisory tasks are in the best position to oversee how this crisis affects the financial system, as illustrated by the Bank of England’s timely stress test published early May 2020. But as the crisis evolves, possible disadvantages of the combined model, such as conflicts of interest between tasks and reputation risk, may also emerge.

References

- Bats, Joost, Jan Willem van den End and John Thoolen (2018), Revisiting the central bank’s lender of last resort function, DNB Occasional Studies 16(4).
- Bats, Joost and Aerd Houben (2020), Bank-based versus market-based financing: implications for systemic risk. *Journal of Banking & Finance*, 114, 105776.
- BIS (2011), Central bank governance and financial stability, A report by a Study Group chaired by Stefan Ingves.
- Borio, Claudio (2014), Monetary policy and financial stability: what role in prevention and recovery? BIS Working Papers, No. 440.
- Borio, Claudio and William White (2004), Whither monetary and financial stability? The implications of evolving policy regimes. BIS Working Papers No. 147.
- Calvo, Daniel, Juan Carlos Crisanto, Stefan Hohl and Oscar Pascual Gutiérrez (2018), Financial supervisory architecture: what has changed after the crisis? FSI Insights on Policy Implementation, No. 8, Bank for International Settlements.
- Cizel, J., J. Frost, A. Houben and P. Wierdsma (2019), Effective Macroprudential Policy: Cross-Sector Substitution from Price and Quantity Measures. *Journal of Money, Credit and Banking*, 51 (5), 1209-1235.
- De Haan, Jakob, Aerd Houben and Remco van der Molen (2012), Governance of macroprudential policy, *Zeitschrift für Öffentliches Recht* 67(2), pp. 283-302.

- European Systemic Risk Board (2011), Recommendation of the European Systemic Risk Board of 22 December 2011 on the macro-prudential mandate of national authorities, Official Journal of the European Union, ESRB/2011/3.
- European Systemic Risk Board (2019), A Review of Macroprudential Policy in the EU in 2018.
- European Systemic Risk Board (2020), A Review of Macroprudential Policy in the EU in 2019.
- Galati, Gabriele, and Richhild Moessner (2013), Macroprudential policy – a literature review, *Journal of Economic Surveys*, 27(5), pp. 846-878.
- Goodhart, Charles (2000), The Organisational Structure of Banking Supervision, FSI Occasional Papers, No. 1, Bank for International Settlements.
- Houben, Aerdt, Rob Nijskens and Mark Teunissen (2014), Putting macroprudential policy to work, *DNB Occasional Studies* 12(7).
- Houben, Aerdt, and Jan Kakes (2013), Financial imbalances and macroprudential policy in a currency union, *DNB Occasional Studies* 11(5).
- Kent, Christopher, and P. Lowe (1997), Asset-price bubbles and monetary policy, Reserve Bank of Australia Research Discussion Paper 9709.
- Kremers, Jeroen, and Dirk Schoenmaker (2010), Twin Peaks: Experiences in the Netherlands, LSE Financial Markets Group Paper Series, Special Paper No. 196.
- Kremers, Jeroen, Dirk Schoenmaker and Peter Wierts (2003), Cross-sector supervision: which model?, in: R. Herring and R. Litan (eds), *Brookings-Wharton Papers on Financial Services*, Brookings Institution, Washington DC.
- Llewellyn, David (2006), Institutional structure of financial regulation and supervision: the basic issues, in: A Fleming, D Llewellyn and J Carmichael (eds), *Aligning financial supervision structures with country needs*, World Bank, Washington DC.
- Osborne, George (2010), Speech by the Chancellor of the Exchequer at the Lord Mayor's dinner for bankers and merchants of the City of London, Mansion House.
- Stein, J. C. (2013, February), Overheating in credit markets: origins, measurement, and policy responses. In Speech given to the symposium on Restoring Household Financial Stability After the Great Recession, Federal Reserve Bank of St. Louis, St. Louis, Missouri, February (Vol. 7).
- Svensson, Lars (2017), Cost-benefit analysis of leaning against the wind, *Journal of Monetary Economics*, 90, pp. 193-213.

Annex A Monetary and non-monetary authorities by jurisdiction

Table A1: Monetary and non-monetary authorities

	Monetary / LOLR	Microprudential	Macroprudential	Resolution
Euro area				
Austria	Central bank	Regulator	Regulator	Regulator
Belgium	Central bank	Central bank	Central bank	Central bank
Cyprus	Central bank	Central bank	Central bank	Central bank
Estonia	Central bank	Regulator	Central bank	Regulator
Finland	Central bank	Regulator	Regulator	Resolution authority
France	Central bank	Regulator	Committee	Regulator
Germany	Central bank	Regulator	Regulator*	Regulator
Greece	Central bank	Central bank	Central bank	Central bank
Ireland	Central bank	Central bank	Central bank	Central bank
Italy	Central bank	Central bank	Central bank*	Central bank
Latvia	Central bank	Regulator	Regulator**	Regulator
Lithuania	Central bank	Central bank	Central bank	Central bank
Luxemburg	Central bank	Regulator	Regulator*	Regulator
Malta	Central bank	Regulator	Central bank	Regulator
Netherlands	Central bank	Central bank	Central bank*	Central bank
Portugal	Central bank	Central bank	Central bank	Central bank
Slovakia	Central bank	Central bank	Central bank	Resolution authority
Slovenia	Central bank	Central bank	Central bank*	Central bank
Spain	Central bank	Central bank	Central bank	Multiple**
Euro area	Central bank	Central bank	Central bank	Resolution authority
Other EU				
Bulgaria	Central bank	Central bank	Central bank*	Central bank
Croatia	Central bank	Central bank	Central bank*	Multiple**
Czech Republic	Central bank	Central bank	Central bank	Central bank
Denmark	Central bank	Regulator	Ministry of finance*	Multiple**
Hungary	Central bank	Central bank	Central bank	Central bank
Poland	Central bank	Regulator	Ministry of finance*	Resolution authority
Romania	Central bank	Central bank	Committee	Multiple**
Sweden	Central bank	Regulator	Regulator	National debt office
Non-EU				
UK	Central bank	Central bank	Central bank	Central bank
US	Central bank	Other	Central bank	Resolution authority
Japan	Central bank	Regulator	Regulator	Regulator

Note: * Designated authority as indicated, but committee as macroprudential authority.

** Several authorities responsible for resolution. In Spain and Croatia, these are the central bank and a resolution authority; In Romania the central bank and the regulator; in Denmark the regulator and a resolution authority

Source: EBA, ESRB, World Bank Bank Regulation and Supervision Survey

Table A2: Microprudential supervision: 2020 versus 2007

	2020	2007		2020	2007
Euro area			Other EU		
Austria	Regulator	Regulator	Bulgaria	Central bank	Central bank
Belgium	Central bank	Regulator	Croatia	Central bank	Central bank
Cyprus	Central bank	Central bank	Czech Republic	Central bank	Central bank
Estonia	Regulator	Regulator	Denmark	Regulator	Regulator
Finland	Regulator	Regulator	Hungary	Central bank	Regulator
France	Regulator	Regulator	Poland	Regulator	Regulator
Germany	Regulator	Regulator	Romania	Central bank	Central bank
Greece	Central bank	Central bank	Sweden	Regulator	Regulator
Ireland	Central bank	Regulator	Non-EU		
Italy	Central bank	Central bank	UK	Central bank	Regulator
Latvia	Regulator	Regulator	US	Other	Other
Lithuania	Central bank	Central bank	Japan	Regulator	Regulator
Luxemburg	Regulator	Regulator			
Malta	Regulator	Regulator			
Netherlands	Central bank	Central bank			
Portugal	Central bank	Central bank			
Slovakia	Central bank	Central bank			
Slovenia	Central bank	Central bank			
Spain	Central bank	Central bank			
Euro area	Central bank	-			

Source: EBA, ESRB, World Bank Bank Regulation and Supervision Survey

An Integrated Macroprudential Framework in the Post-Pandemic World

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1 Introduction

French novelist Jean-Baptiste Alphonse Karr once said of political revolutions, “The more things change, the more they stay the same”. Regime changes often disappoint because succeeding leaders tend to share the same motives and constraints as their predecessors’. Such a dim worldview may seem a far cry from central banking. After all, departure from the gold standard or the adoption of inflation targeting framework did bring about consequential and persistent changes. Even within the current framework, few could fault central banks for lacking imagination or willingness to adapt their playbooks when new policy challenges arise. The introduction of unconventional policies in the wake of the Great Financial Crisis (GFC), and an expanded role as a lender of last resort during the most recent global lockdown are cases in point.

Karr’s remark resonates somewhat louder when it comes to macroprudential policy frameworks (MPF), defined broadly here as frameworks for internalizing macroeconomic implications of financial stability into policy considerations.² Before the Great Financial Crisis (GFC), major central banks followed a benign-neglect approach, refraining from counteracting financial booms with policy tightening, choosing to mop up after the bust with policy rate cuts. Macroprudential tools, though already routine in emerging market economies, were viewed skeptically as a counterproductive meddling with credit allocations. The GFC has forced a rethink of MPF by putting a spotlight on financial stability as a pre-condition

¹ I thank David Archer, Claudio Borio, Daniel Rees and Christian Upper for insightful discussions and their comments on an earlier draft. Views expressed in this article are mine alone, and do not necessarily reflect those of the Bank for International Settlements or my colleagues.

² MPF as defined here could entail the use of any policy tools at disposal to central banks, including monetary policy.

for macroeconomic stability and advanced the debate on how best to achieve this objective. This debate remains active to this day, though many major central banks have effectively followed the ‘separation principle’, which takes macroeconomic and financial stability as two distinct objectives, to be independently pursued by two policy instruments. Macroprudential tools, now fully embraced, are tasked with ensuring financial stability. Monetary policy retains its singular focus on macroeconomic targets such as growth and inflation. One might conclude that, as far as the monetary policy’s role in MPF is concerned, the more things change, the more they remain the same.

This essay critically evaluates this compartmentalized approach to MPF, against an integrated alternative, where both monetary and macroprudential policies work in concert towards an encompassing goal. I will discuss the challenges posed by the environment of low interest rates in making this choice. I will also draw some lessons from the current ongoing pandemic, and conjecture what the future may hold for MPF.

2 Separate or integrated? The state of debate

A key advantage of the compartmentalized approach to MPF is a clear division of responsibility. Monetary policy can focus on keeping inflation near its target and output close to its potential, while macroprudential policy can devote itself solely to financial stability. In principle, this sharp demarcation should help lessen the inaction bias, and protect both policymakers’ credibility. Assigning one tool for one purpose also appears consistent with the well-established Tinbergen principle, which states that the number of instruments must match that of targets if all of the latter were to be achieved.³

Another argument in favor of the separation principle is that each tool has a comparative advantage within its domain. Monetary policy has a broader reach, hence is suitable as a macroeconomic management tool. Macroprudential tools can be targeted to micro pockets of overheating, harder to manage with a blunt instrument. It has also been argued that macroprudential tools such as countercyclical capital buffers offer something monetary policy cannot, in that they help strengthen the financial sector’s resilience to shocks (see e.g. Aikman et al (2018)).

In reality, the demarcation line between the two sides can often be blurry. The two objectives are not independent - indeed financial stability is only a means to macroeconomic stability. As instruments, monetary and macroprudential tools

³ Note, however, that the Tinbergen principle only states the minimum number of tools required, not how they should be used. Whether or not one tool can independently achieve its designated objective lies beyond the Tinbergen principle, and depends on the relationship between the objectives as well as the way the tools interact.

work similarly by influencing financial risk taking, so both can contribute to financial stability or vulnerability. And while many macroprudential tools are generally more targeted, they too generate a macroeconomic impact. That is why releasing macroprudential buffers in recessions is part of the standard rulebook.

These considerations argue for a tighter integration between the two sides, with monetary and macroprudential tools adjusted under one roof in pursuit of an integrated policy objective. This objective clearly must transcend narrow operational targets (e.g. strict inflation targeting over a fixed horizon), but does not have to depart from the usual concept of sustainable economic expansion.⁴ The key is to take an intertemporal perspective and take into account macro-financial feedback mechanisms comprehensively. If attaining a “full employment” in the short term would put financial imbalances on an unsustainable path and jeopardize future macroeconomic stability, then the right policy balance should incorporate this intertemporal trade-off. Any combinations of the two policy tools could be used to achieve the objective.⁵

The separation principle approach may be made necessary by an institutional or political economy backdrop that demands a high degree of accountability. Even so, the interdependence between the two goals will necessitate a pecking order. Typically, short-term macroeconomic goals take precedence, leaving macroprudential policy to mop up any financial stability risks that emerge following monetary policy decisions. Aside from being sub-optimal, this raises the question of whether macroprudential policy can single-handedly do the job, not least if monetary policy is pulling in the opposite direction. Available evidence casts much doubt that it can (see e.g. Gambacorta and Murcia (2017)). In practice, macroprudential policy can also be highly political, and in many countries, central banks do not have binding tools.

The MPF debate is sometimes couched starkly in terms of whether monetary policy is at fault for causing financial crises. Unless such a causal link is proven, the argument goes, monetary policy should not have to respond to financial stability risks. This is an oversimplification of the policy problem, however. The business cycle itself is influenced by a myriad of forces, monetary policy probably ranking low in the list. This does not mean that monetary policy cannot help steer the economy and make it more stable. The financial imbalance process is similarly complex and depends on a host of factors beyond monetary policy. Still, monetary policy can contribute to stabilizing the financial cycle and mitigate its macroeco-

⁴ For example, the Reserve Bank of Australia has a broad mandate to contribute to “the economic prosperity and welfare of the people of Australia”.

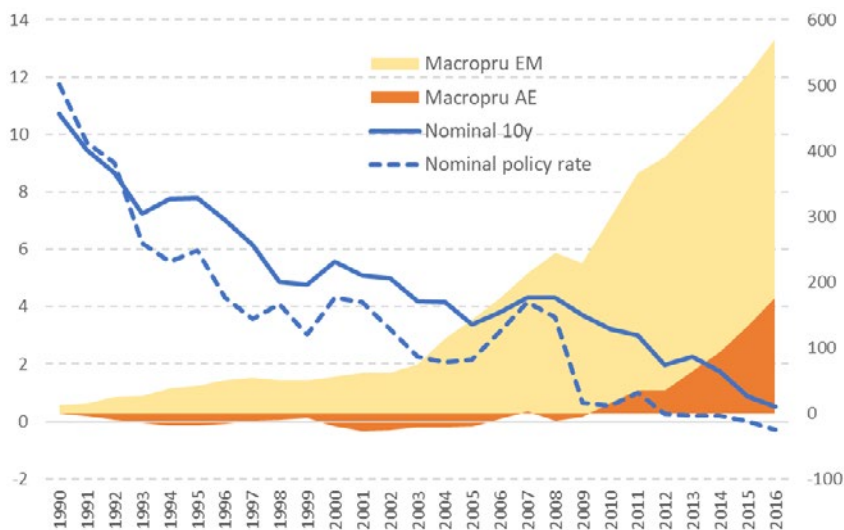
⁵ Under an integrated approach, monetary and macroprudential policies could work as either substitutes or complements depending on the situation. The separation principle would rule out complementary uses of the tools, at least in countering a financial boom.

conomic repercussions.⁶ Whether or not it is the most decisive factor driving financial crises is beside the point.

3 The low-for-long interest rate environment

The operational separation between macroeconomic and financial stability objectives faces even greater challenges in the era of low-for-long interest rates. Global nominal interest rates have never been this low and for this long. The decline in interest rates in turn has boosted asset prices and debt, calling for an increasing reliance on macroprudential policies, both in advanced and emerging market economies (Chart 1). A long list of measures has been introduced, each designed to quell overheating in a different area of the financial markets. Loan-to-value limits and borrower-based measures were adopted to tackle high house prices. Debt-to-income limits were tasked to address high household debt problems. Curbs on foreign exchange lending were introduced in response to high dependence on foreign exchange debt in emerging markets. The list goes on.

Chart 1: Macroprudential policy more active as interest rates fall



Sources: iMaPP database. Author's calculations

Experience since the GFC suggests that, despite their best efforts, macroprudential policies have often struggled to go at it alone in this environment. As macroprudential policies tightened their grip, risks have shifted to darker corners. In the United States, growth in leveraged loans and collateralized loan obligation (CLO) soared in the decade after the GFC. In response, regulatory agencies including the

Federal Reserve have issued guidance to banks, yet this may have triggered a migration of leveraged lending to nonbanks (see Kim et al (2018)). There were also signs of non-bank portfolios becoming riskier and more illiquid, and greater search-for-yield behavior by pension funds and insurance companies. All these developments lay beyond the macroprudential policy reach. Low-for-long interest rates also sapped bank profitability, which macroprudential policy could do little about. Releasing the countercyclical capital buffer would have betrayed its spirit.

One defense for monetary policy is that it has its own war to fight, namely the secular decline in the natural rate of interest (r -star). An influential explanation for the decline in real (hence nominal) risk-free interest rates is that real saving has trended up and outpaced investment over the past few decades, owing to exogenous forces such as declining productivity, higher life expectancy, greater demand for safe assets and global saving glut. This has driven down r -star, requiring an ever lower level of policy interest rate to keep the economy in full employment and the goods market in equilibrium.

What are the implications of falling r -star on financial stability risks? One view is that when the real economy is in equilibrium, so should the financial market. A lower r -star should then imply a lower equilibrium discount rate, which justifies higher levels of sustainable asset prices and debt. Lower interest rates then need not require any macroprudential policy responses.⁷

Another view is that there need not be a divine coincidence between the goods market equilibrium and the financial market stability. This potential disconnect was indeed emphasized by Knut Wicksell in his original conception of the natural interest rates. For example, if investors have nominal target returns, then a lower risk-free interest rate would necessarily push them to take on greater risks. A decline in r -star, or indeed a persistent decline in interest rates whatever its causes, could then exacerbate financial stability risks and worsen the intertemporal tradeoff between short- and long-run macroeconomic stability. In this case, a low-for-long interest rate environment would pose greater challenges to MPF.

The r -star explanation for low interest rates itself is not without dispute. The empirical link between real interest rates and posited determinants such as productivity and demographic changes is elusive in a long sample (see Borio et al (2017)). In fact, shifts in monetary policy regimes appear more successful in predicting changes in real interest rate trends. One way this could arise is through the interaction between monetary policy framework and financial stability. A decline in the risk-free interest rate could encourage excessive financial risk taking, gradually sapping the financial system's strength. When financial institutions finally retrench, this weakens the transmission and justifies even more policy easing to regain the same

⁷ This view assumes that a low r -star is a persistent phenomenon that is unlikely to reverse in the near future.

level of output (see Rungcharoenkitkul et al (2019)). An MPF that places too much emphasis on short-term outcomes could be one cause of a secular decline in real and nominal interest rates, making it increasingly difficult to maintain macroeconomic stability over time.

4 The Covid-19 lessons

At the time of writing, the world is facing a momentous challenge from the Covid-19 pandemic. The crisis is set to leave a lasting imprint on consumer behavior as well as production of goods and services. The debate on monetary policy and macroprudential frameworks would also likely be reshaped, though what the new normal will be remains to be seen. Experiences over the last several months however already highlight some general lessons.

First, the pandemic shatters any illusion that monetary and macroprudential tools can be kept separate under the one tool one purpose arrangement. Given the enormity of the global lockdown shock, there was little debate that all hands must be on deck and macroprudential releases could usefully complement monetary policy easing in providing support to the economy. This raises the question why monetary policy should not also pull some weight to counter financial overheating, particularly if macroprudential policy alone would not suffice. Else, policy would be asymmetric and biased over the cycle, potentially amplifying the financial cycle and adding to macroeconomic instability.

Second, the pandemic shock illustrates the value of preserving financial buffers for rainy days. More stringent financial regulation post-GFC helped build stronger financial institutions that are not only more able to withstand the extended lockdown, but also serve as a source of stability for the rest of the economy. Fostering and preserving the financial sector's resilience may entail some sacrifice of immediate output due to lower borrowing and debt than otherwise, but pay off when bad times materialize. Recognizing and willing to make this intertemporal tradeoff is a central part of MPF.

Third, the financial system extends beyond large systemic financial institutions, and is an ecosystem of lenders and borrowers, large and small. Highly indebted and less liquid firms and households are less able to withstand income losses during the Covid-19 lockdown, and it is their potential destruction that poses the greatest threat to the economy. Limiting real-sector leverage is therefore a key part of making the financial system and macroeconomy more resilient to adverse shocks. Policymakers should maintain this broad perspective, even if their policy tools work more narrowly through bigger players in the financial markets.

Fourth, rebuilding financial system resilience takes time, so should start as soon as the macro-financial conditions permit. Large shocks can arrive at any moment, and the MPF must help prepare the financial system for them in advance. A key

amplification mechanism of the Covid-19 is the high private-sector debt, following a decade of low interest rates. Once the worst of the storm has passed and the recovery has gained traction, it may thus pay to look through smaller shocks and promote prudent risk-taking behavior through opportunistic and carefully timed policy normalization. This would help the financial system regain buffers quickly, as one never knows when the next lightning would strike.

Finally, the pandemic-fighting strategy provides an apt analogy for thinking about MPF. Contact tracing and quarantining can isolate few infected individuals initially and prevent further spread of an epidemic. But this targeted approach relies on an ability to quickly identify new infections, which becomes more difficult and ultimately impossible with active social interactions. That is why contact tracing must go hand in hand with social distancing. Similarly, targeted macroprudential policy can only go so far without some assistance from the more sweeping monetary policy.

5 Toward the post-pandemic era

Time will tell if the role of MPF would evolve in the post-pandemic world. In a bleaker scenario, the next decade could be similar to the one before it, with policy interest rates staying close to their lower bounds most of the time and central bank balance sheets continuing to grow. This could be a necessary response to a prolonged and deep recession, possibly worse than the GFC. Or, similar to the preceding decade, it could also be driven by decisions to run the economy hot and buy extra insurance against the economy sliding back into a slumber. In the latter case, increased financial risk taking will again be the means to achieve desired ends, probably at the cost of lower resilience to future shocks. Macroprudential policy will again need to shoulder the burden, perhaps even heavier than before. Karr's remark would resonate even louder this time around.

With luck, the current decisive health and economic policies will work and help put the global economy back on its feet quickly. Once the patient recovers from the coma, policymakers face a choice. They could maintain the emergency dosage of medicine, to insure against any relapse. The risk is that the patient may catch a new disease before being discharged, with a weaker immune system and a higher dependence on life-support machines. Another option is to take a step back once economic activity resumes robustly, and encourage the economy to rebuild buffers and financial resilience against future shocks – akin to allowing the patient to regain her natural immune system. This would require a somewhat different playbook from what was used in the GFC aftermath, possibly at a cost of somewhat higher short-term market and economic volatility. In return, this strategy would help forge a more resilient macro-financial system than in the past, and mark a major evolution in MPF design.

References

- Aikman, D, J Giese, S Kapadia and M McLeay (2018), “Targeting financial stability: macroprudential or monetary policy?”, Bank of England working papers 734, Bank of England.
- Borio, C, P Disyatat, M Juselius and P Rungcharoenkitkul (2017), “Why so low for so long? A long-term view of real interest rates”, BIS Working Papers no 685.
- Filardo, A and P Rungcharoenkitkul (2016), “A quantitative case for leaning against the wind”, BIS Working Papers no 594.
- Gambacorta, L and A Murcia (2017), “The impact of macroprudential policies and their interaction with monetary policy: an empirical analysis using credit registry data”, BIS Working Papers no 636.
- Kim, S, M Plosser and J Santos (2018), “Macroprudential policy and the revolving door of risk: lessons from leveraged lending guidance”, *Journal of Financial Intermediation*, vol 34, pp 17-31.
- Rungcharoenkitkul, P, C Borio and P Disyatat (2019), “Monetary policy hysteresis and the financial cycle”, BIS Working Papers no 817.