

Classical Economics, Keynes and Money

Essays in Honour of Carlo Panico

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17 Monetary policy and financial stability in the Economic and Monetary Union

Francesco Purificato and Elvira Sapienza

1 Introduction

We feel pleased to contribute a paper to the book in honour of Carlo Panico. In writing about macroeconomic stability and financial stability, it seems right to us start from what Carlo himself has written on this topic. Indeed, based on Sraffa's analysis of money and banking, Carlo has studied the evolution of financial regulation before and after the financial crisis, highlighting how the growth of the financial system can determine an increase in income inequality (Panico et al., 2012). Moreover, based on the experience of the Mexican economy, he has supported the thesis that the process of financial liberalisation can promote both an expansion of the banking sector and a rise in the systemic risk; as a result, this process also affects the conduct of the monetary policy, contributing to generate a lower growth in the Mexican economy (Capraro and Panico, 2021). By moving from the different perspectives of the Economic and Monetary Union (EMU), this chapter also explores these critical factors related to the role of financial regulation. Specifically, the focus will be on how financial stability can influence the conduct of the monetary policy and, in turn, the trade-offs among price stability, output stability and financial stability.

The 2007–2008 financial crisis has shaken the confidence in the macroeconomic policy framework: a monetary policy focused primarily on price stability has proven not to be a sufficient condition for financial stability. As a result, a new theoretical framework has emerged, in which monetary policy aims at price stability, and macro-prudential policy aims at financial stability. However, there is a debate about whether the monetary authority should amend the monetary policy framework to include also financial stability objectives along with price stability. According to the Modified Jackson Hole Consensus (MJHC) view, the monetary policy should pursue its relatively narrow mandate of price stability, stabilising the production around a sustainable long-run level; in contrast, macroprudential authorities should pursue financial stability. Instead, the leaning against the wind vindicated (LAWV) view argues that the monetary authority should also consider the objective of financial stability, as the macro-prudential policy cannot address the financial

cycle adequately, and financial instability can imply adverse effects on price stability. Finally, the financial stability is price stability (FSPS) view suggests merging the intertwined objectives of price and financial stability fully, as the financial sector determines the degree of inside money creation and the risk premium in the economy.

In the aftermaths of the sovereign debt crisis of 2010–2012, European institutions have reformed the institutional framework to pursue the objective of financial stability. They have established the Single Supervisory Mechanism (SSM), which introduces the following critical elements. First, under the direct control of the European Central Bank (ECB), centralised micro-prudential supervision aims to promote the soundness and safety of individual credit institutions. Second, under the responsibility of national designed authorities, decentralised macro-prudential supervision aims to prevent the building up of systemic financial risks; however, in this case, the ECB retains the power to tighten the measures adopted by these authorities.

The chapter's main contribution is a thorough assessment of the new institutional design introduced by the SSM. For this purpose, the essay presents a review of the literature and a simple analytical model to clarify the critical motivations behind the reform process and to discuss the actual application of the SSM.

Concerning the literature review, it detects the following elements. Until 2014, the ECB acts as a LAWV-type central bank, which tends to raise the policy rate more than an MJHC-type central bank to face the trade-off between macroeconomic and financial stability (Friedrich et al., 2019). Nevertheless, the benefits of a more restrictive monetary policy, namely, a lower probability for a financial crisis to occur, outweigh its costs, namely, a lower growth rate during normal times (Svensson, 2017; Kockerols and Kok, 2019). Moreover, the macro-prudential and micro-prudential supervision are effective in handling financial risks, promoting both macroeconomic and financial stability (Darracq Pariès et al., 2019); specifically, following asymmetric shocks, national macro-prudential measures can support the single monetary policy, taking into account national differences. Despite a still incomplete reform process, as the decision-making process lacks total transparency and accountability, and the goal of a levelled regulatory field has not yet been achieved (Schoenmaker and Véron, 2016; Fromage and Ibrido, 2019), some empirical findings appear to support the view that the SSM promotes the financial stability of the banking system (Loipersberger, 2018).

Concerning the analytical model, it describes the decision-making process of a central bank like the ECB. The analytical framework is based on the New Keynesian static macro-model (Bofinger and Mayer, 2007; Dehmej and Gambacorta, 2019; Poutineau and Vermandel, 2015), where we introduce a simplified endogenous mechanism of a financial crisis, as proposed by Woodford (2012). Financial risks depend on endogenous factors, such as the trend of the business cycle, which are affected by the policy rate, and exogenous factors beyond the control of the monetary authority, such as the

propensity to take risks by banks or the impact of macro-prudential and micro-prudential policies. If the exogenous component of the systemic risk is high enough compared to the endogenous part, then a monetary policy based on the LAWV view implies larger output costs than a monetary policy based on the MJHC view. This finding exactly mirrors Panico's argument about the role of financial liberalisation: if the deregulation process promotes increasing financial risks, then a monetary policy pursuing the goal of financial stability reduces the investment level and the competitiveness of the economy, determining a lower economic growth (Capraro and Panico, 2021).

Overall, we can express a positive assessment of the new institutional framework implemented by the European institution, as it appears consistent with the critical factors detected by the literature. According to our model, both centralised micro-prudential policy and decentralised macro-prudential policy under the supervision of the ECB aim at increasing the capacity of the monetary authority to face the exogenous factors affecting stability financial risks. Basically, the new institutional design satisfies Tinbergen's principle. Each instrument should be devoted to the objective that it can most efficiently achieve: the monetary policy mainly aiming at macroeconomic stability and the macro-prudential and micro-prudential supervision aiming at financial stability.

The remainder of the essay is organised as follows. Section 2 provides an overview of the EMU institutional framework. Section 3 reviews the literature, focusing on contributions that consider the peculiar features of the EMU and the actual implementation of the SSM. Based on the analytical model and the key elements detected by the literature, Section 4 discusses and assesses the new institutional framework established by the European institutions. Finally, Section 5 presents some conclusions.

2 The institutional framework

The Treaty on the Functioning of the European Union (TFEU) identified in the price stability the primary objective of the ECB. Subsequently, the ECB's Governing Council adopted the following quantitative definition: in pursuing the objective of price stability, the Governing Council aims to maintain inflation rates below, but close to, 2.0% over the medium term.

The ECB defines financial stability as the ability of the financial system, which consists of financial institutions, markets and market infrastructures, to withstand shocks and the onset of financial imbalances. At the macroeconomic level, financial stability is related to the resilience of the financial system as a whole, namely, a condition in which the system can mitigate the effect of systemic shocks on the credit intermediation process, preventing a negative impact on the real economy. At the microeconomic level, financial stability is related to the soundness and safety of individual credit institutions, namely, a condition in which these institutions can resist idiosyncratic shocks (Boissay and Cappelletto, 2014).

Within the EMU, the TFEU and the Council Regulation 1024/2013, which established the SSM,¹ define the institutional framework to face and pursue the objectives of price stability and financial stability. Table 17.1 re-assumes the critical characteristics of this legal framework, specifying the functions and responsibilities of the monetary authority (Cassola et al., 2019).

In order to pursue the goals of price stability and financial stability, at both macroeconomic and microeconomic level, the European institutions can use three functions: the monetary policy, the macro-prudential policy and the micro-prudential policy. A different degree of centralisation and decentralisation characterises the decision-making and the implementation process connected with these three functions.

In the case of monetary policy, the decision-making process is centralised. Based on the support of the Executive Board and several technical committees,² the Governing Council of the ECB, which comprises the president of the ECB, the governors of euro area National Central Banks (NCBs) and the members of the Executive Board, sets the single monetary policy of the EMU. This institutional body adopts all monetary policy measures, taking into account a clear euro area perspective without reference to regional interests. Specifically, it defines the features of the standard measures as the refinancing operations and the non-standard measures as the asset purchase programmes. In contrast, the implementation process of the monetary policy is decentralised, with the NCBs performing almost all the operational tasks.

In the case of macro-prudential policy, the decision-making and implementation processes are mainly decentralised. The SSM assigns the power to decide and apply macro-prudential measures to the National Competent Authorities (NCAs), namely, the national institutions responsible for implementing the micro-prudential supervision. These measures, for instance, counter-cyclical capital buffers or capital requirements, are applied at the national

Table 17.1 Price and financial stability: the EMU's legal framework

<i>Objectives</i>	<i>Functions</i>	<i>Decision-Making Process</i>	<i>Implementation Process</i>
Price stability	Monetary policy	Centralised – ECB	Decentralised – NCBs ⁽¹⁾
Financial stability	Macro-prudential policy	Decentralised – NCAs ⁽²⁾	Decentralised – NCAs
	Micro-prudential policy	Centralised – ECB	Centralised – ECB
		Centralised – ECB	Centralised for significant institutions – ECB
			Decentralised for other institutions – NCAs

Notes: (1) National Central Banks (NCBs); (2) National Competent Authorities (NCAs).

level regarding the banking sector of a country. Nevertheless, the Governing Council can comment and object to the planned decisions by the NCAs, but mostly it may tighten macro-prudential measures adopted by the NCAs. This legal framework reflects that the euro area banking sector is highly fragmented, and financial imbalances often arise at the country level. Moreover, it also recognises a vital role to the ECB in mitigating possible cross-border spill-over effects, providing a euro area perspective in the assessment of the systemic risk.

In the case of micro-prudential policy, the decision-making process is centralised: supported by the Supervisory Board,³ the Governing Council ensures the homogeneity of supervisory practices and regulatory frameworks for individual credit institutions and the banking sector as a whole. About the implementation of the supervisory activity, the ECB directly supervises financial institutions classified as significant, based on their economic relevance at either country or euro area level. Otherwise, the NCAs are responsible for supervising less significant entities, subject to the oversight of the ECB to make sure the homogenous application of supervisory standards.

3 The literature review

Following the newly emerging paradigm (International Monetary Fund IMF, 2013), the policymaker can use both monetary and macro-prudential policies for counter-cyclical management, the first primarily aimed at price stability and the second at financial stability. Otherwise, the micro-prudential policy focuses on the safety and soundness of individual financial institutions. By starting from a different appreciation of the pervasiveness of the interaction among these policies, the literature presents three alternative views about the relationship between price stability and financial stability: the MJHC view, the LAWV view and the FSPS view.⁴

The first view considers as limited the interaction between monetary and macro-prudential policy, and it suggests maintaining these functions separate, as long as there is sufficient information sharing amongst the authorities. The monetary policy should pursue its relatively narrow mandate of price stability, stabilising the production around a sustainable long-run level; in contrast, macroprudential authorities should pursue financial stability (Svensson, 2012; Bernanke, 2015). This framework is an assignment consistent with Tinbergen's principle, which says that each instrument should be devoted to the objective that it can most efficiently achieve (Smets, 2014). The clear separation of objectives, instruments and communication of the two policy domains will increase the transparency and the accountability of policymakers, increasing the effectiveness and efficiency of policies. According to this view, monetary policy is not an appropriate instrument to pursue financial stability on which it has only a weak, indirect, effect and, rarely, might even constitute a threat to financial stability (Svensson, 2017; Ajello et al., 2019). In order to actively and systematically influence financial risks, policymakers need a separate macro-prudential policy. In leaning against the wind for financial stability purpose, the monetary policy

implies costs superior to the estimated possible benefits since a tighter monetary policy leads to lower average inflation and growth rates, and consequently a slow decrease in the real value of debt over time (Svensson, 2017; 2018).

The LAWV view considers the strong mutual dependencies between the two policy functions, which can be expected to complement and support each other. Monetary policy should have as secondary objective financial stability, as price stability itself has proven not to be a sufficient condition for financial stability (Borio, 2014; Billi and Vredin, 2014).⁵ Besides, the macro-prudential policy cannot address the financial cycle adequately, and the lack of financial stability can, in turn, have considerable adverse effects on price stability. The overall primacy of maintaining a price stability objective over the medium term is not affected. However, taking into account financial stability concerns in the adjustment path allows the central bank to lean against the wind; indeed, the financial cycle interacts with the business cycle in various potentially non-linear ways, with important drivers of financial imbalances, such as credit, liquidity and risk-taking (Smets, 2014). The monetary policy should adopt a flexible inflation targeting framework: the set-up is the same but it becomes more complicated since the policy horizon of the monetary authorities will extend due to the length of the financial cycle compared to that of the business cycle (Woodford, 2012). Thus, central banks may face additional trade-offs, which will require increased credibility of the price stability target.

The FSPS view suggests merging monetary policy and macro-prudential policy objectives fully. The argument is that financial stability and price stability are intimately intertwined, and it is impossible to make a distinction. This close connection comes from the fact that the financial sector determines the degree of inside money creation and the price of risk in the economy (Brunnermeier and Sannikov, 2015). In the case of a negative shock, bank equity declines, assets are sold to reduce the risk exposure, banks' balance sheets deteriorate, and the degree of money creation falls. The overall reduction in the money supply causes a deflationary pressure, and a liquidity spiral affects banks, redistributing wealth away from productive balance sheet-impaired sectors; especially, if fiscal-policy measures cannot be implemented in a timely manner. The monetary policy has to dampen the amplification effects going strictly beyond inflation targeting, figuring out which sectors suffer, redistributing wealth and restoring the flow of funds to productive parts in the economy (Roger, 2009). Essentially, aware of the interactions between price and financial stability, central banks should employ monetary policy tools in such a way as to reduce negative moral-hazard implications in the long run (Brunnermeier and Sannikov, 2014).

In order to assess the adequacy of the EMU institutional framework, a useful starting point would be the stylised facts that emerge from the empirical studies, which analyse the trade-off between macroeconomic and financial stability and the role of macro-prudential policy in the context of a monetary union. For our purposes, the two following sections evaluate these results. Subsequently, Section 3.3 reviews the literature on the SSM implementation.

3.1 The trade-off between macroeconomic and financial stability

The first strand of analysis refers to the interaction between macroeconomic and financial stability. The econometric analysis by Friedrich et al. (2019) studies how the objective of financial stability affects the monetary policy framework and, in turn, the choice of the policy rate during normal times and periods of financial booms, namely, situations where potential systemic risks are building up. The peculiar element of this analysis is the construction of the Financial Stability Orientation (FSO) index,⁶ which allows classifying a monetary authority according to its propensity to use the policy rate to prevent the onset of systemic financial risk. At the end of 2014, when the European institutions had not yet fully implemented the reform process, the ECB scored a value for the FSO index, such that the ECB was classified as a LAWN-type monetary authority. Friedrich et al. (2019) detect that a LAWV-type monetary authority tends to raise the policy rate more than a MJHC-type central bank in the presence of a financial stability risk. This differential behaviour is most significant during period of financial booms, namely, a situation where potential systemic risks are building up.⁷ Substantially, the LAWN-type central bank faces with a short-run trade-off among price stability, output stability and financial stability, and it tends to assign a lower weight to macroeconomic objectives than a MJHC central bank: the latter responds more aggressively than the forward with respect to inflation and output gaps. As a result, during normal times and financial booms, the operation of the LAWV-type central bank is characterised by a more restrictive monetary policy stance, determining lower growth and inflation rates.

At this point, it is essential to evaluate if the benefits of a more restrictive monetary policy, namely, a lower probability for a financial crisis to occur, outweigh its costs, namely, a lower growth rate during normal times. Both Friedrich et al. (2019) and Svensson (2017) detect that the LAWV-type monetary policy implies higher costs in comparison to its benefits. Kockerols and Kok (2019) also support this finding, by modifying the Svensson (2017) framework and taking into account the spatial and time dimensions of the financial cycle dynamic, the ECB's systemic risk indicator (SRI) and the role of macro-prudential supervision.⁸ They find that the LAWV-type monetary policy does not fundamentally alter the structure of the problem and it failed to consider endogenous downturn costs. In such a scenario, an active use of national macro-prudential policies targeting financial stability risks could determine the further benefit of counteracting the national imbalances, alleviating the burden on monetary policy to lean against the wind.

3.2 The role of macro-prudential and micro-prudential supervision

The second strand of analysis refers to the interaction among monetary policy, macro-prudential policy and micro-prudential policy. Few papers have discussed this issue, all using a DSGE model that introduce a financial and a

housing sector and assume strategic cooperation and a joint objective function. Substantially, they find that macro-prudential policies can usefully or partly contribute to macroeconomic welfare although with some costs. Table 17.2 summarises the main features of these papers.

A number of studies find that macro-prudential policies strongly promote macroeconomic welfare acting at the core of the financial system. They support monetary policy in addressing destabilising fluctuations in credit

Table 17.2 The empirical literature on the macro-prudential policy

	<i>Economy (1)</i>	<i>Financial Frictions (2)</i>	<i>Macro-prudential Tools (3)</i>	<i>Effects of Macro-prudential Policy (4)</i>			
				<i>Financial Stability</i>	<i>Output Stability</i>	<i>Distribution of Benefits</i>	
						<i>Core</i>	<i>Periphery</i>
Results based on model estimation							
Darracq Pariès et al. (2011)	CE	CC	CAR	+++	+++	...	...
Carboni et al. (2013)	CE	CC	CAR	+	+		
Quint and Rabanal (2014)	MU	FA	CAR	+++	+++	−	++
Results based on model calibration							
Brzoza-Brzezina et al. (2013)	MU	CC	LTV	+++	−−	−	++
Poutineau, Vermandel (2017)	MU	FA	CAR	+++	+++	+	+++
Dehmej, Gambacorta (2019)	MU	CC	LTV	++	−−	++	++
Rubio and Comunale (2017)	MU		LTV, ETR	+++	+++		
Malmierca (2022)	MU	FA	CAR	++	++	++	++
Darracq Pariès et al. (2019)	MU	FA	LTV	+++	---	+	+++
Kockerols and Kok (2019)	MU	CC	LTV-BCR	---	---	...	...

Notes: (1) Closed economy (CE), Monetary Union (MU); (2) Collateral constraint (CC), Financial accelerator (FA); (3) Capital requirement (CAR), Loan-to-value ratio (LTV), Bank capital requirement (BCR), Extended Taylor Rule (ETR); (4) Positive effect (+), Negative effect (–).

markets and intertemporal wedges between financial costs. Among these studies, Darracq Pariès et al. (2011) estimate a model⁹ with financially constrained households, firms and an oligopolistic banking sector. They examine the monetary policy implications of the various financial frictions to credit supply and demand and furthermore the real economic implications of increasing capital requirements. By means of countercyclical regulation (credit and asset prices) macro-prudential policy strongly affect monetary policy determining a superior macroeconomic outcome. Similar results are obtained by Quint and Rabanal (2014) that uses a two-country (core and peripheral) model with two sectors and two types of agents, savers and borrowers. A financial accelerator mechanism is introduced on the household side such that risk shocks in this sector affect conditions in the credit markets and the broader macroeconomy. The findings show that macroprudential regulations affect savers and borrowers differently: e.g. credit-to-GDP ratio improves welfare in the EMU the most but reduces that of borrowers while nominal credit growth improves welfare for all citizens. Since do not appear any adverse spill-over effect of regulation from one-member state to another, the setting macro-prudential policies at the national or EMU-wide level does not seem to change the outcome.

The importance of a coordination among the different policy functions emerges also in the results of Kockerols and Kok (2019) who try to understand to what extent macroprudential policy is the right tool to address financial stability risks. They take financial cycle dynamics¹⁰ into account considering longer time horizons and changes in bank capital requirement. It emerges that in the short term, the cumulative costs of macro-prudential policy outweigh the benefits, but in a longer-term, the implementation has cumulated net marginal benefits.¹¹

In the sense of a limited impact of macro-prudential policy, Carboni et al. (2013). In their model with financial frictions the banking sector¹² as also households and firms on the real side of the economy, are subject to capital constraints. The assessment presents two dimensions: the transmission mechanism of individual macro-prudential instruments from a system-wide perspective and the strategic complementarities in exceptional crisis circumstances. The impact of alternative macro-prudential configurations on GDP remains contained throughout the regular business cycle overall, while their effects on loans are more pronounced. Instead, during the financial crisis, the macro-prudential response, although effective in leaning against the financial cycle, implies an adverse drop in real GDP.

Other studies find that the effectiveness of the macro-prudential policies as a stabilising tool depends on they being set individually for each region since area-wide policy results ineffective in this respect. Brzoza-Brzezina et al. (2015) provided a model with a housing market and a banking sector, where banks and borrowers face a binding capital constraint. By means a simulation of asymmetric shocks hitting the core and the periphery, they find that a countercyclical application of macro-prudential tools can partly compensate

the loss of independent monetary policy in the peripheral economy lowering the output fluctuations and reducing shocks related to monetary policy or to the housing market.

Rubio and Comunale (2017) develop a DSGE new Keynesian model calibrated for Lithuania and the euro area. They consider two different scenarios: one in which the ECB extends (an extended Taylor rule) its goals to also include financial stability and a second one in which a national macroprudential authority uses the LTV ratio as an instrument. The results show that both rules are effective in making the financial system more stable in both countries but the macroprudential Taylor rule comes with a cost in terms of inflation volatility while the LTV rule, less effective, does not compromise the objective of monetary policy. This reinforces the Tinbergen principle, which argues that there should be two different instruments when there are two different policy goals.

Other evidence that macroprudential policy should be adjusted to regional evolutions comes from Poutineau and Vermandel (2017). They consider the link between investors and the banking system as the main channel for the build-up of financial imbalances and introduce in the model a financial accelerator mechanism on the productive side. In comparing the welfare implications of homogenous versus heterogeneous macroprudential rules across regions it emerges that the welfare gains are unequally shared, with the peripheral countries being the main winners and only limited welfare improvements for the core countries.

Similar outcome is provided by the simplified model of Dehmej and Gambacorta (2019) that considers an additional equation incorporating financial frictions. They find that federal and country-targeted macroprudential policies give similar outcomes when both countries and shocks are fully similar. Otherwise, when core and periphery economies are hit by asymmetric shocks country-targeted macroprudential policies are more appropriate in taming financial and economic imbalances. Again, Malmierca (2020) who builds a two-country model with a financial accelerator to analyses, through different macroprudential scenarios, the response to an asymmetric credit risk shock. When national macroprudential policies are implemented, macroeconomic and financial stability is reached in both countries, mainly due to the private-public debt channel. By contrast macroprudential policies federally implemented lead to higher macroeconomic stability in the country hit by the shock but destabilise the other country because of the open economy channel.

A similar outcome emerges from Darracq Pariès et al. (2019) who use a two-country model with financial frictions representing, through calibration, the essential features of the largest euro-area economies, such as Germany, France, Italy and Spain. The model runs various simulations that illustrate how macroprudential policies measures targeting imbalances at the national level can help to achieve better policy outcomes in terms of price and financial stability, especially in presence of asymmetric financial cycles. However, their impact varies across different macroprudential instruments. Furthermore, they find that

national macroprudential measures (such as LTV ratio or the portfolio-specific capital requirement) can have also relevant cross-border spill-over effects¹³ channelled via international financial and trade linkages. Such outcome provides a rationale for coordinated action among national authorities as well as a co-ordination role for the central monetary and macroprudential authority to help minimise any unintended negative spill-over effects.¹⁴

What emerges from the theoretical and empirical literature is that there are synergies and trade-offs between monetary and macroprudential policies, and these interactions may become particularly pronounced in a monetary union where there is an area-wide monetary policy. Consequently, macroprudential policies targeting national imbalances can help to achieve better policy outcomes in terms of price and financial stability. This underlines the need for a coordination mechanism.

3.3 The application of the SSM

The SSM is a complex supervisory structure that involves the ECB, the NCBs and the NCAs and relies on a high degree of coordination and communication among them; this complexity is a challenge in terms of governance. In line with its objectives, the SSM should positively affect the control of the leading bank risk-taking and spur economic activity, eliminating financial instability (Vallascas and Keasey, 2013; Creel et al., 2015). However, examining the literature investigating its impact, contrasting results appear with respect to the SSM adequacy.

Concerning the effectiveness of the SSM as a supervisory regime to improve financial stability, some authors find a positive effect in terms of market response. Fiordelisi and Galloppo (2018) detect that financial markets positively reacted to the implementation of the SSM, as signalled by the stock market prices that provide information on the expected effectiveness of the SSM to stabilise the financial system. Fiordelisi et al. (2017) find that banks' response to the first step of the SSM was positive: banks under direct ECB supervision reduced their lending activities, with differences across countries in the variation of reserves for credit losses and capital ratios of the treated banks. Specifically, the reserves of French and Italian banks decreased less than those of the other treated banks; as a result, their capital ratios were less affected by the launch of the SSM. However, the more stringent limits imposed on the banks' activity can entail costs for their shareholders by restricting profitable strategies. From this perspective, the expected effect of the SSM will be positive only when its benefits are sufficient to offset these costs. Analysing the stock market reaction to the creation of the SSM for a sample of EU banks, also Loipersberger (2018) concludes that the SSM improves banking stability, especially for banks with lower capitalisation or located in institutionally weaker countries. Overall, the new institutional framework reduces the propensity of banks to take excessive risks and stabilises the financial sector. Nevertheless, the empirical findings by Abad et al. (2020) do not support this

conclusion, highlighting how coordination problems between the ECB and the NCAs may lead to an increase in systemic and idiosyncratic financial risks.

Regarding the SSM architecture, indeed, the literature emphasises some issues. Ferrarini (2015) points out that the SSM represents a semi-strong centralised system: it is still based on supervisory cooperation, although the ECB has direction powers with respect to NCAs. Consequently, it may give rise to agency problems, particularly in the relationships with supervisors of non-euro area countries, affecting the profitability of euro area banks. Concerning the powers conferred to the ECB, Danieli (2020) stresses that the monetary authority mainly focuses on the conduct of the monetary policy; therefore, the fragmentation of the financial system generates the lack of an authority fully responsible for the supervision of the macroprudential policy and the adoption of the micro-prudential policy.

In assessing how the SSM works in practice, Schoenmaker and Véron (2016) find that it is still insufficiently transparent, providing little public information about all supervised banks; specifically, the opacity that characterises the determination of Supervisory Review and the Evaluation Process SREP scores. Moreover, as stressed by the European Court of Auditors (2016), Fromage and Ibrido (2019) and Nicolaides (2019), the SSM does not use a formal set of performance indicators and metrics for monitoring and assessing its effectiveness. Further, Amtenbrink and Markakis (2019) provide a qualitative assessment for the effectiveness of the mechanism of accountability of the ECB and its supervisory board vis-à-vis the European Parliament and national parliaments of the member states. They highlight the lack of a clear yardstick against which to assess the ECB's performance in the area of banking supervision, as well as a gap in terms of political accountability due to the limited sanctioning powers available to the European Parliament as the SSM regulation was not adopted under the ordinary legislative procedure.

Another relevant point concerning the functioning of the SSM is that the goal of a levelled regulatory field has not yet been achieved. Angeloni (2015) observes that the legal fragmentation, the uncertainties surrounding the completion of the banking union and the absence of area-wide deposit insurance limited the extent to which financial resources could be allocated efficiently. Moreover, according to Schoenmaker and Véron (2016), the SSM maintains practices that contribute to cross-border fragmentation: the imposition of entity-level, as opposed to group-level, capital and liquidity requirements, also known as geographical ring-fencing; the omission of geographical risk diversification inside the euro area in stress test scenarios. Going beyond the European perspective and looking closely at nine member states, these authors adopt a two-level perspective that shows how national idiosyncrasies continue to shape the system regarding banking models and structures and of perceptions and politics.

Overall, the ex-post assessment of the SSM reveals positive and negative elements. On the one hand, some empirical findings support the view that the SSM has promoted the financial stability of the banking system, although

inefficient coordination may lead to increased systemic and idiosyncratic financial risks over time. On the other hand, the literature also has shown some deficiencies in the institutional framework, such as the difficulty of the ECB to take on the role of supervisor of the NCAs, the lack of transparency and accountability in the decision-making process and the persistence of a legal fragmentation of the euro area financial system across member countries.

4 An analytical analysis of the EMU institutional framework

Section 4.1 presents an analytical model to analyse the conduct of the monetary policy in the presence of financial risks. Subsequently, based on the analytical findings and the literature described in Section 3.3, Section 4.2 discusses and assesses the new institutional framework established by the European institutions.

4.1 A simple analytical framework

This subsection presents a simple model to analyse the decision-making process of a central bank like the ECB. The analytical framework is based on the New Keynesian static macro-model by Bofinger and Mayer (2007). Specifically, we modify this framework as follows. First, as proposed by Woodford (2012), we introduce a simplified endogenous mechanism of a financial crisis. Second, following Dehmej and Gambacorta (2019) and Poutineau and Vermandel (2015), we consider how the business cycle affects credit conditions for the economy. The analytical framework consists of five equations: a) an equation that determines the expected value of an increase in the risk premium caused by a financial crisis; b) an equation that determines the interest rate on loans by taking into account the mechanism of the financial accelerator; c) the IS curve, which describes the relationship between the aggregate demand and the interest rate on loans. d) the Phillips curve, which describes the macroeconomic trade-off between price stability and output stability; e) the objective function of the monetary authority, which describes its preferences concerning the trade-off between macroeconomic stability and financial stability.

The following equation defines the endogenous mechanism for a financial crisis to occur:

$$p\Theta = (\sigma\gamma + F)\Theta = (\sigma\gamma\Theta) + (F\Theta) = \gamma\Theta_\gamma + \Theta_F \quad (17.1)$$

The risk premium is the difference between the interest rate on loans to firms granted by the banking sector and the interest rate on a safe financial asset, namely, the policy rate. The parameter (Θ) identifies the increase in the risk premium determined by the occurrence of a financial crisis, and p is the

probability that an economy may face a financial crisis. Thus, their multiplication ($p\Theta$) denotes the expected increase in the risk premium. The probability (p) depends on two factors. The first is the endogenous mechanism that can lead to a financial crisis, which implies that the output gap (γ) positively affects the probability (p), and the parameter ($\sigma > 0$) is the marginal impact of γ on p . This parsimonious relation summarises the stylised fact that the growth rate of loans is positively related to the growth rate of output, namely, an increase in the production level raises the leverage of credit institutions. However, the greater the leverage, the smaller the unexpected decline in asset values required to trigger a crisis, such that a positive output gap raises the probability of a financial crisis. The parameter Θ_γ synthesises the marginal effect of γ on the expected increase in the risk premium ($\sigma\Theta$). The second factor concerns the role of exogenous elements, such as the propensity to take risks by banks or the impact of macro-prudential and micro-prudential policies. These elements, identified by the parameter ($F \geq 0$), can influence the expected increase in the risk premium ($\Theta_F = F\Theta$), independently by the output gap (γ). Basically, the monetary authority cannot affect this component of the expected increase in the risk premium through the policy rate; in contrast, it can influence the endogenous component of the expected increase through the policy rate since the probability that an economy may face a financial crisis depends on the output gap.

During normal times, when potential financial vulnerabilities are building up, but they have not started to materialise, the credit rate depends on the monetary policy and the mechanism of the financial accelerator:

$$r_c = r - \gamma\gamma \quad (17.2)$$

The interest rate on loans (r_l) is positively related to the policy rate (r) and negatively to the output gap (γ); the parameter ($\gamma > 0$) defines the sensitivity of the credit rate to the level of economic activity.¹⁵ As shown in Dehmej and Gambacorta (2019) and Poutineau and Vermandel (2015), Equation (17.2) allows a parsimonious representation of the credit market. On the one hand, the loan supply is a negative function of the policy rate: an increase in r raises the opportunity cost for investing in more remunerated financial activities than deposits, so that their demand decreases, as the amount of financial resources available for loans. On the other hand, the loan supply is a positive function of the output gap: an increase in γ raises the value of bank capital since loans are more likely to be repaid, so that also the loan supply increases with the level of economic activity.¹⁶

The following equation defines the IS curve:

$$\gamma = -\alpha(r_c - r_N) + \varepsilon_D \quad (17.3)$$

The variable (r_N) is the natural interest rate, and the parameter (ε_D) identifies a demand shock, namely, an exogenous shift in the aggregate demand deriving

from autonomous changes in consumption or investment. The difference between the interest rate on loans and the natural rate matters for the output gap: favourable financial conditions ($r_c < r_N$) support the aggregate demand, determining a positive output gap ($y > 0$); differently, unfavourable financial conditions ($r_c > r_N$) depress the aggregate demand, determining a negative output gap ($y < 0$). The parameter (α) defines the sensitivity of the output gap to the difference between the credit rate and the natural interest rate.

The following equation defines the Phillips Curve:

$$\pi = \beta y + \varepsilon_S \quad (17.4)$$

The variable (π) is the inflation gap; the parameter (ε_S) represents a supply shock, namely, a cost-push factor like the price of raw materials). The parameter ($\beta > 0$) defines the positive marginal effect of the output gap (y) on the inflation rate (π).

Finally, the following equation identifies the objective function of the monetary authority:

$$L_M = (y)^2 + \lambda_\pi (\pi)^2 + \lambda_\Theta (p\Theta)^2 \quad (17.5)$$

Based on the assumption that the relative weight of output stability in the monetary authority preferences is equal to 1, the parameters ($\lambda_\pi \geq 0$) and ($\lambda_\Theta \geq 0$) identify the relative weight of the goals of price stability and financial stability, respectively.

The monetary authority minimises the loss function represented by Equation (17.5), subject to the constraints defined by Equations (17.1) and (17.4), to handle the trade-off between macroeconomic stability and financial stability. The first-order condition is as follows:

$$\partial L_M / \partial y = 2[y + \lambda_\pi (\beta y + \varepsilon_S) \beta + \lambda_\Theta (\Theta_y y + \Theta_F) \Theta_y] = 0$$

therefore, the optimal output gap is the following:

$$y_{OPT} = -\frac{(\beta \lambda_\pi) \varepsilon_S}{(1 + \lambda_\pi \beta^2 + \lambda_\Theta \Theta_y^2)} - \frac{(\lambda_\Theta \Theta_y) \Theta_F}{(1 + \lambda_\pi \beta^2 + \lambda_\Theta \Theta_y^2)} \quad (17.6)$$

In the case of a positive supply shock and exogenous elements determining the risk of a financial crisis ($\varepsilon_S, \Theta_F > 0$), the optimal output gap is lower than zero ($y_{OPT} < 0$). The monetary authority mitigates the negative impact of these two factors through a restrictive monetary policy: however, the lower the relative weight of price and financial stability in the monetary authority preferences ($\lambda_\pi, \lambda_\Theta$), the lower the decrease in the production level. Notice that the derivative of Equation (17.6) with respect to Θ_y is greater than zero ($\partial y_{OPT} / \partial \Theta_y > 0$); an increase in the marginal effect of the output gap on the

expected increase in the risk premium reduces the output contraction needed to balance the adverse effects of a positive supply shock and exogenous elements determining the risk of a financial crisis.

By substituting Equation (17.2) in Equation (17.3), it is possible to determine the equilibrium output gap; then, by using this expression and Equation (17.6), and solving for r , we obtain the optimal policy rate, namely, the policy rate adopted by the monetary authority to achieve the optimal output gap. In the case of a LAWV-type central bank ($\lambda_\Theta > 0$), the optimal policy rate is the following:

$$r_{lawv} = r_N + \frac{(1 - \alpha\gamma)[(\beta\lambda_\pi)\varepsilon_S + (\lambda_\Theta\theta_y)\theta_F]}{\alpha(1 + \lambda_\pi\beta^2 + \lambda_\Theta\theta_y^2)} + \frac{1}{\alpha}\varepsilon_D \quad (17.7)$$

In the case of a MJHC-type central bank ($\lambda_\Theta = 0$), the optimal policy rate is the following:

$$r_{mjhc} = r_N + \frac{(1 - \alpha\gamma)(\beta\lambda_\pi)\varepsilon_S}{\alpha(1 + \lambda_\pi\beta^2)} + \frac{1}{\alpha}\varepsilon_D \quad (17.8)$$

In this analytical framework, the LAWV-type central bank conducts the monetary policy to manage macroeconomic stability and financial stability. In contrast, the MJHC-type central bank sets the monetary policy to cope only with the trade-off between output stability and financial stability. The following condition allows us to compare the optimal policy rate under these two alternative monetary policy views.

$$r_{lawv} < r_{mjhc} \quad \text{if} \quad \frac{\theta_F}{\theta_y} < \frac{(\lambda_\pi\beta)\varepsilon_S}{(1 + \lambda_\pi\beta^2)} \quad (17.9)$$

Equation (17.9) holds if the expected increase in the risk premium determined by exogenous factors (Θ_F) is low enough compared to the marginal effect of the output gap on the expected increase (Θ_y). Under this condition, the monetary policy based on the LAWV view implies a lower level for the optimal policy rate, namely, lower output costs, than the monetary policy based on the MJHC view.¹⁷ This finding exactly mirrors Panico's view about the role of financial liberalisation: if the deregulation process promotes increasing financial risks, then a monetary policy pursuing the goal of financial stability reduces the investment level and the competitiveness of the economy, determining a lower economic growth (Capraro and Panico, 2021). Thus, reduced efficiency of the macro-prudential and micro-prudential supervision to prevent credit institutions from taking over too many financial risks implies that the monetary authority should not consider the goal of financial stability, but it should focus its action only on the traditional macroeconomic trade-off

between output stability and price stability ($+\Delta\Theta_F$). Otherwise, when the output gap, namely, the policy rate, affects the expected increase in the risk premium decisively, the central bank should take into account the objective of financial stability in conducting the monetary policy ($+\Delta\Theta_Y$).

4.2 Discussion

The Council Regulation 1024/2013 that established the SSM reformed the European institutional framework to pursue the goal of financial stability at the macroeconomic and microeconomic level. Before the reform, centralised monetary policy and decentralised macro-prudential and micro-prudential supervision characterised the institutional design.

The critical implication of the old framework was that the ECB took on the features of a LAWV-type central bank, having to handle the trade-off between macroeconomic and financial stability through only one instrument: the policy rate. As a result, the monetary policy stance generally was more restrictive than that one of an MJHC-type central bank, determining lower growth and inflation rates but also a lower probability of a financial crisis to occur. However, at the macro-level, the empirical literature has detected this framework ineffective, with its costs outweighing its benefits. Moreover, also at the micro-level, the national authorities responsible for the micro-prudential supervision did not prevent the building up of systemic risks: in 2012, for instance, the Spanish government had to apply for a financial support programme of the European institutions in order to rescue its banking sector from the effect of the international financial crisis. According to the simple model presented in Section 4.1, this context refers to a situation where Equation (17.9) does not hold: the expected increase in the risk premium determined by exogenous factors (Θ_F) is sufficiently high in comparison to the marginal effect of the output gap on the expected increase (Θ_Y). The monetary authority cannot affect the expected increase in the risk premium decisively; therefore, a monetary policy based on the LAWV view, which pursues both macroeconomic and financial stability, is not optimal.

These problems pushed the European institutions to launch the SSM to handle the trade-off between macroeconomic and financial stability. Specifically, the SSM introduced the following critical elements: a) centralised micro-prudential supervision under the direct control of the ECB; b) decentralised macro-prudential supervision under the control of the NCAs, with the ECB that retains the power to tighten the measures adopted by the national authorities.

The empirical evidence described in Section 4.2 appears to support this new institutional framework. It finds that the macro-prudential and micro-prudential supervisions are effective in handling financial risks, promoting both financial and macroeconomic stability. The adoption of macro-prudential measures implies a decrease in the probability and severity of the financial crisis, with a moderate adverse effect on output during the business cycle

overall: the marginal benefits of these measures outweigh their marginal costs. Moreover, in the presence of asymmetric shocks, national macro-prudential measures can support the single monetary policy, taking into account national differences. In contrast, the monetary policy only reacts to the average conditions at the union level. Through the centralisation of micro-prudential supervision, the European reform process has aimed at reducing the vulnerability of credit institutions to idiosyncratic risks. Similarly, the introduction of macro-prudential supervision has pursued the goal of preventing the building up of systemic risk at the national level. Concerning our model, both these features of the reform process imply a reduction in the expected increase in the risk premium determined by the exogenous factors (Θ_F). In this context, the condition expressed by Equation (17.9) becomes less stringent because of the adoption of the SSM, and the ECB can more effectively manage the trade-off between its institutional objectives, namely, price stability and financial stability.

Overall, analysing the reaction of financial markets, the empirical literature appears to support the view that the new EMU framework reduces the propensity of banks to take excessive risks, stabilising the financial sector. Nevertheless, the implementation of nationally oriented macroprudential policies may lead to several problems. First, unequal distribution of benefits, with peripheral countries that achieve greater economic stability compared to core countries; especially, when asymmetric shocks affect the most disadvantaged countries precisely. Second, a moral hazard problem; indeed, NCAs could adopt softer macro-prudential policies to support national interest, relying on the bailout by the European institutions.

Concerning the first issue, the new institutional design should consider the impact of both trade and financial linkages across countries and the interaction between monetary policy and national macro-prudential policies. Moreover, it should also take into account the growing integration of financial markets since the birth of the EMU, which has increased in magnitude potential cross-border spill-over effects.¹⁸ All of these factors highlight the case for a strong coordination function, as also emerges from Basel III accords. The reform process of banking supervision goes in the direction to coordinate regularly the two domains of monetary and macro-prudential policy. The Supervisory Board performs this function when it proposes to the Governing Council draft decisions concerning the micro-prudential policy and preliminary evaluations related to national macro-prudential measures. Its composition, which comprises representatives of the ECB and NCAs, allows this internal body of the monetary authority to consider cross-countries linkages in the decision-making process of both micro-prudential and macro-prudential policies.¹⁹ Nevertheless, the literature reviewed in Section 3.3 undermines that the goal of a levelled regulatory field has not yet been achieved. Moreover, it does not agree on the actual ability of the ECB to take on the new role designed by the SSM, generating the lack of an authority responsible for the supervision of the macroprudential policy and the adoption of the micro-prudential policy.

Regarding the second issue, Council Regulation 1024/2013 introduces a precautionary tool to prevent moral hazard behaviours by NCAs. According to Art. 5 of this Regulation, the ECB, if deemed necessary, may tighten macro-prudential measures adopted by the NCAs. Thus, only if the national designed authorities underestimate the onset of systemic financial risks and implement too soft measures, the monetary authority may act, taking into account a euro area perspective. In this case, however, despite the legislative provision, the literature reviewed in Section 3.3 raises several issues. This literature stresses the lack of transparency and accountability in the decision-making process through the study of the actual implementation of the new institutional design.

5 Conclusions

In the aftermaths of the sovereign debt crisis of 2010–2012, the European institutions have established the SSM in order to pursue the objectives of price stability and financial stability. The new institutional arrangement provides for a centralised micro-prudential policy, under the direct control of the ECB, and a decentralised macro-prudential policy, under the responsibility of NCAs and the supervision of the ECB.

The chapter contributes to the literature through a comprehensive discussion on the SSM features and the main reasons behind the reform process. On the one hand, we review the recent empirical literature that analyses the role of the macro-prudential and micro-prudential supervision, in the context of a monetary union like the EMU; moreover, we also review the recent literature on the actual implementation of the SSM. On the other hand, we present an analytical model to analyse the conduct of the monetary policy in the presence of financial risks. These risks depend on endogenous factors, such as the business cycle trend, affected by the policy rate, and exogenous factors beyond the control of the monetary authority, such as the propensity to take risks by banks or the impact of macro-prudential and micro-prudential policies. The analytical finding highlights that if the exogenous component of the systemic risk is high enough in comparison to the endogenous part, then the monetary policy based on the LAWV view implies a higher level for the optimal policy rate, namely, higher output costs, than the monetary policy based on the MJHC view. This finding exactly mirrors Panico's view about the role of financial liberalisation: if the deregulation process promotes increasing financial risks, then a monetary policy pursuing the goal of financial stability reduces the investment level and the competitiveness of the economy, determining a lower economic growth (Capraro and Panico, 2021).

Overall, we can express a positive assessment of the new institutional framework implemented by the European institution, as it seems to be coherent with the empirical evidence that detects a positive effect of the macro-prudential and micro-prudential supervision in increasing financial stability. According to our model, both centralised micro-prudential and decentralised

macro-prudential policies aim at increasing the capacity of the monetary authority to face the exogenous factors affecting stability financial risks. The new institutional design satisfies Tinbergen's principle, such that each instrument should be devoted to the objective that it can most efficiently achieve: the monetary policy mainly aimed at macroeconomic stability and the macro-prudential and micro-prudential supervision aiming at financial stability. Thus, in spite of several problems concerning transparency and accountability in the decision-making process, it appears reasonable the hypothesis that the increased ability to pursue financial stability allowed the ECB to launch a massive asset purchase programme in 2014: the European quantitative easing. By using the micro-prudential supervision to prevent idiosyncratic risks for individual financial institutions and the power to tighten national macro-prudential measures to prevent national systemic risks, the ECB was able to pursue the objective of macroeconomic stabilisation under fewer constraints.

Notes

- 1 The SSM and the single resolution mechanism are the two pillars of the European banking union. The first mechanism refers to the institutional design of the supervision on the European financial institutions; instead, the second introduces an orderly resolution procedure of failing banks with minimal costs for the real economy.
- 2 The Executive Board is an internal body of the ECB; it prepares the meetings of the Governing Council and coordinates the implementation process of the monetary policy.
- 3 The Supervisory Board is an internal body of the ECB, which comprises the chair, the vice-chair, chosen from the members of the Executive Board, four representatives of the ECB and the representatives of the NCAs. Concerning the supervision of credit institutions, its main task is to propose draft decisions to the Governing Council.
- 4 For a survey see Smets (2014).
- 5 Monetary policy can be a source of financial instability, for instance, promoting bank risk-taking concerns, especially in crisis times.
- 6 The FSO index encompasses the following three elements. A statutory dimension that accounts for the degree to which the legal mandate and its implicit interpretation by the central bank refer to the goal to maintain or promote financial stability. A regulatory dimension that accounts for the degree to which a monetary authority is directly responsible for the adoption and implementation of macro-prudential and micro-prudential policies; notice that the availability of these regulatory instruments reduces the pressure on the policy rate as a tool to pursue the goal of financial stability, implying a decrease in the FSO index. Finally, a discretionary dimension that accounts for the degree to which the public explanations of monetary policy decisions explicitly refer to issues related to the objective of financial stability. The value of the index can run from 0.0 to 3.0, with a lower value identifying a JHC-type central bank and higher value a LAWV-type. At the end of 2014, the ECB scored a value of 1.91 for the FSO index.
- 7 Specifically, an increase of 1.0 percentage point in the financial stability risk measure determines an increase in the policy rate of 0.054 percentage points for the LAWV-type, against 0.035 percentage points for the JHC-type.
- 8 The temporal dimension of financial stability explains the build-up of risks related to the functioning of the financial system over time while the spatial dimension refers to the build-up of risks in specific market sectors or segments. The generic composite systemic risk indicator (SRI) created by the European Central Bank (for more details see ECB,

2018, p. 165) is defined as a weighted average of the normalised sub-indicators. Pooled indicator normalisation and constant weights across countries and time implicitly assumes that there are common indicator patterns across the crises experienced by individual European countries at different points in time which, once extracted, are useful in identifying the build-up of systemic risk.

- 9 Various papers of the European Central Bank (ECB) study optimal monetary policy in the Euro area by assuming it works essentially as a closed economy, since area-specific shocks are more important than country-specific.
- 10 They examine its temporal and spatial dimensions of financial instability. The temporal dimension explains the build-up of risks related to the functioning of the financial system over time while the spatial dimension refers to the build-up of risks in specific market sectors or segments.
- 11 In the context of the euro area, the relative effectiveness of macroprudential policy in containing the financial stability risks is higher due to a single monetary policy not well-suited to deal with financial imbalances building up at the national level.
- 12 The sector faces monopolistic competition. The degree of market power of banks and the costs of financial intermediation determine the banks' interest rate-setting behaviour.
- 13 The term 'spillovers' is used to describe when regulations in one market have consequences for other markets or other institutions. But spillovers do not necessarily reflect regulatory arbitrage or policy leakages. Spillovers can also occur as a natural response to changing supply or demand for credit in particular locations and by particular institutions.
- 14 The literature on cross-border macroprudential policy spillovers is grown hand in hand with the use of macro-prudential policy with a mixed evidence suggesting that the effect of macroprudential policy on cross-border bank credit is instrument type specific. However, it is generally not referred to a monetary union. For this reason, we remand for a recent collection of coordinated empirical studies to Buch and Goldberg (2016). A work that attempt to measure cross-border effects of macro-prudential regulation in the euro area is Nocciola and Żochowski (2016). They find the sign of cross-border spillovers is instrument-specific, confirming they play a role in altering the efficacy of macro-prudential policy in containing systemic risk. From this the need for co-ordination.
- 15 During financial distress, the materialisation of financial risks implies that Equation (17.2) becomes $r_c = \Theta + r$, determining an extremely large increase in the interest rate on loans. In this context, the monetary policy only focuses on the objective of output stability to mitigate the impact of the economic downturn, without worrying about the trade-offs among price stability, output stability and financial stability. For this reason, we do not analyse the case of financial distress.
- 16 For a more complete description of the credit market refer to Dehmej and Gambacorta (2019), Poutineau and Vermandel (2015) and Badarau et al. (2020).
- 17 This result also holds for different assumptions. Specifically, if we consider the difference between the credit rate and the policy rate as an argument of the objective function of the monetary authority, or we introduce in Equation (17.2) the endogenous mechanism for the financial crisis described by Equation (17.1).
- 18 Notice that differences in inward and outward transmission channels characterise macro-prudential measures (Darracq Paries et al., 2019; Nocciola and Żochowski, 2016). The inward transmission of cross-over spill-over effects refers to how domestic regulation affects the behaviour of branches of foreign banks. In contrast, the outward transmission of cross-over spill-over effects refers to how national regulation affects foreign activities of domestic banks. Concerning these mechanisms, the European Systemic Risk Board recommend the use of the instrument that exerts a less cross-border effect.

- 19 The ECB Financial Stability Committee (2020) has recently devised a best practice framework for the analysis and assessment of cross-border spill-over effects from the activation of national macro-prudential measures. The framework is meant to serve as a starting point for NCAs when assessing the need for reciprocity in the context of activations of macroprudential measures (European Central Bank ECB, 2018).

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