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Financial Regulation: A Macroprudential Policy Approach

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Abstract: The global financial crisis of 2008underlined the importance of promoting financial stability through better regulation and supervision of financial institutions. This paper highlights the importance of financial regulation using a macroprudential approach in banking supervision. Among the most frequently cited factors for the 2008 financial and economic crisis are the extreme leverage that banks had built up under the previous Basel guidelines and the interconnectedness of the banking system. Capital controls are one of the main mechanisms to enhance financial stability. Macroprudential regulatory requirements and early warning system methods are encouraged to be used to enable quick decision making. Bank supervision, which has both positive and negative outcomes could also overcome market failure caused by flawed information.Furthermore, the monitoring and disciplining of banks could successively boost the governance of bank lending and reduce corruption. Regulatory measures such as tougher restrictions on bank activities and strengthened entry requirements have reduced the probability of banking crises. Finally both Macroprudential policies and Capital controls make the economy more stable and lessen the probability of a financial crisis.
Keywords: Financial Regulation, Banking Supervision, Systemic Risk, Macroprudential Regulation,

1. Introduction

The global financial crisis of 2008 emphasized the significance of promoting financial stability through better regulation and supervision of financial institutions. The main facets of recent regulatory reforms include determining and regulating systemic risk, and designing macroprudential policies suitably. This has been a focus of institutions on a global level.

The same crisis produced losses of financial wealth assessed by the IMF at more than $US 2.7 trillion in the United States, and an extra $US 1.4 trillion in the rest of the world. The crisis nature of the problem reduced in mid-2009, with house prices steadying in the US and GDP growth returning to positive numbers in the third quarter of the year. The final overall cost of the crunch in the US alone, in terms of lower incomes and lost wealth of Americans, is particularly difficult to quantify, though one 2012 Fed estimation shows an approximate cost of $US 6–14 trillion, or perhaps half of a year's GDP. (Grosse, 2017)

One of the key fears about the causes of the financial crisis is that banks engaged in extreme risk-taking. Mainly, the insolvency risk management is critical in financial institutions, because failures are very costly at the micro and macroeconomic levels. Risk management is a fundamental role of the board of directors, and particularly of audit committees, whose roles are to run financial reporting, internal controls, auditor activity, as well as risk management and exposures. (Garcia-Sanchez et al., 2017)

The debate about the relationship between regulation and stability has created practical questions, whether stringent regulation besides supervision are suitable for all financial markets and institutions, and which type of regulation can be followed.Barth et al. (2004), Pasiouras et al. (2006, 2009), Barakat and Hussainey (2013) and Delis (2015) highlight the need for tighter financial regulation to enable financial stability and the significance of building stable buffers to meet any financial distress. On the other hand Hakenes and Schnabel (2011) stated that onerous regulation may be a hindrance to the ability of banks to provide financial resources for economic sectors. Such regulation may also have an adverse effect on bank competition leading to higher loan rates and to potentially a higher probability of loan defaults. Note that Demirgüç-Kunt and Detragiache (2011) did not find any significant positive impact of regulation and supervision on financial stability.

2. Related Literature

Several studies have explored the idea of financial stability, however, discussion regarding the exact definition of financial stability has been unending. Crockett (1997) considered stability in both institutions and markets, whereby stability in financial institutions may refer to the absence of stress, and stability in the financial market may refer to the absence of volatile price movements.Contagion and risk transmission have been extensively studied in models of cross-holdings. A key contribution in this branch of the literature is the now classic paper by Eisenberg and Noe (2001), which presents a clearing algorithm to solve for the equilibrium payment vector in an interbank system characterized by interlocking exposures among institutions.

Issing (2003) outlines financial stability as a system which can guarantee an efficient allocation of savings in order to improve investment opportunities. In a similar vein, the European Central Bank (2005) interprets financial stability as a system which can deliver continued support for an economy.

With capital regulation there is a vast literature but little consensus on the ideal level of requirements. With liquidity regulation, the situation is even more unclear as subject identification is quite vague. Confusion about how liquidity requirements help facing liquidity shortages comes in large part from the lack of consensus of what a liquidity shortage is (Erol&Odonez, 2017).The classic contribution by Allen and Gale (2000) is often cited as being among the first to assess the propagation of risk in an interbank network. More recently, Anand et al. (2013) use the global game theoretical apparatus to model a run in the interbank market in order to assess the relevance of roll-over risk.

Haldane and May (2011) note that liquidity requirements can be seen as a way of short-circuiting the negative spillovers arising from fire sales and liquidity hoarding. Consumers have an inadequate capability to successfully monitor complex financial products, so judicious financial regulations are key to upholding the stability of the financial sector. Different views about the role of financial regulations exist; some support strict financial regulations and supervision (Skott, 1995), while others support laidback oversight (Gordy and Howells, 2006). Several types of regulatory measures are implemented in different economies, and the definition of each measure varies by country. Among the various regulatory measures, three pillars of the Basel II Accord – capital regulation on the minimum required amount, the extent of a government's supervisory power, and private-sector monitoring of banks – are most commonly discussed.

Among the most frequently cited factors for the 2008 financial and economic crisis are the extreme leverage that banks had built up under the previous Basel guidelines and the interconnectedness of the banking system which gave it a systemic dimension. The banking system consequently was not able to absorb the subsequent systemic trading and credit losses nor could it handle the re-intermediation of large off-balance sheet exposures that had built up in the shadow banking system. (Gabbi et al., 2015) As one of the main shortcomings of the previous regulatory regime, the Basel Committee document identified the placing of too great a focus on idiosyncratic risk, i.e. micro-prudential regulation, at the expense of systemic risk, which would call for macro-prudential regulation.

Financial crisis and failure by regulators and credit raters to provide systemic safety. Regulators such as the Federal Reserve, the Federal Deposit Insurance Corporation, and the Controller of the Currency, each with roles in regulating financial institutions in the US, did not see the weaknesses in the evolving mortgage lending and securitization processes. Similarly, the Securities and Exchange Commission (SEC) that oversaw investment banks in the US did not identify the major risks that were looming with the investment banks and other 'intermediaries' activity in securitizing and distributing the debt obligations.

Some of this lack of regulatory success may be a result of the problem of "regulatory capture", which has long been understood to affect markets in which regulators play a key role, and regulated firms thus look for ways to obtain favorable treatment from the regulators (e.g. Stigler, 1971). Quite conceivably it could be the case that regulators in the SEC expected that investment banks were prudently managing their risks, and that the SEC regulators accepted the presentations of the investment banks concerning risk of the collateralized debt obligations without carrying out their own sufficiently-careful risk analysis. When the investment banks turned out to be wrong in measuring these risks, the SEC and other regulators were caught with no independent ability to demonstrate risk evaluation.

3. Capital Regulation

Many emerging market economies have opened up their financial markets in the last two decades and moved away from the rigidly pegged exchange rates. Despite this greater openness, many of these countries have been subject to extremely volatile capital flows and crises associated with 'sudden stops' in capital inflows.

A relatively new view has emerged suggesting that monetary policy alone cannot adequately manage the external shocks facing small emerging economies and must be supplanted with some type of capital control. (Devereux et al., 2019)

It is pointed out that capital-requirement regulation is one of the mainmechanisms to enhance financial stability. Boot andGreenbaum (1992) and Besanko and Kanatas (1993), however, pointed out that a stringent capital requirement decreases monitoringpower. Furthermore, a stringent capital requirement lessens competition forloans, and thereby banks raise loan rates, leading to an increasing probability of default among borrowers. Nonetheless, aneffective capital requirement is considered a useful instrument to absorb losses and to act as a buffer (Hakenes and Schnabel, 2011). Kim and Santomero(1988) showed the way in which a capital requirement can redress the bias towards risk. Further, strict capital requirementscould prompt banks to lessen risky lending. Furlong and Keeley (1989) added that sufficientcapital requirements may maximize banks' values by improving investors' confidence, boosting banks' reputationsand their franchise values.

With respect to the effect of restrictions in non-traditional financial activities such as insurance, securities and property on financial stability, there are contradictory propositions. It is debated that tight limitations may boost monitoring due to low-complexity banking activities, together with a decrease in informational asymmetries. However, reducing restrictions allows banks to gain the benefits of diversifying their products.

3.1 Liquidity Scarcity

Systemic risk is commonly linked with contagion. Contagion is crucial in explaining how a minor shock can lead to large system-wide losses. Contagion is not enough: amplification is also needed. Amplification mechanisms are vital in deepening contagion effects. Liquidity requirements, newly introduced in Basel III and subsequent regulations (CRD IV and CRR), aim at alleviating the impact of liquidity freezes. An integrated theory of contagion and its interaction with amplification mechanisms is not yet available, although many recent and prominent contributions have scrutinized in depth different individual channels of contagion (Aldasoro&Faia, 2016).

Banks' short term funding comes from interbank borrowing and short term liabilities. Liquidity is scarce for two reasons. First, banks are risk averse and consequently are inclined to hoard liquidity in the face of shocks. Second, short term funding is gained by resorting to external investors who assess the quality of their asset investment based on information about banks' returns.

Because of interbank freezes or investors' runs, banks might experience liquidity shortages. The latter typically lead to banks' solvency crises: as postulated in Diamond and Rajan (2005) (among others) illiquid banks quickly turn into insolvent banks as liquidity shortage forces project liquidations. The ensuing asset losses render illiquid banks also insolvent. In turn insolvency of some banks puts further strains on other banks. It is those links and the feedback loops between liquidity and solvency that motivated policy makers to consider liquidity requirements so central in the design of the most recent regulatory architecture.

The crucial feature of capital controls is that they relate solely to financial transactions between residents and non-residents, i.e. they differentiate based on the residency of the parties involved in a financial transaction. For example, controls on capital inflows apply to transactions between foreign creditors and domestic debtors. Similarly, controls on capital outflows apply to transactions between domestic savers and international borrowers.Macroprudential policies, by contrast, limit borrowing by domestic agents independently of whether credit is provided by domestic or foreign creditors. They enact a segmentation between borrowers and all types of lenders, as illustrated in Fig. 2 (Korinek&Sandri, 2016).

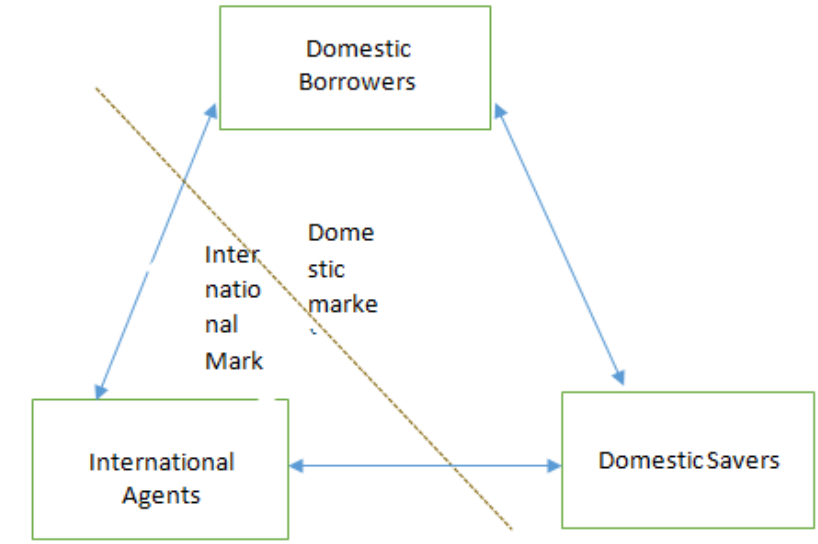

Fig 1. Capital Controls

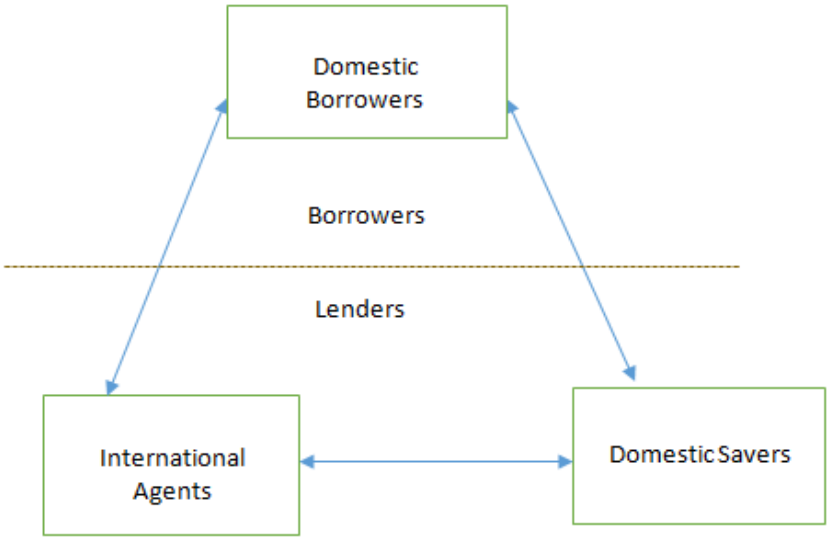

Fig 2. Macroprudential Controls

Should countries use capital controls or macroprudential regulation when they experience capital flow-driven credit booms? Some have reasoned that capital controls ought only to be used as a measure of last resort. Others, have reasoned that capital controls are the more natural instrument when credit growth is largely driven by capital flows from overseas.

4. Macroprudential Regulatory Approach

Macroprudential policies have arisen after it was acknowledged that the actions covered by this, are fitting for the entire financial system, though originally it was considered that the appropriate actions for individual institutions were more than sufficient to prevent systemic risk, existing also the so called "fallacy of composition". Thus, macroprudential measures meant to ensure the proper operation of the financial system and to avoid a series of imbalances, in order to sustain financial stability and to prevent systemic risk. (Tomouleasa, 2015)

If a central bank raises interest rates to confine asset prices it may increase unemployment, and risk an outbreak of deflation. The cleverer alternative to this approach is to introduce targeted rules to decrease

instability across the financial system. These are known as macroprudential regulations as opposed to micro prudential regulations, which safeguard individual consumers or firms.

The modern financial system encompasses many different types of assets and markets, and the guidelines designed to safeguard it are just as varied. Before the financial crisis of 2007-08, banking regulation was mostly a static affair, with capital requirements (which ensure that banks hold enough money on their balance-sheets) and leverage caps (which limit the amount they can borrow) fixed over the business cycle. However, as the crisis confirmed, these rules were not adequate. The 2010 Basel III accord tightened these restrictions and presented the concept of counter-cyclical buffers. The buffers permit regulators to increase capital requirements when credit growth is high relative to GDP, asign that there is anintensified risk of financial instability. These counter-cyclical regulations purpose is to prevent financial crises from occurring by reining in lenders before an asset bubble forms.

More controversially, some regulators are experimenting with targeted rules to try to prevent specific markets from developing bubbles. Last year the Reserve Bank of New Zealand imposed higher loan-to-value ratios on mortgage lenders. Concerned that property prices were rising unsustainably, this move slowed down the flow of credit to buyers. So far the experiment has proven a success, with growth in property prices quickly tapering off, without harming the rest of the economy.

The overall efficiency of these tools, however, is still unclear. Spain's use of "dynamic provisioning", an accounting technique designed to build up capital buffers in good times, did not stop the banking system from requiring a bail-out. And credit markets are closely interlinked, so restricting the market for mortgages may affect business credit in unintentional ways. Although bubbles look obvious with hindsight, forecasting them is tricky. Expecting regulators to identify bubbles in advance—and then design rules to deflate them—may be optimistic. But if countries are to circumvent repeating past mistakes, macroprudential regulations may need to become a permanent part of how they manage their economies.

An annual supervisory stress test of the financial sector in the United States has become a requirement with the implementation of Dodd–Frank Wall Street Reform and Consumer Protection Act (Pub.L.111–203, H.R.4173) of 2010. Macroprudential stress tests have also been used by U.S. and European regulators to reinstate market confidence in financial sectors during an economic crisis. As a reply to the recent financial crisis, the 2009 U.S. stress test led to a significant recapitalization of the financial sector in the U.S. In Europe, the 2011 stress test also served as a crisis management tool during the European sovereign debt crisis. The European exercise lacked believability in this role (Greenlaw et al., 2012), however, due largely to the nonexistence of a clear recapitalization plan for banks failing the stress test.In contrast to U.S. stress tests by the Federal Reserve, European stress tests are conducted in a bottom-up fashion: banks submit their stress test results to national supervisory authorities (NSAs) for review before NSAs submit to the EBA. For this reason, the EBA considers the EU-wide stress test exercise to be a macroprudential stress test. These stress tests are, however, the outcome of a global macroeconomic scenario defined by the European Central Bank (ECB) and share the objective of an overall assessment of systemic risk in the EU financial system.

5. Early Warning Systems

This is a systemic process for assessing and gauging risks early in order to take pre-emptive steps to minimize its impact on the financial system. The purpose of an early warning system (EWS) is to provide an indication of an imminent crisis. A leading indicator is a variable that displays uncommon behaviour in the periods prior to a crisis (Graciela Kaminsky, 1998). Leading indicators are used in a EWS for providing a warning of a looming crisis. According to literature, several leading indicators have been utilised. These include credit levels, asset prices, financial regulations, interest rates, exchange rates, and GDP. Additionally, other variables such as political factors could be considered (Graciela Kaminsky, 1998). It is significant to note that different sources of banking distress will have different indicators.The most common EWS methods are the logit model and signal extraction methods (Davis and Karim, 2008; Demirg¨uc¸-Kunt and Detragiache, 2005). In addition, various other static classifiers have been applied, which include classification trees, neural networks, and random forests (Alessi et al., 2015). Dynamic methods are scarce in EWS literature.

The dynamic Bayesian network is a popular technique for modelling the banking system dynamics. The switching linear dynamic system (SLDS) and the naive Bayes switching linear dynamic system (NB-SLDS) are two methods that have not been considered before in the literature. These methods provide the means to model dynamics as indicator variables that are tracked through time. This is achieved using state space models. (Dabrowski et al., 2016)

Decision-makers in reserve banks and other regulatory bodies are frequently obligated to make decisions on early intervention. Such decisions are often grounded on contradictory model results and other pertinent information. An improved EWS, could lead to decision-makers placing more importance on model results. At best, a better EWS could help to avoid or limit future crisis events. At worst it could serve as a filtering tool for more thorough investigation into impending crises.

6. Network Effects on Banking Regulations

How does the topology and the level of interconnectedness of the interbank network react erratically to regulatory requirements? Adding an extra layer of complexity to the delicate balance that optimal banking regulations should endeavor to attain.The response of an interbank network features a "phase transition": beyond a tipping point of regulatory requirements, the network becomes disproportionately less interconnected, with systemic risk increasing discontinuously in response to this abrupt change in the network architecture (Erol&Odonez, 2017)

As liquidity requirements tighten, the preferred level of counterparties lessen, and after a critical point a bank discontinuously prefers to reduce its counterparties. When that happens the network structure fluctuates abruptly from very dense to very sparse and the cumulative level of interbank activity breaks down (Erol&Odonez, 2017). In other words, as liquidity requirements tighten not only do investment decline but so does systemic risk (measured by the fraction of banks that choose to close operations) increases, discontinuously after a certain threshold. This sudden change prompts a discontinuous increase in distortionary bailouts and a discontinuous decline in welfare.

The reasoning behind the weakness of the network structure relies on the strategic considerations of a bank when it chooses its level of connectivity. When a bank chooses how many counterparties to have, it takes into account how many of those counterparties are expected to be able to provide aid in the case of a refinancing need. How many of a bank's counterparties will be able to provide assistance, however, depends on the number of counterparties that each of the bank's counterparties choose to have. With many banks these strategic considerations may in principle be inflexible.Wang (2016) highlights the externalities that describe the establishment of linkages and the significance of conditioning regulation on the topology of banking networks. Aldasoro et al. (2015) also deliberate the effects of banking regulations in the existence of banking interconnections. They show that liquidity requirements decrease systemic risks at the cost of lower efficiency given a network structure.

Discussion about the ideal level of liquidity requirements, and more generally about optimal banking regulations, has generated a fruitful recent debate.It is surprising there has been minimal discussion of how the proposed regulations would affect the density and topology of interbank lending connections and the banking network generally.A network-blind tightening in regulation can make a discontinuous upsurge in systemic risk: even though the bailouts needed per bank are smaller, more banks know they cannot ride refinancing shocks successfully, and thus they choose to liquidate assets excessively, with the result that the government has to bailout banks that would have been protected by other banks had a network existed (Erol&Odonez, 2017).

Contagion can arise due to network externalities, pecuniary (fire-sale) externalities, liquidity hoarding, and bank runs on short term liabilities. Short term liabilities represent a novel liability-side channel. Banks can enter interbank markets for insurance motives. However, the beneficial effects of insurance have to be balanced with the above-mentioned contagion channels. Taken together, all those channels explain the emergence and fluctuations in systemic risk (Aldasoro&Faia, 2016).

Conclusion

Supervision, together with better monitoring and disciplining of banks, could subsequently boost the governance of bank lending and reduce corruption (Beck et al., 2006b). In particular, it is argued that active supervisory agencies improve banks' efficiency and their capacity to face any financial distress. Regardless of the counter-argument that supervisors may concentrate on encouraging self-interest, such as supervisors hiding supervisory information in exchange for private benefits, thusobstructing financial stability. It is also important to note that governance is still the cornerstone of financial stability and has a positive impact on stability in banking systems. (Shaddady& Moore, 2019) It is also argued that supervision has varying impacts from country to country and from one financial environment to another. In general, powerful and independent supervisory authorities in a well-developed financial system are less prone to financial shocks, while supervisory authorities in poor financial-governance surroundings could be more sensitive to financial distress (Chortareas et al., 2012).

With regard to bank size, small banks are more sensitive to regulatory shocks as compared with large banks. This suggests the significance of financial regulation for small banks to help offer a buffer against financial distress. Bigger banks seem to have a better quality of monitoring and supervision. Financial regulation and supervision may enhance or impede stability. Indeed, financial policymakers should take into account such variations not only from the perspectives of legal and historical backgrounds across countries, but also from the perspectives of institutional backgrounds related to banks' business models, bank size and the stage of economic development.

Regulatory measures such as tougher restrictions on bank activities and strengthened entry requirements have reduced the probability of banking crises. Maintaining macroprudential regulatory requirements and early warning system methods are encouraged to enable quick decision, especially the latter that can give an institution a heads up on an impending collapse.

Well-functioning financial markets and institutionsare valuable assets to our economy. The painful experience of theglobal financial crisis and ensuing severe recession underscoresthe importance of doing all we can to keep the financial systemhealthy. Policymakers and regulators are expanding their data-collection efforts and developing metrics to better monitor financialmarket conditions and to assess emerging financial market stressand systemic risks. We are augmenting microprudential supervision with new macroprudential tools aimed at making the financial system more resilient (Mester, 2017). Macroeconomic models are also being developed that will allow for the evaluation of different policies to promote financial stability. Progress is being made, but there is much more work to do. Ultimately using Capital Controls, Macroprudential policies and Early Warning Systems (EWS) amongst others is important in being able to address the risks of Systemic Risk and the possibility of banking crises.

Ultimately macroprudential guidelineslessen the amount and riskiness of financial dangers, regardless of whether they are financed by local or external lenders. Capital controls increase the total net worth of the economy by reducing net inflows. Both Macroprudential policies and Capital controls make the economy more stable and lessen the probability and seriousness of a crisis.

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