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Rules, Discretion, and Macro-Prudential Policy

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Abstract

The paper examines the implementation of macro-prudential policy. Given the coordination, flow of information, analysis, and communication required, macro-prudential frameworks will have weaknesses that make it hard to implement policy. And dealing with the political economy is also likely to be challenging. But limiting discretion through the formulation of macro-prudential rules is complicated by the difficulties in detecting and measuring systemic risk. The paper suggests that oversight is best served by having a strong baseline regulatory regime on which a time-varying macro-prudential policy can be added as conditions warrant and permit.

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Periods of financial excess in the private sector are also periods of profit increases for many who will resist giving them up. Intellectually, the idea that the public sector knows better than the collective wisdom of the market will be strongly disputed. Practically, a whole host of lobbyists and enlisted media will be engaged to argue the case that “this time is different.”

William White (2006).

I. INTRODUCTION

An important lesson of the financial crisis has been that regulation and supervision of the financial system needs a greater macro-prudential orientation. Implicit in this is the realization (rediscovery some would say) that traditional macroeconomic stabilization and micro-prudential policies are not sufficient, because they leave a regulatory gap to be filled. This gap is created by externalities that individual financial actors do not internalize, and by collective behavior that market mechanisms are ill-equipped to address.¹ The result is interdependencies, and individual and collective actions that lead to excessive procyclicality and systemic fragilities. To contain systemic risk or deal with the fallout if it should materialize, countries are designing and putting in place macro-prudential frameworks to take a system-wide view and define suitable policy responses.

For regulation to be truly effective it has to be designed with an understanding of the regulatory structure, and the possible interventions by financial and political players that could distort the enforcement of the rules. Taking account of the political economy of regulation is likely to be especially important for macro-prudential policy. If authorities find it hard to resist forbearance towards individual institutions, they are likely to face even stronger headwinds in dealing with the financial sector as a whole. The design of a macro-prudential framework should not be just about better ways of measuring risk, forging suitable tools, and devising ways of calibrating their use. But also importantly about creating institutional incentives and mechanisms to make sure that when the need arises, the decision makers will have the authority and backbone to actually use the macro-prudential tools to contain the buildup of systemic risk.

The institutional framework put in place will have to take account of the ground realities that will be faced in implementing policy. Given that macro-prudential policy is aimed at containing systemic risk, it will have to be employed preemptively before system-wide threats become visible. Hence, as White (2006) states, policymakers are likely to face resistance in the application of macro-prudential remedies. A regulatory framework that relies too heavily on a time-varying policy *may* turn out to be too weak. Thus, macro-prudential regulation is likely to need a reasonably predictable “baseline,” a solid foundation on which a time-varying component

¹ See, for instance, Brunnermeier and others (2009) and French and others (2010).

can be added as conditions warrant; the extent to which countries rely on rules versus discretion will depend on a variety of factors, including institutional and governance structures. This paper examines some of the issues that may arise in implementing macro-prudential policy.

II. RULES-BASED MACRO-PRUDENTIAL REGULATION IS DIFFICULT

Three types of externalities that can lead to systemic fragilities justify the need for macro-prudential policies (De Nicolò, Favara and Ratnovski (2012)): (i) interconnectedness of markets and intermediaries that can propagate shocks through the financial system; (ii) strategic complementarities that generate correlated risks among financial institutions and markets; and (iii) fire sales of financial assets that can lead to a cycle of declining asset prices and weakened balance sheets of financial intermediaries.

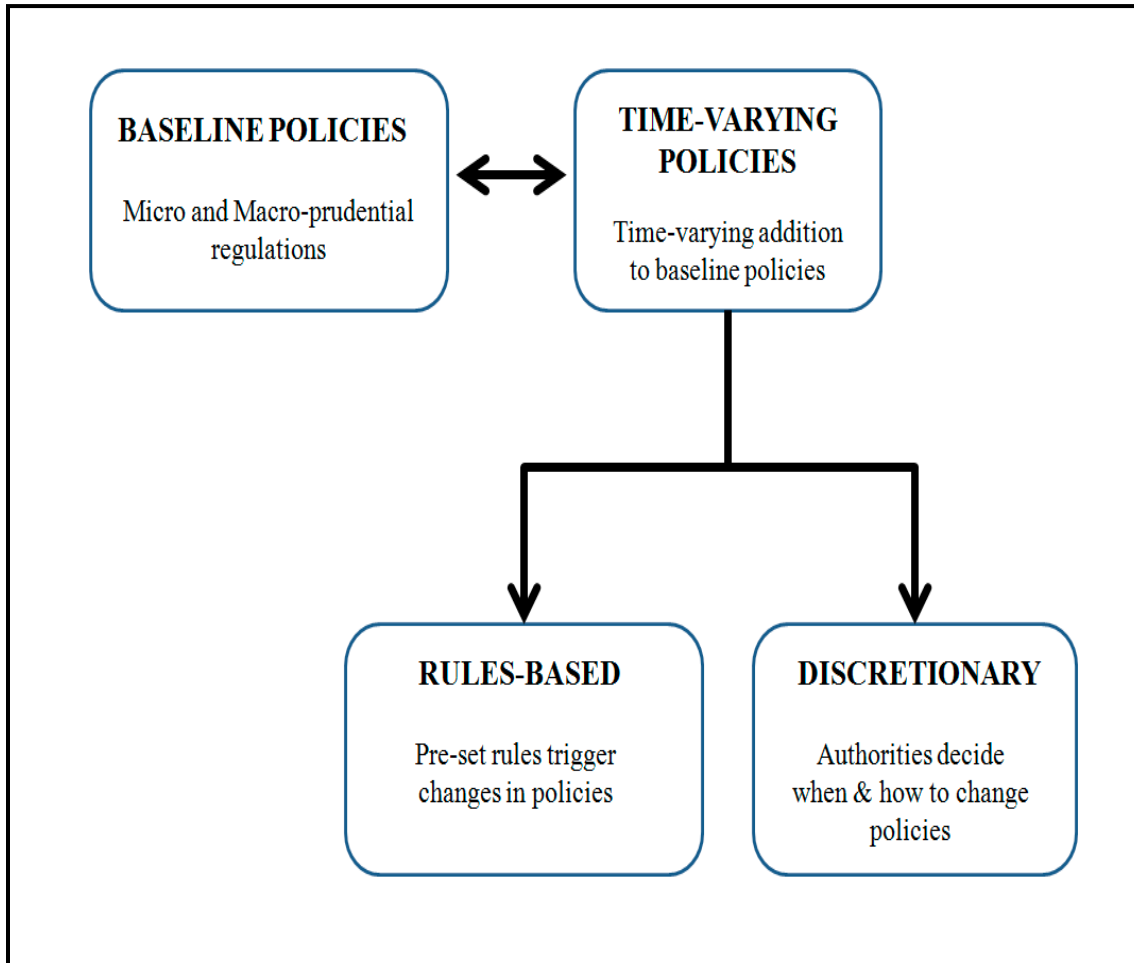
The objective of macro-prudential policy is to limit systemic risk by finding ways to dampen the effects of business and financial cycles, to handle interconnectedness and the buildup of common exposures by institutions and market players, and to catch credit and asset bubbles in their infancy rather than having to deal with them when they are considerably distended and their puncturing may lead to much economic and financial mayhem.

The approach can be broadly characterized as having a cross-sectional dimension that is concerned with risk distribution at a point in time, and a time dimension that deals with the evolution of aggregate risk. The cross-sectional linkages and common exposures are addressed by requiring players to internalize their contribution to system-wide risk. Policies to handle the aggregate risk cycles are focused on stabilizing the system by building cushions during the booms (when risks are being taken on while *measured risks* are low), so that players have the room to deal with the downturns (when risks *materialize*).

Policy design and formulation involves some combination of two kinds of strategies (figure 1): time-invariant regulations that make it hard for systemic risk to build up (baseline policies), and time-varying policies that deploy instruments when systemic risk is perceived as rising to dangerous levels. The use and calibration of instruments in a time-varying strategy can be rules-based or left to the discretion of the authorities.

But will a time-varying macro-prudential policy be effective? The key questions are: how well can policymakers detect the buildup of systemic risk, and will they be able to apply the tools when needed? The first question relates to measurement, since the ability to apply macro-prudential tools on time depends upon being able to measure systemic risk when it starts to increase beyond certain bounds. The second question refers to the political economy of macro-prudential regulation, and the strong pressures that authorities may face to delay or tone down the measures. These two questions, one associated with the ability to discern the accumulation

Figure 1. Macro-Prudential Policies



and magnitude of systemic risk, and the other related to the use of macro-prudential instruments, may seem distinct, but are actually related.

The measurement challenges arise because defining systemic risk is hard and historical experience limited. By their very nature, systemic threats are “tail events,” they represent an agglomeration of risks from a variety of channels, and collecting data and views to make assessments is difficult since in most situations it is likely to involve a multiplicity of sources and agencies. While systemic risk measurement has made some progress in recent years prodded on by the financial crisis, it has not yet produced a satisfactory measure, despite the variety and complexity of models and methods used (Bisias and others (2012)). The measurement of systemic risk continues to proceed without a comprehensive operational definition.

Complicating matters is the endogenous nature of risk. Actions that fortify individual institutions may, when followed collectively, lead to a destabilization of the financial system as a whole. So even with slow moving “fundamentals,” changes in expectations and the resulting adjustments in risk appetites can transform market liquidity, and alter the path and volatility of asset prices. And as Shin (2012a) and Soros (2010) point out prices play a dual role: they not only reflect underlying fundamentals, but are also an inducement to action, especially for market players whose balance sheets are affected by the same prices through mark-to-market assessments. The very reliance on prices that have spillover effects can, under certain circumstances, distort the prices themselves, undermine their integrity and impair their role in allocating resources.

Shin (2012b) shows that the aggregate balance sheet of the banking system expands and contracts endogenously over the cycle. While the aggregate capital buffers remain the same, banks and non-bank financial intermediaries increase their leverage in the booms through collateralized borrowings among themselves and through money and capital markets. He shows how the interdependencies (gross flows across the financial system) increase in the boom, and may make the system more susceptible to an adverse shock. Systemic risk increases both from the higher overall and individual leverage and from the greater cross-holdings across intermediaries.

To operationalize matters, systemic risk can be thought of in terms of interlinkages, correlated exposures, and the probability of fire sales across institutions and asset classes. This has led to mapping institutional and market networks for quantifying contagion risks (Nier and others (2007), Aikman and others (2009)), to calibrating models that take account of asset-correlations (Adrian and Brunnermeier (2008), Acharya and others (2011)), and to examining macro-financial models that allow for fire sales (Kashyap, Berner and Goodhart (2011), Goodhart and others (2013)).

For all the attention paid to the US subprime mortgage market, it constituted only a relatively small part of total exposures for most banks. And total direct interbank exposures to Lehman Brothers, whose failure triggered the worst wave of the ongoing financial crisis, were not all that large compared to the size of the global financial system. Forced sales at dislocated prices played an important part in pushing down asset prices precipitously and deepening institutional and market distress (Shleifer and Vishny (2011)), but trying to anticipate or provide evidence on the nature and extent of fire sales is by its very nature elusive.

Furthermore, the notion of correlated institutional exposures may not fully capture the role of specific risk-amplifying nodes in the network, such as the highly levered investment banks in the recent crisis (Adrian, Moench and Shin (2010)). Some key nodes, like the insurance company AIG, may have been “invisible” from a direct asset exposure point of view, since risk was transferred off-balance sheet using new financial instruments.

From a risk-taking perspective it is also crucial where such nodes are located in terms of the regulatory perimeter. In the build-up to the recent crisis many key intermediaries were so-called “shadow banks,” funded via the repo or money markets, and located outside the realm of traditional commercial banking regulation. These intermediaries became key nodes and were able to play their amplifying role almost unfettered, while (with hindsight) being covered by implicit government guarantees (Claessens and others (2012), Singh (2012)).

Various feedback mechanisms increased the depth of the crisis by propelling it far beyond its direct triggers. One key amplification mechanism was the relationship between funding liquidity and market liquidity (Brunnermeier and Pedersen (2009)). When funding sources dry up and financial institutions are forced to pull out of markets, previously liquid asset classes can become less so. This, in turn, restricts the availability of funding liquidity, and a vicious cycle can take hold. Funding liquidity is threatened not only by fears of insolvency, but also by the fact that high quality assets frequently used as collateral in borrowings, can rapidly fall from grace—for example, the highly rated slices of CDOs and other structured products in the recent crisis.

Shin (2012b) suggests that the pro-cyclicality of the financial system provides an appropriate organizing framework for identifying indicators of vulnerability to crises, especially for banks and other financial intermediaries. He shows that approaches based on market prices while a good gauge of concurrent conditions are not likely to be useful for early signs of trouble. Indicators based on market prices, such as spreads on credit default swaps, did not give notice for the recent global crisis.

Credit growth metrics are more valuable in this regard, but there are doubts about their utility as real time measures. Shin argues for keeping an eye on the composition of bank liabilities. In order to increase lending, banks must first borrow. When credit demand is rising, banks exhaust

their core supply of funds (e.g. customer deposits) and turn to non-core sources, such as funding from money and capital markets. And hence, when the ratio of non-core to total liabilities surges, it is a good indicator that a boom is under way. The sources of non-core funding and its users depends on the structure of a country's financial system and may differ across countries: while for example Ireland and the Republic of Korea saw a heavy usage of wholesale funding by commercial banks before the recent crisis, in the US it was mainly the shadow banking system that facilitated the channeling of such funds to the real estate sector.

No single model of systemic risk is likely to capture all the possible triggers and amplification mechanisms, but the array of measures could be broadened to the point of covering most aspects. For instance, IMF (2009) applies a variety of measures to come to a systemic risk mapping: a network model, two asset correlation based models, a model that estimates the likelihood of systemic defaults, and an economy-wide Value-at-Risk model. This raises the issue whether such a set of indicators could constitute an effective "early warning system" for systemic crises? This question can be parsed further. Can we build a *reliable* warning system and will it be "*early*" enough to provide policymakers with sufficient reaction time for calibrating and using the macro-prudential toolkit?

First, systemic risk in the future may arise in very different ways and it may not be captured by our existing intelligence systems. If so, the current menu of indicators may lull policymakers into a false sense of security. Furthermore, one lesson from this crisis that surely carries over to future crises is the non-linearity of effects in a complex evolving economy (Haldane (2012a)). Suddenly, some very fuzzy boundaries are crossed and the system spirals away from an ostensibly stable equilibrium and into the abyss. Threshold effects severely complicate efforts to quantify the risk of a systemic crisis, and make it particularly difficult for a warning system to be "early," and not just begin to flash red when it is too late to contain the risks or the fallout from their realization. Moreover, decision makers instead of facing risky situations, in which future paths can be assigned probabilities, face Knightian uncertainty under which it is impossible to elaborate all the outcomes, let alone assign them probabilities.

Second, policymakers have to contend with the difficulties of discerning and measuring systemic risk. Consider how policymakers would use an early warning system. They have two options: either they specify in advance what measures will be taken when systemic risk is apparent, or they wait until the warning signals are flashing red and then decide on a set of actions—in figure 1 these options are labeled time-varying rules-based policy and time-varying discretionary policy. Under the first option, the policymakers must face the problem of designing rules for systemic contingencies. The latter option leaves full discretion in the hands of the regulators, and depending on institutional and political structures such discretion could open the door to resistance from the financial industry, politicians, and even the public.

The challenges of systemic risk measurement make it difficult to operationalize the first option: a time-varying policy that is rules based. The classical solution for committing to an action is that of Odysseus, who had his arms tied and told his men not to heed his future words, so that he could sail past the seductive Sirens and hear their music without perishing. The key to a successful rule is the ability to specify in advance the policy action that will be taken when a certain event happens, and having the credibility to implement the policy when the need arises. In the context of macro-prudential regulation this means that we need to resolve what is meant by “event” and what is meant by the contingent “policy action.” The event is the rise of systemic risk beyond some threshold. The action is the application of macro-prudential tools to reduce systemic risk to acceptable levels. Given the intrinsic problems in making systemic risk assessments and designing a suitable macro-prudential toolkit, trying to define preemptive responses to a rare event using fuzzy measures to calibrate (infrequently used) tools is going to be difficult and a hard sell.

For comparison, consider monetary policy. The “event”, inflation, is well defined, as is the “act” of raising short-term interest rates. Further, there is historical experience, data, and reasonably well-founded models that tell us how interest rates have an impact on inflation. Rules can be designed, the Taylor-rule for example, which specify how monetary policy should be conducted. Of course, even for monetary policy, a fully rules-based framework is not implemented by central banks unwaveringly, because the established rules may not be fully adequate for an evolving economy. A policy framework like inflation targeting comes close: the target can be easily measured, there is one policy lever, and there is substantial evidence that provides a link between the target and lever in normal times. Moreover, the inflation gauge is a simple one, which is readily available and comprehensible to the public.

In the realm of macro-prudential regulation, however, any simple measure is bound to be inadequate. And even complex measures will capture only certain facets of systemic risk. Creating a rule that links an array of measures to a set of tools will be tough, both in terms of calibration and communication with the public. This is especially true since macro-prudential tools are unlikely to be changed frequently and their effect on systemic risk will have to be judged relative to a rare-event counterfactual that is based more on assertions than evidence. Since we are dealing with rare events, historical experience may also be of limited value. Comparisons with past occurrences may not be useful, since with evolution of the financial system in terms of contracts, institutions, operations, technology, and regulations, the nature of the interactions among financial players and the contagion mechanisms may be quite different. Measurement difficulties thus preclude an approach to macro-prudential policy that is both rules-based and dynamic.

It is worth noting that the difficulties in systemic risk measurement do not diminish the effectiveness of macro-prudential tools. For instance, housing bubbles are less likely in all

environments that have, say, more stringent loan-to-value ratios (LTVs) requiring households to make higher down payments when buying a house. This constrains household leverage, makes default less likely, and also limits the ability of banks to expand credit to low quality borrowers. The precision with which we can measure systemic risk affects the ability to calibrate and use macro-prudential tools, not the effectiveness of those tools. That macro-prudential policy is essential is not in question. Rather the difficulty of constructing “state-contingent” rules narrows the implementation to a choice between specifying fixed prudential rules in normal times and using discretion when a systemic threat becomes palpable.

Hence, intermediate options may have to be considered. The Bank of England (2009) suggests using rules as a “rough guide” and discretion when necessary, which Goodhart (2011) operationalizes as requiring the macro-prudential authority to explain itself whenever previously stated thresholds are crossed and the authorities choose not to react.² This begs the question how “rough” is defined, and whether it is possible to set meaningful thresholds in advance given the challenges associated with measuring systemic risk.

Goodhart (2011) recommends the following three sets of “markers”: rate of credit expansion, increases in property prices, and the growth of sectoral (financial intermediaries, households, corporations, government) and economy-wide leverage. When at least two of these indicators are growing at a pace that is significantly faster than average, the authority in charge of macro-prudential policy should take action or explain in public why it has not done so. This leaves open the question of what constitutes excessive growth in the different indicators and also, importantly, what exactly is meant by “policy action.” It is possible that if decision makers want to forbear, they could circumvent the requirement of public explanation by changing policy only marginally. Goodhart suggests this could be addressed by having the macro-prudential authority undertake research on the magnitude of changes in macro-prudential instruments that would have been required in broadly similar circumstances in the past, thereby creating public expectations on the size and scope of required policy actions.

III. DISCRETION OPENS THE DOOR TO RESISTANCE

How does the process of making macro-prudential policy differ from that of monetary policy? Although central bankers have at times been accused of succumbing to political pressures for changing policy, few would argue that this makes the implementation of a time-varying monetary policy a near impossible task. In the rules versus discretion debate on monetary policy, most of the rules considered are time-varying in nature, rather than completely fixed like a constant money growth target (Fischer, 1990). In many countries monetary policy is fully based

² In a similar vein, Enriques and Hertig (2010) argue that regulators should be asked to “act or explain” whenever bank credit default spreads breach pre-set thresholds.

on discretion, especially in those where the central bank does not have an explicit quantitative target that must be met. The central bank decides when to apply its tools and in some cases may even choose the objective(s) or combination of objectives (generally inflation control and output growth) it aims to meet with those tools. In what sense is macro-prudential policy different, and discretion more problematic than in the implementation of monetary policy?

First, measurement again goes to the heart of the political economy problem. Measurement uncertainty related to systemic risk leaves room for lobbies to argue that policymakers may be wrong. If a central bank moves to raise interest rates when it finds that inflationary pressures are building, there is little scope generally for a lobby to counter that inflation is not being properly measured. The lobby may highlight special circumstances, but such arguments will only carry weight if circumstances are indeed exceptional. Instead, when a macro-prudential policy is made more stringent because some indicators show systemic or sectoral risks are building up, lobbies have scope to argue with the measurement itself. And since compared to the monetary authorities, macro-prudential policymakers are likely to face greater uncertainty and hence have more doubts about assessing the situation, they may be easier to influence.³

Second, the nature of macro-prudential policy makes it more susceptible to political influence than monetary policy. There are two reasons for this: macro-prudential policy may single out one or a few sectors for special attention; and implementation inevitably involves coordination between several agencies. We discuss each of these in turn.

Macro-prudential regulation is commonly defined in comparison to micro-prudential regulation. Alternatively, however, macro-prudential regulation can be defined in relation to other macroeconomic stabilization policies, primarily monetary policy (Borio and Shim (2009)). To the extent that real and financial cycles overlap, monetary policy could attempt to stabilize both cycles simultaneously. But there are times when these cycles diverge, as they did during the Great Moderation, when the real economy was stable while financial imbalances built up. Macro-prudential tools attempt to diffuse systemic risk and bring about needed corrections in the financial sector without necessarily requiring an adjustment in the entire macro economy.⁴

³ Another reason why monetary policy may face less resistance compared to macro-prudential policy is given by Borio (2011): "...There is at least *some* constituency that dislikes inflation, but *none* that dislikes the inebriating feeling of getting richer."

⁴ The joint conduct and interaction of monetary and prudential policies has been the subject of much recent research (see, for example, Angeloni and Faia (2009), Goodhart, Osorio and Tsomocos (2009), IMF (2012), Wadhvani (2010)). While broadly these policies should complement each other, macro-prudential policy needs to concentrate on preserving financial stability as it is relatively less suited for managing aggregate demand. Similarly, in differentiating and conducting macro- and micro-prudential policies, the primary focus of macro-prudential policy should be on reducing systemic risk; micro-prudential policy in turn should concentrate on firm-specific risks and only indirectly on system wide fragilities.

From a political economy perspective, macro-prudential policy is most challenging to implement when it is of the greatest use. Macro-prudential instruments are likely to be most useful when they are able to target a particular sector at times when the financial cycle diverges from that in other sectors of the economy. However, it is more difficult to tell only a few of the proverbial party-goers that they cannot touch the punch bowl than to take the bowl out of the room. If the entire economy is overheating and the central bank decides on a rate hike, the political resistance is likely to be relatively muted. Industry lobbies will not see much scope for changing policy, since it applies to everyone. Instead, when a sector is singled out, especially one that is highly concentrated and has the resources to wield a lot of power, resistance to targeted restrictions may be intense.

How exactly can the financial industry affect macro-prudential policy? Lobbies could try to orchestrate a public outcry, but macro-prudential policymakers may be able to garner support for resisting self-serving public criticism from financial players or politicians. A graver and more insidious threat is that political influences could alter the operation of the macro-prudential decision making structure itself in ways that are less visible and more difficult to explain to the public.

Consider the coordination between the agencies depicted in figure 2 in different institutional frameworks for conducting macro-prudential policy.⁵ Given differing agency mandates and the need to take a systemic view, such coordination involves sharing information, developing ways and means of communicating, and establishing processes for implementing policy. Two key agencies involved in macro-prudential decision making are the central bank and the bank regulator. By central bank we mean the authority in charge of monetary policy and liquidity provision. In practice, sometimes the central bank is both a monetary authority and a bank regulator, but there are relatively few advanced economies where these two agencies are fully integrated. For practical purposes, therefore, we treat the central bank (i.e., monetary authority) and the bank regulator as separate agencies in our discussion.⁶

⁵ Not all countries have separate market regulators. In some countries financial market supervision and/or consumer protection are part of the micro-prudential bank regulator's mandate. For a discussion on the institutional assignment of the market regulation mandate, see Kremers and Schoenmaker (2012), Taylor (2012), and Carmichael (2012).

⁶ In the United States, the Federal Reserve is only one of several bank regulators; in Japan, Switzerland, Australia and Canada, among others, the central bank and the bank regulator are separated; and even in the United Kingdom where these agencies are being merged again, the bank regulator will remain an operationally independent subsidiary of the Bank of England. In the euro-zone, the ECB is the "central bank" and national central banks or other agencies charged with micro-prudential responsibilities are the "bank regulators." The ECB is now being endowed with micro-prudential responsibilities.

Figure 2. Agencies Involved in Macro-Prudential Policies

Central Bank (Monetary Authority, Liquidity Provider)	
Micro-Prudential Bank Regulator(s) (Systemically and Non-Systemically Important Banks)	
Markets Regulator (Money, Capital, Derivatives)	Markets Regulator (Conduct of Business / Consumer Protection)
Treasury / Ministry of Finance	
Other Regulators (Insurance, Competition,.....)	

The central bank plays a leading role in macroeconomic surveillance and the interpretation of aggregate risks, because the very nature of its job requires it to have the data and skills to perform system-wide analyses. In terms of potential macro-prudential tools, however, it possesses only a few, such as reserve requirements. Most of the toolkit is with the bank regulator. It is this agency that interacts directly with individual banks and when needed imposes measures upon them. These include for example systemic capital and liquidity surcharges, levy on non-core liabilities, rescaling risk weights, reducing loan-to-value (LTV) ratios, and imposing credit growth caps. In fact, several instruments (for example, capital, liquidity, and reserve requirements) in the hands of the bank regulator can be used for both micro-prudential and macro-prudential purposes, and this blurs the distinction between the two types of policies—with differences in policy categorization depending on the timing and nature of interventions. Table 1 lists the main macro-prudential instruments according to the agencies that control them.⁷

Three agencies, the central bank, the bank regulator, and the markets regulator are the primary sources of information for macro-prudential policy making. The central bank provides “hard” information like data on current macroeconomic developments, as well as “soft” information on macroeconomic analysis and forecasts. Similarly, the bank regulator’s input consists of both hard data, for example, bank capitalization and liquidity levels, and soft information like views on the risk strategies adopted by banks. In addition, the market regulator in charge of financial market supervision may have an important role to play in providing information about new variations in financial contracts, risk transformations, and intermediation through non-banks, and money, capital, and derivative markets. Other agencies that are likely to play an important role in macro-prudential oversight are the Treasury (Ministry of Finance) and the regulator for the insurance industry.⁸

One aspect of macro-prudential policy making on which there is some consensus is that the authority to take decisions must be clearly placed *somewhere* among these agencies (IMF (2011)). If such authority is not explicitly assigned, each agency will have to separately perform what it sees as its role in containing systemic risk with at most informal coordination between the agencies. However, when no agency or committee is given full ownership, systemic risk prevention may end up too low on each agency’s priority list. Moreover, if every agency fulfills

⁷ For recent surveys of macro-prudential policy tools see Bank of England (2011), Galati and Moessner (2011), Lim and others (2011), Hanson, Kashyap and Stein (2011), and Bank for International Settlements (2012b).

⁸ With the exception of the US where the Treasury has recently established the Office for Financial Research, the Treasury usually does not specialize in the analysis of financial stability, nor is it endowed with many macro-prudential tools. However, since it is the ultimate back-stop to the financial system, the Treasury has to play the role akin to that of an “owner” who is liable when things go wrong. It also plays an important role in defining the financial environment through the issuance of sovereign debt instruments, which play a key role as collateral in market-based financial intermediation.

Table 1. Main Macro-Prudential Tools

Agency	Macro-Prudential Tools
Central bank	Bank reserve requirements Foreign exchange / reserve management
Bank regulator	Capital requirements (systemic surcharges) Liquidity requirements Leverage requirements Rules on maturity mismatches Collateral rules (e.g. LTVs) Credit growth caps Sectoral exposure caps Disclosure regulations Risk-based deposit insurance pricing Bank resolution schemes (including living wills) Accounting rules Restrictions on compensation structures
Market regulator (financial market)	Restrictions on financial contracts Collateral rules (e.g. margin requirements, haircuts) Regulations on short-selling Restrictions on trading venues (e.g. CCPs) Trading stops (e.g. circuit breakers) Disclosure requirements
Market regulator (consumer protection)	Regulation of financial contracts (e.g. terms of mortgage contracts) Rules on selling strategies (e.g. information provision to customers)
Treasury	Financial transaction and other taxes Deductibility of interest payments on certain types of debt
Insurance regulator	Regulation of systemically important insurers

only “its part” of macro-prudential regulation, without anyone taking a comprehensive view, there are likely to be gaps in the system. Hence the importance of a well-defined and clear mandate for macro-prudential decision making.

No matter where this mandate is placed, there will be difficult challenges related to coordination: information sharing, assessment of risks, timing and implementation of interventions, and jointly communicating with the public.⁹ The more so because the bank regulator, which stands both at the beginning (information) and the end (implementation) of the macro-prudential decision process, is unlikely to have the sole lead. It is unlikely to have the required data and human capital for conducting macro-financial analysis, and hence it cannot put together macro-prudential policy on its own (Bini Smaghi (2009)).¹⁰ This means that during the process of formulating, calibrating, and implementing macro-prudential policy, the bank regulator will be required to provide information and views to another agency or a joint committee. A simplified representation of this decision process is given in figure 3.

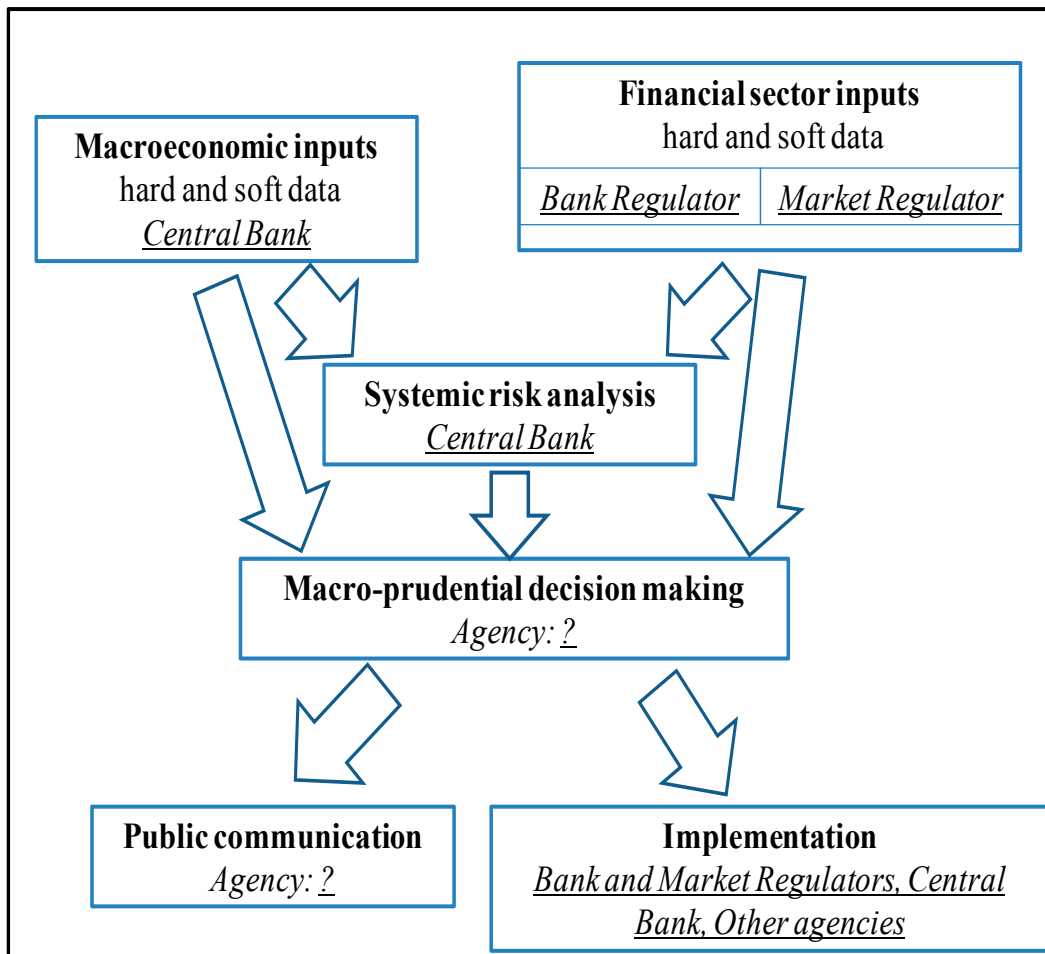
We can use this figure to highlight the weak links or vulnerabilities to which the decision process may be subject. The first set of vulnerabilities arises from the fact that agencies need to provide each other with soft information, which is difficult to convey and its presentation is easy to manipulate to suit a given agency’s interests. The bank and markets regulators have to supply soft supervisory information, while the central bank, in addition to its provision of macroeconomic analysis and forecasts, will also be the key source of systemic risk assessments. The central bank is usually the only institution where both the knowledge of the macro economy and the financial sector can be combined together to analyze macro-financial linkages, and a monopoly on this type of analysis implies that it can be presented in whatever way best aligns with the central bank’s interests.

Another set of vulnerabilities stem from the separation of the decision maker (the macro-prudential authority) from the implementing agencies, which implies that the extent to which the decision maker is able to effectively implement its policies will depend on the willingness of those agencies to cooperate. Different institutions have different skill-sets and cultures, and differing perspectives may hinder the exchange of information and the formation of a policy response (Schoenmaker and Wiertz (2011)). Related to this, a further challenge arises in the

⁹ See, for example, Bair (2012), Blinder (2013), and Connaughton (2012) for a discussion in the context of the US response to the financial crisis.

¹⁰ Those euro-zone national central banks that are endowed with regulatory responsibilities are an exception to this statement, since they conduct macro-prudential analyses in a domestic context as well as make contributions to the European Systemic Risk Board.

Figure 3. The Macro-Prudential Decision Process



external communication to the public, in which the voices of separate agencies have to be combined into a coherent message.

Which of these vulnerabilities are likely to be the most significant depends upon which agency gets the macro-prudential mandate and on the institutional power structure in a particular country. As discussed in Nier and others (2011), many countries are bestowing the macro-prudential mandate on the central bank (e.g. UK) or granting it to a macro-prudential policy committee on which the different agencies involved are represented (e.g. EU, US).

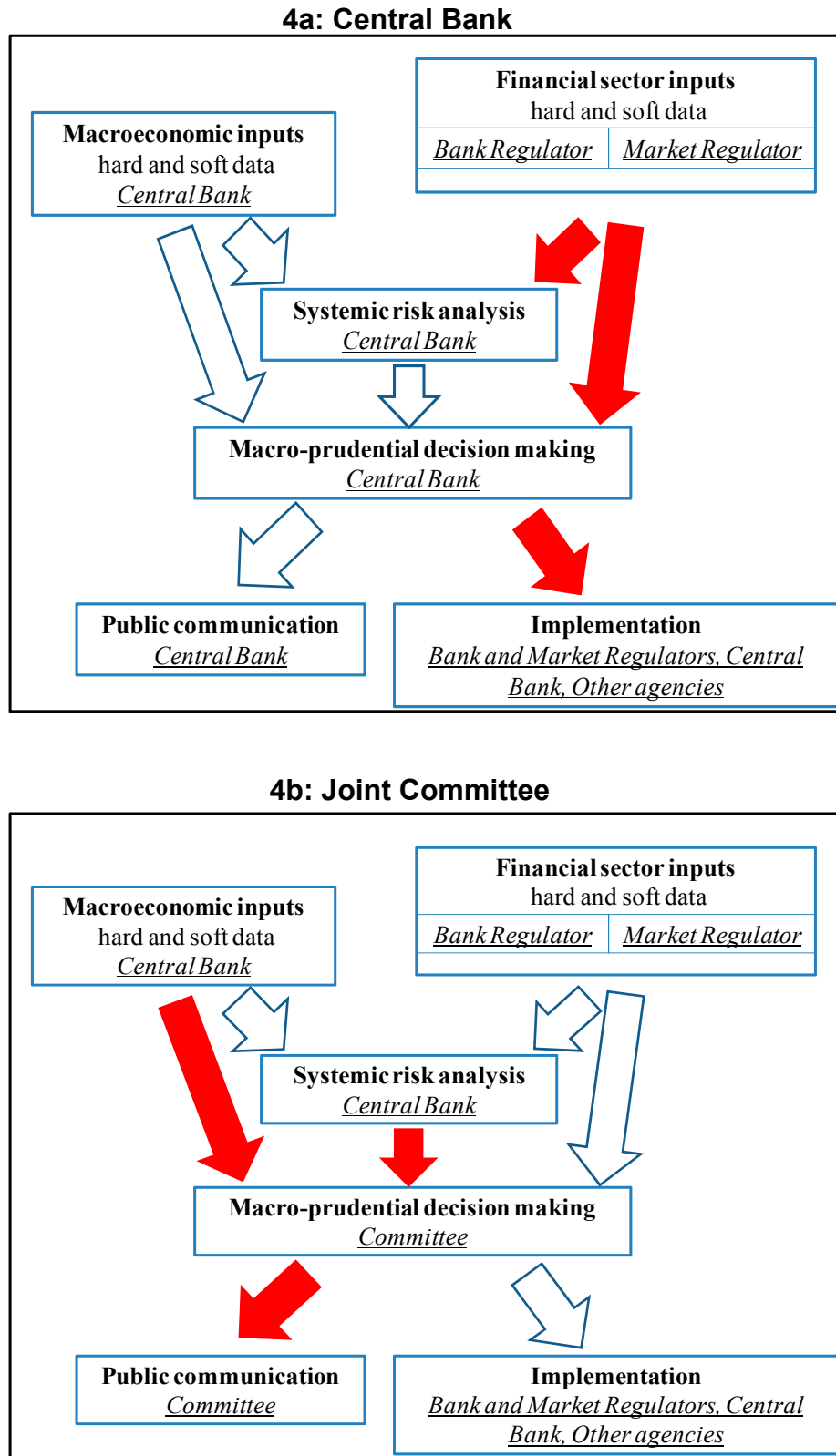
Many of the vulnerabilities discussed above are magnified when macro-prudential policy is made at a supra-national level, as for instance within the European Systemic Risk Board, rather than within a country. Soft information is more likely to be lost across borders and languages. And implementation directives from an authority based outside a country can be more alienating, exacerbating the potential for conflict, and complicating resolution, especially when there may be no acceptable overarching governance or legal framework to address the issues. Systemic risk is globally concentrated in a relatively small number of large banks and non-banks operating across borders (the Financial Stability Board has identified 29 global systemically important financial institutions (G-SIFIs)), and purely domestic solutions for these financial institutions are likely to be inadequate.

Figure 4 depicts the frameworks when the macro-prudential authority rests in the central bank (4a) or a joint committee (4b). The colored arrows highlight the points in the policy process where difficulties could arise. Central bank leadership unifies systemic risk analysis and macro-prudential decision making, and the central bank does not need to coordinate public communication with other agencies. However, this “lack of involvement” of other agencies is also a drawback and raises the possibility of inter-agency conflict, because the bank and markets regulators must provide key inputs to the central bank and implement the policy response that is devised, without having a say in the decision making. This could endanger the flow of soft supervisory information, as well as the speed and extent of policy implementation, and thereby also the ability to credibly communicate macro-prudential policy to the public. Directives that give the central bank overarching powers to make the bank regulator do its bidding will be difficult to define and enforce.

By what means could a financial sector lobby go about exploiting the vulnerabilities of inter-agency conflict? The most direct route would be to try to capture the bank and markets regulators, which could manifest itself in either less stringent regulation or weaker enforcement of supervision.¹¹ Some bank regulators are funded by direct contributions from the banks they

¹¹ See Pagliari (2012) for a recent analysis of regulatory capture.

Figure 4. Central Bank versus Joint Committee as Macro-Prudential Policymaker



supervise, which could make them unduly sensitive to the opinions of these institutions. Others receive their funding from the Treasury, presenting banks with an indirect route to influence the bank regulator through political contributions and appointments at the ministry. Overall, the operational independence of regulators may mean little without funding and intellectual independence (Fullenkamp and Sharma (2012)). And a central bank's independence in making macro-prudential decisions may mean little without the cooperation of other regulators.

But what if the bank regulator is placed within the central bank? For instance, in the debates surrounding the formation of an EU-wide banking union, the possibility of assigning full micro-prudential responsibilities to the European Central Bank has been floated. This would make the ECB into a monetary authority cum bank regulator that also chairs macro-prudential regulation within the European Systemic Risk Board. In the wake of the financial crisis, the option of making the US Federal Reserve a single super-agency was also discussed, but rejected. Centralizing monetary policy and bank regulation in one agency might resolve the issue of independent funding for the bank regulator, although not necessarily, as for instance in the case of the Dutch Central Bank where the monetary policy departments are funded by the central bank's own resources whereas the regulatory departments are funded by the supervised institutions. The creation of a super-agency does resolve the problems of inter-agency conflict. But it creates an unwieldy institution with far-reaching powers that is outside the realm of democratic accountability. This may be unacceptable in many countries and increases the possibility of political interference and second guessing of the decisions taken by such a super-agency.

Furthermore, there is a yet more fundamental reason that any central bank led model may weaken the implementation of macro-prudential policy. In such a framework, the central bank not only has responsibility for macro-prudential policy but also for monetary policy. As we have argued, the timing of macro-prudential interventions is difficult to make because of the preemptive nature of the policy, the measurement challenges, and likely industry resistance. Faced with these hurdles, central banks may not make the right tradeoffs in using the two policies at their disposal. For example, central banks may be tempted to delay the use of macro-prudential tools with the knowledge that liquidity provision can be used to deal with systemic disturbances. The "Greenspan Put" was an illustration: since bubbles are difficult to identify ex ante the central bank should not attempt to prick or defuse them, but instead provide ample liquidity if and when things do go wrong.¹²

¹² For further discussion on the conflict of interests that may arise in the joint conduct of financial stability and monetary policies see, for example, Goodhart and Schoenmaker (1995) and Masciandro, Quintyn, and Taylor (2008).

A joint committee where all the agencies have a say could prevent dogmatic thinking. Deliberations among officials with different backgrounds and experience should improve the design of policy. Such an arrangement should also minimize inter-agency conflicts and facilitate implementation. In particular, the bank and markets regulators are less likely to resist the enforcement of decisions that they have debated and negotiated, even if they voted against them on the committee.

However, consensus on policy interventions may be harder to forge with a committee of representatives from different agencies. It may hamper the speed with which macro-prudential policy can respond to fast changing circumstances, and increase the difficulty of coordinating a coherent message to the public. In addition, with multiple decision makers, a committee structure can increase the channels by which the industry may be able to exercise its influence on regulation and supervision. For example, some of the agencies on the committee may not have the requisite budgetary and political independence.

Both financial regulators and central banks can have incentives to forbear. Each of the different institutional frameworks for conducting macro-prudential policy leaves open some paths through which other players can sway decision makers and distort policy and delay or prevent its implementation. Only a rules-based approach can fully protect a time-varying policy from being manipulated, but, as argued earlier, such a tactic may not be feasible for macro-prudential regulation.

Counter-cyclical capital requirements in Basel III provide an example of the rules-versus-discretion trade-off in the design of time-varying macro-prudential policy. The Basel Committee has stipulated that bank regulators should implement a capital surcharge of up to 2.5 percent of risk-weighted assets during times of excessive credit growth, where the credit/GDP ratio is to be used as a guiding variable. However, both the extent and the timing of the surcharge are left to the discretion of the national regulators, as well as the manner in which the credit/GDP ratio is to be interpreted. Kowalik (2011) has argued that this is likely to induce regulatory forbearance. However, the alternative of tying capital surcharges to pre-fixed credit/GDP thresholds is unlikely to find traction as long as this ratio does not have sufficient empirical support as a reliable indicator of asset bubbles.

IV. A STRONG BASELINE: REDUCING THE BURDEN ON TIME-VARYING POLICY

Given the inherent challenges of designing and implementing a time-varying macro-prudential policy, governments should strive to build a strong baseline regulatory regime and then supplement that with a time-varying component. In such a conception of the regulatory framework, there would be trade-offs involved in combining time-invariant (or baseline) and

time-varying macro-prudential policy. The time-invariant rules should be designed to create robust institutions in normal times and also prevent or slow down the creation of systemic risk.¹³ Also, as Haldane (2012b) argues, faced with uncertainties, cognitive limits, and the complexity of the economic and financial system, regulations and decision rules may have to be reasonably simple and tractable to be effective.

From a systemic perspective, the structure of the financial industry and the incentives embodied in the rules and regulations are crucial for stability, and hence macro-prudence may require limitations on organizational form, activities, and governance arrangements. Also, in practice, it is difficult to categorize prudential instruments as micro or macro since many of the same instruments can be used for achieving multiple objectives. To counter the pro-cyclicality of the regulatory framework, even micro-prudential rules (for example those on provisioning) are now being strengthened with forward-looking through the cycle assessments, rather than determining them based on recent experience of defaults and failures.

In response to the recent crisis experience, reforms in a number of areas are trying to increase the sturdiness of the financial system. A vital part of the current reform effort is the drive to increase the quantity and quality of bank capital. Controversy continues over the nature of bank capital, and the adequacy of current methods for capturing banking risks properly. Questions remain about the effectiveness of risk-weighting schema, and the extent to which they should be reinforced by limits on raw leverage ratios.¹⁴ In tandem with higher capital buffers, there are plans to place restrictions on bank structure and activities, to limit the risk taking on the back of government guarantees.¹⁵ For example, the Volcker Rule in the US seeks to limit proprietary trading and puts constraints on hedge fund and private equity investments; the Vickers Rule in the UK proposes ring fencing retail and small business deposits to enforce a separation of investment banking, including derivatives, debt and equity underwriting, and trading and investing in securities; the Liikanen Report on the EU banking sector recommends that proprietary and other trading activities be placed in a separate legal entity if such activities are a significant part of a bank's business.

Given the scarcity of funding that developed in many financial systems during the global financial crisis, regulators are keen to establish rules for the holding of liquid assets. Liquidity is

¹³ Given the management and regulatory challenges posed by large banks, such institutions should have a higher degree of public accountability compared to smaller ones, and also bear the burden of demonstrating the benefits to society of continued growth and greater bank scale and scope (see, for example, Baxter (2011-12)).

¹⁴ See, for example, the discussions in Acharya and others (2011), Admati and others (2010), Admati and Hellwig (2013), Duffie (2011), Hart and Zingales (2011), Le Leslé and Avramova (2012), Rajan (2009), Morrison (2011), and Pazarbasioglu and others (2011).

¹⁵ See Fisher (2013), Hoenig (2011), Hoenig and Morris (2012), and Ötoker-Robe and others (2011).

a public good, and banks do not consider the externalities created when each of them holds too few liquid assets or has a funding profile with a substantial proportion of short-term debt that comes with rollover risks attached. Liquidity regulations, in the form of a liquidity-coverage ratio and a net-stable funding ratio, will be a part of the new Basel standards.

Capital and liquidity *surcharges* are being contemplated for systemically important financial institutions (SIFIs), including non-bank financial intermediaries. Such additional capital and liquidity requirements, levied on “large” institutions (and possibly increasing in the size of their balance sheets) would impose a cost on expansion beyond certain thresholds, which identify an institution as too-big-to-fail, or too-interconnected-to-fail or too-important-to fail. Global and domestic SIFIs could also be subjected to risk and size-adjusted deposit insurance premiums, and leverage ratios that are more stringent than for smaller institutions that are not deemed systemically important. An additional option is the imposition of a tax on non-core liabilities, as was done recently in Korea, where a combined leverage cap on foreign exchange derivative contracts and a 20 basis point charge on dollar-denominated wholesale funding, has been quite successful at subduing short-maturity capital inflows (Bruno and Shin, 2012).

The regulation of bank activities, and requirements on capital and liquidity, constitute attempts to safeguard retail banking and the payments system from the volatility of financial markets. However, the shadow banks and other parts of the financial system are intimately connected to financial markets, and to the extent that they can cause system-wide stress are also perceived as having “implicit” government guarantees. US money market mutual funds, for instance, had to be back-stopped by the US Treasury when they experienced a run during 2008.

As a result of the crisis, there is increasing recognition of the bank-like role played by money market mutual funds and the need for better regulation. A number of measures are being discussed: minimum liquidity and maximum maturity requirements, limits on exposures to single issuers, suspension of redemptions in a crisis, government insurance of deposits for an appropriate fee, and floating net asset values. In this regard, the reform of the repurchase agreement (repo) market is also pertinent. The repo market is a significant, if not primary, source of funding for the shadow banking sector, and hence the regulations and procedures for collateral management in the repo market play a vital role in the creation of leverage, maturity mismatches, and hence systemic fragilities. The rules need to facilitate the orderly unwinding of repo transactions when counterparties default, and reduce the likelihood of panics and disorderly fire sales of underlying assets.¹⁶

¹⁶ See, for example, Acharya and others (2011) and Gorton and Metrick (2010).

Regulators are also trying to make the securitization process more robust, since its contamination in the run up to the crisis produced systemic fragilities in a number of ways. Lax origination, information asymmetries, distorted incentives and the resulting loss of pertinent information along the securitization chain, led to asset-backed securities whose characteristics were not fully understood by many of the financial players. Structured financial products based on such securities (and artificially manufactured using derivatives) added to the opacity and mispricing of risks. Issuance and distribution of toxic securities, aided and abetted by ratings agencies and faulty analysis, eventually led to market seizures and institutional distress once the true risks became apparent. To the extent that these assets were also used as collateral for borrowings, their sudden re-pricing raised counterparty risks, increased uncertainties, and made financial connections more brittle. As a consequence, leverage, collateral re-use, and collateral management more generally are getting a hard look from supervisory bodies (Claessens and others (2012), Financial Stability Board (2012)).

Another aspect of the financial system that has come under increasing scrutiny is the over-the-counter (OTC) derivative markets. The clarity of contractual obligations and the understanding of exposures are important, especially during times of financial uncertainty when any doubts about market processes and their performance can lead to system-wide stress. OTC products played a significant role in the build-up of hidden exposures before the recent crisis, especially in the shadow banking and insurance sectors. To enhance transparency and enable better handling of risks, the migration of standardized derivatives on to well-managed central counterparties is therefore being encouraged.¹⁷

The role of loan-to-value (LTV), debt-to-income (DTI), and loan-to-income (LTI) ratios in addressing procyclicality is being re-examined. Such requirements serve dual purposes: they restrain borrowers from becoming highly levered and prevent lenders from taking on too much counterparty risk. This prepares both borrowers and lenders for better navigating the turns in the business, financial, and/or credit cycles when defaults rise and systemic risk may increase. Several Asian countries have constrained household leverage, using both baseline and time-varying regulation: China, Hong Kong SAR, Singapore, India, Malaysia, Thailand, and the Republic of Korea implement significant caps on LTVs in property markets, which are supplemented by additional time-varying measures as needed.¹⁸ The time-varying rules can be either stricter LTV ratios or other measures, such as Singapore's tax on foreigners to discourage international capital flows into the domestic property market, China's restrictions on bank credit

¹⁷ See Singh (2010) who argues for a capital levy on OTC transactions to encourage the transition. Reliable clearing, settlement, and recording of transactions are vital for the functioning of money, capital, and derivative markets. Market and transaction arrangements are being strengthened to reduce systemic threats that may arise from weaknesses in the financial infrastructure (Bank for International Settlements (2012a)).

¹⁸ See Lim and others (2011) and Siregar (2011).

for real estate investments to counter rapid growth of house prices, and India's countercyclical changes in risk weights and in loan provisioning.

V. CONCLUDING REMARKS

The conduct of macro-prudential policy is complicated by a number of factors: systemic risk has to be addressed preemptively before it becomes apparent; preemption is difficult in the context of "tail events" that are experienced after large time intervals during which public memory of events past has faded and economic and financial systems have evolved in many ways; systemic fragilities are hard to detect and measure given the complexity of interactions within the financial system and between the financial system and the rest of the economy; aggregate risk cycles have multiple drivers, some of them endogenous, and hence early warning indicators are hard to devise; and, the intrinsic difficulty of making policy with a system-wide focus that involves collecting information, maintaining surveillance, analyzing hard and soft data, allocating authority over decisions, coordinating the action of multiple agencies, and communicating with the public.

Given the nature of the macro-prudential issues and the inherent problems faced in dealing with them, a discretionary time-varying macro-prudential policy may face resistance from interest groups. Limiting discretion through the formulation of macro-prudential rules is complicated by the difficulties in measuring and assessing systemic risk. And the greater the difficulties in appraising systemic risk in a timely manner, and calibrating and using time-varying macro-prudential remedies, the greater should be the emphasis on containing systemic risks by having players and markets internalize the externalities they create.

This suggests that oversight is best served by having a strong baseline regulatory regime on which a time-varying macro-prudential component can be added as conditions warrant and permit. Implementing the time-varying component requires conservative "markers or thresholds" which when crossed force a public examination of trends in financial and real variables, and hence lead to appropriate reactions from private and public actors that reduce the likelihood of precipitating systemic crises.

In this context, the institutional structure of regulation and supervision, and the incentives it embodies will be critical. The devastation caused and the costs imposed by the global financial crisis suggest that the system of oversight must be designed to *prevent* the emergence of systemic threats because once a system-wide melt down starts it is hard to control due to the complexity of the system, the struggle of managing expectations under stress, and the challenges of coordinating and implementing policy through multiple agencies.

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