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Macroprudential Policy

Silver Bullet or Refighting the Last War?

Claude Lopez, Donald Markwardt,
and Keith Savard



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Executive Summary

As many central banks contemplate the normalization of monetary policy, their focus is turning to the promise of macroprudential policy as a tool to manage possible future systemic risk in financial markets. Janet Yellen and Mario Draghi, among others, are pinning much of their hopes for managing financial stability in the context of Basel III on macroprudentialism. Despite central banks' clear intention that this policy will play a significant role in developed economies, few policymakers or financial players truly understand what macroprudential policy is, much less how to assess its efficacy or necessity.

Our report aims to clarify the concept of macroprudential policy for a broader audience, cultivating a better understanding of these tools and their implications for broader monetary policy going forward. The report also advocates the use of more refined indicators for financial cycles as benchmarks for policy discussions on macroprudential policy.

Key points:

- The fundamental objective of macroprudential policy is to prevent unnecessary constraints on the supply of credit.
- How macroprudential policies influence financial and real variables depends on the tool. A better understanding of these channels is necessary to tailor and calibrate the policies to countries' specific needs.
- Successful experiences with macroprudential policy have shown the need for linkage with fiscal and monetary policies as well.
- While there is no "one policy fits all," financial cycles across the world are quite integrated and largely driven by conditions in major advanced economies. Yet, so far, the economies that have had the most experience with macroprudential tools are emerging countries with relatively closed economies.
- A strong institutional framework is essential to ensure that macroprudential policy can work effectively. If central banks are to build adequate support for macroprudential regulation, they will have to cogently explain the public and social purpose this policy serves.
- There is also a political challenge in the relationship between finance ministries and central banks on macroprudential questions, given that many decisions will have fiscal as well as financial and monetary implications with institutional politics at play.
- The apparent failure of regulation usually leads to new, and increasingly complex, measures, which generate further unintended consequences (see Basel I, II, and III). So far, little thought has been given to how the financial system will react to these new measures or whether focusing mainly on the banking system will ensure systemwide stability or generate more distortions.
- Timing is a key element in the success of these policies. We provide evidence that credit per GDP, a widely used indicator, might not be the best proxy for the financial cycle. As an alternative, we prefer focusing on the extent to which financial intermediaries (e.g. banks) rely on supplementary, "non-core" funding in order to better assess the possibility of "overheating." This measure also allows for the decomposition of funding sources in order to determine which intermediaries or funding methods potentially pose the greatest threats to an economy's financial stability.

I. Introduction

Before the global financial crisis unfolded, imbalances and risks within the financial structure had accumulated to such a level that they jeopardized the entire system and—absent unprecedented and extraordinary interventions by central banks and governments—threatened to devastate the real economy. Prior to 2007, a financial event such as a speculative bubble in the housing market or the downfall of a systemically important “too big to fail” institution might have been viewed as an isolated event, with blame laid solely on participants or regulators in the particular industry. With hindsight it has become evident that these seemingly unrelated risks of price bubbles or susceptibility to financial contagion are in fact closely intertwined. These intimate linkages and risk exposures among financial system participants pose serious threats to economic growth.

Ironically, the quiet buildup of financial “fault lines” leading up to the crisis was due in part to financial institutions’ and regulators’ growing overconfidence in their ability to micromanage risks on an individual, or firm, level, without regard for broader systemic impact. Financial institutions were confident they had eliminated most of their risks by hedging their known idiosyncratic (individual) risks with products like credit default swaps, and diversifying exposures based on historical return relationships (e.g. real estate performance is a mostly local phenomenon so a sustained nationwide downturn is mathematically near impossible).

Regulators monitored individual financial institutions in an attempt to ensure that no single body was taking outside risks. Regulators and financial institutions alike failed to anticipate that the burgeoning use of securitized products like credit default swaps could create harder-to-assess risk exposures among institutions such as banks, and that small destabilizing forces could ripple into catastrophic market disturbances in a fragile system.

It is clear then why the crisis has highlighted the need for macroprudential supervision that takes a wider view of the financial system, beyond (but in complement to) traditional microprudential regulation. Macroprudential supervision is concerned with the stability of entire industries and the health of the relationships within the financial sector that can significantly impact

the economy. While macroprudentialism has no precise definition, its principal goal is to monitor systemic risk. Such risk is a negative externality created by financial institutions that do not fully bear the cost of their actions but affect other participants in the financial system. It can manifest in two dimensions: across institutions (contagion risk) or across the financial cycle (procyclical risk). These risk dimensions are closely linked and their problems often accumulate at the same time—to participate in and enhance gains during an upswing in the financial cycle, firms can increase leverage and concentrate that leverage in opaque but intimately connected areas of the financial system.

While macroprudentialism has no precise definition, its principal goal is to monitor systemic risk.

Policy	Objective	Level of Impact
Monetary	Price stability	Macro: stable economic growth
Macroprudential	Stability of financial sector	Both macro and micro
Microprudential	Stability of financial institutions	Micro: protection of consumers

A new framework to fill the gap

Just as microprudential policy is too narrow in scope to take on these broader challenges, monetary policy is too blunt an instrument to address systemic risk in the financial system. Macroprudential supervision is emerging as a critical tool to fill this gap, where it can help coordinate policies and supervision among existing microprudential and monetary tools. With such supervision still in its nascent stages, consensus must still be developed on the best way to monitor or measure systemic risk. In the event that such risks to the financial system are reliably detected, questions remain as to what sort of actions—if any—are most desirable under a macroprudential framework.

Empirical evidence may serve as a guide to assessing the efficacy of various macroprudential policies. Naturally, one might look to Asian economies that have been leaders in implementing macroprudential supervision and countercyclical measures. Studies have found many of these wide-ranging policies successful in achieving their objectives, whether cooling housing markets (by setting loan-to-value limits on mortgages) or dampening the extension of credit (by placing levies on procyclical types of funding for banks).

However, understanding how these policies can be effectively implemented in developed Western economies such as Europe or the United States is a major challenge. Many Asian countries that employed macroprudential measures were more closed economies, with the ability to simultaneously coordinate monetary and fiscal measures. In more open Western economies, autonomous action by monetary and fiscal decision-makers cloud the ability to assess whether similar policies could be orchestrated.

Overall, the system-wide focus is clearly welcome in light of recent crises, yet many unknowns still exist as policymakers seek to move forward in adopting macroprudential tools. This report aims to clarify the current state of the discussion around macroprudential policies. More specifically, it highlights the strengths and limitations of these “trendy” tools, in order to identify those (if any) that can enable policymakers to achieve their main objective (reduce the risk of crisis and lower any excessive procyclicality) while providing a better understanding of their cost.

We will proceed as follows. Section II presents the fundamental rationales behind such policies as well as how the currently available toolkit should be used. Section III describes the Basel III framework on how to monitor systemic risk, while Section IV proposes a complementary indicator to monitor the financial cycle and draws several stylized facts regarding previous experience with macroprudentialism. Section V looks at the interaction between macroprudential policy and political economy, while Section VI concludes with the lessons learned and issues remaining.

II. Macroprudential Tools: How Do They Work?

a. Fundamental rationales

Most policymakers (governments, central banks, and international institutions) agree on the need for macroprudential policy to reduce systemic risk, whether it is to correct for market failure or smooth financial cycles. Unfortunately, macroprudential principles are not the main motivation for this consensus in an environment where monetary and fiscal policies have very little room left to maneuver. The guidelines proposed by the Basel Committee on Banking Supervision (BCBS) in Basel III provide a rather telling story: They are mostly based on existing microprudential and regulatory tools to which “Pigouvian” taxes and levies have been added to meet their new macroprudential objectives.^{1, 2}

Understanding the fundamental rationales behind macroprudential policy is essential to appreciate how it complements monetary, fiscal, and structural policies. Indeed, financial regulatory policies are not enough to address systemic risk, and other policies—especially monetary and fiscal policy—also have roles to play. Coordination among monetary, fiscal and macro- and microprudential policies is essential, nationally as well as internationally.

The underlying causes of contagion or procyclicality risks dictate the type of policy required. Aggregate shocks such as commodity price shocks and policy deficiencies such as poorly conducted microprudential and monetary policies can generate both types of risk. Yet macroprudential policy would not be the appropriate answer in either case.

Externalities and market failures arising from various financial frictions and market imperfections should motivate macroprudential policies, especially when microprudential supervision and monetary policy are conducted effectively. The 2007-08 crisis illustrates that spillovers across financial institutions and between the financial sector and the real economy are the key market failures that create systemic risk. Since then, these externalities have been commonly classified following two dimensions:

- **Contagion risk:** excessive concentration of risk among a few highly interconnected groups, as with too-big-to-fail institutions, which can take down the wider financial system when destabilized.
- **Procyclical risk:** the underlying buildup of risks over time that are hidden and underpriced. In this case, the financial sector generates systemic risk endogenously.

Hence, the macroprudential toolbox should focus on these two dimensions. However, financial regulatory policies are not enough to address systemic risk.

1. Microprudential tools are caps on loan-to-value ratios, limits on credit growth, additional capital adequacy requirements, reserve requirements and other balance sheet restrictions.

2. A Pigouvian tax is applied to a market activity that is generating negative externalities (costs for somebody else). The tax is intended to correct an inefficient market outcome by imposing costs equal to the negative externalities.

b. Macprudential toolkit

Theoretically, the toolkit available is quite large as it includes existing microprudential and other regulatory tools, taxes, and levies, as well as new instruments. In practice, however, the IMF has identified 18 main instruments, and in 2013 it launched a survey on Global Macprudential Policy Instruments (GMPI) in which central banks or national authorities disclosed which they were using. As a complement, Zhang and Zoli (2014) proposed an index that records the frequency of their use.^{3,4} Both indices focus on the 2000-2013 period for 43 countries—24 of which are emerging and 19 advanced.⁵

TABLE 1 / Country group classifications

	MaPP ^a	advanced ^b	open ^c		MaPP	advanced	open
Argentina*	y			Kuwait	y		
Australia*	y	y	y	Latvia	y	y	y
Austria	y	y	y	Lebanon	y		y
Bangladesh				Lithuania			
Belgium		y	y	Malaysia	y		
Bolivia				Mexico*	y		
Brazil*	y			Morocco			
Bulgaria	y		y	Netherlands	y	y	y
Canada*	y	y	y	New Zealand	y	y	y
Chile	y		y	Nicaragua			
China*	y			Nigeria	y		
Colombia	y			Norway	y	y	y
Costa Rica				Pakistan			
Croatia	y			Panama			
Czech Republic		y		Peru	y		
Denmark		y	y	Philippines	y		
Egypt				Poland	y		
Estonia	y	y	y	Portugal		y	y
Euro Area*		y	y	Romania	y		
Finland	y	y	y	Russia*	y		
France*		y	y	Saudi Arabia*	y		y
Germany*		y	y	Serbia	y		
Greece		y	y	Singapore	y	y	
Guatemala				Slovakia	y	y	y
Hong Kong	y	y	y	Slovenia		y	y
Hungary	y		y	Spain	y	y	y
Iceland		y	y	Sweden	y	y	y
India*	y			Switzerland	y	y	y
Indonesia*	y			Thailand	y		
Ireland	y	y	y	Turkey*	y		
Israel	y	y	y	United Kingdom*	y	y	y
Italy*		y	y	United States*	y	y	y
Japan*		y	y	Uruguay	y		
Korea*	y	y					

*G-20 members.

^a MaPP index from Zang and Zoli (2014).

^b Income-based classification from IMF WEO (April 2014).

^c DeFacto Financial Openness from Cerutti et al. (2015).

3. Table 1 lists the countries considered.

4. This index, proposed by Zhang and Zoli (2014), records the major prudential measures from a wide range of sources (studies, central banks, or national supervisors' websites). They use a binary variable, taking on value 1 for tightening actions and -1 for loosening ones. It accounts for changes in policy stance only since 2000, ignoring the impact of pre-2000 actions. See Cerutti et al. (2015) and Zhang and Zoli (2014) for details on these indices.

5. We rebuilt the indicators so they consider the same groups of countries.

Box 1 classifies these measures around three main axes: housing, contagion, and reserve requirements. If we refer to the previous classification of externalities, we see that many could address both the contagion and the procyclical risks. As a result, since each tool has unique advantages and limitations, a combination is likely to provide a better solution to the problem of correcting the same externality.

BOX 1: Macprudential toolbox for MaPP⁶

- Housing-related measures, such as loan-to-value ratio and ratio caps,** debt-to-income ratio, dynamic loan-loss provisioning, and general countercyclical capital buffer/requirement, loan-to-deposit ratio*
- Contagion measures, such as leverage ratio, capital surcharge on SIFIs, limits on interbank exposures, concentration limits, limits on domestic currency loans, and levy/tax on financial institutions, sector specific buffer/requirement,* margins/haircuts on collateralized financial market transactions*
- Reserve requirements:⁷ reserve requirement ratios, limits on foreign currency loans, FX and/or countercyclical reserve requirements,** limits on open FX positions or currency mismatches*

*New tool with too little data to be included in the analysis.

** Instruments derived by Cerutti et al. (2015) from the Global Macprudential Policy Instruments (GMPI) survey from the IMF.

Diversity in the type of instruments in use

Overall, the use of macroprudential tools has become more frequent and varied over the years, across all the countries considered.

TABLE 2a / Instruments used, by region

Number of countries		Contagion			Housing-related			Reserve			Total		
		2000	2006	2013	2000	2006	2013	2000	2006	2013	2000	2006	2013
22	Open	17	18	32	12	16	42	3	5	5	32	39	79
21	Closed	19	27	36	8	22	37	9	14	22	36	63	95
19	Advanced	9	11	23	11	14	33	2	2	4	22	27	60
24	Emerging	27	34	45	9	24	46	10	17	23	46	75	114
5	Adv. Asia	2	3	6	5	8	11	1	1	2	8	12	19
6	Eme. Asia	4	6	10	2	8	12	1	1	3	7	15	25
14	Europe/US	8	9	19	6	6	23	1	1	2	15	16	44
6	Latin Am.	13	15	16	7	7	11	6	9	9	26	31	36
3	Middle East.	4	4	5	0	2	4	2	2	2	6	8	11
9	CEE/CIS*	5	8	12	0	7	18	1	5	9	6	20	39

*Central and Eastern Europe/Community of Independent States

Sources: Cerutti et al. (2015) and authors' calculations.

In 2013, closed or emerging economies have used instruments related to contagion and housing in roughly equal amounts, while using many of the reserve requirement instruments as well, which they consider monetary tools. In contrast, open or advanced economies favor measures related to housing but also use some of the contagion-risk instruments. Among the instruments available, both emerging and advanced countries prefer loan-to-value-related measures and debt-to-income-ratio. In addition, emerging countries use concentration limits and reserve requirement measures quite frequently, which is consistent with their concerns about large, volatile capital flows and related systemic risks.

6. Authors' classification based on Zhang and Zoli (2014) and Cerutti et al. (2015).

7. While reserve requirements can be categorized as macroprudential policy tools, they are often used as monetary policy instruments in emerging economies.

TABLE 2b / Types of instruments used

Measures in 2013	Advanced economies		Emerging economies	
	Total	Percent	Total	Percent
Housing-related				
Loan-to-value related measures	24	40%	30	26%
Debt-to-income ratio	6	10%	11	10%
Dynamic loan-loss provisioning	1	2%	5	4%
General countercyclical capital buffer	2	3%	0	0%
Contagion				
Leverage ratio	4	7%	3	3%
Capital surcharges on SIFIs	2	3%	3	3%
Limits on interbank exposures	4	7%	11	10%
Concentration limits	7	12%	19	17%
Limits on domestic currency loan	0	0%	4	4%
Levy/tax on financial institution	6	10%	5	4%
Reserves requirements				
Limits on foreign currency loans	2	3%	7	6%
Reserves requirements related measures	2	3%	16	14%

Sources: Cerutti et al. (2015) and authors' calculations.

By 2013, the overall number of instruments used had doubled since before the crisis, while the emerging nations' share remained stable at about two-thirds. Clearly, these countries have more flexibility in implementing these tools.

Frequency of macroprudential measures in use

Changing the focus from the type of instruments to the frequency of their use, Figures 1a, 1b, and 1c report the number of macroprudential measures implemented by the different groups of countries.

Since 2006, the macroprudential policy stance has significantly tightened. Yet most of the regions experienced a loosening at the height of the global financial crisis in 2009, followed by a tightening when capital flows resumed in 2010, following exceptionally accommodative monetary policy in advanced economies. These temporary changes in behavior support the idea that macroprudential policy has been used as a countercyclical tool. Overall, Asia has used macroprudential measures the most frequently, accounting for 58 percent of the usage in 2013, of which 38 percent is in emerging Asia.

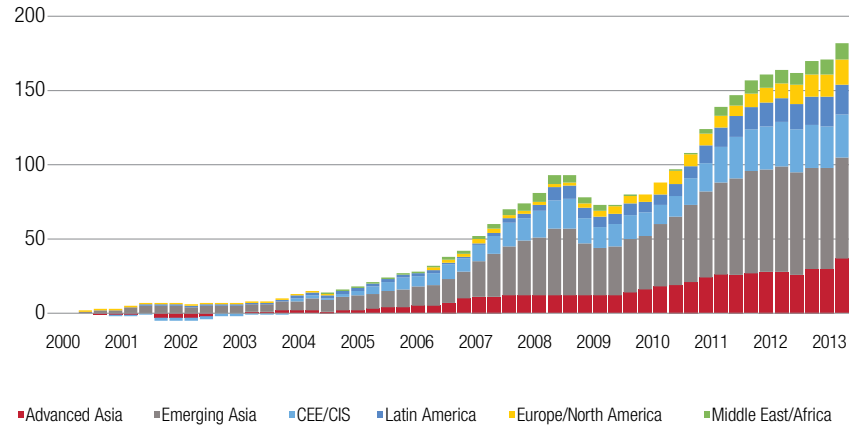
A closer look at the average number of measures per country reveals clear differences across regions but also within Asia. While both advanced and emerging Asian countries are the most active users of macroprudential tools, very few countries are driving this trend, namely China, India, and South Korea (Figures 1b and 1c).

China and India have been heavy users of domestic prudential policy tools, especially reserve requirements and housing measures, accumulating 40 and 14 measures in 2013, respectively. Coincidentally, a country's macroprudential policy stance seems to be strongly related to its housing prices. As an example, ASEAN countries that have experienced more stable housing prices in recent years have had a lower rate of implementation of macroprudential policy compared with the rest of Asia.⁸

Finally, it is worth noting that the tools considered to date are mostly based on existing microprudential tools that are adaptable to macroprudential objectives. These tools are part of the road map proposed in Basel III to mitigate systemic risk.

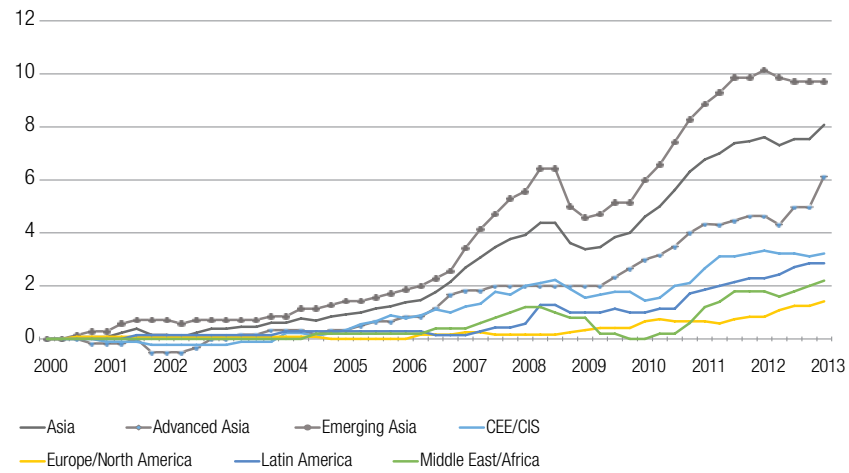
8. In our sample, ASEAN countries are Indonesia, Malaysia, and Singapore, which in 2013 reported -1, 5, and 10 macroprudential measures, respectively.

FIGURE 1a / Cumulative number of measures in place, by region



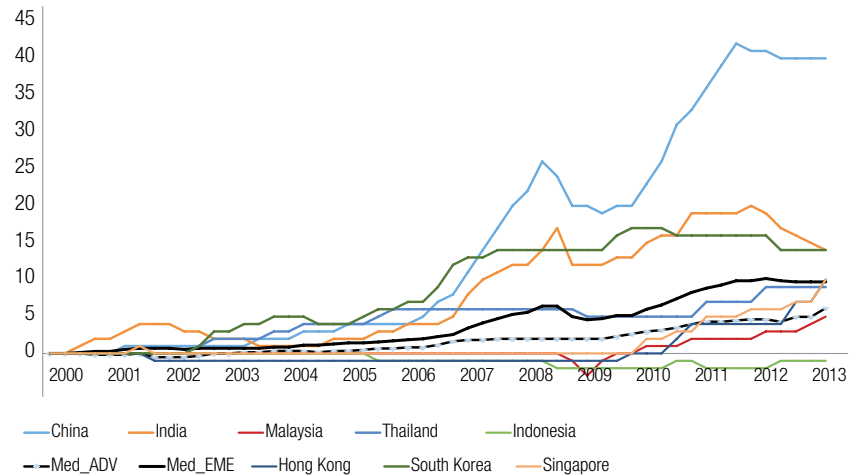
Sources: Zhang and Zoli (2014) and authors' calculations.

FIGURE 1b / Average number of measures in place per country, by region



Sources: Zhang and Zoli (2014) and authors' calculations.

FIGURE 1c / Average number of measures in place in Asia, by country



Sources: Zhang and Zoli (2014) and authors' calculations.

III. Systemic Risk

a. Basel III framework

The regulations suggested in Basel III address the systemic risk issue by (i) significantly increasing capital buffers for risks related to the interconnectedness of the major dealers and (ii) incentivizing institutions to reduce counterparty risk through clearing and active management (hedging).

While the first point aims at reducing the contagion risk generated by global systemically important financial institutions (G-SIFIs), current initiatives focus mostly on banks. Every year, the Financial Stability Board and similar institutions in other countries publish a list of global and domestic/national systemically important banks (G-SIBs and D/N-SIBs) based on a methodology that refers to size, interconnectedness, cross-border activity, the lack of available substitutes, and complexity. Then, each country applies its regulatory measures (Dodd-Frank for the United States) such as higher loss absorbency, more intensive scrutiny, and resolution planning requirements.

The second point aims at reducing procyclical risk. Basel III introduces a framework for a time-varying capital buffer on top of the minimum capital requirement. The countercyclical capital buffers are intended to make banks more resilient against imbalances in credit markets and thereby enhance medium-term prospects for the economy. In good times when systemwide risks are growing, the regulators could impose countercyclical capital buffers, which would help the banks withstand losses in bad times. Basel III suggests credit per GDP as the proxy for the financial cycle.

Basel III represents a significant cooperation and coordination effort across G-20 countries. Yet its guidelines or, more precisely, their implementation at the country level raises many questions. At this stage of the Basel III process, two main drawbacks should be highlighted. First, will stabilizing the banking sector be enough to stabilize the whole financial system? Indeed, the current thrust of regulation could create powerful incentives to move financing from the banking system to unregulated financial institutions and securitization. Second, will policymakers be able to reliably identify the buildup of financial risks in order to effectively lean against the cycle? Even when excesses are evident, assessing their impact on the real economy and weighing them against the effects of tighter macroprudential policy are quite challenging. The difficulties range from the risk of diagnostic error (both Type I and II) to how to account for country circumstances and characteristics (financial structure, industrial organization and ownership structure, openness, exchange rate regime, international financial integration, political economy, etc.).

b. Monitoring

Timing is a key element in the macroprudential framework defined in Basel III, whether it is assessing the risk of contagion and defining an appropriate response or adjusting countercyclical buffers. In this section, we suggest the use

Timing is a key element in the macroprudential framework defined in Basel III, whether it is assessing the risk of contagion and defining an appropriate response or adjusting countercyclical buffers.

of complementary indicators to more accurately monitor the state of the financial system. Furthermore, we provide evidence that a widely used indicator, credit per GDP, might not be the best proxy for the financial cycle. As an alternative, we prefer focusing on the degree of financial intermediaries' reliance on supplementary "non-core" funding in order to better assess the possibility of "overheating." This measure also allows the decomposition of funding sources in order to determine which intermediaries or funding methods potentially pose the greatest threats to an economy's financial stability.

Contagion and systemic risk: SRISK indicator

In the absence of consensus regarding the most effective methodology for assessing the resilience of financial systems, the Basel III framework advocates country-specific stress tests. As a result, central banks such as the Bank of England, the European Central Bank, and the Federal Reserve evaluate their system's capital adequacy, on a yearly basis, relying on supervisory/confidential data. The outcome of these tests may lead to policy responses if the level of capitalization is deemed unsatisfactory based on Basel III guidelines (or more accurately, with the country's regulations derived from Basel III, such as Dodd-Frank for the U.S.). Yet, these tests are country- or currency-area-specific and thus difficult to compare.

As an alternative, Acharya et al. (2010 and 2012) and Brownlees and Engle (2015) propose a measure of systemic risk (SRISK) that relies solely on publicly available market data. Similar to the stress tests, the SRISK measure represents the capital a financial institution would need to raise during severe marketwide downturns to function normally. The data are updated every two weeks and available at the New York University Volatility Laboratory website.

While the indicators are complementary, for this report we prefer the SRISK measure because (i) it is available for several countries, (ii) it accounts for the endogenous nature of the systemic risk, which makes it macroprudential based, (iii) its assessment does not depend on Basel risk regulation (capital ratio measurement), and (iv) it has a higher frequency—bimonthly instead of yearly.

Financial cycle and systemic risk: credit-per-GDP versus liability ratios

Basel III guidelines are more specific when it comes to the financial cycle. They recommend a formula that translates the credit gap measure into activation of the countercyclical capital buffer (CCB). The CCB should be imposed if the credit-to-GDP ratio exceeds its trend value. More specifically, threshold values of the gap are used to define when the buffer should be deployed. If the gap is below 2 percent, the CCB is zero. If the gap is above 10 percent, the CCB should be set at its maximum of 2.5 percent of risk-weighted assets.⁹ Between the lower and upper threshold, the CCB should vary with the extent of the buildup of systemic risk.

9. Drehmann et al. (2014) suggest calculating the long-term trend using the Hodrick–Prescott filter with a lambda of 400,000.

While an aggregate indicator for credit is useful, knowing the source and quality of the credit is essential when assessing whether a policy response is needed and how it should be calibrated. Monitoring systemic risk within the financial cycle requires correct evaluation of both the stage of the credit cycle relative to its long-term behavior and the propagation of financial risks or systemic risk spillovers. The credit-to-GDP ratio captures only the first.

Following Shin and Shin (2011), we build an alternative indicator using the composition of bank funding.¹⁰ The idea is that funding markets are the balance-sheet counterpart to intermediate lending, and they can be sorted into two categories:

- Core liabilities, namely retail deposits of domestic household and business, which are stable and grow in line with the economy.¹¹
- Non-core liabilities, encompassing the other major forms of funding such as lending between banks or foreign lending, are more volatile. Non-core liabilities include funding sources for banks—and, in more mature financial markets, other financial intermediaries.

In times of “excessive” credit growth, non-core liabilities increase in order to fund the fast-growing lending that cannot be accommodated by core liabilities. Both liabilities should provide useful signals on financial conditions. Hence we calculate two indicators:

- Non-core liabilities to GDP ratio: Normalizing by the level of economic activity allows a better understanding of the size of the financial market and its non-core fraction relative to the size of the real economy. While directly comparable to the credit-to-GDP ratio, it also shares its main drawback: GDP is a poor “real-time” measure because it is often revised.
- Non-core to total liabilities ratio: increasing proportions of non-core funding relative to core deposits could indicate a credit market that is “overheating.” Focusing on the composition of the financial system enables the buildup of one funding method or intermediary to be monitored (see Box 2 for more detail).

These indicators are complementary in the effort to understand the vulnerability of a country’s financial market based on its reliance on short-term funding or short-term foreign currency debt as well as type of lender. Both sets of information are essential when designing well-targeted policy.

In times of “excessive” credit growth, non-core liabilities increase in order to fund the fast-growing lending that cannot be accommodated by core liabilities.

10. Shin and Shin (2011) consider one country: South Korea.

11. Our definitions are in line with IMF’s core and non-core liquidity definition (2015). The data are collected from national and international institutions’ websites such as IMF, central banks, and regulatory agencies.

BOX 2: Composition of an economy’s non-core liabilities

The composition of an economy’s non-core liabilities may indicate a buildup of systemic risk as non-core liabilities are often in foreign currencies, cross-held by other intermediaries, and/or of shorter duration than retail deposits.

In Figure A, components of financial companies’ liabilities are disaggregated by type of financial institution and liability category. Segments in blue/purple hues indicate liabilities of depository corporations (DC) (or monetary financial institutions for euro area economies), which include institutions traditionally thought of as banks—those that accept deposits. Liabilities of other financial corporations (OFCs) are displayed in orange/red. OFCs include but are not limited to insurance companies, funding corporations, and holding companies.

Liabilities issued by OFCs can be considered borrowing to fund “shadow banking” activity. The figures below confirm that shadow banking has a more prominent role in developed economies such as in Japan and the U.S. than in developing economies. This disparity is slightly more pronounced in the charts given that some emerging Asian central banks (South Korea, Malaysia) do not report balance sheet data for OFCs. Little data is available because their OFC sectors are not sufficiently developed to be measured. Indeed, Indonesia and Thailand have begun reporting OFC liabilities, but they represent less than 8 percent of total core and non-core liabilities.

When viewed through the lens of non-core liabilities as a ratio of either core liabilities or the country’s gross domestic product, it is evident that emerging Asian economies are far less dependent on non-core liabilities to fund banking operations. The United States, by contrast, experienced remarkable growth in OFC liabilities in recent decades while its depository institution liabilities remained somewhat level (below 25 percent).

Types of non-core liabilities

Liabilities to non-residents (LTNR)

While domestic retail deposits are considered part of banks’ core funding because of their stability, deposits from non-residents fall under non-core liabilities because they lack the same type of stability and can be subject to sudden withdrawals or reversals in the event of crisis. Foreign currency deposits cause a currency mismatch between the foreign currencies the bank borrows in and the domestic currency it lends to residents. Such currency mismatches—which were at the heart of the Asian financial crisis of the late 1990s—increase systemic risk in the banking sector, especially in emerging markets.

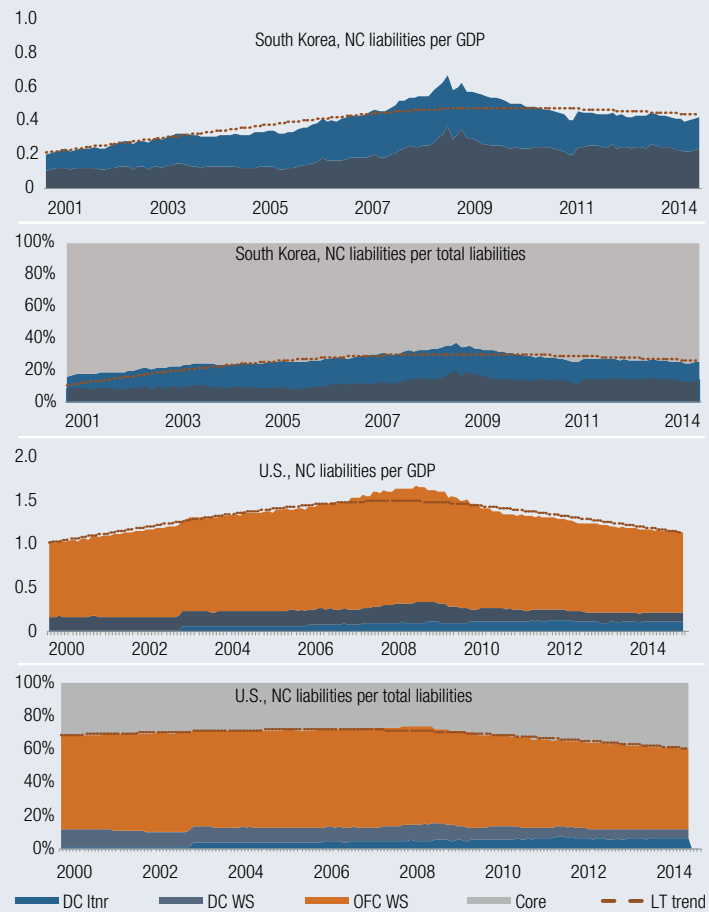
Loans

This category is made up primarily of repurchase agreements, or “repos,” which are effectively collateralized loans. Repos are a popular form of short-term borrowing for financial institutions. Often, repurchase agreements last just one day and are subsequently “rolled over” in a cycle of very-short-term borrowing. Due to their short-term nature and being subject to haircuts or rollover risk during times of financial distress, repos can be considered a less stable source of funding than core deposits.

Securities other than shares

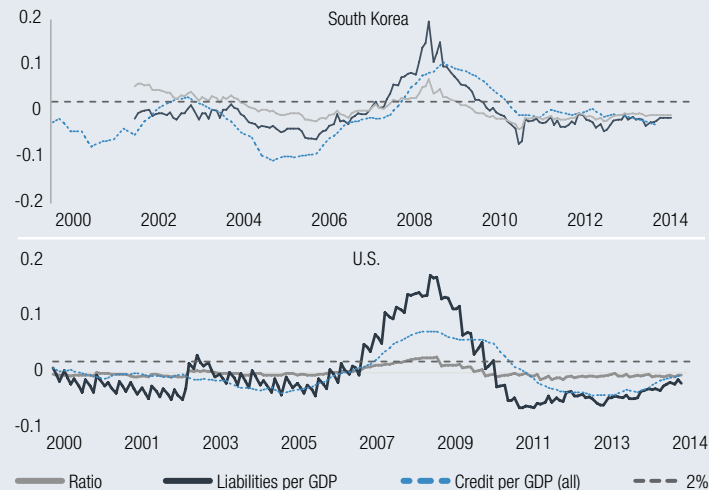
Securities other than shares are any kind of negotiable debt instrument, including bonds, commercial paper, and certificates of deposit. In developed economies, commercial paper has played a significant role in financial intermediaries’ ability to raise short-term debt. In early 2007 the U.S. financial sector had \$1.8 trillion in commercial paper outstanding, before falling by nearly 20 percent as financial markets froze in the aftermath of the Lehman Brothers collapse. Vulnerability to such sudden, sharp funding reductions illustrate why these types of securities are considered “non-core” and their rapid buildup may indicate an accumulation of systemic risk.

FIGURE A / Non-core (NC) liabilities, categories



Note: WS means “wholesale” and represents the sum of loans and securities other than shares. Sources: Bank of Korea, U.S. Federal Reserve, and authors’ calculations.

FIGURE B / Non-core liabilities, categories



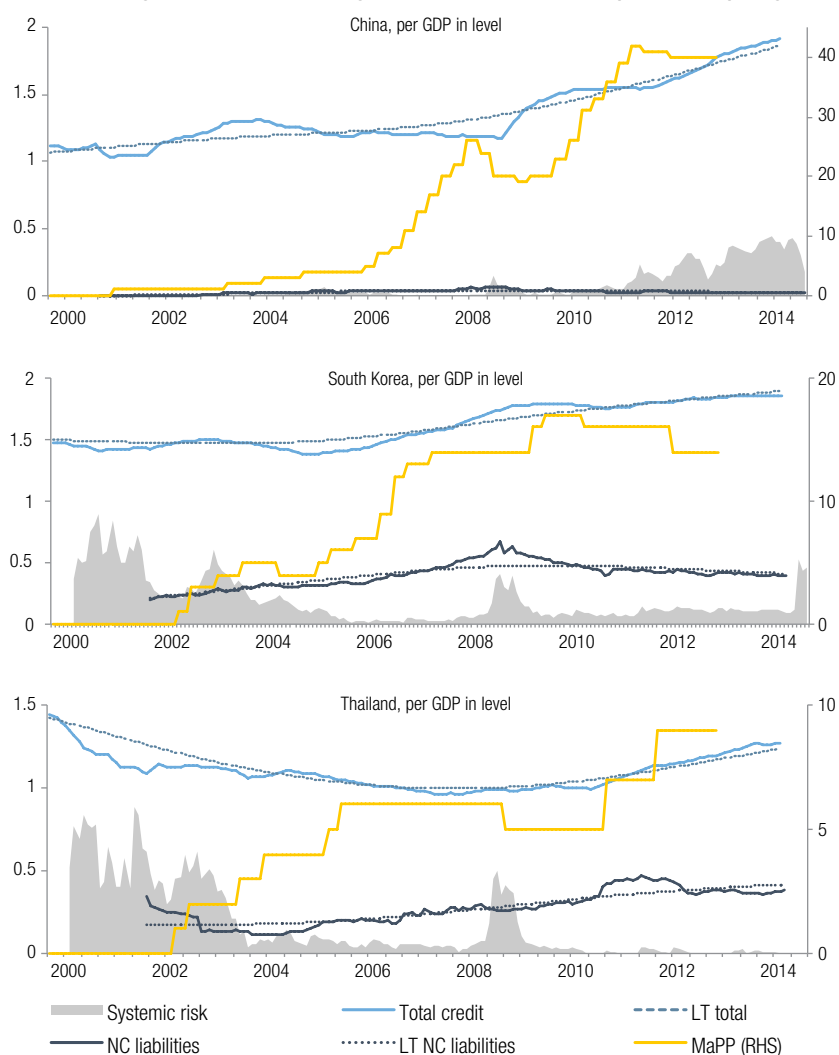
Source: Authors’ calculations.

c. Stylized facts

Figure 2 plots all the measures discussed, that is both to-GDP ratios and their long-term trend, SRISK and the macroprudential index measuring frequency of use. For this illustration, we focus on the most active countries in terms of macroprudential policy (see Figure 1c): China, South Korea and Thailand.¹²

The three countries tend to increase the number of macroprudential tools in use when the financial cycle indicators deviate from the long-term trend. These also coincide, at least for China and South Korea, with higher levels of systemic risk. Furthermore, a comparison of the to-GDP ratios shows that very little of the credit in the economy relies on non-core liabilities for the three countries. South Korea, which has the most reliable data among the three and has been cast as a successful illustration of macroprudential policy, reports an average total credit-to-GDP of 185 percent for 2014 with 40 percent depending on non-core liabilities.

FIGURE 2 / Systemic risk, credit cycle indicator, and macroprudential policy index

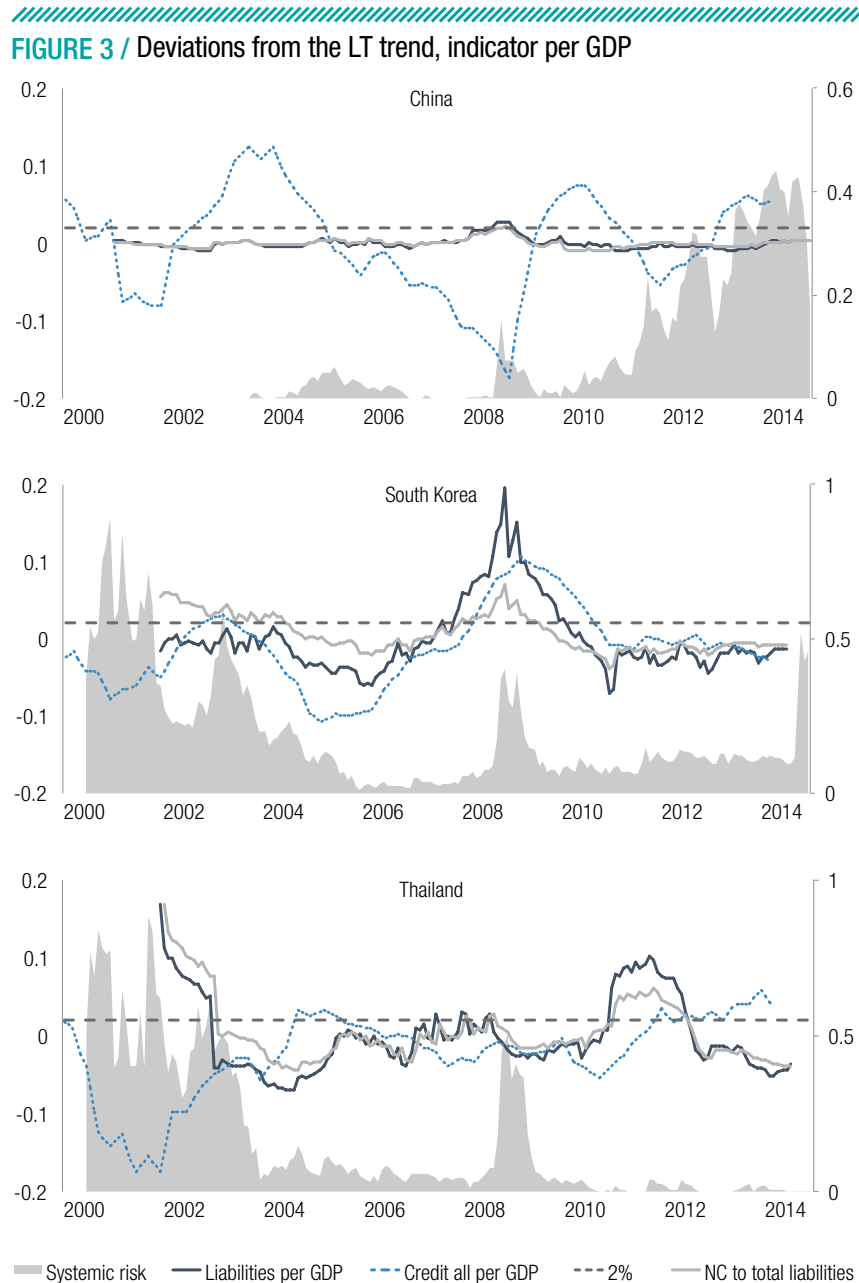


Sources: Zhang and Zoli (2014), BIS, central banks of China, South Korea, and Thailand, and authors' calculations.

12. Even though we report Chinese data as an illustration, the Chinese financial system is unique and the categories used here may not capture most of it.

Focusing on the timing of the indicator, Figure 3 reports indicators' deviation from their long-term trend and the 2 percent threshold level, beyond which countercyclical buffers should be deployed. In each of the three cases, the GDP ratios identifying a significant deviation in trend at different dates, with the non-core liabilities-based indicator signaling at least three months earlier.

Figure 3 also reports deviations from the long-term trend for the non-core to total liabilities ratio. The level of this ratio confirms that the financial systems of these economies are relatively simple, relying mostly on standard banking activities (close to 80 percent).¹³ Yet, both countries observe a change in composition, with growth in the fraction of non-core liabilities, relative to total liabilities, faster than the long-term trend around the same time as the other liabilities ratio.



Source: Authors' calculations.

13. Based on the data, China's ratio is around 2 percent but China's financial system is a special case.

Performing the same analysis for all the countries confirms the usefulness of the non-core liabilities ratios for both advanced and emerging economies. Table 3 summarizes some of the key features that can be observed when focusing on the 2006-2011 period. Overall, both to-GDP ratios have identified 27 instances where deviations from the long-term trend surpass the 2 percent level. Of those, 67 percent of the time the liabilities-based indicator signals a strong deviation from the long-term trend three months in advance on average.

TABLE 3 / Credit/financial cycle indicator

Signaling	Full sample		Without euro countries	
	Credit to GDP	Non-core to GDP	Credit to GDP	Non-core to GDP
Timing difference	Faster 30% of the time	Faster 67% of the time	Faster 15% of the time	Faster 85% of the time
Average		3 months earlier		5 months earlier
Median		4 months earlier		6 months earlier
Magnitude				
Average maximum	9%	26%	8%	20%
Median maximum	8%	13%	8%	9%
Duration				
Average	23 months	28 months	21 months	22 months
Median	21 months	28 months	20 months	20 months

Source: Authors' calculations.

The lag extends to five months if the euro zone countries are removed from the sample. Euro zone countries started reporting “Other Financial Corporations” information in 2008, so the limited amount of data makes estimating a long-term trend for the period studied difficult. Furthermore, the deviation based on the liabilities tends to be stronger, with a magnitude differential varying from 12 to 17 percentage points on average. It also lasts longer, from one to seven months on average, depending on the group of countries considered. These differences may well be essential when it comes to designing an adequately calibrated policy response.

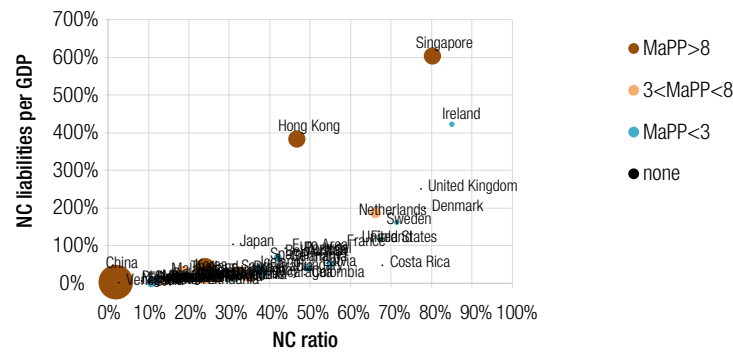
Common factors and challenges

Looking coincidentally at the macroprudential index and the non-core liabilities-based ratios (per GDP and per total liabilities), Figures 4a, 4b, and 4c highlight common factors across countries with the strongest macroprudential stances.

With the exception of Singapore and Hong Kong, which are special cases as leading international financial centers, the financial markets of the countries recording at least four macroprudential measures depend overwhelmingly on banks' core funding, as both liabilities-based ratios are below 50 percent. In other words, these countries have limited depth in their financial systems relative to their real economies and have relatively "simple" financial structures, with banks more important than capital markets. Whether they are closed emerging economies (China, Malaysia, Poland, Romania, Russia, Thailand, and Turkey), closed advanced economies (South Korea and Singapore) or open advanced economies (Hong Kong, the Netherlands, and Slovakia), their access to autonomous monetary policy is restricted. Whether this is due to proactive exchange rate management, greater carry-trade inflows or being part of a monetary union, the outcome is the same: Macroprudential policy seems to be an alternative to monetary policy for reining in domestic liquidity. Finally, most of these countries have more concentrated institutional systems (industrial organization, ownership structure, central bank, and government), making the implementation of these tools easier.

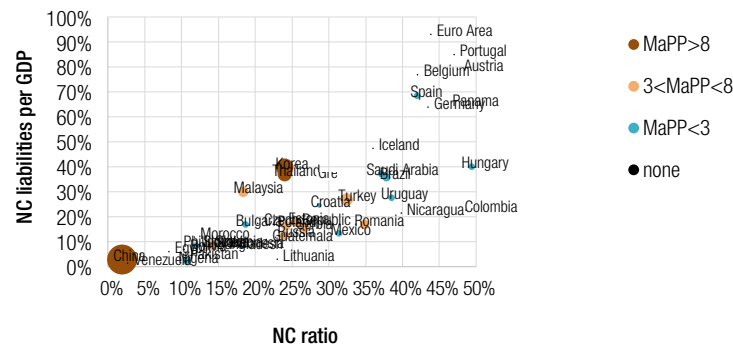
Whether this is due to proactive exchange rate management, greater carry-trade inflows or being part of a monetary union, the outcome is the same: Macroprudential policy seems to be an alternative to monetary policy for reining in domestic liquidity.

FIGURE 4a / Macroprudential index versus non-core (NC) liability-based ratios



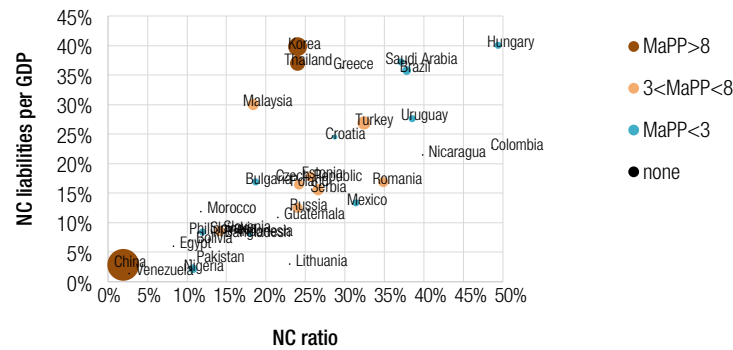
Source: Authors' calculations.

FIGURE 4b / Macroprudential index versus non-core (NC) liability-based ratios (zoom 1)



Source: Authors' calculations.

FIGURE 4c / Macroprudential index versus non-core (NC) liability-based ratios (zoom 2)



Source: Authors' calculations.

IV. What About the U.S., the UK, and the Euro Zone?

Unlike the countries previously discussed, the euro zone, the UK, and the U.S. are relatively large, open economies with well-developed and complex institutions. For instance, in the U.S., less than half of total liabilities outstanding can be linked to bank balance sheets, while more than half can be attributed to the so-called shadow banking system. In Europe, banks are still responsible for the majority of financial intermediation. In France, they account for close to 60 percent of total liabilities, although the share of non-bank financial intermediation has increased. Furthermore, the recent crisis showed these countries tend to influence the global financial cycle. Monitoring systemic risk is essential for them as they actively contribute to it, yet the complexity of these advanced Western economies makes the task extremely challenging.

Beyond their macroeconomic conditions, their network of international banks needs to be taken into account because its complexity may exacerbate policy's unintended consequences. A very open capital account and large foreign bank presence make circumvention of the rules more likely. Aiyar, Calomiris, and Wieladek (2014) show that foreign bank branches increased their lending in the UK in response to tighter measures applied to local banks, a sign of cross-border competition and regulatory arbitrage. Similarly, as supervisors required UK-based banks and their subsidiaries to meet higher capital requirements during the 2000s, local banks lent less abroad.

In the presence of independent monetary policy, its interaction with macroprudential policy cannot be ignored and should be managed. So far, only the Bank of England hosts both the Monetary Policy Committee and the Financial Policy Committee, which is responsible for macroprudential measures. The U.S. Federal Reserve has some macroprudential tools, but others are dispersed among several agencies. The European Central Bank's main difficulty is the key difference between macroprudential and monetary policies: Macroprudential policy must be country-specific and is sensitive to a country's political pressure while it must be coherent for the euro zone as a unit. Unfortunately, the political economy constraints on macroprudential policy may be more difficult than those on monetary policy. Indeed, the actual benefits of such policy remain rather abstract to many, while its distributional effects can be easily predicted and tend to be politically sensitive: Constraining households' access to loans in housing markets or the rise in the price of financial intermediation (spreads) arising from some measures are obvious examples.

In the presence of independent monetary policy, its interaction with macroprudential policy cannot be ignored and should be managed.

V. Interaction With the Political Economy

As noted earlier, the IMF, consistent with statements by the Financial Stability Board and the Bank for International Settlements (BIS), describes macroprudential policy as “the use of primarily prudential tools to limit systemic risk. A central element in this definition is the notion of systemic risk—the risk of disruptions to the provision of financial services that is caused by an impairment of all or parts of the financial system, and can cause serious negative consequences for the real economy.” Although the concept of macroprudential policy seems simple, the need to intervene in an economy and its financial system, using a variety of tools to ward off systemic risk, is more complicated. It is unlike monetary policy, which generally involves a straightforward arrangement whereby one instrument targets one objective.

Adhering to the general view that there are two types of macrofinancial risks, macroprudential instruments can take either a time series (procyclical) or cross-sectional (contagion) approach. Both dimensions can influence the political economy of macroprudential policy. From the time series perspective, efforts to mitigate systemic risk through policy interventions in financial and credit markets, designed to affect price formation and/or direct credit and investment flows away from certain areas and into others, clearly have a distributional impact. This can instigate a political response as affected constituencies seek redress. Cross-sectional actions are more geared to limiting tail risk and therefore once in place they are more likely to spur interaction with regulators and other officials than with politicians. Therefore, it appears that macroprudential policy is inherently more political than monetary policy, which is generally viewed—at least in more advanced economies—as the domain of central banks and their technocrats.

There is also an important, yet often underappreciated, ideological/philosophical component of macroprudential policy. By its very nature, there is a presumption that financial markets are inefficient, operate on less-than-perfect information, and are subject to regulatory arbitrage and herding. Although it would be premature to declare a paradigm shift, it is not a stretch to claim that underlying assumptions concerning the efficient-market hypothesis, and how they relate to wider macroeconomic performance, have been challenged and revised by the declared need for macroprudential policy by the regulatory community (Baker, 2013b). In this sense, regulators’ cognitive filters have been reprogrammed by the reliance being placed on this policy as financial instability is increasingly viewed as a cyclical, endogenous, and endemic characteristic of modern financial markets (Baker, 2013a).

Institutional framework of macroprudential policy

Because macroprudential policy is at an early stage of implementation, it faces a number of crucial issues. One of the most important is building—or refining—its institutional underpinnings. A strong institutional framework is essential to ensure that the policy can work effectively. As noted by the IMF and others, the framework must foster the ability to act in the face of evolving systemic threats, assuring access to information and defining an appropriate range and reach of macroprudential instruments. It needs to establish strong accountability and compel assertive and timely action, despite lobbying by the financial industry or political pressure.

For many countries, the central bank has been the focal point for macroprudential policy. In instances where powers have been delegated to central banks, they also can be revoked by politicians, especially where macroprudential mandates remain vague and allow considerable discretion. Paradoxically, high levels of central bank discretion and empowerment are likely to increase the political questioning and scrutiny they can expect.

If central banks are to build support for macroprudential regulation, they will have to cogently explain the public purpose this policy serves. Simply speaking about the importance of financial stability is unlikely to be successful, reflecting the public's inclination toward financial stability myopia and time inconsistent preferences. In the end, the failure to build broader rationales and constituencies will damage their capacity to fulfill their new regulatory role. However, cultivating constituencies and a broader sense of purpose for this project potentially erodes central banks' claims to technically impartial and nonpolitical authority.

Although central banks are playing a key role in the exercise of macroprudential policy, they are not the only institutions involved. Participation by government departments and regulatory agencies can help bring about the effective use of macroprudential tools. In addition, governments can be useful in ensuring the support of tax policy and facilitating legislative changes to mitigate systemic risk by creating regulatory authority over nonbank lenders and other institutions.

Because the relationship between central banks and government institutions is at an early stage when it comes to managing macroprudential policy, challenges are still being identified. For now, it is safe to say that if institutional silos and rivalries develop, it could hinder risk identification and mitigation, undermining the effectiveness of the policy. The overlap among policy areas is another major challenge. There is also a political challenge in the relationship between finance ministries and central banks on macroprudential questions, given that many decisions will have fiscal as well as financial and monetary implications with institutional politics at play.

The political landscape

Macroprudential policy by most standards is a new field and it is hard to say how it will play out politically. Among the unknowns is the degree of involvement from politicians and industry players as well as the attitudes of the wider public toward the tactics and tools used to conduct policy. Assessing how the institutional design of macroprudential frameworks will interact with the wider political process requires some degree of speculation.

At this point, the intervention of politicians generally has been limited. Legislation has defined broad aspects of the policy and its operation. However, much of the detail has been left to government and central bank officials to figure out. In the United States, the system for implementing macroprudential tools and measures is composed of many independent regulators, each of whom has mandates focused on particular institutions or markets. The legislation governing each agency limits its objectives and the reach of its regulations. No agency has the explicit objective of maintaining financial stability—for taking into account the macroprudential add-ons to microprudential oversight.

The Financial Stability Oversight Council (FSOC), created as part of the Dodd-Frank legislation, has made progress in promoting cooperation among many agencies in the context of shared goals but isn't as effective as it needs to be in the balkanized U.S. regulatory system. The fact that the FSOC has to make recommendations on a comply-or-explain basis indicates difficulties and shortcomings in the political process. At minimum, the FSOC structure needs to be changed to enhance its independence and its ability to take unpopular stands, especially on countercyclical macroprudential policy.

At its core, the emerging political economy of macroprudential regulation suffers from a political constituency problem. As Claudio Borio of the Bank for International Settlements recounts, there is no readymade constituency against the inebriating feeling of growing rich that is characteristic of a financial boom (Borio, 2013). Unlike monetary policy, whose prowess in fighting inflation can be linked to an individual's own welfare, a macroprudential perspective alludes to systemically beneficial outcomes only tenuously associated with individual gains. In this type of circumstance, it is understandable that politicians might not want to be associated with a policy that could be viewed as "taking away the punch bowl."

VI. Concluding Remarks

The macroprudential framework and the regulations implemented in various countries are still a work in progress. So far, most regulations focus on banks, whether the banking system represents 20 percent or 100 percent of a nation's financial sector.

The success of these regulations in promoting financial stability remains unclear and their potential unexpected consequences quite unsettling, as financial activities tend to migrate to less regulated markets with the resulting risks often underestimated. As Goodhart's law (1975) states: "Any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes."

At the recent "Rethinking Macro Policy III" conference in Washington, D.C., IMF Chief Economist Olivier Blanchard said: "Policymakers cannot be simple observers, as what the financial system will be depends very much on regulation. And we do not have a good sense of what regulation should be." Such a warning should encourage policymakers to acquire a better understanding of the issues before trying to regulate them. Already, we have learned from Basel I, II, and III that failing to heed the financial sector's reaction to proposed changes in policy and regulation leads to more complex and less efficient measures. What about changing strategy and trying dialogue?

Failing to heed the financial sector's reaction to proposed changes in policy and regulation leads to more complex and less efficient measures.

References

- Acharya, Viral V., Lasse H. Pedersen, Thomas Philippon, and Matthew P. Richardson. "Measuring Systemic Risk," technical report, Department of Finance, New York University, 2010.
- Acharya, Viral V., Lasse H. Pedersen, Thomas Philippon, and Matthew P. Richardson. "Measuring Systemic Risk," *CEPR Discussion Papers* 8824, 2012.
- Aiyar, Shekhar, Charles W. Calomiris, and Tomasz Wieladek. "Does Macro-Prudential Regulation Leak? Evidence from a UK Policy Experiment," *Journal of Money, Credit and Banking*, 46(1), 181-214, 2014.
- Baker, Andrew. "The Gradual Transformation? The Incremental Dynamics of Macroprudential Regulation," *Regulation & Governance*, 7(4), pp. 417-434, 2013b.
- Baker, Andrew. "The New Political Economy of Macroprudential Ideational Shift," *New Political Economy*, 18(1), 112-139, 2013a.
- Basel Committee on Banking Supervision. "Countercyclical Capital Buffer Proposal, Consultative Document," Bank for International Settlements, Basel, 2010.
- Basel Committee document. "Global Systemically Important Banks: Updated Assessment Methodology and the Higher Loss Absorbency Requirement," July 2013.
- Borio, Claudio. "Macroprudential Policy and the Financial Cycle: Some Stylized Facts and Some Suggestions," Re-Thinking Macro II conference, IMF, Washington, April 16-17, 2013.
- Brownlees, Christian T., and Robert F. Engle. "SRISK: A Conditional Capital Shortfall Index for Systemic Risk Measurement," Department of Finance, New York University, 2015.
- Cerutti, Eugenio, Stijn Claessens, and Luc Laeven. "The Use and Effectiveness of Macroprudential Policies: New Evidence," IMF working paper 69, 2015.
- Drehmann, Mathias, Claudio Borio, and K. Tsatsaronis. "Anchoring Countercyclical Capital Buffers: the Role of Credit Aggregates," *International Journal of Central Banking*, 7(4), 2011.
- Drehmann, Mathias, and Mikael Juselius. "Evaluating Early Warning Indicators of Banking Crises: Satisfying Policy Requirements," *International Journal of Forecasting*, 30(3) pp. 759-780, 2014.
- Goodhart, Charles. "Problems of Monetary Management: The U.K. Experience," *Papers in Monetary Economics* (Reserve Bank of Australia), 1975.
- Harutyunyan, Artak, Alexander Massara, Giovanni Ugazio, Goran Amidzic, and Richard Walton. "Shedding Light on Shadow Banking," IMF working paper 1, 2015.
- IMF. "The Interaction of Monetary and Macroprudential Policies," 2013.
- IMF. "World Economic Outlook," April 2014.
- Shin, Hyun Song, and Kwanho Shin. "Procyclicality and Monetary Aggregates," NBER working paper 16836, 2011.
- Zhang, Longmei, and Edda Zoli. "Leaning Against the Wind: Macroprudential Policy in Asia," IMF working paper 22, 2014.

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