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Working Paper

Central banking for financial stability in Asia

ADB Working Paper, No. 377

Provided in Cooperation with:

Asian Development Bank Institute (ADBI), Tokyo

Suggested Citation: Kawai, Masahiro; Morgan, Peter J. (2012) : Central banking for financial stability in Asia, ADB Working Paper, No. 377, Asian Development Bank Institute (ADBI), Tokyo

This Version is available at:

<https://hdl.handle.net/10419/101153>

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ADB Working Paper Series

Central Banking for Financial Stability
in Asia

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and Peter J. Morgan

No. 377
August 2012

Asian Development Bank Institute

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This paper also appeared as an article published in *Public Policy Review* 8 (4) September 2012.

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Suggested citation:

Kawai, M. and P. J. Morgan. 2012. Central Banking for Financial Stability in Asia. ADBI Working Paper 377. Tokyo: Asian Development Bank Institute. Available: <http://www.adbi.org/working-paper/2012/08/28/5221.central.banking.financial.stability.asia/>

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Abstract

A key lesson of the 2007–2009 global financial crisis (GFC) was the importance of containing systemic financial risk and the need for a “macroprudential” approach to surveillance and regulation that can identify system-wide risks and take appropriate actions to maintain financial stability. By virtue of their overview of the economy and the financial system and their responsibility for payments and settlement systems, there is a broad consensus that central banks should play a key role in monitoring and regulating financial stability. Emerging economies face additional challenges because of their underdeveloped financial systems and vulnerability to volatile international capital flows, especially “sudden stops” or reversals of capital inflows. This paper reviews the recent literature on this topic and identifies relevant lessons for central banks, especially those in Asia’s emerging economies.

Major topics discussed include the debate about the definition of financial stability, the consistency of a financial stability objective with the more traditional and well-established central bank objective of price stability, the appropriate governance structure for coordination of macroprudential policy with other financial supervisors and entities, and the appropriate policy instruments to achieve macroprudential policy objectives, including conventional, unconventional, and macroprudential tools. Finally, the paper considers issues involved with regional financial regulatory cooperation. Overall, the report concludes that the “lean versus clean” debate has been resolved largely in favor of the former, and that central banks should have a financial stability mandate and the policy tools to successfully pursue that mandate.

JEL Classification: E52, F31, G28

In this report, “\$” refers to US dollars.

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1. INTRODUCTION

A key lesson of the 2007–2009 global financial crisis (GFC) was the importance of containing systemic financial risk and the need for a “macroprudential” approach to surveillance and regulation that can identify system-wide risks and take appropriate actions to maintain financial stability. By virtue of their overview of the economy and the financial system and their responsibility for payments and settlement systems, there is a broad consensus that central banks should play a key role in monitoring and regulating financial stability. Nonetheless, there is wide debate about the definition of financial stability, the consistency of a financial stability objective with the more traditional and well-established central bank objective of price stability, the appropriate governance structure for coordination with other financial supervisors and entities, and the appropriate policy instruments for such policies.

Emerging economies face additional challenges because of their underdeveloped financial systems and vulnerability to volatile international capital flows, especially “sudden stops” or reversals of capital inflows. This paper reviews the recent literature on this topic and identifies relevant lessons for central banks, especially those in Asia’s emerging economies.

The paper is organized as follows. Section 2 examines the definition of financial stability and related definitions of systemic risk and macroprudential policy. Section 3 considers the compatibility of the objectives of financial stability and price stability for a central bank. Section 4 describes policies a central bank can use to manage financial stability. Section 5 describes the requirements of architectures for effective coordination of financial stability regulation in a situation with multiple supervisory bodies, both nationally and regionally. Section 6 concludes the paper.

2. FINANCIAL STABILITY AND MACROPRUDENTIAL POLICY

2.1 Financial Stability

The GFC has heightened the awareness of financial stability and the need for a macroprudential dimension to financial surveillance and regulation. The International Monetary Fund’s (IMF) analysis (IMF 2009) stated that “macroeconomic policies ... did not take into account building systemic risks” and that “a key failure during the boom was the inability to spot the big picture threat of a growing asset price bubble.” It is widely believed the United States (US) Federal Reserve underestimated the buildup of financial imbalances coming from housing price bubbles, high leverage of financial institutions, and interconnections among different segments of the financial market. In addition, Taylor (2009) argued that the Federal Reserve’s monetary policy stance was too easy, in that it kept the federal funds rate too low for too long, fueling the housing boom and other economic imbalances, although Bernanke (2010) disputed this view. The Federal Reserve appears to have assumed that, even if the asset price boom collapsed, the impacts on the financial system and the economy could be mitigated by lowering policy interest rates and adopting other complementary policy measures.

Several excellent reviews of what went wrong in financial regulation (Group of Thirty 2009; Brunnermeier et al. 2009; de Larosiere Group 2009) point to regulatory and supervisory deficiencies, including inadequate macroprudential supervision. Due to the propensity to focus on individual institutions (the traditional “microprudential” approach), supervisors around the world failed to recognize interconnections and links across financial firms, sectors, and markets due to the lack of a macroprudential approach. Supervisors only focused on their piece of the puzzle, overlooking the larger problem. Shin (2009) pointed out a fallacy of aggregation, that is, the fact that “mis-educated” supervisors and examiners were focused on individual institutions, without regard to the impact on the system.

Nonetheless, there is no generally agreed definition of financial stability, because financial systems are complex with multiple dimensions, institutions, products, and markets. Indeed, it is perhaps easier to describe financial instability than stability. The European Central Bank website defines financial stability as:

... a condition in which the financial system—comprising of financial intermediaries, markets and market infrastructures—is capable of withstanding shocks, thereby reducing the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities. (ECB 2012)

Further, the ECB defines three conditions associated with financial stability:

- (i) The financial system should be able to efficiently and smoothly transfer resources from savers to investors.
- (ii) Financial risks should be assessed and priced reasonably accurately and should also be relatively well managed.
- (iii) The financial system should be in such a condition that it can comfortably absorb financial and real economic surprises and shocks. (ECB 2012)

Perhaps the third condition is the most important, because the inability to absorb shocks can lead to a downward spiral whereby they are propagated through the system and become self-reinforcing, leading to a general financial crisis and broadly disrupting the financial intermediation mechanism.

Schinasi (2004: 8) proposes, at a more theoretical level:

A financial system is in a range of stability whenever it is capable of facilitating (rather than impeding) the performance of an economy, and of dissipating financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events.

Again, the emphasis is on resilience to shocks and a continued ability to effectively perform the basic function of mediating savings and investment (and consumption) in the real economy.

In a similar vein, threats to financial stability are considered to pose systemic risks. The Committee on the Global Financial System (CGFS 2010: 2) defines systemic risk as “a risk of disruption to financial services that is caused by an impairment of all or parts of the financial system and has the potential to have serious negative consequences for the real economy.”

2.2 Macprudential Policy

In turn, the aim of macroprudential supervision and regulation is to reduce systemic risk and preserve systemic financial stability by identifying vulnerabilities in a country's financial system and implementing policy actions to address those vulnerabilities in a timely manner to prevent a crisis. In contrast to microprudential supervision, which takes a "bottom-up" approach that focuses on the health and stability of individual financial firms, macroprudential supervision takes a "top-down" approach that focuses on the economy-wide system in which financial market players operate, and helps assess sources of risks and incentives. It requires the integration of detailed information on banks, nonbank financial firms, corporations, households, governments, and financial markets.

CGFS (2010: 2) notes more specifically that: "Preventative in its orientation, macroprudential policy is distinct from financial crisis management policy." Commentaries on macroprudential policy acknowledge that prevention of crises or economic boom-bust cycles may be too ambitious a goal. For example, CGFS (2010: 15) concludes that "[i]t is uncertain whether a more activist approach to operating the instruments would actually be effective in moderating the financial cycle." The key point is to increase the resilience of the financial system so that it can absorb losses from economic and other shocks while remaining viable. Nonetheless, a second and related aim of macroprudential policy is to limit the buildup of systemic risk by leaning against the financial cycle and thereby dampen its volatility (CGFS 2010). As part of this, it should work to reduce the procyclicality of the financial system and the regulatory framework.

Borio (2010) classifies macroprudential policy into two dimensions—time and cross-sectional. The first involves dealing with how aggregate risk in the financial system evolves over time. This is a response to the tendency toward procyclicality of the financial system as a result of positive feedbacks between the economy and financial system, the so-called macro-financial channel. The guiding principle for macroprudential policy in this case is to build up buffers in good times, as aggregate risk grows, so that they can be drawn down in bad times, as it materializes. The cross-sectional dimension involves dealing with how risk is allocated within the financial system as a result of common exposures and interlinkages in the financial system. In this case, the guiding principle for policy is to calibrate prudential tools with respect to the contribution of each institution to systemic risk, as well as to take steps to increase the transparency of such risks.

Similarly, the Group of 30 (2010: 7) defines the aim of macroprudential policy as "to enhance the resilience of the financial system and to dampen systemic risks that arise and propagate internally in the financial system through the interconnectedness of institutions by virtue of common exposure to shocks and the tendency of financial institutions to act in procyclical ways that magnify the extremes of the financial cycle."

2.3 Need for Stronger Macroprudential Policy in Asia

In Europe and the United States, undetected systemic risks before the GFC arose for several reasons, including widespread use of sophisticated derivative financial products to move risks around the system; the development of the unregulated shadow-banking system; excessive

reliance on wholesale funding by banks; under-capitalization of banks; and lack of understanding of the riskiness of innovative financial products. These factors on the whole did not apply to Asian financial systems during the crisis, and this helps to explain why those economies did not suffer financial crises and recovered relatively quickly. Moreover, in the aftermath of the 1997–1998 Asian financial crisis, Asian economies greatly strengthened their financial systems, reduced foreign debt, improved their monetary policy and financial regulatory frameworks, and moved toward greater currency flexibility.

Nonetheless, Asian economies need to strengthen their macroprudential policy frameworks for several reasons. First, although emerging Asia does not have much of the shadow-banking system that plagued the financial stability in developed economies, many financial institutions exist outside the formal banking system, including real estate finance companies and credit card companies. Finance companies triggered the Thai financial crisis and merchant banks were behind the Korean financial crisis, both in 1997. Asian economies have to be aware that regulatory gaps and balkanization could create risks to financial stability, and that new regulatory regimes need to be constructed that oversee the entire financial system in a broad and integrated manner. Asian financial systems also show signs of procyclicality, most notably in the close relation between bank lending, real estate cycles, and overall economic growth.

Perhaps most importantly, Asian economies are subject to large and volatile international capital flows. Capital inflows provide emerging market economies with invaluable benefits in pursuing economic development and growth as they enable them to finance needed investment, smooth consumption, diversify risks and expand economic opportunities. However, large capital flows, if not managed properly, can expose capital-recipient countries to at least three types of risks (Kawai and Takagi 2010):

- (i) Macroeconomic risk. Capital inflows could accelerate the growth of domestic credit, create economic overheating including inflation, and cause the real exchange rate to appreciate, thus threatening sustainable economic growth and price stability.
- (ii) Risk of financial instability. Capital inflows could create maturity and currency mismatches in the balance sheets of private sector debtors (particularly banks and corporations), push up equity and other asset prices, and potentially reduce the quality of assets, thereby contributing to greater financial fragility.
- (iii) Sudden stops and/or reversals of capital flows. Capital inflows could stop suddenly or even reverse themselves within a short period, resulting in rapid reserve decumulation or sharp currency depreciation.

The Asian financial crisis, as well as other emerging economy crises, highlighted the systemic risks associated with so-called “double-mismatches” associated with borrowing short term in foreign currencies and lending longer term in domestic currencies. It is noteworthy that about 15% of the large capital inflow episodes over the past 20 years ended in crisis, with emerging Asia experiencing proportionately more episodes of hard landings (Schadler 2010).

Closely related with this, Asian economies are exposed to activities of large global banks, which could become an issue if one or several such banks needed to be resolved. Finally, Asian financial systems are likely to increase in complexity as they develop, so that issues of market transparency and interconnectedness of financial firms are likely to become more relevant. Authorities need to continuously upgrade technical and analytical capacity to effectively regulate and supervise financial institutions and markets to promote financial innovation and stability.

3. ROLE OF A CENTRAL BANK IN FINANCIAL STABILITY

A country's central bank is well qualified to play a key role in monitoring and regulating financial stability from the point of view of its surveillance capacity and the policy tools at its disposal. This reflects its routine work of monitoring the macroeconomic developments and financial system conditions and its responsibility for overseeing payments and settlement systems. As described in more detail in Section 4, central banks have a number of policy tools that can affect financial stability, including monetary policy instruments and, in some cases, exchange rate management tools and macroprudential policy tools. These tools can be used both to prevent crises and to mitigate crises when they occur. Nonetheless, there is wide debate about the consistency of an objective of financial stability with the more traditional and well-established central bank objective of price stability. More broadly, the current debate focuses on the appropriate role of a central bank within a broad architecture of financial stability and macroprudential policy responsibility.¹ This section describes the issues related to central bank financial stability mandates and the current state of such mandates.

3.1 Financial Stability Mandate versus Price Stability Mandate

The debate has been lively about whether a central bank mandate for financial stability would conflict potentially with the more traditional mandate for price stability. Some studies concluded that targeting asset prices directly, as part of an augmented Taylor Rule, could be potentially destabilizing. For example, Bernanke and Gertler (2000: 46) argue that:

Given a strong commitment to stabilizing expected inflation, it is neither necessary nor desirable for monetary policy to respond to changes in asset prices, except to the extent that they help to forecast inflationary or deflationary pressures.

However, few proponents of a financial stability mandate actually propose targeting asset prices; instead they merely support taking asset price movements into account as a risk factor in setting monetary policy over a longer period of time. Cecchetti, Genberg, Lipsky, and Wadhwani (2000: xix) conclude that:

A central bank concerned with stabilizing inflation about a specific target level is likely to achieve superior performance by adjusting its policy instruments not only in response to its forecasts of future inflation and the output gap, but also to asset prices.

Similarly, Borio and Lowe (2002: 20) argue that:

...a slightly modified policy regime, under which the central bank responds not only to short-term inflation pressures but also, at least occasionally, to financial imbalances, may ultimately deliver a better combination of monetary and financial stability.

The crux of the matter is that an environment of low and stable inflation may be conducive to the development of financial imbalances, as low interest rates and profitable investment opportunities contribute to an increasing appetite for risk. This pattern was described in Minsky (1986), and has been emphasized by Borio and Lowe (2002), Borio and White (2004), and

¹ See Section 5 for a detailed discussion of financial stability architecture.

others. This implies that, in a period of low inflation, systemic imbalances are likely to appear first in the financial sector and later in the real sector with a significant lag. This also highlights the need for a longer-term time horizon for monetary policymaking.

This debate is closely related to the “lean versus clean” debate of whether it is preferable for the monetary authority to “prick” bubbles before they burst by “leaning against the wind,” or to wait until the bubble bursts, and then clean up the mess afterward via aggressive monetary policy easing. The “clean” school position was epitomized by former US Federal Reserve Chairman Alan Greenspan who offered four main reasons against leaning (Greenspan 2002). First, bubbles are hard to detect. To justify leaning against an asset-price bubble, a central bank must assume that it can identify when asset prices have deviated from fundamental values, which is almost impossible. Second, raising interest rates may be ineffective in restraining the bubble, because market participants expect higher rates of return from investing in bubble-driven assets. Third, there are many asset prices, and at any one time a price bubble may be present in only a fraction of assets, while monetary policy actions are a very blunt instrument that would likely affect all asset prices. Fourth, some theoretical models suggest that raising interest rates could cause a bubble to burst severely, thus damaging the economy. Equally important to the “clean” view is the belief that the monetary authorities have the tools to keep the harmful effects of a bursting bubble at a manageable level, as long as they respond in a timely fashion (Mishkin 2011).

However, the huge costs and lengthy recovery period following the global financial crisis due to the deleveraging process have severely undermined this argument. This experience highlights the potential risks of a “credit-driven” bubble and supports argument in favor of leaning, rather than cleaning, to prevent such bubbles.

The success of the Reserve Bank of Australia (RBA) in curbing a housing price bubble in 2002–2004 provides further support for the leaning school. As described in Bloxham, Kent, and Robson (2011), the RBA grew increasingly concerned about excessive lending in the housing sector in 2002 and 2003, and gradually raised interest rates, even though the outlook for inflation was benign. Although the RBA justified the tightening within the framework of inflation targeting, it repeatedly expressed concerns about high credit growth per se. The RBA also made frequent public announcements about its concerns to influence expectations. Bloxham, Kent, and Robson (2011) note that the RBA’s approach was not inconsistent with its forward-looking inflation-targeting framework, which allows for including the ability to account for potential risks to longer-term prospects even when near-term inflation pressures are contained. These moves were accompanied by tighter lending restrictions imposed by the Australian Prudential Regulatory Authority. Although there are methodological difficulties in identifying a clear link between these policies and the formation of housing prices, the fact that housing prices peaked in December 2003, at a time when housing bubbles elsewhere were gaining momentum, is strong circumstantial evidence in favor of a positive effect of such proactive policies.

As a result, the consensus has swung strongly in favor of a central bank paying close attention to financial stability and leaning against the wind, even if it is not an official part of their mandate. This is reflected in quotes by prominent central bank governors, including:

Ben Bernanke, US Federal Reserve (2009b): The Fed played a major part in arresting the crisis, and we should be seeking to preserve, not degrade, the institution's ability to foster financial stability and to promote economic recovery without inflation.

Jean-Claude Trichet, European Central Bank (2010): Responding to monetary and credit dynamics as part of a comprehensive assessment of the risks to price stability in the medium term implies that interest rate decisions will tend to “lean against” accumulating financial imbalances and asset price misalignments.

Masaaki Shirakawa, Bank of Japan (2011): In this regard, central banks use their unique institutional culture of looking at the system as a whole when analyzing the economy and financial markets through the conduct of monetary policy and various operations.

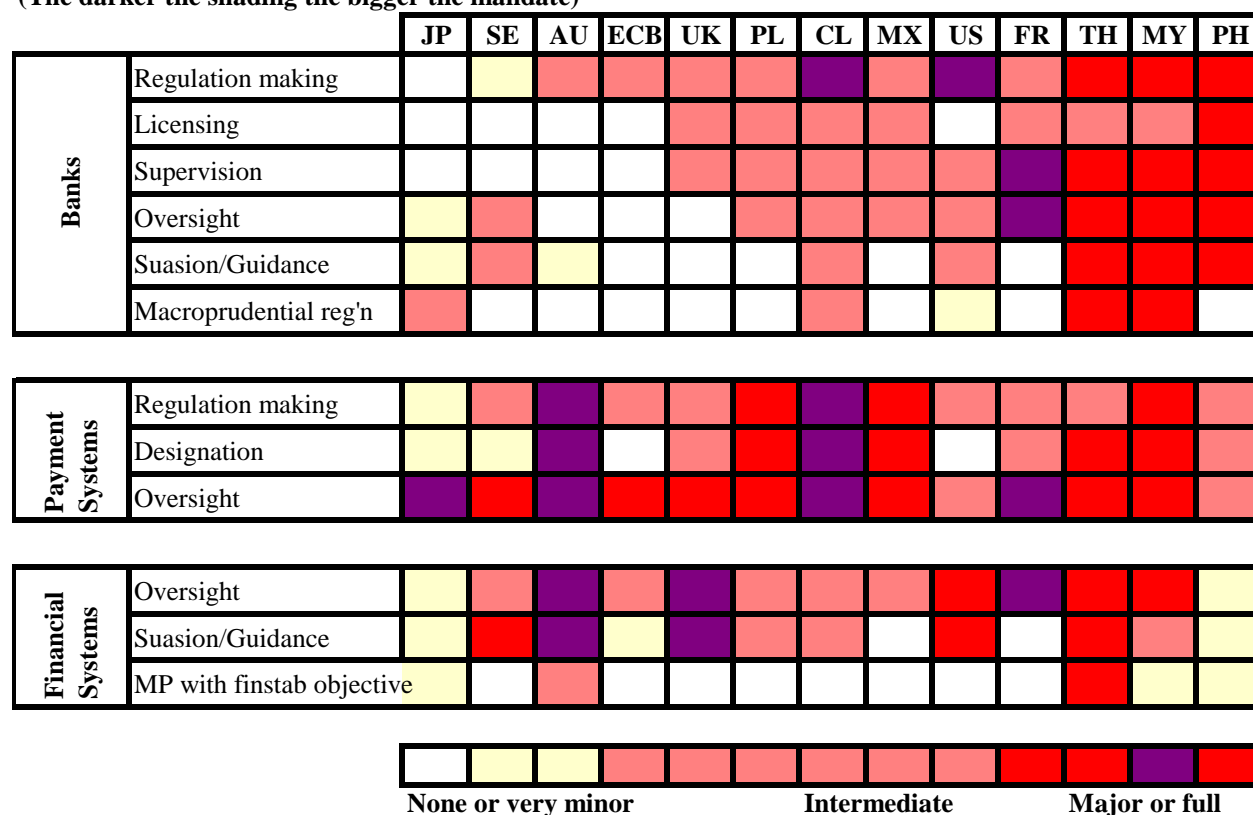
Mervyn King, Bank of England (2010:4): I welcome these new responsibilities. Monetary stability and financial stability are two sides of the same coin.

3.2 Current Situation of Central Bank Financial Stability Mandates

The specific responsibilities for financial stability vary widely across central banks. Figure 1 provides a good summary of financial stability mandates of a large number of central banks of advanced and emerging economies as of 2009, based on a survey of central banks by BIS (2011). A darker shade is associated with a stronger mandate. The survey divides mandates into three major areas: banking sector, payments system, and financial system. The mandate for the banking sector varies widely across countries. European central banks are generally very light in their banking sector responsibilities, while emerging economy central banks in Latin America and Asia have the strongest mandates, and Japan and the US fall in between. The mandate related to the payments system is broadly strong, reflecting the traditional responsibility of central banks in this area. For the financial system as a whole, relatively strong mandates are recognized for oversight and suasion and guidance, but few central banks have an explicit monetary policy mandate for financial stability. Interestingly, all central banks with such mandates are in Asia. The global financial crisis taught the lesson that the relative strength of financial stability mandates had a significant effect on the resilience of financial systems.

Figure 1: Financial Stability Related Mandates of Central Banks in 2009

(The darker the shading the bigger the mandate)



Notes: AU = Australia; CL = Chile; ECB = European Central Bank; FR = France; JP = Japan; MX = Mexico; MY = Malaysia; PH = Philippines; PL = Poland; SE = Sweden; TH = Thailand; UK = United Kingdom; US = United States;

Source: Adapted from Bank for International Settlements (2011).

The experience of the global financial crisis led to major legislative reforms in a number of developed economies that tended to significantly extend the responsibility of their central banks for financial stability. The United Kingdom (UK) saw perhaps the most far-reaching revamp and resulting increase in central bank responsibility. A new Financial Policy Committee (FPC) will have the responsibility to reduce risks to the financial system as a whole and will, among other things, be able to recommend changes to Prudential Regulatory Authority (PRA) and Financial Conduct Authority (FCA) policies and rules on a “comply or explain” basis. The FPC also has the power to direct the microprudential authorities to adjust specific macroprudential tools. The new PRA brings into the Bank of England responsibilities that previously rested with the Financial Services Agency. The PRA is responsible for the authorization, in conjunction with the FCA, and prudential supervision of individual deposit-taking firms (including banks, building societies, and credit unions), insurance companies (including friendly societies), and certain designated investment firms.

In the US, the Dodd-Frank legislation gave the Federal Reserve Board (Fed) new responsibilities including supervision of thrift holding companies as well as oversight of

nonbank financial firms and certain payment, clearing, and settlement utilities that the new Financial Stability Oversight Council (FSOC) designates as systemically important. To meet these responsibilities, the Fed created a new Large Institution Supervision Coordinating Committee that uses horizontal, or cross-firm, reviews to monitor industry practices, common investment or funding strategies, changes in the degree or form of financial interconnectedness, or other developments with implications for systemic risk. It also established the Office of Financial Stability Policy and Research to help monitor global financial risks and analyze the implications of those risks; serve as a liaison to the FSOC and its various working groups; and help develop and evaluate alternative approaches to implementing macroprudential regulations (Bernanke 2011).

In the euro area, the European Central Bank's (ECB) financial stability mandate has not changed, but the strong presence of the European System of Central Banks (ESCB), which includes the ECB, in the newly created European Systemic Risk Board (ESRB)² ensures that it will be able to exercise substantial influence over macroprudential policy.

4. HOW A CENTRAL BANK CAN HELP ACHIEVE FINANCIAL STABILITY

A central bank has a number of policy tools that can affect financial stability, including monetary policy instruments and, in some cases, exchange rate management tools and macroprudential policy tools. These tools can be used to prevent and mitigate crises. Monetary policy tools are ordinarily aimed at affecting the demand for and supply of money, primarily open market operations and reserve ratio requirements. In a crisis, the lender of last resort function of the central bank can simply be seen as an extreme version of open market operations. Macroprudential policy tools are aimed at reducing systemic financial risk, most typically by restraining bank credit growth.

However, there is a fair degree of confusion about the distinction between microprudential and macroprudential policy tools. For example, loan-to-value ratios were originally developed as microprudential tools to ensure viability at the level of an individual bank. But they have been employed as macroprudential tools to control the real estate cycle, rather than real estate exposure of particular banks in several economies, such as the People's Republic of China (PRC); Hong Kong, China; and the Republic of Korea (Korea). Therefore, whether or not a policy tool is regarded as microprudential or macroprudential has to be judged in terms of its broad objective, that is, whether it is used to promote the health of individual financial firms or to contain financial vulnerabilities in certain sectors such as the real estate sector. It should be clear that if loan-to-value ratios are modified in response to the regulator's perception of the risks of the credit cycle, they should be regarded as macroprudential policy tools.

² See Section 5.

4.1 Monetary Policy Tools

As described in Section 3, a central bank can use its normal monetary policy tools to “lean against the wind” to restrain the development of credit bubbles. In normal times, open market operations are typically conducted with sales of short-term government paper (a virtually riskless asset) for cash with the aim of raising the level of short-term money market rates.

If the economy falls into a liquidity trap with zero nominal short-term interest rates, and/or suffers seize-ups in particular markets that disrupt the normal financial intermediation process, then the central bank can resort to so-called “unconventional” measures.³ Open market operations can become unconventional ones if they broaden the types and maturities of assets to be purchased, the credit rating or equivalent metric of the assets, and the time horizon of the purchases. The objectives of such purchases can range from lowering long-term bond yields to easing freeze-ups of specific markets, such as those for interbank borrowing or asset-backed securities. Lender of last resort operations are just one example of this.

Descriptions of central bank balance sheet operations typically distinguish between quantitative easing and credit (or qualitative) easing—see for example, Bernanke and Reinhart (2004) and Borio and Disyatat (2009)—although the distinction in practice is not so clear-cut.⁴ The aim of quantitative easing is to expand the size of the central bank’s balance sheet by increasing the size of reserve deposits—current account balances—beyond the level that is required to bring the overnight funds rate to zero. Possible channels of impact of such a policy include (i) the permanent, positive effect on base money and money supply; (ii) the signaling effect of the central bank’s commitment to keep the policy interest rate low; and (iii) the portfolio balance effect of money supply increase, that is, the effect of inducing investors’ shift toward other assets due to the imperfect substitutability of money for other financial assets, thereby raising their value and stimulating final demand (Morgan 2012).

Credit (or qualitative) easing is aimed at changing the shares of various kinds of assets held by the private sector, with the expectation that this will lead to changes in their relative prices, and thereby stimulate real economic activity. For example, a central bank’s outright (permanent) purchases of long-term government bonds could be expected to reduce long-term bond yields, stimulate long-term investment and boost overall economic activity. A central bank’s direct lending to market participants could reduce credit market spreads and improve the functioning of private credit markets more generally, when the normal transmission mechanism breaks down. Like quantitative easing, credit (or qualitative) easing generally involves an increase in the size of a central bank’s balance sheet, but attempts to change the mix of assets, not the

³ Such measures are regarded as “unconventional” mainly relative to the standard practice during normal times of central banks in developed economies, which is almost exclusively to target the short-term money market interest rate by open market operations. Emerging market economies tend to use a broader range of operations much more regularly, as did developed economy central banks in earlier periods.

⁴ See Morgan (2012) for a more detailed discussion.

level of bank reserves (liabilities). Bernanke (2009a) provides a detailed description of the US Federal Reserve's credit easing measures.⁵

Table 1 shows that many central banks in developed economies pursued credit-easing policies during the GFC. These included policy measures aimed at influencing wholesale interbank markets, credit markets for commercial paper, etc., and broader financial conditions.

Table 1: Recent Examples of Credit Easing

Objective	Measures adopted	Fed	ECB	BoE	BoJ	BoC	RBA	SNB
(i) Influence wholesale interbank market conditions	Modification of discount window	X		X				
	Exceptional long-term operations	X	X	X	X	X	X	X
	Broadening of eligible collateral	X	X	X	X	X	X	X
	Broadening of counterparties	X		X	X	X	X	
	Inter-central bank FX swap lines	X	X	X	X	X	X	X
	Introducing or easing conditions for securities lending	X		X	X	X		
(ii) Influence credit markets	CP funding/purchase/collateral eligibility	X		X	X	X	X	
	ABS funding/purchase/collateral eligibility	X	X	X			X	
	Corporate bond funding/purchase/collateral			X	X	X		X
(iii) Influence broader financial conditions	Outright purchase of public sector securities	X		X	X			
	Outright purchase of other non-public sector securities				X			X

Notes: ABS = asset backed security; BoE = Bank of England; BoJ = Bank of Japan; CP = commercial paper; ECB = European Central Bank; Fed = US Federal Reserve; FX = foreign exchange; RBA = Reserve Bank of Australia; SNB = Swiss National Bank.

Sources: Morgan (2012). Adapted from BIS (2009).

In Asian emerging economies, unconventional measures were adopted by the Bank of Korea, the Monetary Authority of Singapore (MAS), the Reserve Bank of India (RBI), and the Central Bank of Taipei, China (CBC). Perhaps the most significant unconventional policy measures in the region outside Japan have been those involving provision of foreign currency liquidity by central banks via the Fed swap arrangements to offset the shortage of US dollars arising from capital outflows.⁶

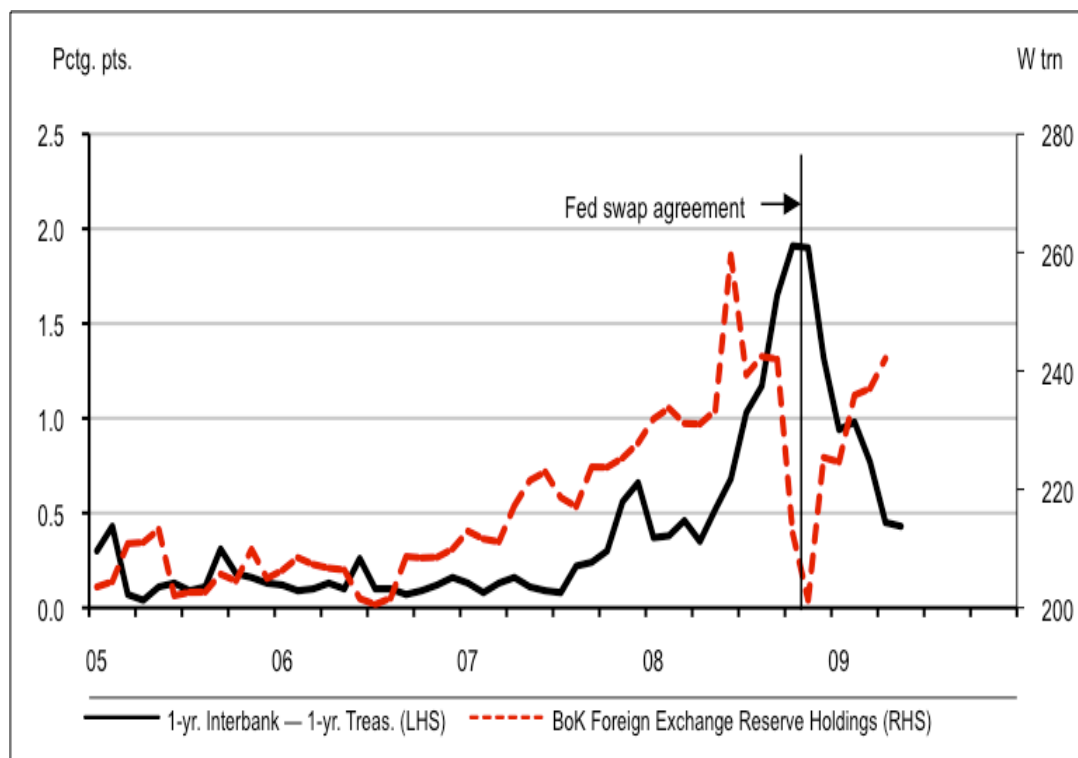
For example, the Fed and the Bank of Korea announced the implementation of a \$30 billion swap agreement on 29 October 2008. This appears to have been effective in easing the shortage of dollar funds in the Korean market. Figure 2 shows that the spread between the Korean one-year interbank rate and the one-year Treasury bill rate, a measure of banking sector credit risk, spiked upward from mid-2008 when the Bank of Korea's foreign exchange

⁵ Although the Fed's large-scale outright purchasing operations of Treasury bonds, agency bonds and mortgage backed securities in 2009 and 2010 were widely referred to as "quantitative easing" (QE1 and QE2, respectively), the Fed has not described them as such, instead referring to them as credit easing measures.

⁶ There is debate about whether such measures can be regarded as unconventional or not.

reserve holdings (mainly US Treasuries) dropped sharply. However, once the foreign reserve holdings began to rise again in December, as a result of the loan by the Fed, the spread shrank rapidly again. The Bank of Korea drew roughly half of the Fed's swap line, and total foreign exchange reserve holdings rose by 40.8 trillion won (roughly \$29 billion) during that period. The Bank of Korea also expanded its won-yen swap agreement with the Bank of Japan from \$3 billion equivalent to \$20 billion equivalent, and established a won-yuan swap with the People's Bank of China of up to 180 billion yuan, although it did not make use of these.

Figure 2: Korean Money Market Spreads and Bank of Korea Foreign Exchange Reserve Holdings



Note: BoK = Bank of Korea; LHS = left-hand side; RHS = right-hand side.

Sources: CEIC Data Co. Ltd. Database (accessed 15 September 2009); Morgan (2012).

The Bank of Korea took a number of other unconventional actions, including broadening the list of eligible counterparties and collateral for repurchase operations, providing funding support to those financial firms which contribute to the Bond Market Stabilization Fund, and providing funding support to the Bank Recapitalization Fund in order to facilitate banks' expansion of their equity capital (Bank of Korea 2009a). It also contributed funds to the Korea Credit Guarantee Fund to enable it to offer payment guarantees for the principal and interest of the loans (up to 10 trillion won) provided to the fund through the Korea Development Bank, expanded the range of firms qualified for foreign currency loans secured by export bills from small and medium-sized enterprises to all enterprises to encourage foreign and domestic banks in Korea to finance export trade (Bank of Korea 2009b).

The MAS was the only other central bank in the region aside from the Bank of Japan, the Bank of Korea, and the RBA to establish such a swap line with the Fed. However, the MAS did not make use of the swap line, so any impact on spreads was only the result of expectations of possible use.

The RBI adopted several unconventional measures aimed at increasing the availability of rupee and foreign currency liquidity. Measures aimed at expanding rupee liquidity included a special repo window under the liquidity adjustment facility for banks for lending to mutual funds, non-bank financial companies, and housing finance companies, and a special refinance facility that banks can access without any collateral. The RBI also set up a special purpose vehicle to provide liquidity support to non-banking financial companies (RBI 2009). However, the degree of unconventionality of these measures was modest.

The Central Bank of Taipei, China also adopted a number of unconventional measures in September and October 2008, including expanding the eligible counterparties for its repo operations; extending the term of such operations from 30 days to 180 days; expanding eligible collateral to include certificates of deposit; and linking the interest rates on central bank reserve deposits to market rates (CBC 2008a; 2008b). These operations seem to have been effective in reducing interbank spreads relative to policy rates by about 30–40 basis points during that period.

Central banks can also attempt to influence market expectations by making announcements about the expected trend of future monetary policy. A large volume of literature has developed around what generally is referred to as the “commitment” or “policy duration” effect. The basic idea is simple—even though a central bank may set the very short-term rate, normally the overnight interbank rate, at zero, the market still has considerable uncertainty about the future development of monetary policy. This is reflected in the yield curve, since longer-term rates essentially reflect the market’s expected future path of short-term rates plus a risk premium. Therefore, if a central bank can persuade the market that it will keep the policy rate lower than the market would expect otherwise, this should cause longer-term rates to fall, thereby stimulating the economy. This type of policy has been analyzed theoretically by a number of authors, including Svensson (2001) and Eggertsson and Woodford (2003).

4.2 Currency and Capital Flow Management

Capital inflows provide emerging market economies with substantial potential benefits in pursuing economic development but, if not managed properly, can expose recipient countries to macroeconomic risks, financial instability, and sudden stops and/or reversals of capital flows. A central bank’s management of the exchange rate and capital flows can play a key role in reducing such volatile and potentially destabilizing capital flows.

Sterilized intervention has been the favorite tool applied by many emerging Asian economies to prevent nominal exchange rate appreciation and economic overheating. Between 2000 and 2007, intervention in the foreign exchange market was unidirectional, that is, purchasing the US dollar to prevent domestic currency appreciation against the dollar, leading to large buildups of foreign exchange reserves across the region. Such interventions had to be sterilized to prevent overheating of the economy. Continuous foreign reserve accumulation cannot be sustained for a long time and, hence, should stop by allowing greater exchange rate flexibility in times of surges in capital inflows. The challenge is to make this an attractive policy

option for the region's authorities. Allowing one's currency to appreciate in response to significant capital inflows is desirable for better macroeconomic and financial-sector outcomes—from the perspective of containing domestic inflationary pressure and incipient asset price bubbles and reducing financial sector vulnerability—as it can lessen the need to accumulate foreign exchange reserves, allow more prudent monetary policymaking, and set the ground for facilitating external adjustment.⁷

In addition to sterilized intervention aimed at stabilizing exchange rates, capital controls are a common tool for limiting capital inflows in emerging market economies.⁸ Countries that have substantially liberalized their capital account, market-based controls—such as the Chilean unremunerated reserve requirement imposed on capital inflows—have been the predominant option in recent years.⁹ However, designing and implementing capital inflow controls is not easy. Administering capital controls requires highly competent country regulatory authorities as they must constantly watch for unwanted flows—often disguised—entering through various channels. For these economies, returning to draconian capital controls or recreating a system of extensive administrative controls is no longer a viable option. Table 2 shows recent capital control measures adopted in Asia.

Table 2: Recent Measures to Influence Capital Inflows in Asia

PRC: Closed capital account
2002: QFII introduced
2006: QDII limits introduced
2011: RQFII introduced
Indonesia
2010: One-month holding period on SBIs (central bank notes)
Korea
2010: Limits on FX derivative contracts on domestic banks (50% of capital) and foreign banks (250%)
2011: 'Macroprudential stability levy' on non-core foreign currency liabilities
Taipei, China
2009: Prohibited use of time deposits by foreign funds
2010: One-week deadline for money to be invested or repatriated
Thailand
2006: Unremunerated reserve requirements (30%) on loans, bonds, mutual funds, swaps and non-resident Baht accounts.
2008: Limits on commercial bank net foreign currency exposure.
2010: 15% withholding tax on capital gains and interest income on foreign bonds

⁷ However, exchange rate appreciation, if pursued unilaterally, could damage international price competitiveness of the countries concerned.

⁸ In Ostry et al (2010), however, tools aimed at controlling large capital inflows that may fuel domestic credit booms are not seen as macroprudential tools per se but rather as measures that can buttress prudential regulations.

⁹ Brazil imposed a tax on fixed-income and equity inflows in October 2009 in response to surges in capital inflows and, in the following month, imposed another tax on certain trades to prevent circumvention.

Note: FX= foreign exchange; PRC = People's Republic of China.

Source: Authors' compilation based on central bank reports and news reports.

Other measures aimed at restraining capital inflows include limits on open foreign exchange positions and constraints on the type of foreign currency assets, or market-based regulations designed to reduce the incentives for capital inflows. These kinds of measures are desirable in that they do not distinguish between local and foreign investors. Regarding currency exposure risks, Korea, the Philippines, and Thailand set foreign currency exposure limits, while India, Malaysia, and the Philippines set limits on currency mismatches. In 2008 the Bank of Thailand set the limit on commercial banks for net open position for each currency at 15% of banking capital or \$5 million, and set the limit for aggregate currency position at 20% of banking capital, or \$10 million. In August 2011, Korea implemented a “macroprudential stability levy” on non-core foreign currency liabilities, to curb excessive increases in foreign currency liabilities of financial institutions.

4.3 Macroprudential Policy Tools

Some central banks also have macroprudential powers to promote financial stability by virtue of having responsibility for supervising the banking sector. This enables them to restrain the buildup of financial imbalances by using tools such as loan-to-value ratios, debt-service-to-income ratios, credit exposure limits on specific sectors (especially real estate), and limits on loan growth, among others. Some of these tools tend to be time-invariant, while others can be altered in a discretionary way according to the authorities' assessment of the economic and financial situation. Many macroprudential tools have been developed for use as microprudential tools (loan-to-value ratios, exposure limits, among others.) at a bank level, but can be adapted to macroprudential used by calibrating them in relation to the macro-financial cycle. If central banks do not have such powers, they must try to work with the supervisory agencies having those powers if they believe it is necessary to have them implemented.

Sector-targeted macroprudential tools are used to restrict bank lending and other financial activity during boom periods. They generally aim to limit the tendency for a self-perpetuating cycle between asset values and credit growth to lead to an unsustainable asset bubble. Measures include loan and underwriting standards, loan-to-value ratios, debt-service-to-income ratios, caps on credit growth, and exposure limits. Table 3 provides a summary of macroprudential measures in Asia.

Table 3: Asian Experience with Macroprudential Tools

Objective	Tools	Examples
Manage aggregate risk over time (procyclicality)	Countercyclical provisioning	PRC; India
	Loan-to-value ratios	PRC; Hong Kong, China; Indonesia; Japan; Korea; Malaysia; Philippines; Singapore; Thailand
	Debt-service-to-income ratios	PRC; Hong Kong, China; Korea
	Tighter lending criteria	PRC; Hong Kong, China; Korea; Malaysia; Philippines; Singapore; Thailand
	Credit limits	PRC; Hong Kong, China; India
	Tighter supervision	PRC; Hong Kong, China; India; Korea; Malaysia; Singapore
	Capital requirements	India; Malaysia
	Exposure limits on lending to specific sectors	Korea; Malaysia; Philippines; Singapore
Manage aggregate risk at every point in time (systemic oversight)	Capital surcharges for systemically important banks	PRC; India; Philippines; Singapore
	Liquidity and funding requirements	PRC; India; Korea; Malaysia; Philippines; Singapore; Thailand
	Loan-to-deposit requirements	PRC; Korea
	FX exposure limits	Korea; Philippines
	Limits on currency mismatches	India; Malaysia; Philippines

Notes: FX = foreign exchange; PRC = People's Republic of China.

Sources: CGFC (2010); Lamberte, Manlagñit, and Pratedwannahij (2010); Sheng (2010).

Loan-to-value (LTV) ratios cap the percentage of the value of an asset that can be financed by a bank loan, thereby ensuring an adequate cushion of collateral value for the loan in case it should sour. These are typically used to cool lending to residential and commercial property markets. A description of issues related to them can be found in Borio, Furfine, and Lowe (2001). Table 3 suggests that LTV ratios are the most commonly used macroprudential policy measure in the region. Some countries impose LTV ratios all the time, while others impose them only as needed. Table 4 shows the normal levels of LTVs for property lending used in a number of countries, typically either 70% or 80%. Gerlach and Peng (2005) studied the use of LTVs in Hong Kong, China and found them to be effective in increasing the resilience of the banking sector.

Table 4: Caps on Loan-to-value (LTV) Ratios for Property Lending in Asia

Country	Max LTV Ratio New Loans (%)	Typical Loan Term (Years)	Mortgage Rate
Hong Kong, China	70	20	ARM
Indonesia	80	15 (max 20)	ARM
Japan	80	20 - 30	ARM
Korea, Rep. of	70	3 - 20	ARM
Malaysia	80	30	ARM
Philippines	70	10 - 20	ARM
PRC	80	10 - 15 (max 30)	ARM
Singapore	80	30 - 35	ARM
Thailand	80	10 - 20 (max 30)	ARM

Notes: ARM = adjustable rate mortgage; PRC = People's Republic of China.

Source: Lamberte, Manlagnit, and Pratedwannakij (2010).

Debt-service-to-income ratios enforce minimum levels of the expected ability of borrowers to service debt, providing another cap on excessive lending. Their use in Asia is more limited than that of LTV ratios, as they have been implemented only in the PRC; Hong Kong, China; and Korea. This probably partly reflects difficulties in obtaining and verifying income data in other countries. Typically they have been implemented along with LTV ratios.

Tighter lending criteria allow regulators to order financial institutions to restrain credit growth. This can take a variety of forms. For example, in 2010, the Hong Kong Monetary Authority instructed lenders to set their mortgage rates 0.7 ppt above the one-month Hang Seng interbank offered rate (HIBOR) to prevent interest price competition from eroding banks' profit margins and potentially the stability of the financial system (BBA 2010). Other possibilities include maximum loan sizes, minimum repayment terms (for credit cards) and restrictions on subprime loans. Such measures have been used in the PRC; Hong Kong, China; Malaysia; the Philippines; Singapore; and Thailand.

Credit limits cap the overall rate of loan growth, and have been used in the PRC; Hong Kong, China; and India. However, the limits in the PRC frequently have not been closely enforced.

Tighter supervision is amorphous, but includes actions such as supervisory letters to encourage prudence in residential property lending, advice to limit to industry average the ratio of property-related lending to total loans, advice to limit the growth rate of residential mortgages relative to nominal GDP, encouraging banks to coordinate information on exposures, and monitoring exposures to systemically important institutions. This has been employed mainly in the PRC; Hong Kong, China; India; Korea; Malaysia; and Singapore.

Exposure limits restrain the credit exposure of financial firms to particular sectors and firms, or to foreign currencies and/or maturity mismatches. They are intended to limit the degree of risk in banks' balance sheets, or restrict the buildup of risk in the targeted sector in the case of sectoral limits particularly for the property sector. Most countries in the region, except the PRC, Indonesia, and Japan, have employed these limits. Korea and the Philippines impose limits on foreign currency exposures, while India, Malaysia, and the Philippines have limits on maturity mismatches.

Leverage requirements have been introduced as part of the Basel Committee on Banking Supervision reform proposals as many financial firms proved to be highly over-leveraged in the period leading to the global financial crisis. The Basel Committee proposes to test a minimum Tier 1 leverage ratio of 3%, including both on- and off-balance sheet exposures and derivatives. While the consensus is strong to base the leverage ratio on the new definition of Tier 1 capital, the committee also will track the impact of using total capital and tangible common equity (BCBS 2010). No Asian economies employ such leverage requirements, although, as described below, some employ maximum loan-to-deposit ratios to limit liquidity risk.

Capital surcharges set higher risk weights for loans to systemically important financial institutions, thereby requiring larger amounts of capital. The PRC, India, the Philippines, and Singapore have imposed capital surcharges on exposures to systemically important financial institutions.

Liquidity and funding requirements have been adopted by the PRC, India, Korea, Malaysia, the Philippines, Singapore, and Thailand for prudential purposes. The most common way is by adjusting the required reserve ratio. India in 2008 also set a mandatory requirement that 25% of liabilities be held in government securities as a solvency and liquidity buffer. Only three countries have required maximum **loan-to-deposit ratios**—the PRC, Korea, and the Philippines. The ratio for the PRC and the Philippines is 75%, while Korea introduced a ratio of 100% in 2010, with a grace period until 2013 for implementation. However, most other Asian countries have loan-to-deposit ratios well below 100%, so there does not appear to be a pressing need for strengthening such a requirement in most cases.

4.4 Resolution Capacity

Aside from monetary and macroprudential policy tools, perhaps the most important tool in a financial crisis is the ability to smoothly resolve systemically important financial institutions (SIFIs) that become insolvent without disrupting the overall financial system. The domino-like impacts from the collapse of Lehman Brothers in September 2008 highlighted the importance of such a function. The resolution powers, if they exist, may or may not rest with the central bank. If they do not, however, there needs to be a mechanism for close coordination between the central bank and other agencies involved in resolution procedures.¹⁰ These are discussed further in Section 5. In the US, the Federal Reserve had powers to resolve large banks, but the Dodd-Frank legislation extended this authority to cover non-bank SIFIs as well.

Of course, the decision to extend lender of last resort finance to an ailing institution versus resolving it depends largely on whether the institution is judged to be illiquid or insolvent, which is always difficult to determine quickly in the heat of a crisis when timely and adequate information may be lacking. This highlights the need to have well-defined procedures in place for communicating information and making decisions in such a situation, as discussed in Section 5.

¹⁰ FSB (2011) contains a detailed description of the desired features of a comprehensive resolution regime for SIFIs.

5. ARCHITECTURE FOR FINANCIAL STABILITY

The experience of the global financial crisis shows the need for a strong systemic stability regulator that can make objective assessments of the financial situation and take pre-emptive actions where needed (Kawai and Pomerleano 2012). However, responsibilities for financial stability frequently are divided among multiple entities, mainly central banks and financial regulators. Moreover, other policymakers need to be involved in decision-making as well, especially the finance ministry, since it is responsible for committing public funds in the case of resolution, and the deposit insurance agency, which often has responsibility for bank resolution. An effective structure for systemic stability regulation must ensure adequate sharing of information and good coordination of decision-making and policy implementation.

5.1 Key Components of a Systemic Stability Regulator

Kawai and Pomerleano (2012) argue that countries should establish an effective, powerful systemic stability regulator that is in charge of crisis prevention, management, and resolution. Using the methodology first presented by Carmichael and Pomerleano (2002) to address the role of a systemic stability regulator, they highlight the importance of the following four components:

- (i) **Clarity of objectives and mandates:** what the stability regulator expects to achieve.
- (ii) **Adequate resources:** the political backing, legal support, and human and financial resources to enable the stability regulator to carry out its objectives and mandates effectively.
- (iii) **Strong implementation powers:** the instruments, tools, and techniques that the stability regulator uses to achieve its objectives.
- (iv) **Effective structure and organization:** the organizational structure of the stability regulator that is able to perform the delegated financial stability responsibilities in the most effective way.

The relationship between such a systemic stability regulator in charge of macroprudential policy and a central bank charged with traditional monetary policy is an important issue. To achieve both price stability and financial stability, there have to be at least two policy instruments, that is, monetary policy and macroprudential policy. However, in practice it is often questionable to what extent macroprudential policy tools can be wielded independently of monetary policy. If monetary conditions are easy and investments attractive, market participants may try to evade specific macroprudential regulations and make investments by alternative means, and their ability to evade such regulations tends to increase over time. This suggests that both monetary and macroprudential policies should aim in the same direction.

5.2 Possible Modes of a Financial Stability Regulator

Various possible modes of architecture exist for a financial stability regulator. First, a fully consolidated stability regulator, combining all the functions of central banking, financial supervision and regulation, and treasury—as in the case of Singapore—could be the ideal arrangement from the perspective of maintaining financial stability. This option would require a powerful national agency in charge of systemic stability regulation, capturing all the macroprudential functions, resolution authorities and monetary policymaking. However, because of the importance of central bank independence, this model is not a realistic option for many developed countries.

The second option would be for a central bank to play the systemic stability regulator function by taking over macroprudential supervisory and regulatory powers. As noted above, a central bank has the best overall perspective on a country's macroeconomic and financial conditions. However, if a central bank has focused on price stability and acquires a new mandate of maintaining financial stability, it faces a challenge of executing the new responsibility as this requires much broader expertise and culture than traditional central banking. This arrangement could also expose a central bank to the risk of political interventions once the eruption of a crisis requires management and resolution policies, and could interfere with its mandate for price stability.

The third option would be to establish a coordinated systemic stability regulatory council, comprising the finance minister, the central bank governor and the head(s) of national financial supervisors. An independent, powerful working group that supports this council, may be chaired by a reputable expert and include finance and central bank deputies, deputy head(s) of supervisors, and other relevant parties as active members, with authority to engage in crisis prevention, management, and resolution. The working group would provide recommendations for policy actions to the council, which would make the ultimate decision. A country's central bank should continue to conduct independent monetary policymaking while taking into account the decisions made by the council; it may assume a secretariat role, given its usual advantages in analysis of macro-financial surveillance for systemic stability. A key requirement is for full sharing of information, though this often proves to be the weak link of council-like arrangements in practice. This point strongly suggests that the central bank should have direct access to financial system data and monitoring, and at least some supervisory responsibility would be very helpful for this purpose.

Table 5 summarizes the architectural arrangements for financial stability in a number of advanced and emerging economies. In the UK, the Bank of England has overarching responsibility for financial stability, so it falls into the second class above, while the others have a council-like structure. The US has by far the biggest number of participants, reflecting the large number of industry-specific regulators. Other countries typically have three or four entities in the structure. Since most of these structures are fairly new, they have yet to be tested, but the variety of architectural arrangements should provide interesting empirical evidence over time.

Table 5: Examples of Financial Stability Architecture

	Coordinating entity	Entities included	Chair	Sub-entities	Designate macroprudential instruments
National					
Australia	Council of Financial Regulators	RBA, APRA, ASIC, Treasury	RBA	None	?
India	Financial Stability and Development Council	MoF, RBI, SEBI, IRDA	Finance Minister	Subcommittee (chaired by RBI)	No
Indonesia	Financial System Stability Forum	MoF, BI, IDIC	MoF	Steering Committee (7 members of Executive Board)	No
Japan	Informal meeting	MoF, BoJ, FSA	?	None	?
Korea	Informal meeting	MSF, BoK, FSS	?	None	?
UK	Bank of England, MOU between PRA and FCA	BoE, FCA	N/A	None	Yes
US	Financial Stability Oversight Council	Treasury, Fed, SEC, Commodity Futures Trading Commission, Office of the Comptroller of the Currency, FHFA, National Credit Union Administration, FDIC	Treasury	None	Yes
Regional					
EU	European Systemic Risk Board	European System of Central Banks, national financial supervisory authorities, ECB, EC, three ESAs and EFC.	President of ECB (General Board)	Steering Committee (14 members of General Board)	Yes

Notes: APRA = Australian Prudential Regulatory Authority; ASIC = Australian Securities and Investments Commission; BoE = Bank of England; BoJ = Bank of Japan; BoK= Bank of Korea; EC = European Commission; ECB = European Central Bank; EFC = Economic and Financial Committee; ESA = European Supervisory Authority; EU = European Union; FCA = Financial Conduct Authority; FDIC = Federal Deposit and Insurance Corporation; Fed = US Federal Reserve; FHFA = Federal Housing and Finance Agency; FSA = Financial Supervisory Agency; FSS = Financial Supervisory Service; IDIC = Indonesia Deposit and Insurance Corporation; IRDA = Insurance Regulatory and Development Authority; MoF = Ministry of Finance; MOU = memorandum of understanding; MSF = Ministry of Strategy and Finance; PRA = Prudential Regulatory Authority; RBA = Reserve Bank of Australia; RBI = Reserve Bank of India; SEBI = Securities and Exchange Board of India; SEC = Securities and Exchange Commission; UK= United Kingdom; US = United States.

Source: Authors' compilation.

5.3 Regional Cooperation

The discussion so far has dealt with macroprudential policy in a single country, but the experiences of the Asian financial crisis, the global financial crisis, and the euro area financial crisis show that such crises can be contagious, transmitted by volatile capital flows within a region. Therefore, regional perspectives on systemic risk regulation are needed as well. This is particularly so when global systemically important financial institutions are involved.

The European Union (EU) has by far the most developed regional-level financial supervision framework. In the wake of the euro area financial crisis, there has been an intensive discussion on the need to create a banking union. This reflects the reality that banking activities in the EU (especially the euro area) are highly integrated and that, to maintain regional financial stability, a region-wide approach would be needed. The idea is to create a region-wide system for common bank supervision and regulation, deposit insurance, and bank resolution. Pisani-Ferry et al. (2012) argue that such a system should ideally cover all banks within the countries included; supervisory authority should be granted either to both the ECB and/or a new agency; a European resolution authority should be established, with the possibility of drawing on European Stability Mechanism resources; and, eventually, a fully centralized deposit insurance system. Moreover, a banking union would require at least implicit European fiscal backing. There is also a discussion that the European Central Bank should acquire the authority of overseeing SIFIs as in the case of the US Fed.

Within Asia, existing policy dialogue processes include the ASEAN+3¹¹ meeting for finance ministers and the Executives' Meeting of East Asia-Pacific Central Banks for central bank governors. From 2012 central bank governors will join the ASEAN+3 finance ministers meeting for the Economic Review and Policy Dialogue, whereas only deputy governors had attended previously. However, the development of an Asian Financial Stability Dialogue (AFSD), as proposed by Kuroda (2008), could enhance communication about common risk factors and possibly lead to coordinated actions to reduce systemic risks. The AFSD would include finance ministries, central banks, financial supervisors, and deposit insurance companies.

At the global level, the International Monetary Fund and Financial Stability Board (FSB) can assist in assessing risk, while the newly-formed ASEAN+3 Macroeconomic Research Office, which is the surveillance arm of the Chiang Mai Initiative Multilateralization and the economic review and policy dialogue, could be a counterpart of the IMF and the AFSD could become the regional counterpart to the FSB.

There is no doubt that Asia needs an effective mechanism of intensive policy dialogue and cooperation. The existing policy dialogue processes among the region's finance ministers described above can play a critical role in fostering the establishment of such a mechanism, but the development of an AFSD could provide a more complete platform for such cooperation.

¹¹ Ten member nations of the Association of South East Asian Nations plus the PRC, Japan, and Korea.

6. CONCLUSIONS

The global financial crisis highlighted the problem that surveillance and regulation of system-wide financial stability was inadequate in many countries in the pre-crisis period. The dimensions of systemic risk in both procyclicality of the financial system and interconnectedness of various financial institutions and markets were not adequately appreciated, nor was the need for a macroprudential perspective on such risks. Moreover, when responsibility for financial supervision was divided among central banks and financial supervisors, most countries lacked an adequate architecture to ensure coordinated surveillance, analysis, information sharing, and policy actions.

Defining financial stability is not an easy task because it has multiple dimensions and is related to complex financial systems. But this should not lessen the need to do so. Crucial aspects of the definition include the need for the financial system to be resilient with respect to internal and external shocks, and to be able to avoid self-reinforcing negative spirals of asset price declines and credit contractions that can fundamentally disrupt the normal functioning of the financial system to mediate savings and investment in the economy. The definitions of systemic financial risk and macroprudential policy also flow from this perspective.

Central banks' overview of the macroeconomic developments and financial system conditions, together with their oversight of payment and settlement systems, gives them a unique perspective on system-wide financial stability. The case is strong for central banks to have an explicit mandate for financial stability. Although there may be short-term conflicts between the traditional central bank objective of price stability and that of financial stability, in the medium and long term, these objectives should be largely consistent with each other because development of a financial crisis during periods of price stability will eventually lead to deflation and economic downturn. This does not imply that central banks should target asset prices directly, but they need to take a proactive approach to identify when credit cycles may lead to a buildup of systemic risk, and take pre-emptive actions to reduce such risks. Moreover, the debate about "leaning" versus "cleaning" seems to have been resolved in favor of the former, in view of the large costs associated with recent financial crises in terms of fiscal cost and losses of economic output and employment.

Central banks have various tools to support financial stability, including standard and "unconventional" monetary policy tools, currency market intervention tools, and, in some cases, supervisory authority and macroprudential tools. These can be used to help prevent crises by dampening the credit cycle and strengthening banks and other financial firms to ensure that they are adequately capitalized and reserved to be able to ride out systemic shocks. If a crisis strikes, then central banks can resort to the conventional measures of lowering the policy interest rate and, if such measures prove inadequate, resort to a range of unconventional measures including commitment effects, quantitative easing and credit easing. This includes the key central bank role of lender of last resort. Adequate infrastructure for resolution of insolvent SIFIs is also necessary. Coordination is needed between monetary and macroprudential policies to reduce the incentive of market participants to evade specific rules.

Systemic stability regulation needs to involve all major players, including the central banks, financial supervisors, finance ministries, and deposit insurance agencies. It is important to ensure consistency of such regulation with the price stability objective. A variety of organizational structures exist for systemic stability regulation, but they all require clear

regulatory objectives and mandates, sufficient regulatory resources and powers, adequate information flow, and effective regulatory implementation tools. Putting in place a resolution framework for SIFIs is particularly important. Specifically, the central bank needs to have direct access to financial sector information. Finally, regional institutions such as an Asian Financial Stability Dialogue can contribute to sharing information and coordinating policies in a region that is subject to volatile capital movements and where financial contagion can easily develop.

REFERENCES

- Bank for International Settlements (BIS). 2009. *BIS Quarterly Review*. June.
- . 2011. Central Bank Governance and Financial Stability: A Report by a Study Group. Basel: Bank for International Settlements.
- Bank of Korea. 2009a. Financial Stability Report. No. 13. 28 April.
- . 2009b. Press Release. The BOK to Expand Range of Those Qualified for Loans Secured by Export Bills Purchased. 2 January.
- Basel Committee on Banking Supervision (BCBS). 2010. The Basel Committee's response to the Financial Crisis: Report to the G20. Basel: Bank for International Settlements. October.
- Bernanke, B. 2009a. Federal Reserve Policies to Ease Credit and Their Implications for the Fed's Balance Sheet. Speech to the National Press Club, Washington, DC. 18 February.
www.federalreserve.gov/newsevents/speech/bernanke20090218a.htm
- . 2009b. The Right Reform for the Fed. Washington Post. 29 November.
www.washingtonpost.com/wp-dyn/content/article/2009/11/27/AR2009112702322.html
- . 2010. Monetary Policy and the Housing Bubble. Speech at the Annual Meeting of the American Economic Association, Atlanta, Georgia. 3 January.
www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm
- . 2011. Implementing a Macroprudential Approach to Supervision and Regulation. Speech at the Federal Reserve Bank of Chicago 47th Annual Conference on Bank Structure and Competition. Chicago, Illinois. 5 May.
www.federalreserve.gov/newsevents/speech/bernanke20110505a.pdf
- Bernanke, B. and M. Gertler. 2000. Monetary Policy and Asset Price Volatility. NBER Working Paper 7559. Cambridge, MA: National Bureau of Economic Research.
- Bernanke, B. and V. R. Reinhart. 2004. Conducting Monetary Policy at Very Low Short-Term Interest Rates. *American Economic Review*. 94 (2): 85–90.
- Bloxham, P., C. Kent and M. Robson. 2011. Asset Prices, Credit Growth, Monetary and Other Policies: An Australian Case Study. NBER Working Paper 16485. Cambridge, MA: National Bureau of Economic Research.
- Borio, C. 2010. Implementing a Macroprudential Framework: Blending Boldness and Realism. Basel: Bank for International Settlements.

- Borio, C. and P. Disyatat. 2009. Unconventional Monetary Policies: An Appraisal. BIS Working Papers 292. Basel, Switzerland: Bank for International Settlements.
- Borio, C., C. Furfine and P. Lowe. 2001. Procyclicality of the Financial System and Financial Stability: Issues and Policy Options. BIS Papers No 1. Basel: Bank for International Settlements.
- Borio, C., and P. Lowe. 2002. Asset Prices Financial and Monetary Stability: Exploring the Nexus. BIS Working Papers 114. Basel, Switzerland: Bank for International Settlements.
- Borio, C. and W. White. 2004. Whither Monetary and Financial Stability? The Implications of Evolving Policy Regimes. BIS Working Papers 147. Basel, Switzerland: Bank for International Settlements.
- British Bankers' Association (BBA). 2010. A Possible Macro-prudential Approach. London: British Bankers' Association.
- Brunnermeier, M., A. Crockett, C. Goodhart, A. Persaud, and H. S. Shin. 2009. *The Fundamental Principles of Financial Regulation*. Geneva and London: International Center for Monetary and Banking Studies, and Centre for Economic Policy Research, London.
- Carmichael, J. and M. Pomerleano. 2002. *The Development and Regulation of Non-bank Financial Institutions*. Washington, DC: World Bank.
- Cecchetti, S., H. Genberg, J. Lipsky and S. Wadhvani. 2000. Asset Prices and *Central Bank Policy*. Geneva Report on the World Economy 2. London: Centre for Economic Policy Research and International Center for Monetary and Banking Studies.
- Central Bank of Taipei, China. 2008a. Monetary Policy Decisions of the Executive Directors Meeting. 25 September.
www.cbc.gov.tw/ct.asp?xItem=32637&ctNode=448&mp=2
- . 2008b. Monetary Policy Decisions of the Executive Directors Meeting. 30 October.
www.cbc.gov.tw/ct.asp?xItem=33012&ctNode=448&mp=2
- Committee on the Global Financial System (CGFS). 2010. Macroprudential Instruments and Frameworks: A Stocktaking of Issues and Experiences. CGFS Papers No. 38. Basel: Bank for International Settlements.
- de Larosiere Group. 2009. Report on Financial Supervision: High-Level Group on Financial Supervision in the EU (February).
www.ec.europa.eu/internal_market/finances/docs/de_larosiere_report_en.pdf.
- Eggertsson, G. B. and M. Woodford. 2003. The Zero Bound on Interest Rates and Optimal Monetary Policy. *Brookings Papers on Economic Activity*. 1 (2003): 139–233.

- European Central Bank. 2012. *Financial Stability Review. What is Financial Stability?* Frankfurt: European Central Bank.
www.ecb.int/pub/fsr/html/index.en.html
- Financial Stability Board. 2011. Key Attributes of Effective Resolution Regimes for Financial Institutions. Basel: Bank for International Settlements.
www.financialstabilityboard.org/publications/r_111104cc.pdf
- Gerlach, S. and W. Peng. 2005. Bank Lending and Property Prices in Hong Kong. *Journal of Banking and Finance*, 29 (2, February): 461–481.
- Goodfriend, M. 2000. Overcoming the Zero Bound on Interest Rate Policy. *Journal of Money, Credit and Banking* 32: 1007–1035.
- Greenspan, A. 2002. Opening Remarks. In *Rethinking Stabilization Policy. A Symposium sponsored by the Federal Reserve Bank of Kansas City, Kansas City, US.* 1–10.
- Group of Thirty. 2009. *Financial Reform: A Framework for Financial Stability.* Washington, DC.
www.group30/pubs/reformreport.pdf
- . 2010. *Enhancing Financial Stability and Resilience: Macroprudential Policy, Tools, and Systems for the Future.* Washington, DC. Group of Thirty.
- International Monetary Fund (IMF). 2009. *Initial Lessons of the Crisis for the Global Architecture and the IMF.* Prepared by the Strategy, Policy, and Review Department. Washington, DC: IMF.
www.imf.org/external/np/pp/eng/2009/021809.pdf
- Kawai, M. 2008. Toward a Regional Exchange Rate Regime in East Asia. *Pacific Economic Review*. 13 (1 February): 83–103.
- Kawai, M. and M. Pomerleano. 2012. Strengthening Systemic Financial Regulation. In M. Kawai, D. Mayes, and P. Morgan, eds. *The Implications of the Global Financial Crisis for Financial Reform and Regulation in Asia.* Cheltenham, UK: Edward Elgar Publishing. pp. 29–49.
- Kawai, M. and S. Takagi. 2010. A Survey of the Literature on Managing Capital Inflows. In M. Kawai and M. B. Lamberte, eds. *Managing Capital Flows: The Search for a Framework.* Cheltenham, UK: Edward Elgar Publishing. pp. 46–72.
- King, M. 2010. Speech at the Lord Mayor's Banquet for Bankers and Merchants of the City of London at the Mansion House. London: Bank of England. 16 June.
www.bankofengland.co.uk/publications/Documents/speeches/2010/speech437.pdf

- Kuroda, H. 2008. Asia's Contribution to Global Development and Stability, Speech at the ADBI Annual Conference, Tokyo, Japan. 5 December.
www.adbi.org/files/speech.2008.12.05.closing.remarks.kuruda.adbi.annual.meeting.2008.pdf
- Lamberte, M., M. Manlagnit, and K. Pratedwannakij. 2010. Financial Supervision and Regulation for Postcrisis Asia. Presented at the PECC, SINCPEC and ADBI Conference. Towards Balanced and Sustainable Growth Strategies for Post-Crisis Asia: A Shifting Paradigm and Challenges. Singapore. 16 August.
- Minsky, H. 1986. *Stabilizing an Unstable Economy*. New Haven, CT: Yale University Press.
- Mishkin, F. 2011. How Should Central Banks Respond to Asset-Price Bubbles? The 'Lean' versus 'Clean' Debate After the GFC. *Reserve Bank of Australia Bulletin* June Quarter: 59–69.
- Morgan, P. 2012. The Role and Effectiveness of Unconventional Monetary Policy. In M. Kawai, P. Morgan, and S. Takagi, eds. *Monetary and Currency Policy Management in Asia*. Cheltenham, UK: Edward Elgar. pp. 27–63.
- Ostry, J., M. Chamon, A. Ghosh, K. Habermeier, M. Qureshi, and D. Reinhardt. 2010. Capital Inflows: The Role of Controls. IMF Staff Position Notes. SPN/10/04. Washington, DC: International Monetary Fund.
- Pisani-Ferry, J., A. Sapir, N. Véron and G. Wolff. 2012. What Kind of European Banking Union? Brussels: Breugel.
www.bruegel.org/publications/publication-detail/publication/731-what-kind-of-european-banking-union/
- Reserve Bank of India. 2009. Third quarter review of RBI monetary policy 2008-09, Press Statement by Dr. D. Subbarao, Governor, 27 January. http://www.banknetindia.com/banking/3qreview09_press.htm .
- Schadler, S. 2010. Managing Large Capital Inflows: Taking Stock of International Experiences. In M. Kawai, and M. B. Lamberte, eds. *Managing Capital Flows: The Search for a Framework*. Cheltenham, UK: Edward Elgar. pp. 105–128.
- Schinasi, G. 2004. Defining Financial Stability. IMF Working Paper WP/04/187. Washington, DC: International Monetary Fund.
<http://cdi.mecon.gov.ar/biblio/docelec/fmi/wp/wp04187.pdf>
- Shin, H.S. 2009. It is Time for a Reappraisal of the Basic Principles of Financial Regulation. Vox web site, 31 January. <http://www.voxeu.org/article/financial-regulation-built-sand-today-s-microprudential-regulation-rules-need-macroprudential-complements>

- Shirakawa, M. 2011. How to Address Tail Risks. Speech at Annual General Meeting 2011 of the Foreign Bankers' Association in the Netherlands. 27 June.
www.boj.or.jp/en/announcements/press/koen_2011/ko110628a.htm/
- Svensson, L. E. O. 2001. The Zero Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap. *Monetary and Economic Studies*. 19 (S-1): 277–312.
- Taylor, J. B. 2009. *Getting off Track: How Government Actions and Interventions Caused, Prolonged, and Worsened the Financial Crisis*. Stanford, CA: Hoover Institution Press.
- Trichet, J-C. 2010. Lessons Drawn from the Crisis. Speech at 150th Anniversary of the Central Bank of the Russian Federation High-Level International Conference on Central Banks and Development of the World Economy: New Challenges and a Look Ahead. Moscow. 18 June.
www.ecb.int/press/key/date/2010/html/sp100618.en.html (accessed 21 April 2011).