

SM/13/145
Correction 2

September 3, 2013

To: Members of the Executive Board

From: The Secretary

Subject: **Key Aspects of Macprudential Policy**

The attached corrections to SM/13/145 (6/11/13) have been provided by the staff:

Factual Errors Not Affecting the Presentation of Staff's Analysis or Views

Page 4, Glossary, line 8: for "Committee for the Global Financial System"
read "Committee on the Global Financial System"

Page 4, Glossary, line 22: for "Financial Stability Oversight Committee"
read "Financial Stability Oversight Council"

Page 6, para. 5, line 3: for "International Settlements (BIS), FSB, Committee"
read "International Settlements (BIS), Financial Stability Board (FSB), Committee"

Page 6, para. 5, line 3: for "Committee for the Global Financial System"
read "Committee on the Global Financial System..."

Page 19, para. 47, line 3: for "that it can be activated to increase the resilience of the framework to a whole range of shocks."
read "that it can be activated to increase the resilience of the system to a whole range of shocks."

Page 26, para. 69, line 2: for "information on "Other financial corporations," where typically"
read "information on "Other financial corporations" (OFCs), where typically"

Page 26, footnote 39: for "Data on the balance sheets of other financial corporations (OFCs) are available"
read "Data on the balance sheets of OFCs are available"

Page 28, footnote 41, line 2: for "Financial Stability Oversight Committee (FSOC) in the U.S."
read "Financial Stability Oversight Council (FSOC) in the U.S."

Page 46, para. 115, bullet 3, line 3: for "Moreover, the FSOC chaired by"
read "Moreover, the Financial Stability Oversight Committee chaired by"

Page 46, footnote 54, line 2: for "Financial Stability Commission."
read "Financial Stability Committee."

Page 51, footnote 60, line 1: for "Korea also implemented caps on loan-to-deposits ratio (2009) to shift banks' funding structure away from wholesale funding and ceilings on banks' FX derivative positions (2010 and 2011)."
read "Korea also implemented caps on the loan-to-deposits ratio (2012) to shift banks' funding structure away from wholesale funding and ceilings on banks' FX derivative positions (2010, 2011 and 2012)."

Page 51, footnote 60, line 5: for "percent in January 2013. Combining it with the levy"
read "percent in December 2012. Combining them with the levy"

Typographical Errors

Executive Summary, fifth bullet, line 3: for "differences in the phase of financial cycles and conflicts"
read "differences in the phase of financial cycles, and conflicts"

Page 4, Glossary, line 37: for "SDSS" read "SDDS"

Page 10, footnote 11: for "See further (IMF 2013a), Blanchard and others (2013) and Stein (2013)."
read "See further IMF 2013a, Blanchard and others (2013), and Stein (2013)."

Page 21, para. 50, line 2: for "(Perotti and Suarez, 2010; Shin, 2010a, Huang and Ratnovski, 2011)"
read "(Perotti and Suarez, 2010; Shin, 2010a; Huang and Ratnovski, 2011)"

Page 25, para. 64, fourth bullet, line 4: for "others, 2011, FSB 2012)."
read "others, 2011; FSB 2012)."

Page 26, para. 70, line 8: for "SDSS" read "SDDS"

Page 28, para. 76, line 8: for "However, soft powers alone are unlike to be sufficient"
read "However, soft powers alone are unlikely to be sufficient"

Page 29, para. 81, line 2: for "(IMF, 2011a; Nier and others, 2011; IMF, 2013a, Viñals, 2011)."
read "(IMF, 2011a; Nier and others, 2011; IMF, 2013a; Viñals, 2011)."

Page 37, para. 111, line 3: for "SDSS" read "SDDS"

Page 46, first bullet, line 6: for "Ministry of Finance" read "ministry of finance"

Page 46, first bullet, line 7: for “Financial Market Stabilization Agency”
read “financial market stabilization agency”

Page 49, para. 116, line 5: for “Moreover, it is worth noting that that simulation results”
read “Moreover, it is worth noting that simulation results”

Page 50, para. 118, line 1: for “Table 2 and Figure 8 shows” read “Table 2 and Figure 8 show”

Page 51, para. 120, first bullet, line 1: for “Korea adopted MSL as a macroprudential tool”
read “Korea adopted the MSL as a macroprudential tool”

Page 52, first bullet, line 1: for “The introduction of a minimum CFR in New Zealand has contributed to sharp shift away”
read “The introduction of a minimum CFR in New Zealand has contributed to a sharp shift away”

Page 54, para. 124, line 2: for “price growth to probability”
read “price growth to the probability”

Page 54, para. 125, line 8: for “point credit-to GDP growth” read “point credit-to-GDP growth”

Page 56, para. 129, first bullet, line 3: for “lines of credit are off-balance sheet item”
read “lines of credit are an off-balance sheet item”

Page 56, para. 130, first bullet: for “by placing limits on and off-balance sheet items”
read “by placing limits on on-balance and off-balance sheet items”

Page 56, para. 130, third bullet, line 2: for “Moreover, the new regulatory regime”
read “Moreover, a new regulatory regime”

Page 57, para. 130, fourth bullet, line 3: for “Dodd-Frank Act’s “skin-in-the-game” credit risk retention requirement will be the major reform”
read “Dodd-Frank Act’s “skin-in-the-game” credit risk retention requirement will be a major reform”

Page 58, para. 131, line 3: for “November 2009 the G-20 economies requested the IMF and FSB recommend data enhancements”
read “November 2009 the G-20 economies requested the IMF and FSB to recommend data enhancements”

Page 60, para. 139, line 5: for “with some twelve G-SIFIs deriving more than half of their revenues outside”
read “with some twelve G-SIFIs deriving more than half of their revenues from outside”

Page 61, para. 141, line 2: for "According to the reciprocity principle, however, the home supervisor"

read "According to the reciprocity principle the home supervisor"

Questions may be referred to Mr. Nier, MCM (ext. 34483).

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KEY ASPECTS OF MACROPRUDENTIAL POLICY

June 10, 2013

EXECUTIVE SUMMARY

The crisis has underscored the costs of systemic instability at both the national and the global levels and highlighted the need for dedicated macroprudential policies to achieve financial stability. Building on recent advances, this paper provides a framework to inform the IMF's country-specific advice on macroprudential policy. It recognizes that developing macroprudential policy is a work in progress, and addresses key issues to help ensure its effectiveness.

- The goals and scope of macroprudential policy need to be defined clearly. Macroprudential policy should aim to contain systemic vulnerabilities, and not be overburdened with objectives that it is unsuited to achieve.
- To achieve its goals, macroprudential policy must be supported by strong supervision and enforcement and complemented by appropriate monetary, fiscal and other financial sector policies. In turn, effective macroprudential policy can help these other policies achieve their goals.
- Effective macroprudential policy requires the ability to assess systemic risk, assemble and deploy the toolkit, monitor and close regulatory gaps, and close data and information gaps. While principles and practice can be established in each of these areas, much further work remains.
- Strong institutional and governance frameworks are essential for the effective conduct of macroprudential policy. They can benefit from an appropriate strength of powers and clear accountability. The central bank needs to play an important role, even if the precise arrangements are driven by the political economy and traditions.
- Cross-border implications of macroprudential policies call for international coordination. Such multilateral issues can arise from a lack of national action, differences in the phase of financial cycles, and conflicts between home and host authorities of cross-border financial institutions. A range of mechanisms are available to address these problems, but coordination will remain challenging in practice.

The Fund can play a key role, through its bilateral and multilateral surveillance and in collaboration with standard setters and country authorities, to help ensure the effective use of macroprudential policy for domestic and global stability.

Approved By
José Viñals

Prepared under the guidance of Jan Brockmeijer, by a team led by Erlend Nier and Jacek Osiński (MCM), comprising Jessica Allison, Chikako Baba, Johannes Ehrentaud, Yitae Kim, Heedon Kang, Ivo Krznar, Srobona Mitra and Tomas Mondino (all MCM), in collaboration with Ruud De Mooij and Michael Keen (FAD), Lev Ratnovski (RES), Shuntaro Hara, Manju Ismael, Vanessa Le Lesle and Alison Stuart (SPR), and Andrew Kitili and Elena Loukoianova (STA).

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Glossary

ACE	Allowance for Corporate Equity
AE	Advanced Economy
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BoE	Bank of England
CCB	Countercyclical Capital Buffer
CESEE	Central, eastern, and southeastern Europe
CGFS	Committee for <u>on</u> the Global Financial System
CFMs	Capital Flow Management Measures
CFR	Core Funding Ratio
DGI	Data Gaps Initiative
D-SIBs	Domestic Systemically Important Banks
DTI	Debt-to-Income
EME	Emerging Market Economy
ESRB	European Systemic Risk Board
EWE	Early Warning Exercise
FCA	Financial Conduct Authority
FDIC	Federal Deposit Insurance Corporation
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
FSC	Financial Stability Contribution
FSOC	Financial Stability Oversight Committee <u>Council</u>
FPC	Financial Policy Committee
FX	Foreign Exchange
GFSR	Global Financial Stability Report
G-SIFI	Global Systemically Important Financial Institution
G-20	Group of 20
IAG	Inter-Agency Group
ISD	Integrated Surveillance Decision
LTV	Loan-to-Value
MSL	Macroprudential Stability Levy
MoF	Ministry of Finance
NSFR	Net Stable Funding Ratio
OECD	Organization for Economic Cooperation and Development
OFCs	Other financial corporations
PRA	Prudential Regulation Authority
SD DSS	Special Data Dissemination Standard
WEO	World Economic Outlook

INTRODUCTION

This paper aims to strengthen the basis for practical guidance and country-specific advice in the field of macroprudential policy, through surveillance and technical assistance. It builds on and extends the paper on an “Organizing Framework for Macroprudential Policy” (April 2011), distills lessons from further work since then, and offers further analysis of key issues arising in ensuring the effectiveness of macroprudential policy.

- 1. The crisis has shown that systemic risks need to be contained by dedicated financial policies.** The crisis has fostered a recognition that systemic risks can grow under the surface of apparent economic tranquility. Financial stability need not therefore emerge as a natural by-product of an appropriate macroeconomic policy mix. Rather, achieving the objective of financial stability requires dedicated macroprudential policies.
- 2. Macroprudential policy is needed to achieve the stability of the system as a whole.** Macroprudential policies can build-on, but are not the same as traditional microprudential policies. The traditional focus on idiosyncratic risks and the solidity of individual institutions needs to be complemented by a system-wide perspective as both macro-financial linkages and interconnections within the financial system can give rise to systemic risk.
- 3. While increasing use is made of macroprudential policy, it remains work in progress.** Macroprudential policies have been used with some success in a number of mostly emerging market economies (EMEs) well before the most recent crisis, and often in response to earlier crisis episodes. And while use of macroprudential policy tools is growing rapidly, and many countries are striving to build appropriate institutional underpinnings for such policies (Annex I), the macroprudential policy framework remains work in progress to date.¹
- 4. The objective of the paper is to help ensure that macroprudential policy can make an effective contribution to domestic and global stability.** In line with the Financial Surveillance Strategy (IMF 2012a) the paper is intended to contribute to a better understanding of the interactions between macroprudential, macroeconomic and other financial and regulatory policies, the effectiveness of macroprudential policies, and their potential costs and side effects, as well as the institutional arrangements to assure adequate governance and accountability of macroprudential policy. In so doing the paper aims to provide a framework that can guide the Fund’s country-specific advice. The paper finally contributes by examining the multilateral aspects of macroprudential policy and sets out the role of the Fund in this regard.
- 5. The paper draws on work undertaken over the past two years.** It builds on and extends the paper on the “Organizing Framework for Macroprudential Policy” (IMF, 2011a). In addition to a range of staff policy and research papers produced since then, the paper also draws on insights

¹ The background paper provides detail on the use of macroprudential policy tools across countries. Advances in institutional arrangements underpinning macroprudential policy were also surveyed in Nier and others (2011).

gained in the context of technical assistance, surveillance and Financial Sector Assessment Programs (FSAPs) over the past two years. It also takes account of ideas developed elsewhere (Bank for International Settlements (BIS), [Financial Stability Board \(FSB\)](#), Committee ~~for~~ [on](#) the Global Financial System (CGFS), country authorities, and academia), and has benefited from discussion with a select group of external experts in the field of macroprudential policy.²

6. The paper addresses key issues that need to be considered to ensure that macroprudential policy can work effectively. It first recalls the definition and sets out the scope of macroprudential policy (Section II). It then discusses:

- interactions of macroprudential policy with other public policy areas (Section III);
- operationalizing macroprudential policy (Section IV);
- institutional and governance frameworks (Section V); and
- multilateral aspects of macroprudential policy (Section VI).

7. The paper recognizes that developing macroprudential policy will remain work in progress in the years to come. Throughout, the paper highlights challenges and limitations of macroprudential policy, which are summarized in Section VII. The paper finally sets out the role of the Fund, in partnership with the FSB and national authorities, to help ensure that macroprudential policy can be pursued effectively in support of domestic and global stability (Section VII).

MACROPRUDENTIAL POLICY—DEFINITION AND SCOPE

This section recalls the definition of macroprudential policy offered in previous Board papers (IMF, 2011a), and develops the appropriate scope of macroprudential policy, drawing on a number of further studies. In doing so, it also aims to clarify that the pursuit of a number of other public policy objectives is not necessarily “macroprudential.”

8. Macroprudential policy has been defined as the use of primarily prudential tools to limit systemic risk.³ 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.⁴

9. The rationale for macroprudential intervention rests on the presence of three sets of systemic externalities. These arise through: (i) the tendency of the financial system to amplify

² IMF staff would like to thank Markus Brunnermeier, E Philip Davis, Ilan Goldfajn, Lex Hoogduin, Anil Kashyap, Donald Kohn, Sir Andrew Large, Nicholas Le Pan, David Longworth, and David Strachan for their valuable comments and suggestions.

³ See IMF (2011a) and FSB, IMF, and BIS (2011).

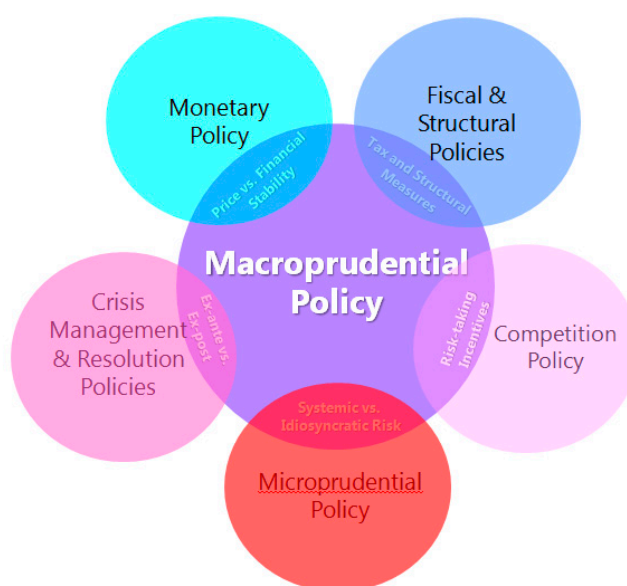
⁴ See IMF, FSB and BIS (2009).

confused with ‘credit policies’ that subsidize credit for particular sectors of the economy, or other structural policies that can affect the composition of demand. In short, for macroprudential policy to work well, it needs well-defined objectives and should not be co-opted for other purposes.

RELATIONSHIP WITH OTHER POLICIES

Financial stability is affected by a range of policies other than macroprudential policies, both ex ante and ex post. This section sets out the range of these effects across these other policies and discusses the interactions that arise, recognizing that the precise nature and strength of interactions may vary across these other policy fields and with country-specific circumstances (Figure 1).⁹

Figure 1. Relationship between Macroprudential and Other Policies



Source: IMF staff.

A. Monetary Policy

19. Strong complementarities and interactions between monetary and macroprudential policies reinforce the need for a strong macroprudential framework. Complementarities explain why central banks have a strong interest in ensuring the effective pursuit of macroprudential policy and are often at the forefront in the push for the establishment of macroprudential frameworks. Interactions also call for some degree of coordination between monetary and macroprudential policies, while preserving the established independence and credibility of monetary policy.

⁹ There may also be interactions between these other policies, such as between competition and resolution policies and between monetary and fiscal policy. However, these are beyond the scope of the present paper.

20. As set out in IMF (2013a), even when monetary policy is set consistent with price stability, the resulting monetary stance may have undesirable side effects for financial stability.

- Where low policy rates are consistent with low inflation, they may still contribute to excessive credit growth and the build-up of asset bubbles and sow the seeds of financial instability.
- In small open economies, increases in interest rates may be necessary in the face of inflationary shocks, but can draw in capital flows that may contribute to excessive financial risks. Conversely, the need for interest cuts to counter subdued domestic demand may lead to large capital outflows that can jeopardize domestic financial stability.

21. Where there is a strong macroprudential policy framework, this can reduce conflicts and create more room for maneuver for monetary policy to pursue price stability.¹⁰ Where macroprudential policy is assigned an appropriate range of tools, it will be better able to address undesired side effects of monetary policy at their source. This can help alleviate conflicts in the pursuit of monetary policy and reduce the burden on monetary policy to ‘lean against’ adverse financial developments, thereby creating greater room for maneuver for the monetary authority to pursue price stability. However, since macroprudential cannot be expected to be fully effective, the conduct of monetary policy needs also to take account of financial stability considerations.¹¹

22. Moreover, to the extent that macroprudential policy reduces systemic risks and creates buffers, this helps the task of monetary policy in the face of adverse financial shocks. It can reduce the risk that monetary policy runs into constraints in the face of adverse financial shocks, such as the zero lower bound—recently hit by many advanced economies—or the risk of strong outflows associated with cuts in interest rates in small open economies.

B. Fiscal and Structural Policies

23. Appropriate fiscal and structural policies are critical to reduce the likelihood of macroeconomic shocks. The build-up of systemic risk can be driven strongly by macroeconomic imbalances—internal or external—and distortions that affect the composition of output.

- Where a consumption boom is fed by capital inflows in the presence of persistent current account deficits, macroprudential policies alone are unlikely to be effective at controlling these underlying forces and prudent fiscal and structural policies are needed to contain these imbalances.
- The crisis also showed that prudent fiscal policies are essential to maintain the safety of sovereign debt and to avoid adverse feedback loops between sovereign risk and the financial system.

¹⁰ Further discussion, evidence, and case studies are provided in IMF (2013b).

¹¹ See further IMF (2013a), Blanchard and others (2013), and Stein (2013).

impact of systemic risk events. As such, they may not provide sufficient comfort to policymakers. Further progress is needed in the following areas:

- **Early warning.** The forward-looking properties of systemic risk measures are generally weak, even though some measures appear relatively promising, such as combinations of credit-to-GDP and asset valuation measures.
- **Thresholds.** Policymakers need clear and reliable signals indicating when to “worry” and when to take action, and allowing them to monitor the impact of such action over time. For example, empirical evidence suggests that when credit and property prices grow beyond certain levels the probability of a financial crisis over 2 to 3 years increases considerably (Annex IV). Despite recent progress, further work is needed in this area.
- **System’s behavior.** The capacity to model the system’s behavior is limited in several areas, including endogenous responses to the materialization of aggregate shocks, such as feedback and multi-round effects, and nonlinear risk correlations during periods of financial distress.

B. Selecting and Assembling the Macroprudential Toolkit

45. The authorities need to select and assemble a set of macroprudential instruments that can help address the key potential sources and dimensions of systemic risk. Since the manifestations of systemic risk can depend on country-characteristics, no specific set of tools can readily be identified as “best practice.” Equally, since risks can build-up rapidly, and acquiring and implementing new tools takes time, there is merit in considering and introducing a range of tools ex ante. Interlocking use of several tools can help overcome the shortcomings of any one single tool and enable the policymaker to adjust the overall policy response to a range of risk profiles, thereby promoting the effectiveness and efficiency of the policy response.

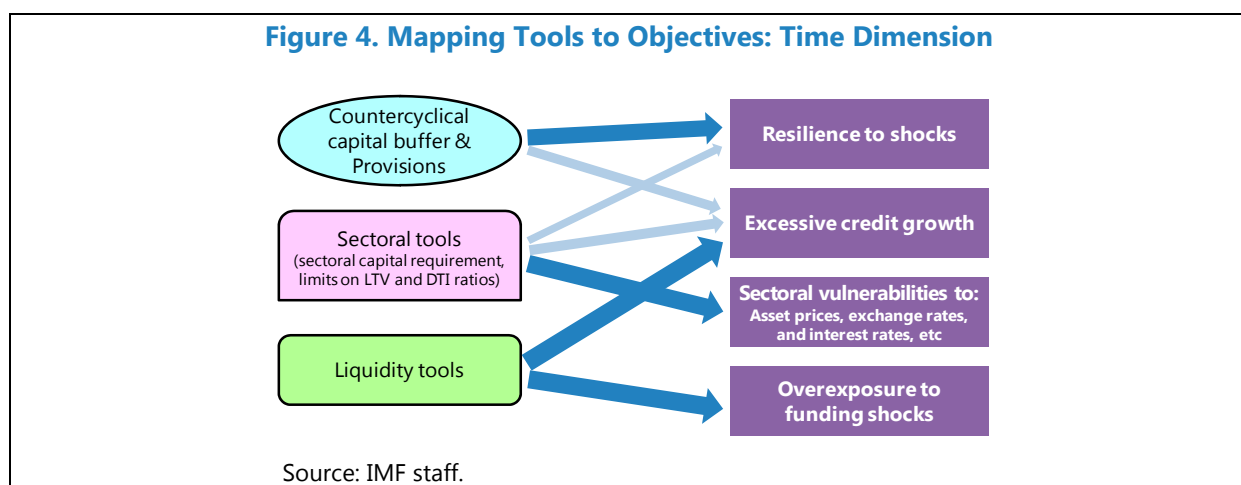
46. In the time dimension, consideration should be given to three sets of tools (Figure 4): (i) countercyclical capital buffers and provisions, to increase resilience to shocks; (ii) sectoral tools, to contain a build-up of risks in particular sectors; and (iii) liquidity tools, to contain funding risks. These three sets of tools can reinforce and complement each other in addressing the build-up of risks through time.

47. Countercyclical capital buffers and provisions. The countercyclical capital buffer (CCB) will be available in many countries through implementation of Basel III.²⁸ The advantage of the CCB is that it can be activated to increase the resilience of the framework-system to a whole range of shocks. The release of the buffer is expected to avoid credit crunch effects by reducing the pressure on banks to deleverage in times of financial stress.²⁹ While experience with these tools is still to be gained,

²⁸ The requirement will be phased in gradually from 2016 to 2019. However, countries may consider an accelerated phase in. Early adopters include China, New Zealand, Switzerland and the U.K. See further the background paper.

²⁹ Jiménez and others (2012) show that the effects of varying dynamic provisions on credit in Spain were much stronger in crisis times than they were ahead of the crisis, providing evidence of the effectiveness of dynamic provisioning in buffering shocks.

simulation exercises suggest that activation of CCBs would have been triggered by increases in credit to GDP well ahead of the crises in Ireland and Spain, providing additional resilience and complementing dynamic provisions in the case of Spain (see Figure 7 in Annex III and background note). However, the CCB is a blunt tool, applied uniformly to all exposures and is likely to be slow to react to the build-up of risks in particular segments of the credit market. In addition, where banks hold voluntary buffers above the minimum, or can easily generate capital through strong earnings, the activation of the buffer may not markedly slow down overall credit growth.³⁰



48. Sectoral capital requirements. Increases in risk weights for lending to particular segments of the credit market can complement the CCB. In principle, a targeted increase in risk weights can be applied to any category of loans for which strong credit growth gives cause for concern. This can include mortgage lending, unsecured consumer credit, or specific segments of such credit, as in Brazil and Turkey, and corporate lending or specific corporate segments, such as lending to commercial property, as proposed in the U.K. (background paper). An increase in risk weights is expected to increase loan interest rates for lending to the targeted sector and can also increase the resilience of lenders to a deterioration in credit quality.³¹

49. LTV and DTI ratios. The international experience justifies a particular emphasis on tools that can contain vulnerabilities in residential housing markets. A number of countries have found that the pass-through of an increase in capital requirements on mortgage loans to loan growth can be limited when strong increases in asset prices and credit feed each other (e.g., Israel, Korea). This suggests the use of additional tools that act on the demand for credit and directly increase the resilience of borrowers to shocks.

³⁰ The Basel CCB applies to risk-weighted exposures. Where the calculation of such risk weights is subject to gaming, consideration should be given to introducing additional capital tools that apply to all exposures equally, such as a leverage ratio.

³¹ Minimum haircut and margining requirements can also be thought of as sectoral tools, aiming to affect the leverage cycle in specific markets, and are further discussed below.

- An LTV ratio introduces a cap on the size of a mortgage loan relative to the value of a property, thereby imposing a minimum down payment.
- A DTI ratio restricts the size of a mortgage loan to a fixed multiple of household income, thereby containing unaffordable and unsustainable increases in household debt.

The available research (surveyed in the background paper) suggests that these tools can reduce feedback between credit and prices in upswing, as well as improve resilience to shocks, thereby reducing default rates and boosting recovery values when the housing market turns. However, they can also be seen as more intrusive and calibration can seek to soften their impact, e.g., by exempting first-time buyers (as in Korea, background paper). Moreover, the evidence suggests that LTV ratios can have a relatively strong effect on house prices and aggregate demand (IMF 2013b), which can justify a gradual approach to tightening of such ratios (as in Canada and the Netherlands).

50. Liquidity tools. The crisis has highlighted the systemic externalities associated with funding liquidity risk (Perotti and Suarez, 2010; Shin, 2010a; Huang and Ratnovski, 2011) and sparked a greater emphasis on liquidity tools that reduce vulnerabilities from a system-wide increase in wholesale, short-term and FX funding. These tools can be quantity-based or price-based constraints that aim to reduce reliance on vulnerable non-core funding. While Basel III includes prudential measures to reduce funding risks (Liquidity Coverage Ratio and Net Stable Funding Ratios (NSFRs)), additional tools can be adapted to local conditions.³² Examples are the Macroprudential Stability Levy introduced in Korea and the Core Funding Ratio (CFR) introduced in New Zealand, as well as the use of (marginal) reserves requirements for macroprudential purposes in a number of emerging markets. An additional benefit of liquidity tools is their effect on loan growth. Since core funding, such as retail deposits, grows slowly, credit booms will often be funded by increases in wholesale funding. By constraining such funding, liquidity tools can then also contribute to a slowing of overall credit growth, complementing the effects of the countercyclical capital buffer or provisions and sectoral tools.

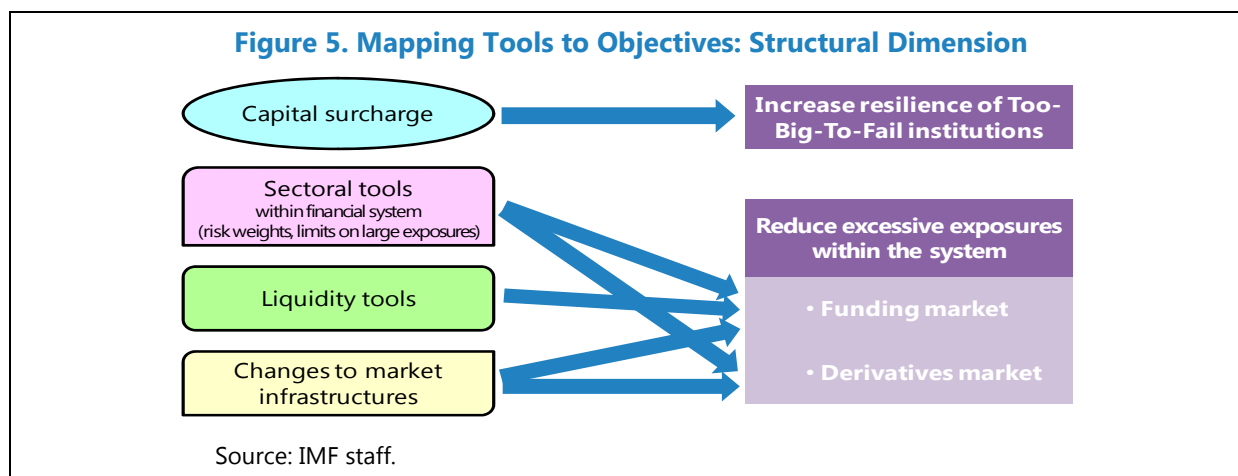
51. A range of complementary tools can contain structural risks from interconnectedness and contagion within the financial system (Figure 5). First, to improve resilience and resolvability of those institutions whose failure poses systemic risks to the system, prudential requirements can be tightened on those firms. Capital surcharges for global and domestic systemically important institutions are the key example. Second, to reduce the contagious effect of the failure of such institutions, prudential tools can be used to discourage exposures to such institutions or excessively large exposures within the financial system more generally (Arregui, Scarlata, and others, 2013).

- This can take the form of increased sectoral capital requirements for exposures within the financial system or specific types of exposures that are growing rapidly, as proposed for the U.K. Financial Policy Committee (FPC).

³² The NSFR that will be introduced as part of Basel III can serve as an international benchmark for quantity-based tools. Perotti and Suarez (2011) discuss the relative merits of price-based and quantitative constraints. See also the background paper for further discussion.

- It can also take the form of quantitative limits on the size of such exposures relative to capital, extending existing large exposure regimes to exposures within the financial system, as is currently being discussed by the Basel Committee.
- Since non-core funding is often raised in wholesale financial markets, liquidity instruments can contribute to a reduction of domestic or cross-border exposures among financial institutions (Shin, 2010a and 2010b).

52. Changes can also be made to the market infrastructure, including payment, settlement and clearing arrangements, to reduce the build-up of credit exposures arising from transactions within the financial system. Growing counterparty credit risks from derivatives transactions have been the main concern in the aftermath of the crisis and spurred efforts to introduce central counterparties for the clearing of derivatives as part of the G-20 led reform initiative. These entities need to be designed prudently and supervised closely, however, since while they reduce interconnectedness they also concentrate systemic risk. Finally, since contagious effects are often strengthened by a lack of information, mandating increased transparency over exposures can be a particularly useful measure in the structural dimension.



C. Calibrating Macroprudential Tools

53. Use of macroprudential tools needs to trade off their benefits and costs. It needs to bring together the analysis of changes in the sources and level of systemic risk; an understanding of the transmission of the available macroprudential policy tools; and an assessment of the costs and distortions arising from macroprudential policy action (CGFS, 2012; Arregui and others, 2013). While macroprudential action in the structural dimension will often take the form of a sustained initiative that imposes new constraints, action in the time dimension can involve dynamic changes to evolving conditions, with tightening of constraints followed by a relaxation as risks abate or crystallize.

54. The transmission mechanism of macroprudential action is subject to considerable uncertainty. While it is possible to map the channels of transmission of macroprudential tools conceptually, the strength of these effects is still uncertain. A growing literature—reviewed in detail

equity (Goodhart, 2008). This will tend to lead to a switch of business activity to less constrained intermediaries that are outside the scope of the regulation. It can also lead to a shift toward market-based financing and efforts by regulated firms to open up connected operations in the less regulated sector. This problem is generic, and applies to all financial regulation.³⁵

63. In principle, a macroprudential approach is well-suited to address the boundary problem. It is less focused on protecting bank depositors, but takes a system perspective that encompasses all individually systemic institutions and all providers of financial services that are collectively systemically important (IMF 2011a; Nier, 2011). A macroprudential intervention or an extension of the regulatory perimeter that is motivated by macroprudential concerns, rather than the desire to protect investors, need therefore not imply an extension of the “safety net.”

64. A macroprudential approach calls for an extension of tools to all provision of credit that is ultimately dependent on short-term funding and leverage cycles in markets.

- In line with recommendations by the FSB, equivalent prudential intervention should be extended to “bank-like” intermediaries that do not take deposits, but whose economic function is the provision of credit to the economy and who depend on short term debt funding.
- Regulation should also extend to providers of leverage in markets that are dependent on short term funding or secured funding (e.g., broker dealers).
- A macroprudential approach calls for the regulation of credit products traded in financial markets. This can include the regulation of securitization activity in a manner that creates transparency and ‘skin in the game’ across the intermediation chain.
- A macroprudential approach finally calls for the regulation of haircuts in securities lending and repo markets, as well as margin requirements in derivatives markets, to avoid margin spirals that contribute to excess leverage and procyclicality (Geanakoplos, 2010; Longworth, 2010; Hanson and others, 2011; FSB 2012).

65. While some of these approaches are new, there is growing practical experience, as countries have encountered the need to respond to arbitrage and the growing provision of credit by non-banks and in markets when deploying macroprudential tools. Annex V highlights the experience in Croatia, Korea, New Zealand and the U.S.

E. Closing Data and Information Gaps

66. Effectiveness of macroprudential policy will benefit from a sustained effort to close information gaps. Data and information gaps can hinder the early detection of systemic risk and increase uncertainty on the need for a response to identified concerns, impede the design and enforcement of macroprudential instruments, and complicate the policing of the regulatory

³⁵ For instance, the introduction of Basel I is thought to have spurred the rise of securitization in the U.S. (Goodhart, 2008).

perimeter. While the most pressing data and information gaps can vary across financial systems, the crisis has thrown such gaps into sharp relief, in both advanced and emerging markets.³⁶

67. Information gaps can impede the assessment and mitigation of risks in the household and corporate sector. Data on the household sector is scarce in many countries, and greater granularity is needed to assess and mitigate risks. For instance, to implement and enforce effective LTV and DTI ratios, information on real estate prices, preferably at a regional level is needed.³⁷ In addition, credit registers are required to provide information on pre-existing senior loans, enabling the overall ratios to be computed. Similarly, to assess the need for and enforce measures that contain FX exposures on the part of the corporate sector, granular data is needed on cross-border credit flows to such institutions. More generally, loan-level data that would allow computation of indicators of leverage and vulnerabilities to asset price and interest rate shocks across borrower and asset classes are often not available.³⁸

68. Gaps also hamper the assessment of interconnectedness and the mitigation of risks in the structural dimension. Information is often missing on domestic and cross-border exposures between financial institutions, including between those that are potentially systemically important. Detailed information on counterparties and maturities in funding markets is often not collected. In addition, information on exposures arising in over-the-counter derivatives markets is often missing, reducing the ability of the authorities to assess risk concentrations and design and enforce regulatory constraints, such as on potentially systemically important institutions.

69. Information gaps often also hinder the policing of regulatory boundaries. For instance, there is a lack of information on “Other financial corporations,” (OFCs), where typically only statistical data is available and this information only captures very basic indicators, such as the total assets of such institutions.³⁹ Information is missing in particular on money market mutual funds, where little is known about investment portfolios and maturities (Heath, 2013).

70. Closing information gaps requires improvements in both statistical and supervisory data. This requires not just new data, but also improvements in the granularity, frequency, and timeliness of existing data. In closing information gaps, it is important to ensure homogeneity and comparability of data at the international level and to leverage existing official databases, such as those maintained by the IMF and BIS. Consideration needs also to be given to the costs of information collection for both the financial industry and the official sector, which calls for well-targeted improvements in national and international data. The IMF/FSB/G20 Data Gap initiative and special data dissemination standard (SDDSS) Plus represent important advances in this regard (see further Annex VI).

³⁶ See further Cerutti and others (2011), and Heath (2013).

³⁷ Progress is being made on collecting real estate prices, with about 64 countries reporting to the BIS.

³⁸ See Geanakoplos and Pedersen (2011).

³⁹ Data on the balance sheets of ~~other financial corporations~~ (OFCs) are available in the standardized reporting forms (SRFs). However, OFC data are currently reported only by 30 countries.

INSTITUTIONAL ARRANGEMENTS

This section summarizes key considerations in the design of effective institutional frameworks. Most of these were developed in existing work, notably IMF (2011a), Nier and others (2011), and IMF (2013a), and discussed by the Board on previous occasions. The section also draws on the growing country experience and staff advice provided in technical assistance, e.g., IMF (2012a).

71. A strong institutional framework is essential to ensure that macroprudential policy can work effectively. The framework needs to foster the *ability to act* in the face of evolving systemic threats, assuring access to information and an appropriate range and reach of macroprudential instruments. It needs to establish strong accountability, based on clear objectives that can guide the exercise of macroprudential powers, and strong communication to create public awareness of risks and understanding of the need to take mitigating action. It needs finally to assure *willingness to act* and counter biases for inaction or insufficiently timely action that can arise from difficulties in quantifying the benefits of macroprudential action, and are often exacerbated by lobbying by the financial industry, political pressures, and the need for coordination among agencies.⁴⁰

A. Macroprudential Powers

72. Where financial systems evolve dynamically, limiting systemic risk requires powers to foster the ability to act. Where linkages with the real sector and between financial institutions change with time, a macroprudential policymaker requires powers to adjust its approach accordingly. Powers are needed to ensure the policymaker can obtain the necessary information; influence the strength of regulatory constraints placed on the financial system; designate individual institutions as systemically important; and initiate changes in the regulatory perimeter to expand the reach of macroprudential policies to collectively important providers of credit and liquidity (IMF, 2011a).

73. The strength of such powers can vary and be

- “hard” (direct), enabling the policymaker to have direct control over the calibration of specific macroprudential tools,
- “semi-hard,” enabling the policymaker to make formal recommendations, coupled with a ‘comply or explain’ mechanism, or
- “soft,” enabling the policymaker to express an opinion, or a recommendation that is not subject to comply or explain.

Each type of power can be useful and the effectiveness of the policy frameworks can benefit from a combination of these powers.

⁴⁰ As set out in IMF (2011a), the benefits of action accrue in the future and are highly uncertain, while the costs of imposing macroprudential constraints are felt immediately, by both borrowers and providers of funds. As a result, macroprudential policy is subject to strong lobbying and political pressures.

74. Hard powers are usefully assigned over the calibration of a well-defined set of macroprudential tools.⁴¹ Such powers can avoid delay and other frictions in implementation that arise when there is a need for cooperation by other policymakers. They will therefore often be considered in particular for tools that control the rapid build-up of risks in the time dimension. Direct powers can also increase effectiveness of policy since they enable the policymakers to communicate credibly with the financial markets. Direct powers over a well-defined set of tools provide the macroprudential policymaker with a “stick” that she can credibly threaten to use.

75. The advantage of a power to recommend actions, coupled with a ‘comply or explain’ mechanism, is that it is broad. Recommendations can be used to influence the whole range of regulatory actions that can be taken by other supervisory and regulatory agencies. In particular such recommendations may be used to address the structural component of systemic risk, where macroprudential interventions may be less frequent, or where implementation requires further judgment by the supervisory agency. The ‘comply or explain’ mechanism is important for effectiveness since it increases the chance of compliance and ensures transparency and public accountability as regards cooperation by other agencies. When separate supervisory agencies can point to the recommendation by the macroprudential authority this can also strengthen their hand and help overcome industry opposition or political pressure.

76. Soft powers are useful to extend the influence of the macroprudential policymaker beyond existing prudential tools. A soft recommendation is appropriate when the macroprudential policymaker addresses the legislature to initiate the establishment of new macroprudential tools, or changes in the legal framework to extend the regulatory perimeter. Soft tools, such as ‘opinions’ can also be appropriate when the macroprudential policymaker is concerned that the build-up of systemic risk is fed by broader macroeconomic imbalances. They can then be used by the macroprudential authority to urge policy action by the government to contain such imbalances. However, soft powers alone are unlikely to be sufficient to ensure the effectiveness of the overall policy framework.

77. Information collection powers need to complement powers over policy tools. Information collection powers are needed to close information gaps. In order to avoid duplicative costs on the financial industry, the macroprudential authority should seek to obtain information that is available to other agencies and legal impediments to such exchange of information will often need to be reviewed. Since financial activity can migrate in response to regulation in unintended ways, the policymaker needs to have the power to collect information beyond the regulatory perimeter. It can therefore be useful to establish a broad back-up power that enables the authority to collect information directly from financial firms, such as provided to the Office for Financial Research in the United States.

B. Objectives and Accountability

⁴¹ Hard powers can also be useful for the designation of systemically important institutions, as provided to the Financial Stability Oversight ~~Committee-Council~~ (FSOC) in the U.S.

78. The exercise of macroprudential powers needs to be guided and constrained by a well-defined objective. This can form the basis for a framework to hold the policymaker accountable for achieving the objective. A well-defined objective can also guard against the risk of abuse of macroprudential policy, and its use as a substitute to escape more difficult policy choices in other policy areas, such as fiscal and structural policy.

- The objective can articulate the scope of responsibilities of the macroprudential policymaker in both the time and structural dimension. For instance, it might specify that the policymaker should (i) ensure the overall resilience of the system; (ii) contain risks from unsustainable increases in credit, leverage and asset prices; and (iii) contain structural risks from inter-linkages within the financial system.
- To help ensure that the macroprudential policymaker recognizes trade-offs in the pursuit of financial stability, it can be appropriate to specify secondary objectives, such as the need to maintain the contribution of the financial system to the long-run growth of the economy, or the need to protect the interests of depositors.

79. In addition to a well-defined objective, an accountability framework can include a range of communication tools. Such tools can help the public to establish whether the authority is taking appropriate action to achieve its objective. They can also influence the conduct of the macroprudential policymaker in ways that foster the effective pursuit of the objective.

- Publication of a policy strategy. The framework can encourage the development and publication of a policy strategy that the decision-maker intends to follow in the deployment of specific macroprudential tools over which it has direct control. Such a strategy can generate a degree of commitment by setting out under what conditions these tools would be employed.
- Record of meetings. Where policy decisions are made by a macroprudential committee, the framework can specify the publication of a record of the meetings of the committee that establishes transparency on issues discussed and clarity as regards the votes cast by members on policy decisions.
- Periodic reports. A basic mechanism is a requirement to publish periodic reports on the activities of the macroprudential policymaker, including an assessment of risks and policy actions taken to mitigate the risks.

C. Assignment of the Mandate

80. To strengthen 'willingness to act,' it is important that the macroprudential mandate is assigned to *someone*, a body or a committee (IMF, 2011a). Where a clear assignment is lacking, collective action problems lead to underinvestment in systemic risk identification and mitigation across agencies and reduce accountability, since in the end *no one* is fully responsible for the crisis outcome.

81. It is desirable for the central bank to play an important role in macroprudential policy (IMF, 2011a; Nier and others, 2011; IMF, 2013a; Viñals, 2011). This can harness the expertise of the central bank in systemic risk identification and its incentives to ensure macroprudential policy is

pursued effectively. It can also help shield macroprudential policymaking from political interference that can slow the deployment of tools or bias their use toward other objectives.

82. In practice, these two basic principles lead to the increasing prevalence of three models for macroprudential policymaking:

- **Model 1:** The macroprudential mandate is assigned to the central bank, with macroprudential decisions ultimately made by its Board (as in the Czech Republic).
- **Model 2:** The macroprudential mandate is assigned to a dedicated committee within the central bank structure (as in the U.K.).
- **Model 3:** The macroprudential mandate is assigned to a committee outside the central bank, with the central bank participating on the macroprudential committee (as in Australia, France and the U.S.).

83. The choice of model in any given country will often be driven strongly by traditions as well as political economy considerations. This includes importantly the perceived need for checks and balances in the conduct of macroprudential policy. In addition, the existing arrangements for monetary and supervisory policy as well as legal (constitutional) constraints are likely to play a strong role in shaping the arrangements. The pros and cons of each model, and mechanisms to address the drawbacks of each model are examined in more detail in Nier and others (2011).

84. Model 1 is a natural choice in highly integrated arrangements where the central bank already concentrates the relevant regulatory and supervisory powers. Where supervisory and regulatory agencies are established outside the central bank the assignment of the mandate to the central bank is usefully complemented by coordination mechanisms, such as a coordination committee chaired by the central bank.

85. Model 2 can help counter the risk of dual mandates for the central bank, by creating dedicated decision-making structures for monetary and macroprudential policy even as both functions are under the roof of the central bank. It also allows for participation of separate supervisory agencies and external experts on the decision-making committee. This can foster an open discussion of trade-offs that brings to bear a range of perspectives and helps disciplining the powers being assigned to the central bank.

86. Model 3 can more easily accommodate a desire for a strong role of the Ministry of Finance (MoF). Participation of the MoF can be useful when changes in legislation are needed to expand the macroprudential toolkit or the regulatory perimeter. However, a dominant role of the MoF risks delaying macroprudential action and can compromise the independence of participating agencies, including the central bank and separate supervisory agencies (Nier and others, 2011). Some of these risks can be countered by assigning the central bank the chairmanship (as in Australia), a strong voice (as in Mexico) or a veto over policy decisions (as in Germany). They can also be countered by establishing only soft powers for the decision-making committee.

87. More generally ‘willingness to act’ can be driven by the governance of the decision-making committee, including its voting arrangements. In principle, it is desirable for a

THE ROLE OF THE FUND

108. The Fund is in a unique position, in cooperation with international partners and national authorities, to help its members establish effective macroprudential policies. With its mandate to promote the effective operation of the international monetary system; its near universal membership; a breadth of expertise that spans macroeconomic and financial stability analysis; and a focus on analyzing members' domestic policy mix and policy coordination across countries, the Fund has a key role to play. In partnership with the FSB and country authorities, the Fund can help its member meet the range of practical challenges arising in establishing well-functioning macroprudential policy, thereby ensuring that macroprudential policy can contribute effectively to domestic macroeconomic stability, and that national macroprudential policies 'add up' to contribute to global financial stability.

109. The Fund can help national authorities assess macro-financial risks and advise on the appropriate policy tools to address these risks. The Fund has stepped up its analysis of macro-financial risks and uses its existing surveillance and technical assistance instruments, including Article IV consultations, mandatory financial stability assessments and the FSAP, to advise on the policy response. In line with the Integrated Surveillance Decision (ISD), surveillance focuses on the impact of individual countries' economic and financial policies on countries' own stability and the actual or potential spillover effects of individual countries' policies on global stability. In particular, the macroeconomic and macroeconomically relevant structural aspects of monetary, fiscal and financial sector policies of individual countries are always the subject of bilateral surveillance. As part of its multilateral surveillance the Fund would also focus on and discuss with member countries actual or potential spillovers that may significantly impact global stability, including alternative policy options that would minimize the adverse impact of spillovers on global stability. More generally, the goals are to enhance the complementarity between monetary, macroprudential and microprudential policies; to identify policy tools to minimize negative side effects, and to consider the cross-border effects of policies in different jurisdictions.

110. The Fund can help ensure appropriate institutional underpinnings for national macroprudential frameworks. Through its financial sector surveillance, FSAP and other technical assistance work, the Fund can help national authorities build strong institutional foundations and governance arrangements for macroprudential policies, as well the institutional capacity to operationalize macroprudential policies, in a manner that ensures effectiveness of these frameworks within the legal, political and resource constraints faced by the authorities.

111. The Fund can help close data gaps that impede the analysis of macro-financial linkages and interconnectedness both at the national and global level. Through the IMF/FSB/G-20 Data Gap initiative, SDSSS and SDDS Plus, increased prominence is being given to data for monitoring the build-up of sectoral risks and cross-border financial linkages. Work has begun on mapping global flows of funds and better capturing data on shadow banking. Important progress is also being made in capturing data on G-SIFIs that will, with time, enhance the ability of macroprudential authorities

to analyze systemic risks. Staff is also being encouraged, in the context of Article IV consultations, to highlight data gaps that inhibit assessments of financial stability.

112. The Fund can become a global macroprudential facilitator. This involves continued and increased efforts in the following areas.

- Acting as a global risk advisor, through the Fund's risk assessment work and its multilateral surveillance (including Global Financial Stability Report (GFSR), World Economic Outlook (WEO), Early Warning Exercise (EWE) and spillover work) which can demonstrate how global systemic risks transmit to individual countries.
- Ensuring that the stability and spillover implications of macroprudential policies are discussed in the context of Fund surveillance.
- Conducting further rigorous research into macro-financial linkages and the transmission and effectiveness of macroprudential policies, drawing on the research expertise available at the Fund and growing data on the use of such measures around the world.
- Helping national authorities to develop the capacity to monitor and assess systemic financial risks and to operationalize macroprudential policy.
- Promoting the effort to close data and information gaps, notably through the IMF/FSB/G20 data gaps initiative, in order to improve the ability of macroprudential authorities to detect the emergence of systemic risk and ensure effective bilateral and multilateral surveillance.
- Providing a range of international fora for dialogue and exchange of experiences with macroprudential policies, given the novelty of national frameworks and diversity of approaches taken. Examples include the annual Financial Stability and Systemic Risk Forum (launched this year) and the High-level Policy Roundtables (organized around the Spring and Annual Meetings).
- Promoting regional cooperation and understanding, including through co-sponsoring of regional conferences on macroprudential policies, and engaging with regional macroprudential bodies and groups, such as the ESRB.
- Collecting, consolidating and disseminating information on policies, including by establishing a new database on macroprudential instruments.

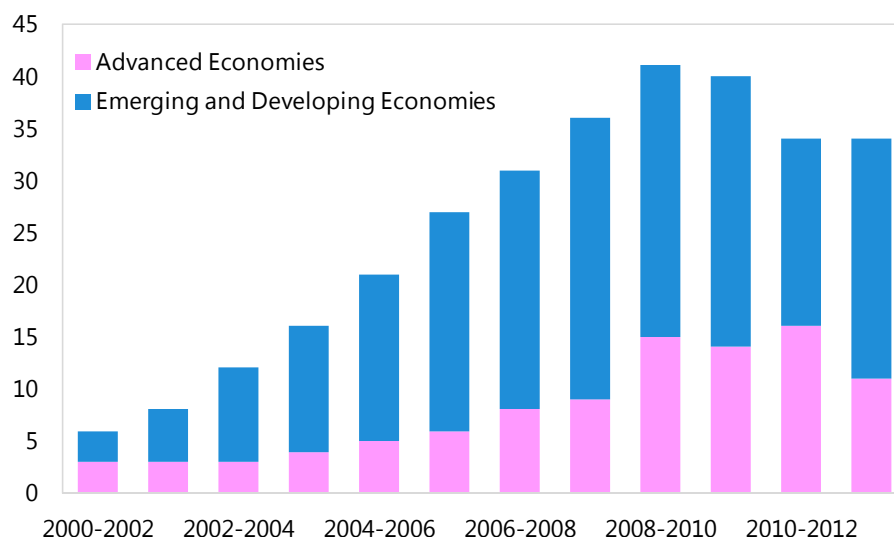
ISSUES FOR DISCUSSION

113. Do Directors agree with the analysis and conclusions of the paper, and that they can provide a basis for the Fund's advice on macroprudential policy? Do Directors agree that the Fund should play a key role, through its bilateral and multilateral surveillance and in collaboration with standard setters and country authorities, to help ensure the effective use of macroprudential policy for domestic and global stability?

Annex I. Macroprudential Tools and Institutional Arrangements⁵¹

114. Both emerging and advanced economies use macroprudential tools to reduce various sources of systemic risks (see Annex III for further details). A dataset on macroprudential policies compiled by Lim and others (2013) suggests that over the last ten years there was an increasing use of macroprudential tools (Figure 6). EMEs have been using a broad range of tools to target risks from housing market, credit growth foreign indexed loans and foreign currency mismatches. An increasing number of advanced economies have also implemented macroprudential tools, often to target systemic risk in mortgage and housing markets (examples include Canada, Hong Kong, Israel, Netherlands, Norway, Singapore, Switzerland and Sweden).

Figure 6. Introduction/Changes of Macroprudential Tools
(Number of countries)



Source: IMF staff based on Lim and others (2013).

Note: Each column represents number of countries that implemented or changed a macroprudential instrument over a rolling three-year period.

115. Since the 2008 crisis, a number of countries have also made changes to the institutional arrangements for macroprudential policy. Some of the most recent examples include:

- **U.K.:** An independent FPC at the BoE was established on April 1, 2013. The committee is charged with a primary objective of identifying, monitoring and taking action to remove or

⁵¹ Prepared by Ivo Krznar (MCM).

reduce systemic risks.⁵² The FPC has a secondary objective to support the economic policy of the government.

- **European Union:** The ESRB, created at the end of 2011 as a macroprudential authority of the EU, has played a key role in providing guidance on national macroprudential frameworks, to ensure that macroprudential policy is operational in all member states. A number of EU countries have started to develop their macroprudential institutional arrangements in line with ESRB recommendations.⁵³ For example, in Germany, a Financial Stability Committee was established in March 2013, consisting of the Ministry of Finance, the central bank, the federal financial supervisory authority and the Financial Market Stabilization Agency, with the central bank playing the leading role.⁵⁴
- **South Africa:** The 2011 proposal that would introduce a “twin peaks” model of financial regulation includes the granting of an explicit mandate to the central bank to oversee and maintain financial stability. Moreover, the Financial Stability Oversight Committee, chaired by the central bank, would facilitate information sharing between agencies and would have a power to make recommendations to relevant agencies on a comply or explain basis.
- **Korea:** A formal Macroeconomy and Finance Meeting was newly set up in July 2012, with four agencies as members—the Ministry of Strategy and Finance (head), the Bank of Korea, the Financial Services Commission, and the Financial Supervisory Service. While each agency conducts its primary policy independently, the committee assesses external and domestic systemic risks and coordinates the use of macroprudential instruments.
- **New Zealand:** In May 2013, a memorandum of understanding (MOU) was signed between the ministry of finance and the central bank to provide governance arrangements for the use of four new macroprudential tools (LTVs on mortgage credit loans, CFR, a CCB, sectoral capital requirements). Under the MOU, the central bank should consult the Minister of Finance ahead of the any macro-prudential policy decision. However, final policy decisions would be made independently by the Reserve Bank.

⁵² The FPC can make recommendations to any institution including to the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) on a comply or explain basis. It also has a power to direct those regulators to adjust specific macroprudential tools.

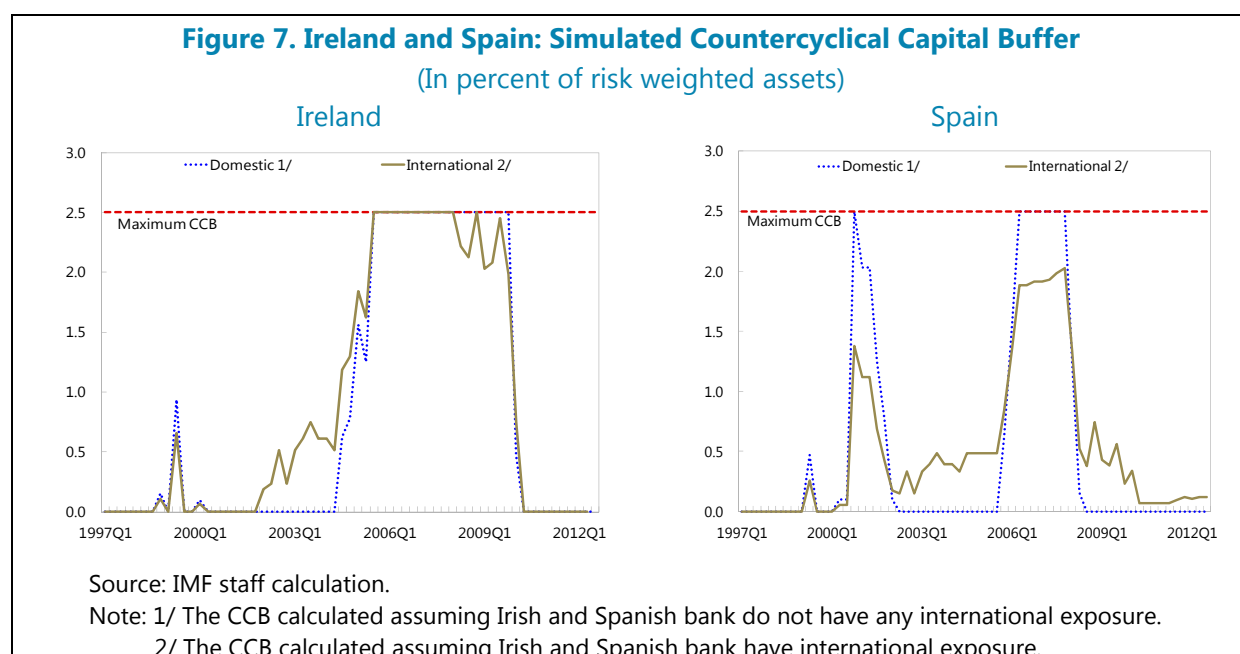
⁵³ The guidance recommends that central bank should play a key role in macroprudential policy.

⁵⁴ The central bank is tasked with systemic risk monitoring. It also suggests respective warnings or recommendations for corrective measures, and submits such warnings or recommendations to the Financial Stability Commission.

Annex III. Effectiveness of Tools in Time Dimension⁵⁵

Countercyclical Capital Buffer

116. While the countercyclical buffer is a new tool, simulations can be used to illustrate how it would work in practice. It is considered what a small set of indicators, including the credit to GDP gap, might have signaled to the authorities in Ireland and Spain in the period before and during the crisis (Figure 7). This analysis is not a comprehensive examination of all available information that might be considered. Moreover, it is worth noting that ~~that~~ simulation results depend on and can change substantially with different starting date of the credit gap calculation. In both cases we use 1997 as the starting date.



117. Figure 7 shows the hypothetical evolution of the CCB in Ireland and Spain since 1997.⁵⁶ If the CCB had been available at the time, the additional buffer would have built up to its maximum three years ahead of the financial crisis. This suggests that the credit gap measure might be a good indicator for the activation of the CCB.

- For the case of Ireland, a simple calculation based on 2008 Tier 1 capital shows that the additional buffer would have amounted to up to a quarter of the fiscal costs of the financial crisis for the authorities. Alternatively, if raising additional capital would have been difficult for some banks, the buffer would have led to a decrease in credit growth, thereby mitigating the housing price boom.

⁵⁵ Prepared by Heedon Kang, Yitae Kim, and Ivo Krznar (MCM).

⁵⁶ For further information, see the background paper.

- In Spain, the additional capital of 2 percent prior to the crisis would have saved almost all fiscal costs of the financial crisis for the Spanish authorities (as calculated by Laeven and Valencia).⁵⁷ Moreover, the additional capital is about 70 percent larger than the estimated €24 billion in dynamic loan-loss provisioning.

Sectoral Tools

118. Table 2 and Figure 8 show that countries often make use of sectoral tools, such as sectoral capital requirements and maximum limits on loan-to-value and debt-to-income ratios. During the post financial crisis period, many advanced economies (AEs) and EMEs, such as Hungary and Norway, recently adopted these instruments as new tools.⁵⁸ Empirical analyses and country studies suggest that these measures have been found successful, by and large, in containing the risk build-up in specific sector(s).⁵⁹

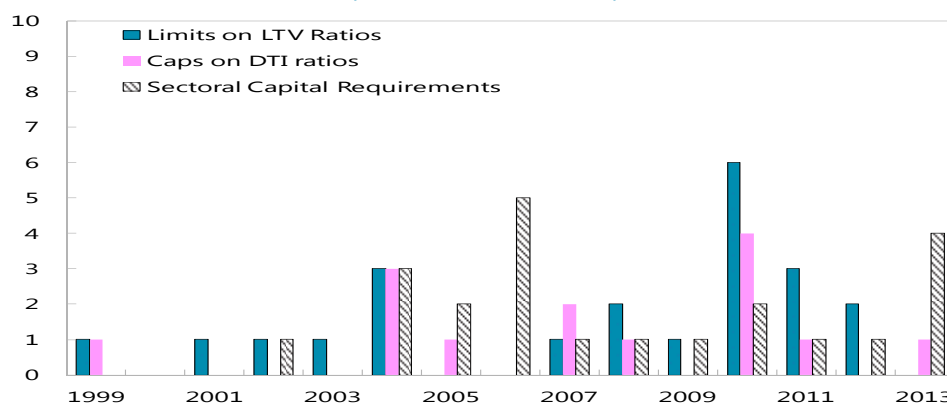
Table 2. Number of Countries with Sectoral Macprudential Tools

	Limits on LTV Ratio	Caps on DTI Ratio	Limits on LTV and DTI ratios	Sectoral Capital Requirements	One tool	Any two tools	All three tools
Number of Countries (Total = 46)	24 (52 percent)	14 (30 percent)	14 (30 percent)	23 (50 percent)	36 (78 percent)	18 (39 percent)	7 (15 percent)

Source: IMF staff calculation.

Figure 8. Introduction of Sectoral Macprudential Tools

(Number of countries)



Source: IMF staff calculation.

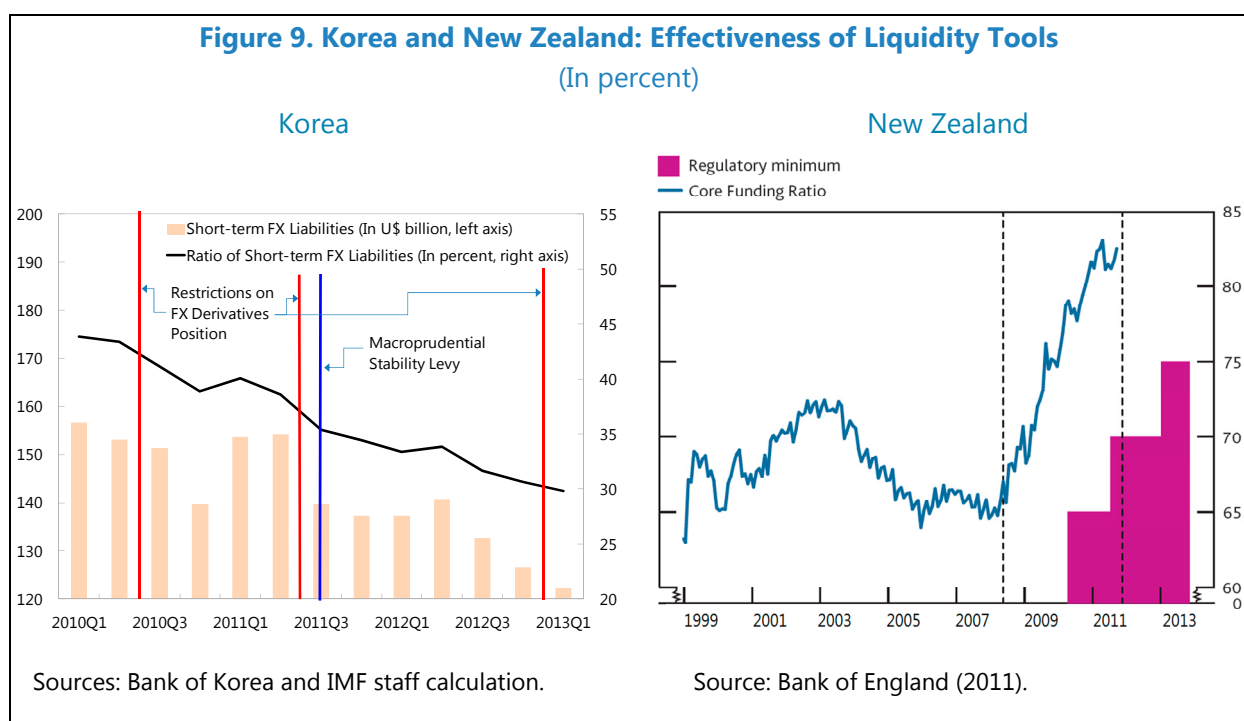
⁵⁷ This calculation assumes that losses are spread evenly across all financial institutions.

⁵⁸ Up until now, nine AEs and fourteen EMEs implemented caps on LTV ratio. Six AEs and eight EMEs adopted limits on DTI ratio, which complemented the limits on LTV ratio in all the countries except Poland.

⁵⁹ For further information, see the background paper.

Liquidity Tools

119. A few small open economies moved ahead of others to implement new macroprudential liquidity tools. These developments arise since the Basel committee is still negotiating international liquidity standards, such as the NSFR, and since these will not come into effect before 2018. For example, Korea in August 2011 introduced a price-based Pigovian tax on banks' non-core foreign currency liabilities, so called the Macroprudential Stability Levy (MSL), and New Zealand implemented from April 2010 a quantity-based minimum requirement of 65 percent core funding, the so called CFR (Figure 9).



120. While the experience is limited, preliminary evidence suggest that liquidity tools can limit overexposure to funding shocks and also put a brake on procyclical lending.

- Korea adopted [the](#) MSL as a macroprudential tool as of August 1, 2011.⁶⁰ The measure appears to have been effective in curbing banks' reliance on short-term FX funding and in

⁶⁰ Korea also implemented caps on [the](#) loan-to-deposits ratio (2009 and 2012) to shift banks' funding structure away from wholesale funding and ceilings on banks' FX derivative positions (2010, ~~and~~ 2011 and 2012). FX derivative positions were limited to 50 percent of capital for domestic banks and 250 percent for foreign banks' branches in June 2010, and the limits were lowered to 40 percent and 200 percent in June 2011 and were cut again to 30 percent and 150 percent in ~~January-December~~ 2013. Combining ~~it-them~~ with the levy, the authorities target both the source and the costs of the excessive dependence on short-term non-core FX borrowings, and to encourage long-term and stable sources of funding.

reducing vulnerabilities from FX mismatches and their links to exchange rate volatility.⁶¹ Banks' short-term FX liability dropped by 9.3 percent (US\$14.4 billion) in the third quarter of 2012 relative to the previous quarter.

- The introduction of a minimum CFR in New Zealand has contributed to a sharp shift away from short-term funding with maturity less than a year. By forcing banks to compete for more retail funding, or borrow in wholesale markets for terms longer than one year, it may also have had an impact on credit growth.

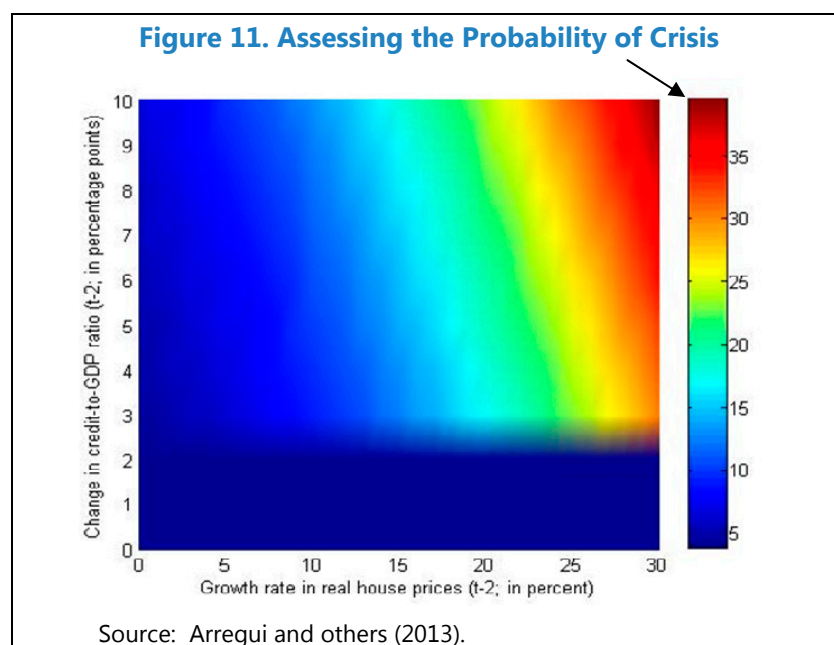
⁶¹ Since these measures were brought in only recently, firm conclusions on their effectiveness would need more thorough analysis as more data become available.

Measurements: Probability of Crisis (p), Output Loss in the Event of a Banking Crisis (l), and Cost of Policy (α)

123. Empirical analysis with different types of models provide rules-of-thumb estimates for p , l and α . A survey of macroprudential policy instruments in use by countries is also used to estimate the effectiveness of five different policy instruments in harnessing credit growth and other indicators.

124. A panel logit model using annual data 1970–2010 relates credit growth and house price growth to the probability of a banking crisis (Laeven and Valencia, 2010). The model allows for a non-linear effect of house price growth conditional on credit-to-GDP growth higher than 3 percentage points (see IMF, 2011b for thresholds based on noise-to-signal analysis). The rationale is that it is difficult to disentangle healthy asset price growth (one driven by productivity growth) from non-healthy ones, but policymakers should be very cautious if both house prices and (mortgage) credit are growing rapidly. In addition, all sources of credit should be included, not just the ones from banks (see Arregui and others, 2013, on how probabilities of crisis differed greatly between estimates based on bank credit growth versus all consumer credit growth from all sources).

125. The related ‘heatmap’ can be used to estimate the probability of a banking crisis for various combinations of credit and house price growth (Figure 11). For instance, a combination of 5 percentage point credit-to-GDP growth and 15 percent real house price growth leads to $p=14$ percent; a 6 percentage points credit growth and 20 percent house price growth pushes p up to 20 percent. By lowering credit growth, policies would reduce p to p^* .



126. Data for 10 countries and 12 crisis events show that GDP, on average falls about 8 percent per year ($l=0.08$) from the trend-level, for five years. This loss is also related to the growth in credit prior to the crisis. A cross-section model of 67 banking crises shows that a 1 percentage point higher credit-to-GDP growth is associated with a higher average yearly cost of a financial crisis of 0.6 percent in terms of trend level of GDP. By lowering credit growth, policy instruments could lower crisis costs, l^* . The paper has estimates of l^* for four policy instruments.

127. A bivariate model of the GDP level and credit-to-GDP gap for the U.S. produces medium-term forecasts of output conditional on two states of the banking sector—distress

and normal times. The cost of policies is directly related to the macro-financial linkages in the model. It shows that a 1 percent lowering of the credit-to-GDP gap lowers the GDP forecast by about 0.2 percent ($\alpha=0.002$) if there is no banking distress. Policies that reduce credit growth would thus incur a cost on the GDP forecast if systemic risks were mis-measured. The paper also has estimates of α for four different policy instruments.

Policy Effectiveness: p^* and l^*

128. Actual experience with macroprudential policy instruments show that policies have been effective in reducing imbalances. Dynamic panel regressions show that LTV limits, reserve requirements and sectoral risk weights on capital can slow down credit growth; and both DTI limits and reserve requirements work towards reducing loan/deposit ratio. Moreover, the policies have prolonged impacts. The probability of crisis can be reduced from p to p^* by reducing credit growth and deducing the new p^* from the probability heatmap above. Reducing credit growth would also reduce the depth of crisis from l to l^* . For instance, starting with a credit-to-GDP growth of 5 percentage points and real house price growth of 15 percent, $p = 14$ percent (from the heatmap) and $l=0.092$ (9.2 percent). Capital risk weights reduce credit growth, on average across time and countries, by about 5 percentage points accompanied by lowering of real house price growth. Together, these would lower p to $p^*=3.8$ percent, and l to $l^* = 0.05$ percent. Gathering the p , p^* , l , l^* and α delivers a positive net benefits, on average, of using capital risk weights.

Annex V. Shadow Banking System and Regulatory Arbitrage⁶³

129. Regulations applied to banks can be circumvented by substituting bank credit with credit from the shadow banking system which is subject to less stringent regulation. The following countries provide examples of the emergence of the shadow banking system as a response to regulatory changes.

- **Croatia:** in response to the 2003 credit growth cap implementation banks cut back on holdings of securities and on unused lines of credit (both items were included in the credit aggregate; unused lines of credit are an off-balance sheet item) and used this to offset higher growth in other categories. Moreover, banks with affiliated leasing companies encouraged clients to take leases rather than loans.
- **Korea:** circumvention of tighter limits on the LTV ratio in 2009 involved expansion of credits by non-banks (mutual credits, mutual savings banks, and credit-specialized financial institutions).
- **New Zealand:** light regulation of non-bank deposit taking finance companies (in comparison to the banking sector) was one of the factors behind their rapid growth during the first half of the 2000s.
- **U.S.:** the securitization of loans (mostly mortgages) was caused, in part, by bank capital requirements that encouraged banks to take these assets off their balance sheets. However, investment vehicles where the securitized debt was held had implicit and explicit credit and liquidity support from banks, resulting in imperfect risk transfer.

130. In response, the authorities expanded the regulatory perimeter or changed the regulation of regulated entities in order to encourage them to better manage the risks related to shadow banking activities.

- In Croatia, the 2007 credit growth cap closed the line of credit loophole by placing limits on on-balance and off-balance sheet items separately and dealt with the leasing problems by capturing funding of the leasing company within the credit limit.
- In Korea, the perimeter of LTV regulation was expanded to cover non-banks in a few months following the 2009 regulation imposed on banks.
- In New Zealand, prudential regulation of non-bank deposit taking finance companies was transferred to the Reserve Bank. Moreover, ~~the a~~ new regulatory regime was introduced (in 2010) similar to the prudential regulation of banks covering requirements on capital, liquidity, related party exposures, credit ratings and governance and risk management.

⁶³ Prepared by Ivo Krznar and Heedon Kang (MCM).

- In the U.S., the FSOC was empowered to designate non-bank financial companies as systemically important, subjecting such companies to supervision and regulation by the Federal Reserve. The Dodd-Frank Act's "skin-in-the-game" credit risk retention requirement will be ~~the~~a major reform of the securitization market which is intended to provide sponsors with a meaningful incentive to monitor and control the quality of securitized assets and align the interests of the sponsor with those of investors. There is long experience in the United States also with regulation of margin lending in securities markets, as surveyed in Elliott and others (2013).

Annex VI. The G-20 Data Gaps Initiative⁶⁴

131. The global financial crisis revealed key data gaps that must be addressed to facilitate financial stability analysis and smooth functioning of financial markets. To address this need, in November 2009 the G-20 economies requested the IMF and FSB to recommend data enhancements and improvements to statistical frameworks, which led to the data gaps initiative (DGI). The DGI is supported by an Inter-Agency Group (IAG) comprised of the BIS, European Central Bank, Eurostat, IMF (chair), Organization for Economic Cooperation and Development (OECD), UN, and the World Bank.

132. The G-20 endorsed the 20 recommendations of the IAG, which are designed to address and elaborate on (i) the build-up of risk in the financial sector; (ii) cross-border financial linkages; (iii) vulnerability of domestic economies to shocks; and (iv) improve communication of official statistics. The DGI has progressed on many fronts—detailed in several progress reports—and has gained traction among the G-20 countries (<http://www.imf.org/external/np/g20/pdf/093012.pdf>). The availability and broader dissemination of internationally comparable data have increased through the establishment of a set of Principal Global Indicators, which include data on key economic and financial statistics for the G-20 and other economies with systemic financial sectors (<http://www.principalglobalindicators.org/default.aspx>).

133. The DGI also supports other data initiatives. These include the FSB work on shadow banking and legal entity identifiers, and the G-20 Action Plan on Local Currency Bond Markets. The DGI underpinned the IMF's 2011 Triennial Surveillance Review and the strengthening of the Fund's Data Standards Initiatives, in particular, through the establishment of a third tier, the SDDS Plus. The SDDS Plus builds directly onto the foundation laid by the DGI and commits "adherents" to rigorous dissemination standards for coverage, periodicity, and timeliness, of time series data.

134. In addition, there is regular engagement with G-20 member countries. STA undertakes regular bilateral visits on the DGI to G20 member countries, and organizes regional conferences and high-level events, such as the High Level Forum on Statistics and Financial Stability that will take place in November 2013.

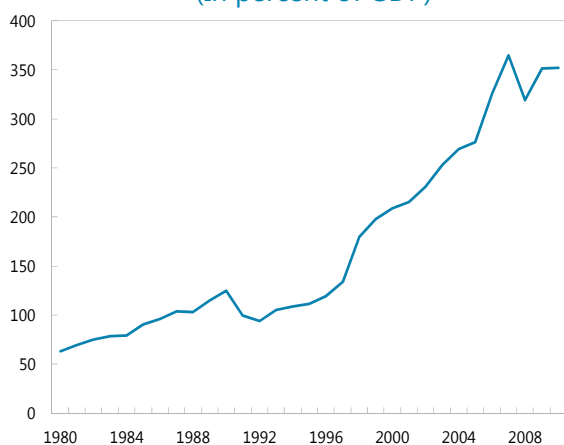
135. The DGI is evolving, with an active work program but data challenges remain. These challenges involve sustaining the momentum and pace of progress, ensuring the G-20 countries' continued implementation of the work program, completing the work on the new conceptual/statistical frameworks being developed by international institutions, and ensuring adequate resources to support countries' data enhancement programs.

⁶⁴ Prepared by Andrew Kitili (STA).

Annex VII. Global Interconnectedness and Systemic Risk⁶⁵

136. The rapid financial globalization of the past three decades has led to sharp increases in interconnectedness. Financial globalization has been reflected in the over six-fold increase in the external assets and liabilities of nations as a share of GDP (Figure 12). Even more striking is the sharp increase in cross-border lending and investment activities of banks, in particular since the late 1990s (Figure 13).

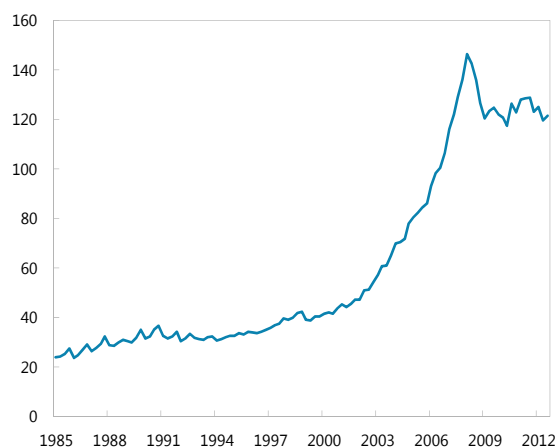
Figure 12. External Assets and Liabilities as a Share of GDP
(In percent of GDP)



Sources: Updated and extended version of the Lane and Milesi-Ferretti (2007) dataset.

Notes: Estimates of foreign assets and liabilities of countries using available stock positions, supplemented by cumulative capital flows with valuation adjustments.

Figure 13. Banks' External Assets
(In percent of GDP)



Sources: BIS Table 2A and Table 6A, WEO, and IMF staff's calculations.

Notes: External positions of reporting banks for all countries as a percent of total GDP for countries with reporting banks.

137. Financial globalization has brought benefits, such as more efficient intermediation of savings, and diversification of risks, but also increased vulnerabilities. The speed with which illiquidity and losses in some markets spread during the crisis is evidence of the risks associated with interconnectedness. Shocks in one part of the system can be amplified and transmitted through common intermediaries that collectively become overexposed to risk in the upswing of a credit cycle and overly risk-averse in a downswing.

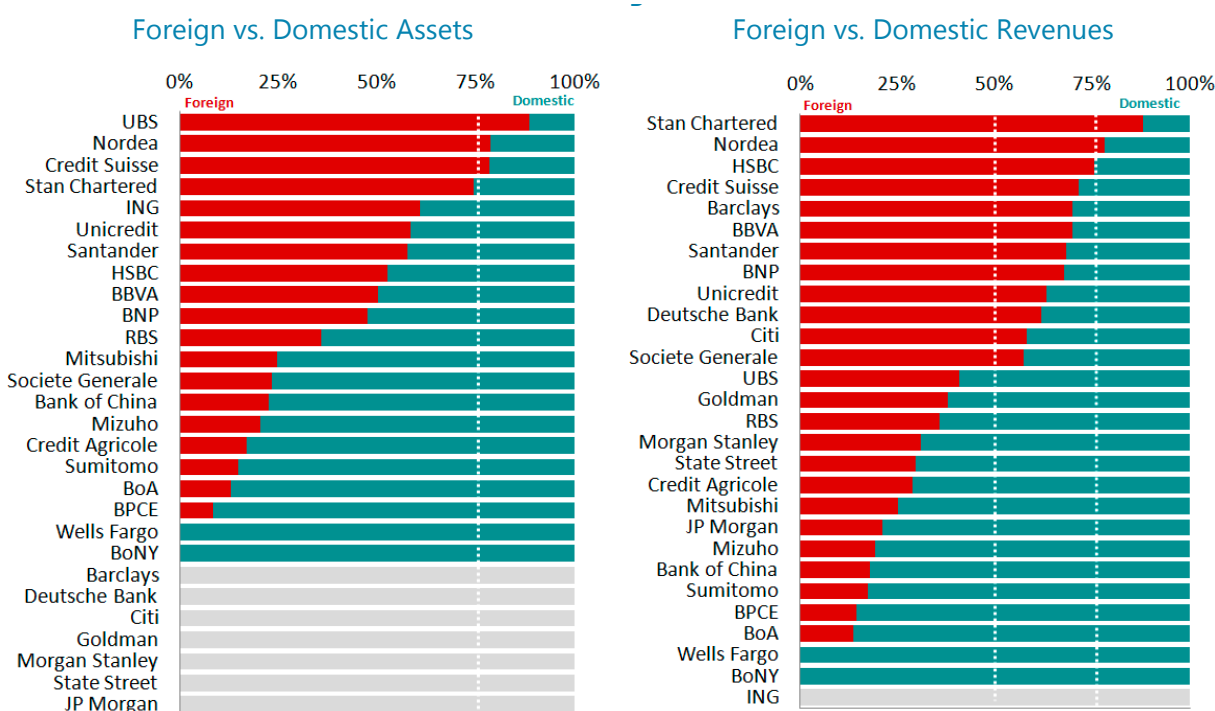
138. Cross-border financial activity also creates substantial challenges for the effective identification of systemic risks and containment of such risks. In countries with a high share of foreign banks and in the absence of information on parent institutions and their exposures, it is difficult for national authorities to assess domestic systemic risk. Cross-border activity also

⁶⁵ Prepared by Vanessa Le Lesle, Shuntaro Hara, and Manju Ismael (SPR) and Chikako Baba and Tomas Javier Mondino (MCM).

complicates the transmission of macroprudential policy action, especially where countries are home or hosts of globally systemically important institutions.

139. Closer analysis of the geographic footprint of G-SIFIs is critical. Such analysis can aid in understanding the possible unintended consequences that macroprudential policy actions taken by one country may have on other countries. However, this analysis is hampered by significant data gaps on the activities and exposures of these institutions and is complicated by their wide international diversification, with some twelve G-SIFIs deriving more than half of their revenues from outside their home country (including three G-SIFIs exceeding the 75 percent mark, as seen in Figure 14).

Figure 14. Geographic Breakdown of Twenty Nine G-SIFIs by Assets and Revenues
(In percent)



Sources: SNL, Banks' Annual Reports and IMF staff estimates.

140. For bilateral and multilateral surveillance, a deeper appreciation of systemic risk concentrations and interconnections is essential. To further develop an accurate understanding of financial interconnections and the buildup of systemic risk concentrations, data gaps need to be bridged and additional analytical tools developed. Such analysis can then guide a dialogue with policy makers on the macroprudential policies to address systemic risks as well as the potential spillovers of such policy actions.

Annex VIII. Reciprocity Principle: a Cornerstone of the Countercyclical Capital Buffer Framework⁶⁶

141. Under the BCBS proposal, each jurisdiction determines the CCB for credit exposures to counterparties in its country. According to the reciprocity principle, ~~however~~, the home supervisor ensures that for an internationally active bank domiciled in its jurisdiction the CCB is calculated on a consolidated basis, according to the geographic location of its exposures. In other words, the CCB for internationally active banks will be a weighted average of the CCBs that are being applied in jurisdictions to which the bank have an exposure. The home supervisor is not allowed to impose a buffer requirement for credit exposures to a foreign country that is below the requirement set by the host supervisor. While the home supervisor can set a higher buffer requirement for foreign exposures, the mandatory reciprocity principle would not apply to the amount of the buffer above 2.5 percent. Reciprocity with respect to add-on buffers higher than 2.5 percent would be voluntary.

142. While bank with domestic credit exposures are subject to the full amount of the CCB determined by their respective supervisor, the CCB of internationally active banks will reflect the structure of their domestic and foreign exposure. Table 3 provides an example for four countries and two internationally active banks.

Table 3. Example of Reciprocity Principle
(In percent)

Country	Domestic Buffer rate*		Credit Exposure Bank A		Specific Buffer Rate Bank A		Credit Exposure Bank B		Specific Buffer Rate Bank B
1	2.50	✕	60	≡	1.50	+	7		0.18
2	1.70		20		0.34	+	13		0.22
3	1		13		0.13	+	20		0.20
4	0		7		0.00	+	60		0.00
*Reciprocity applies from 0 to 2.5 percent			100		1.97	≡	100		0.60

Source: IMF staff calculation.

⁶⁶ Prepared by Ivo Krznar and Johannes Ehrentraud (MCM).