SM/13/145
Correction 1

July 25, 2013

To: Members of the Executive Board

From: The Secretary

Subject: **Key Aspects of Macroprudential Policy**

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

Evident Ambiguity

Page 8, para. 15, line 2: for "As set out in IMF (2012b), the prime difference is the objective. CFMs are designed to influence capital flows and affect the exchange rate."
read "As set out in IMF (2012b), the prime difference is the objective. CFMs are designed to limit capital flows."

Page 17, footnote 25, line 4: for "of FX denominated or indexed mortgages in Central, Eastern, and Southeastern Europe (CESEE) are prominent examples."
read "of FX denominated or indexed mortgages in some countries in Central, Eastern, and Southeastern Europe (CESEE) are prominent examples."

Page 21, para. 51, first bullet: for "This can take the form of increased risk weights 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)."
read "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)."

Page 50, new footnote 57 added to read: "This calculation assumes that losses are spread evenly across all financial institutions." Subsequent footnotes renumbered.

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

Page 30, para. 82, first bullet: for "The macroprudential mandate is assigned to the central bank, with macroprudential decisions ultimately made by its Board (as in Malaysia, and the Czech Republic)."
read "The macroprudential mandate is assigned to the central bank, with macroprudential decisions ultimately made by its Board (as in the Czech Republic)."

Page 35, line 1: for "Examples of such regional coordination mechanisms are the ESRB and the Nordic-Baltic Group."
read "Examples of such regional coordination mechanisms are the ESRB and the Nordic-Baltic Macroprudential Forum."

Page 35, footnote 48: for "In August 2010, the Nordic-Baltic Cross-Border Stability Group was established to enhance financial stability in the region. A memorandum of understanding was signed by Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, and Sweden. It calls for regular regional meetings, enhanced information sharing and joint risk assessment with a common template, as well as a preliminary framework for cost sharing related to the crisis management. However, the responsibilities for the management and resolution of financial crises remain with the national authorities and coordination remains voluntary."
read "The Nordic-Baltic Macroprudential Forum was set up in 2011. It meets twice a year at the level of the central bank governors and heads of supervision of the participating countries, to discuss macroprudential issues relevant to the Nordic-Baltic region."

Page 46, third bullet: for "A formal Macroeconomic and Financial Committee was newly set up in July 2012"
read "A formal Macroeconomy and Finance Meeting was newly set up in July 2012"

Page 50, Table 2:

for	"	23	13	24	37	6
		50 percent	28 percent	52 percent	80 percent	13 percent"
read	"	24	14	23	36	7
		52 percent	30 percent	50 percent	78 percent	15 percent"

Page 50, Figure 8: figure corrected to account for changes to Table 2 in the main paper and Table 3 in the background paper.

Typographical Error

Page 43: for "Ostry, Jonathan D., Atish R. Gosh, Karl Habermeier, Luc Laeven, Marcos Chamon, Masvash S. Qureshi and Annamaria Kokenyne, 2011, IMF Staff Discussion Note 11/06 (Washington: International Monetary Fund)."
read "Ostry, Jonathan D., Atish R. Gosh, Karl Habermeier, Luc Laeven, Marcos Chamon, Masvash S. Qureshi and Annamaria Kokenyne, 2011, "Managing Capital Inflows: What Tools to Use?" IMF Staff Discussion Note 11/06 (Washington: International Monetary Fund)."

Questions may be referred to Mr. Nier (ext. 34483) and Mr. Kang (ext. 38693) in MCM.

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Att: (8)

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adverse aggregate shocks; (ii) macro-financial feedback mechanisms that result in an overexposure to such adverse aggregate shocks; and (iii) linkages within the financial system that increase the vulnerability of the system to idiosyncratic or aggregate shocks.

10. Externalities can arise when the financial system amplifies adverse shocks to the economy (Hanson and others, 2011). This can take the form of a credit crunch where multiple banks respond to a common adverse shock by cutting new lending, in turn reducing investment and employment, with contractionary consequences for the economy. The desire to shrink assets can also lead to fire sale effects, where multiple institutions seek to sell illiquid securities, thereby depressing prices, further weakening balance sheets and increasing the cost of credit.

11. A range of externalities can lead to an overexposure of the system to aggregate shocks (De Nicolò and others, 2012). Endogenous feedback between credit and asset prices can result in excessive leverage and increases the vulnerability of the system when asset prices turn. Competitive pressures and capital flows can fuel credit booms, leading to an erosion of lending standards and increased exposure to macroeconomic shocks. At the same time, overreliance on short-term wholesale funding exposes the system to confidence shocks and sudden stops.

12. Externalities can also arise across the financial system (Acharya and others, 2009). As credit grows, there can be an excessive reliance on short-term wholesale funding provided by banks and non-banks, exposing the system to liquidity risk. A build-up of exposures in funding and derivatives markets can also render individual intermediaries "too interconnected to fail." Exposures to such intermediaries then benefit from implicit guarantees, leading to excessive growth of such exposures, while reducing market discipline and the incentive to control risk on the part of the systemic institutions. The failure of intermediaries that are critical to the functioning of key markets, such as providers of market infrastructure, can also impose an externality on the system as a whole.

13. These externalities give rise to three objectives or 'tasks' for macroprudential policy. First, macroprudential policy seeks to increase resilience of the financial system to aggregate systemic shocks, by building buffers that absorb their impact and help maintain the ability of the financial system to provide credit to the economy. Second, in the *time dimension*, it can seek to contain the build-up of systemic vulnerabilities over time, by reducing procyclical feedback between asset prices and credit and containing unsustainable increases in leverage and volatile funding. Third, in the *structural or "cross-sectional" dimension*, macroprudential policy can seek to control the build-up of vulnerabilities within the financial system that arises through interlinkages between financial intermediaries and the critical role played by institutions in key markets, and can render individual institutions too important to fail.

14. Macroprudential policy uses primarily prudential tools to achieve its objectives. This can include countercyclical capital buffers and provisions, sectoral capital requirements, measures to contain liquidity and foreign exchange (FX) mismatches, and caps on loan-to-value (LTV) and debt-to-income (DTI) ratios. Macroprudential policy can also seek to affect the design of products offered to borrowers in retail markets, and the functioning and institutional underpinnings of wholesale markets. It can finally seek to use tools that are traditionally associated with other policy fields, such

as monetary (e.g., reserves requirements), fiscal (e.g., levies imposed on wholesale funding) and competition policy (e.g., takeover policies), as set out in more detail below.

15. An important distinction is between macroprudential measures and capital flow management measures (CFMs). As set out in IMF (2012b), the prime difference is the objective. CFMs are designed to limit~~influence~~ capital flows ~~and affect the exchange rate~~. Macroprudential measures are prudential tools that are designed to limit systemic vulnerabilities. This can include vulnerabilities associated with capital inflows and exposure of the financial system to exchange rate shocks. While there can therefore be overlap, macroprudential measures do not seek to affect the strength of capital flows or the exchange rate per se.[5]

16. More broadly, macroprudential policy is not well-suited to control asset prices, including the prices of securities (stocks and bonds), or interest and exchange rates. Since these prices are likely to be driven by a range of fundamental and speculative factors—including other policies—affecting them should not be seen as a primary aim of macroprudential policies.

17. Rather, macroprudential policy can seek to contain the vulnerability of the system to asset price reversals, such as from leveraged exposures to asset prices.[6] In the presence of such vulnerabilities, macroprudential policy should take action to increase the resilience of the system to asset price shocks.[7] In their absence, however, macroprudential policy action may not be warranted. For instance, a 'search for yield' that increases investment in risky assets should be a concern for macroprudential policy only to the extent that it leads to the build-up of systemic vulnerability, such as an unsustainable increase in leverage taken by borrowers or investors.[8]

18. Macroprudential policy needs to be geared to containing systemic vulnerabilities and should not be overburdened with broader objectives, such as the management of the level and composition of aggregate demand (IMF, 2013a). Macroprudential policy can contribute to macroeconomic stability by containing unsustainable credit booms and reducing the impact of shocks on the provision of credit to the economy. However, macroprudential policies should not be overburdened with a broader role in macroeconomic management. Moreover, they should not be

[5] As explained in IMF 2012b, there is overlap between macroprudential measures and CFMs. Measures to contain systemic risks from capital inflows can be both macroprudential measures and CFMs. See also Ostry and others (2011).

[6] Vulnerabilities can arise where real or financial assets are used as collateral for credit, such as in mortgage and repo markets. Feedback between asset prices and the supply and demand for credit can then drive up leverage. Vulnerabilities can also arise when the design of debt contracts implies a strong effect of swings in asset prices, or interest and exchange rates, on the likelihood of borrower defaults (as for FX denominated mortgages or interest only loans). Finally, vulnerabilities arise where securities (including stocks and bonds) are held on the balance sheet of banks, or held by other bank-like intermediaries and are ultimately funded short-term.

[7] Such action can, of course, in turn have a measurable effect also on asset prices.

[8] The evidence suggests that stock market busts need not be associated with systemic implications (Hahm and others, 2012). Likewise, the experience suggests that the bursting of a high-yield bubble may have limited consequences for financial stability. The bursting in 1990 of the bubble in United States (U.S.) junk bonds and demise of Drexel Burnham Lambert is an example.

38. Strong increases in credit can signal a build-up of systemic risk. The empirical literature finds that increases in the ratio of private sector credit to GDP, as measured by the growth in credit relative to GDP or by the deviation from its long-run trend, is the best single indicator of an increase in the probability of a crisis over a horizon of 1 to 3 years (Drehmann and others, 2011; Drehmann and Juselius, 2012; IMF, 2011b; Lund-Jensen, 2012). Use of broad measures of credit, including credit provided by non-banks and cross-border, can improve the indicator (Drehmann and others, 2011; IMF, 2011b; Arregui and others, 2013). However, it is also found that not all credit booms end in a bust, as they may be justified by better fundamentals, and that loan growth can contribute to a healthy financial deepening (Dell'Ariccia and others, 2012).

39. It is important to consider the macroeconomic environment that gives rise to increases in credit and additional indicators of the build-up of systemic risk. Combining the analysis of credit growth with other indicators can help in deciding whether excessive credit growth poses systemic risk. These indicators include:

- the prices of *assets* that are used as collateral for secured lending and that may contribute to feedback between increases in leverage and asset prices; [23]
- the *leverage* taken by borrowers in those asset markets, on average as well as on new loans, since the latter will be a more timely measure of credit conditions;[24]
- changes in *lending standards*, as can be captured by decreases in lending margins and increases in household and corporate leverage;
- measures of *balance sheet stretch* in the household and corporate sectors, as can be captured by debt-service to income ratios for each sector (Drehmann and Juselius, 2012);
- increases in exposure of the household and corporate sectors to *interest rate* and *currency* risks that create vulnerabilities to aggregate shocks; and[25]
- *external imbalances*, as reflected in current account deficits and an appreciation of the real exchange rate, that can increase the probability of crises. [26]

[23] See Borio and Lowe (2003), Drehmann and others (2011) and IMF (2011b) on combining credit growth with equity price growth, and Arregui and others (2013) and Lund-Jensen (2012) on combining credit growth and house price growth.

[24] Geanakoplos and Pedersen (2011) point out that the data to construct these indices are often not collected.

[25] Country experiences suggest that exposures to tail risks, including sharp changes in interest rates, house prices and exchange rates, tend to increase in the run-up to crises as lending standards fall and the terms of financial contracts change. The increased prevalence ahead of the crisis of interest-only and adjustable rate mortgages in the U.S. and of FX denominated or indexed mortgages in some countries in Central, Eastern, and Southeastern Europe (CESEE) are prominent examples.

[26] Kaminsky and Reinhart (1999) show that weak exports and a resulting current account deficits are frequently observed before financial crises. Barrell and others (2010) find strong evidence on the ability of current account deficits and housing prices to predict banking crises. Jordan and others (2010) show that credit growth emerges as the single best predictor of financial instability, but that the correlation between lending booms and current account imbalances has grown much tighter in recent decades. Lund-Jensen (2012) finds evidence that real appreciations are a predictor of banking crisis, in model that also uses the credit to GDP gap.

40. Close analysis of the build-up of vulnerabilities within the financial sector is essential. This analysis needs to consider whether an increase in credit to GDP is sustainable, or stretching the system and subjecting it to unsustainable increases in credit, FX and liquidity risks. It should consider:

- the capacity of the financial system to absorb *default risk* and *changes in asset valuations*, as can be measured by leverage ratios and measures of profitability, and assessed through various types of stress tests; and
- the extent to which banks increase reliance on wholesale funding to finance credit expansion, thereby exposing the system to *liquidity shocks*, as measured by the ratio of non-core to core funding or the ratio of credit to deposits.

41. In the structural dimension the analysis needs to consider the extent to which linkages within the financial system pose a threat. The crisis has shown that new products, such as credit default swaps, can lead to rapid changes in risk-concentrations across the financial sector and increased exposure to tail risks for some institutions, which in turn render these institutions "too important to fail." It also highlighted changes in the structure of the financial system where non-banks, such as money market mutual funds, become important sources of funding for banks, while the liquidity mismatches of such institutions can contribute to endogenous fire sale dynamics that weaken the financial system.[27]

42. Monitoring and analysis of these interconnections is important to assess the need for a macroprudential response. This needs to recognize that connections within the financial system can act both as shock absorber and as shock transmitter and that an increase in connectivity is not always associated with increases in systemic risk. Recent advances in techniques to assess risks arising from interconnections (such as network analysis), and methods based on market prices (such as contingent claims analysis), can help assess the risk from interconnectedness (Arregui, Scarlata, and others, 2013). However, such analysis is often still hampered by gaps in the data available to the authorities.

43. A range of indicators and methods need to be combined with qualitative judgment to arrive at the decision on when to act. While slow-moving indicators are useful for detecting the build-up of risks, high-frequency and market-based indicators are better in predicting an imminent materialization of systemic risk and can help prepare the authorities to respond to stresses several months in advance (Blancher and others, 2013; Arsov and others, 2013).

44. The systemic risk monitoring framework is work in progress in a number of key dimensions. Tools exist to assess most sectors and levels of aggregation (Annex II). However, these tools provide only partial coverage of potential risks and only tentative signals on the likelihood and

[27]By contrast, where credit provision and investment does not involve leverage or liquidity mismatch, this can lead to greater resilience as non-bank institutions, such as insurance companies and pension funds, act as a shock absorber (FSB 2012).

- 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).

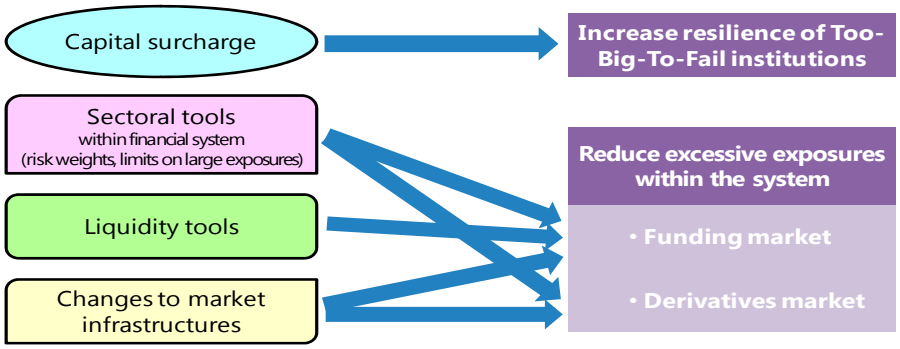
- This can take the form of increased sectoral capital requirements ~~risk weights~~ for exposures within the financial system or specific types of exposures that are growing rapidly, as proposed for the U.K. Financial Policy Committee (FPC).

[32] The NFSR 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.

Figure 5. Mapping Tools to Objectives: Structural Dimension



Source: IMF staff.

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

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 ~~Malaysia, and~~ 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

are the ESRB[47] and the Nordic-Baltic Macroprudential Forum~~Group~~.[48] There can also be more ad-hoc structures organized to deal with specific problems, such as the "Vienna initiative."[49]

- **Bilateral approaches** require strengthening home-host cooperation in the macroprudential field. Forms of this cooperation may differ, ranging from the cooperation in relation of individual institutions (as in supervisory colleges), to bilateral agreements that coordinate macroprudential measures of the countries involved.

CHALLENGES AND THE ROAD AHEAD

104. This paper has charted the progress made over the past few years in establishing macroprudential policy frameworks. The analysis has drawn on a number of country experiences, as well as the analytical advances that are being made to help policymakers decide whether and when to act and how to use macroprudential tools effectively.

105. The paper has also pointed to a number of important challenges and limitations of macroprudential policy.

- Detecting systemic risk will remain inherently difficult, even as progress is being made in developing quantitative approaches.
- Calibrating macroprudential tools is challenging in the face of uncertainty over the transmission of macroprudential tools.
- Achieving strong governance is difficult when success is not easily measurable, but costs are more immediate.
- Biases in favor of inaction over action are compounded by financial lobbying, political interference and public opposition.[50]
- Communication challenges arise even as some elements (e.g., periodic reports, etc.) can be borrowed from monetary policy frameworks.
- Macroprudential policies are prone to being be circumvented, both at the national level (boundary problem) and through cross-border arbitrage (leakage problem).

[47] IMF (2013c) provides a description of the ESRB framework.

[48] ~~In August 2010, the Nordic-Baltic Cross-Border Stability Group was established to enhance financial stability in the region. A memorandum of understanding was signed by Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, and Sweden. It calls for regular regional meetings, enhanced information sharing and joint risk assessment with a common template, as well as a preliminary framework for cost sharing related to the crisis management. However, the responsibilities for the management and resolution of financial crises remain with the national authorities and coordination remains voluntary.~~The Nordic-Baltic Macroprudential Forum was set up in 2011. It meets twice a year at the level of the central bank governors and heads of supervision of the participating countries, to discuss macroprudential issues relevant to the Nordic-Baltic region.

[49] See http://vienna-initiative.com.

[50] These issues are a greater concern than for monetary policy, since the costs of targeted macroprudential action will fall predominantly on the financial industry, or on specific groups of households and corporations (Nier and others 2011, Blanchard and others 2013).

- Flexible use of tools is required to keep pace with developments in the financial sector, but this can conflict with political and legal traditions.
- Closing information and regulatory gaps is necessary, but challenging, and will often require legislative change.
- In a financially integrated world, multilateral coordination of policies is desirable, but is not easily achieved where the incentives of home and host authorities are not aligned.

106. As experience with the use of macroprudential tools accumulates over the next few years, further research can guide policy. As experience accumulates this can form the basis of further research, including on the mapping of risk indicators to policy responses, the strength of transmission of specific macroprudential tools, and the effects of combining tools for the ultimate objective of reducing the probability and depth of crises.

107. Policymakers need to engage with challenges and avoid pitfalls in the design and application of macroprudential policy.

- **Policymakers should not be lulled by apparent macroeconomic stability.** Financial imbalances often grow in the background and under the surface of apparent economic tranquility, and need not translate into inflationary pressures.
- **Policymakers should not be led to believe that any one quantitative approach is sufficient for systemic risk assessments.** They should be aware of the limitations of present techniques used for stress testing and network analysis in capturing the full dimension of systemic risks. A range of methods and indicators need to be combined and complemented with qualitative information, based on market intelligence, and sound analysis of real imbalances.
- **Policymakers should not over-rely on a single tool.** The countercyclical buffer will be established by way of implementing Basel III in many countries. However, effective mitigation of systemic risk requires use of interlocking tools in both the time and structural dimension.
- **The policy framework should not overburden macroprudential policy.** Macroprudential policy cannot cure all ills. For it to make a contribution to macroeconomic stability, its objectives need to be defined clearly and in a manner that can form the basis of a strong accountability framework.
- **Macroprudential policy needs to be complemented by strong macroeconomic policies.** Prudential policies alone are unlikely to be effective in containing systemic risk driven by real imbalances. Macroeconomic policies including monetary, fiscal and structural policies are needed to correct these.
- **Macroprudential policy should not be expected to prevent all future crises.** Policymakers need to accept that crises will continue to occur and be prepared to manage these crises through appropriate policies.

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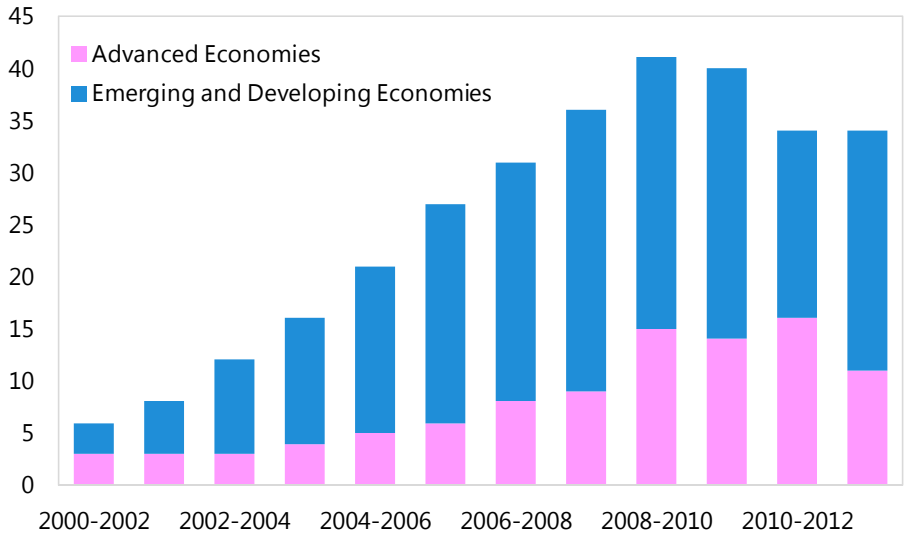
Annex I. Macroprudential Tools and Institutional Arrangements[51]

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 polices compiled by Lim and other (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 FSOC, 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 Macroeconomyic and Finance Meetingial Committee 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.

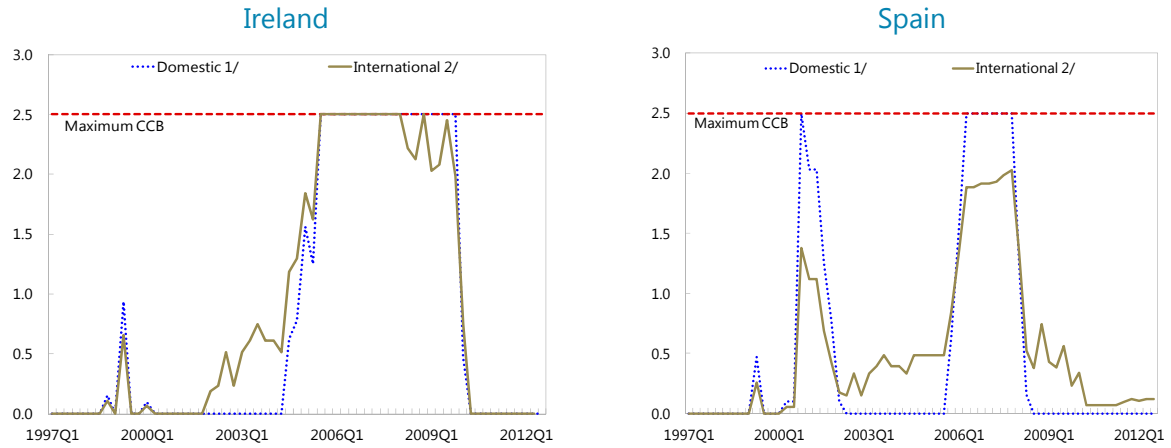
[54] The central bank is tasked with systemic risk monitoring. It also suggests respective warnings or recommendations for corrective measures, and submits such warnings or recommendations to the Financial Stability Commission.

Annex III. Effectiveness of Tools in Time Dimension[55]

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.

Figure 7. Ireland and Spain: Simulated Countercyclical Capital Buffer
(In percent of risk weighted assets)



Source: IMF staff calculation.
Note: 1/ The CCB calculated assuming Irish and Spanish bank do not have any international exposure.
2/ The CCB calculated assuming Irish and Spanish bank have international exposure.

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 shows 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]

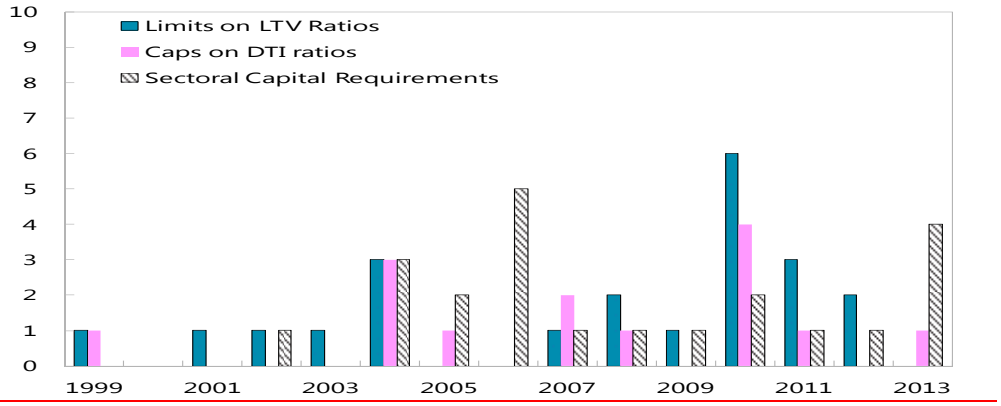
Table 2. Number of Countries with Sectoral Macroprudential Tools

	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)	243 (520 percent)	14 (30 percent)	143 (3028 percent)	234 (502 percent)	367 (7880 percent)	18 (39 percent)	76 (153 percent)

Source: IMF staff calculation.

Figure 8. Introduction of Sectoral Macroprudential 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.