

# IMF Working Paper

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## The Macprudential Framework: Policy Responsiveness and Institutional Arrangements

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and Xiaoyong Wu*

**IMF Working Paper**

Monetary and Capital Markets Department

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**Abstract**

This paper gauges if, and how, institutional arrangements are correlated with the use of macroprudential policy instruments. Using data from 39 countries, the paper evaluates policy response time in various types of institutional arrangements for macroprudential policy and finds that the macroprudential framework that gives the central bank an important role is associated with more timely use of macroprudential policy instruments. Policymakers may also tend to use macroprudential instruments more quickly if the ability to conduct monetary policy is somehow constrained. This finding points to the importance of coordination between macroprudential and monetary policy.

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## I. INTRODUCTION

The global financial crisis has underscored the need for a new macroprudential policy framework to prevent the buildup of systemic financial risks. In many countries, efforts are under way to establish such a policy framework by making new, or improving on existing, institutional arrangements. In the quest for a new policy framework, a natural question to ask is: what type of institutional arrangement is most effective? While no one size fits all, previous research by the IMF indicates that it is desirable for an institutional arrangement to provide for the timely use of macroprudential policy tools, which are shown to be effective in countering the cyclicalities in the financial system.<sup>2</sup>

This paper attempts to gauge if institutional arrangements can affect the timely use of macroprudential policy instruments. This is achieved by evaluating policy response time under different institutional arrangements in a cross-country study of 39 countries, using newly updated data based on the 2010 IMF survey on Financial Stability and Macroprudential Policy (see Appendix). Policy response in this paper refers to the use of macroprudential instruments to address risks that contribute to the buildup of systemic vulnerabilities over time, or the time dimension of systemic risk.

A key assumption of the paper is that all observed policy actions are warranted by emerging risks. No attempt is made to judge when or whether policy action should be taken, which is beyond the scope of this paper. The assumption seems plausible for policy instruments used to address the time dimension of systemic risk, i.e., tightened in the upswing of the credit cycle and loosened in the downswing. To ensure that this assumption holds, all instruments in the sample are carefully examined to exclude those that seem to be unrelated to the credit cycle and have a microprudential focus. As it turns out, these instances are extremely rare in the sample.

The paper finds a negative correlation between policy response time and the central bank's involvement in the macroprudential policy framework. This finding supports the Fund's position that "the central bank needs to play an important role" in the macroprudential policy framework.<sup>3</sup> While not purporting to show that a short response time is, in and of itself, effective or even desirable, the finding is consistent with previous Fund research showing that an institutional arrangement can enhance the timeliness of policy responses if it (i) facilitates systemic risk monitoring and identification, and (ii) fosters cross-agency policy coordination. The central bank is in a unique position to do both.

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<sup>2</sup>See IMF (2011a), Nier et al (2011) and Lim et al (2011); Global Financial Stability Report (GFSR), September 2011.

<sup>3</sup>See IMF (2013).

## II. MEASURING INSTITUTIONAL ARRANGEMENTS

Real-life institutional arrangements have certain distinguishing dimensions. The Fund's previous work has identified five such dimensions from institutional arrangements in place or being developed around the world:<sup>4</sup> (i) the degree of institutional integration between the central bank and financial regulatory/supervisory functions; (ii) the ownership of the macroprudential mandate; (iii) the role of the government (treasury) in macroprudential policy; (iv) the degree of organizational separation of decision-making and control over instruments; and (v) the existence of a coordinating body for macroprudential policy.

These dimensions may be quantified to indicate the respective roles of the central bank and the government in various institutional arrangements. To that end, this paper constructs three indices: a macroprudential index (MaPP) indicating the role of the central bank in the macroprudential policy framework; a microprudential index (MiPP) indicating the degree of involvement of the central bank in prudential regulation and supervision;<sup>5</sup> and a government index (MoF) indicating the degree of involvement of the government in macroprudential policy.<sup>6</sup> The indices measure *de facto* arrangement and are not mutually exclusive.<sup>7</sup> The indices assign a score of 1 to 4, with a higher value indicating a more important role:

- **The MaPP index:**

- 1 – The financial stability/macroprudential policy mandate is shared by multiple agencies including the central bank, but there is no coordination body,

- 2 – The mandate is shared by multiple agencies including the central bank, and the central bank is a member of a coordination body,

- 3 – The mandate is shared by multiple agencies including the central bank, and the central bank chairs the coordination body, and

- 4 – The central bank, or a committee of the central bank, is the sole owner of the mandate.

- **The MiPP index:**

- 1 – The central bank has no regulatory/supervisory functions,

- 2 – The central bank supervises the banking sector,

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<sup>4</sup>See Nier et al (2011).

<sup>5</sup>This index is similar to the one constructed by Masciandaro et al (2011) - the Central Bank as Financial Supervisor Index.

<sup>6</sup>The indices are based on the 2010 IMF survey on Financial Stability and Macroprudential Policy, information provided by IMF country economists, the authorities' websites, and FSAP reports.

<sup>7</sup>The index scores do not necessarily sum up to the same number for all countries. The scores reflect the institutional arrangement at the time of policy action.

- 3 – The central bank supervises the banking sector and part of the nonbank financial sector, and
- 4 – The central bank supervises the entire financial sector.
- **The MoF index:**
  - 1 – There is no macroprudential policy coordination body or the government is not a member,
  - 2 – The government is a member/observer of the policy coordination body,
  - 3 – The government co-chairs the policy coordination body with other agencies, and
  - 4 – The government chairs the policy coordination body.

The indices thus constructed show some common features of institutional arrangements across countries. For instance, the central bank shares the financial stability/macroprudential policy mandate with other agencies as a member of a policy coordination body (2 in MaPP) in a majority of countries in the sample (Table 1). Similarly, the central bank has prudential regulation functions in a majority of the sample countries, with 41 percent having responsibility for banking supervision (2 in MiPP), 18 percent for banking and some nonbank supervision (3 in MiPP), and 8 percent for all financial regulation and supervision (4 in MiPP). The government also tends to share the financial stability/macroprudential policy mandate with other agencies and plays a leading role in only a minority of the sample countries (4 in MoF). A full tabulation of the results is presented in Table 4.

**Table 1. Institutional Arrangement Indices  
(% of countries)**

Score	MaPP	MiPP	MoF
1	7.7	33.3	23.1
2	61.5	41.0	46.2
3	10.3	17.9	5.1
4	20.5	7.7	25.6

Source: Fund staff calculations.

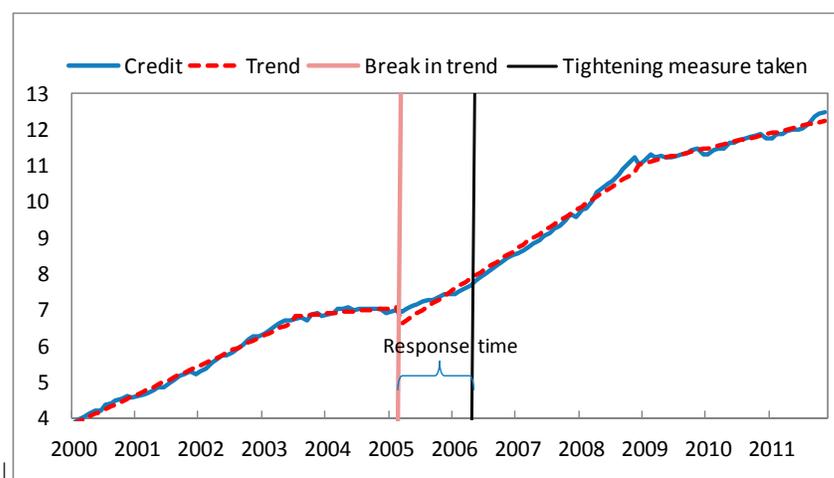
### III. MEASURING RESPONSE TIME

Response time measures elapsed time between the emergence of a risk and the subsequent use of a policy instrument. While the use of a policy instrument is usually well documented, it is not always clear when a risk has emerged. The judgment of risks depends on the policymaker's risk tolerance, and there does not seem to be a universally accepted level of risk tolerance across countries. Given the difficulty in identifying the emergence of risks, this paper uses significant and distinctive changes in the behavior of a risk variable as the start point of response time. These changes are identified using two different approaches, i.e., a

break-in-trend analysis and a distance from peak/trough analysis, both providing a benchmark for measuring response time without the need to assess the risk tolerance. A third approach, a threshold analysis, is also tried, but it involves judgment on the emergence of risks and is included only as an experiment.<sup>8</sup>

- *Approach 1: break-in-trend analysis.* Under this approach, a structural break in the level and slope of a trend function represents a change in the behavior of a risk variable and is used as the start point of response time. To identify such structural breaks, the methodology of Carrion-i-Silvestre, Kim and Perron (2009) is used, which detects the break date by minimizing the sum of squared residuals across all possible break points. From an initially assumed number of breaks, OLS is used to remove insignificant levels and slopes to identify the final set of break dates (Figure 1).<sup>9</sup>

**Figure 1. Break-in-Trend Analysis**

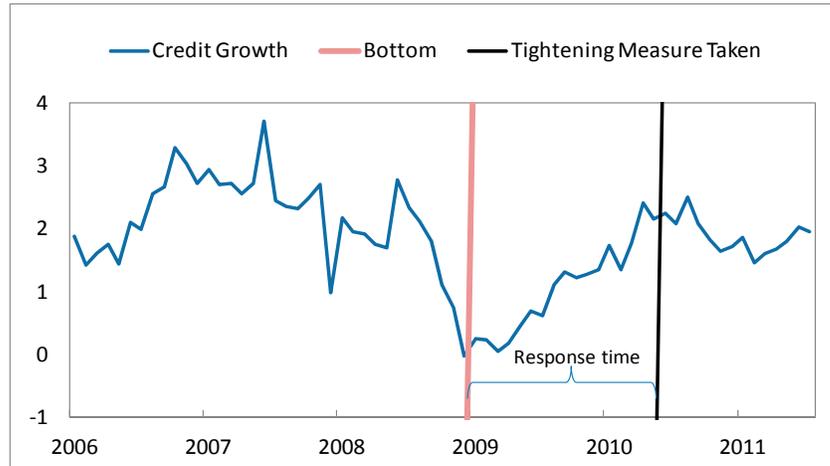


Source: Fund staff calculations.

- *Approach 2: distance-from-peak/trough analysis.* Under this approach, a turning point (peak/trough) in the path of a risk variable represents a change in its behavior and is used as the start point of response time. The turning points are estimated from a six-month moving average of seasonally adjusted data. Like Approach 1, this approach is capable of ranking policy responsiveness under different institutional arrangements by providing a common yardstick that is independent of any judgment of risk tolerance or when the risks emerged (Figure 2).

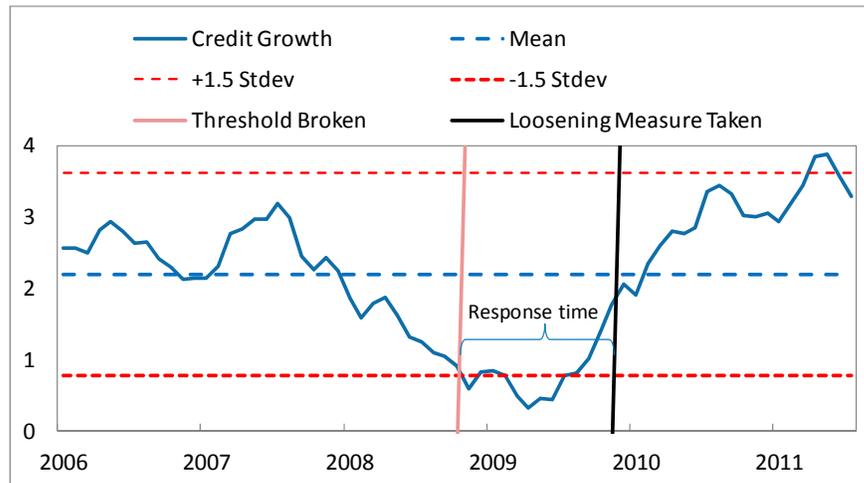
<sup>8</sup>Judgments can be arbitrary, and the arbitrariness may limit the usefulness of this approach.

<sup>9</sup>The Markov switching model provides an alternative. As it turns out, however, it was not able to identify two stages in the risk variables for many countries in the sample.

**Figure 2. Distance-from Peak/Trough Analysis**

Source: Fund staff calculations.

- Approach 3: threshold analysis.* Under this approach, a risk is considered to have emerged only after the risk variable crosses a certain threshold, and the threshold is used as the start point of response time. Following previous work by the Fund, a growth rate (yoy) that is 1.5 standard deviations from the historical mean during the sample period is chosen as the threshold.<sup>10</sup> The date corresponding to this threshold is then selected as the start point for calculating response time.

**Figure 3. Threshold Analysis**

Source: Fund staff calculations.

<sup>10</sup>See IMF (2012). The GFSR also used 5 percent (yoy) growth in credit/GDP as a threshold.

In the calculation of response time, credit and credit growth are used as the risk variable. Credit is widely considered an important variable to focus on for systemic risk oversight.<sup>11</sup> Most of the countries responding to the IMF survey have used macroprudential policy to target credit or credit growth.<sup>12</sup> Using credit and credit growth as the risk variable to calculate response time also has the advantage of covering the largest number of instances of macroprudential policy instruments being used. On the other hand, response time calculated for other risk variables, such as leverage, liquidity and house prices, based on the use of instruments to address credit-related risks may not be accurate.<sup>13</sup> The calculation of response time for these other risk variables based on instruments used to target them turns out not to be feasible as very few macroprudential policy instruments were used to specifically target these risks. This paper uses eight macroprudential policy instruments in calculating response time: caps on the LTV, caps on the DTI, limits on foreign currency lending, ceilings on credit/credit growth, reserve requirements, capital requirements, provisioning requirements, and restrictions on profit distribution (see Appendix).

The estimated response time reflects policy action taken in both the upswing and downswing of the credit cycle. The sample includes monthly data from 39 countries that used macroprudential instruments during the period of 2008–2011, in which both tightening and loosening of macroprudential instruments occurred. Thus, response time is calculated in a two-step process: the response times for the upswing and downswing are measured separately and then averaged to arrive at the final number. If an instrument is used multiple times in either the upswing or the downswing, the first time of its implementation is used in the calculation of response time.

The calculated average response times seem close for Approaches 1 and 2 but not for Approach 3. The results under Approach 3 excluded more than half of the countries in the sample, for which response time could not be calculated. These are countries where policy action is taken well before the threshold is reached, and excluding them makes the average response time under Approach 3 the longest among the three approaches (Figure 4). The fact that many countries take action before a threshold is reached seems to indicate that the assumption of a *common* risk threshold across countries, such as one represented by a growth

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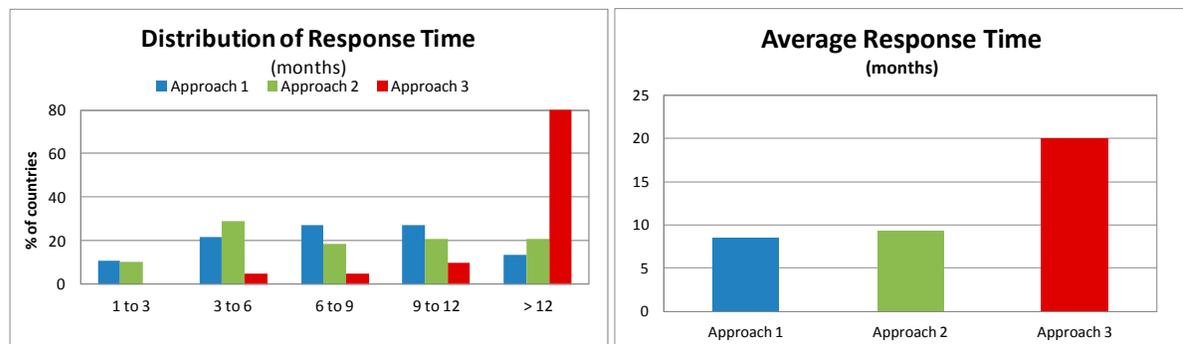
<sup>11</sup>See, for example, Arregui et al (2013).

<sup>12</sup>According to the 2010 IMF survey, country authorities have used macroprudential instruments to address four broad categories of systemic risk: (i) risks generated by strong credit growth and credit-driven asset price inflation; (ii) risks arising from excessive leverage and the consequent deleveraging; (iii) systemic liquidity risks; and (iv) risks related to large and volatile capital flows. See Lim et al (2011) for details.

<sup>13</sup>Credit/GDP is another risk variable, but it tends to be negatively correlated with GDP growth. See, for example, Repullo et al (2010) and Repullo and Saurina (2012). As a result, policy action based on credit/GDP tends to be procyclical. According to the IMF survey, most countries use credit growth, rather than credit/GDP, as a guide for policy actions. Therefore, this paper does not use credit/GDP in calculating response time.

rate 1.5 standard deviations from the historical mean, is arbitrary and unrealistic.<sup>14</sup> A threshold estimated from cross-country panel data may be, on average, a good indicator of the likelihood of an impending financial crisis, but it may not be a probable trigger for preventive policy action in any given country. Policymakers may be more likely to look at the behavior of a risk variable over time, and in combination with other variables, than focus on a single threshold in deciding to use macroprudential policy instruments.

**Figure 4. Calculated Response Time**



Source: Fund staff calculations.

#### IV. RESPONSE TIME AND INSTITUTIONAL INDICES

There seems to be some correlation between response time and the MaPP index. In particular, the average response time seems negatively correlated with the MaPP index under both Approach 1 and Approach 2 (Figure 5).<sup>15</sup> On the other hand, the correlation is not obvious under Approach 3, but this approach is probably not representative of the sample. Approach 3 includes fewer than half of the countries in the sample and has a much longer average response time because countries that take action before a threshold is breached are excluded. The negative correlation seems to suggest that it is desirable for the central bank to play an important role.<sup>16</sup>

The relationship between response time and the MiPP index is less clear. The average response time seems to be negatively correlated with the MiPP index under Approach 1, but a similar result does not hold for Approach 2 or Approach 3. It is therefore unclear whether such a negative correlation exists. While integrating prudential regulation in the central bank has the potential advantage of placing policy decision and tools in the same agency that can

<sup>14</sup>The same holds for the rolling 1.5 standard deviation.

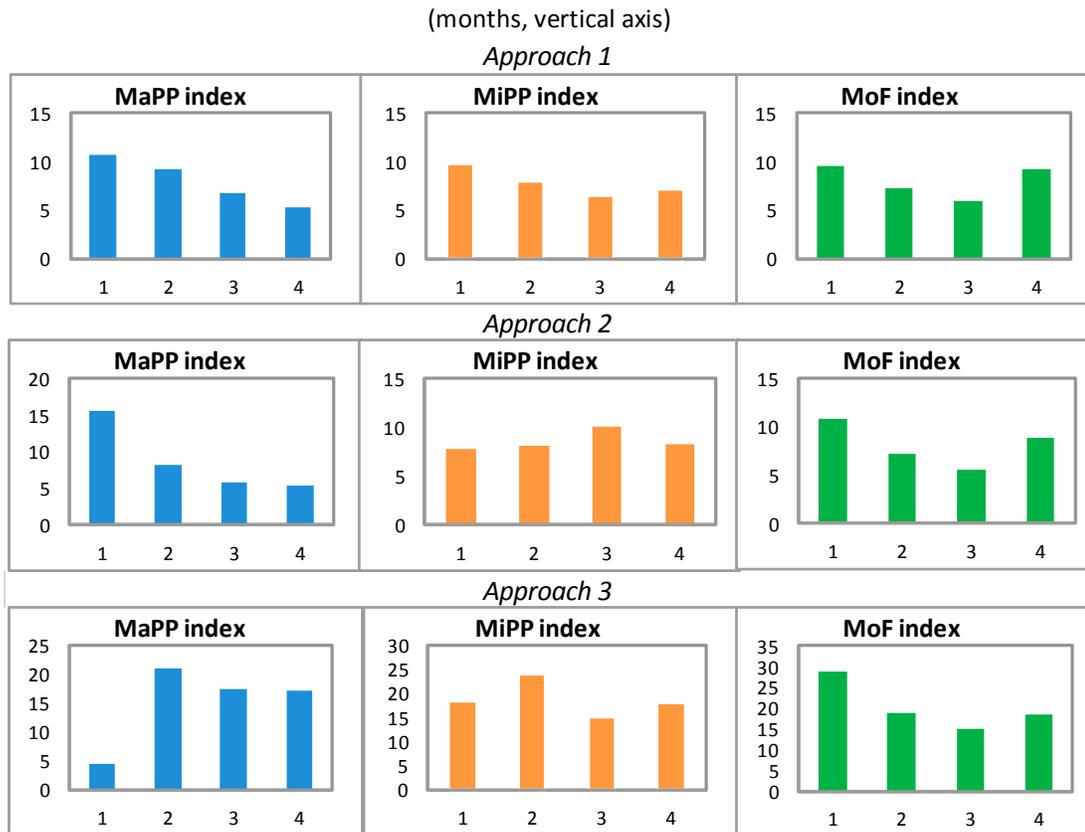
<sup>15</sup>The column height represents the average response time of countries grouped by their institutional arrangements.

<sup>16</sup>See IMF (2013).

reduce response time, this advantage would not be achieved if the central bank were not given the decision-making role.

The relationship between response time and the MoF index is also unclear. The correlation seems nonlinear, with response time initially declining but reversing course later. This, however, does not indicate that the participation of the government in the macroprudential policy framework is not important. The fact that the average response time is the longest in the absence of a policy coordinating body (1 in MoF) under all three approaches suggests that the government's involvement can improve the macroprudential policy framework. As noted by the Fund's previous work, participation by government helps garner political support for policy actions, although a stronger role of the government relative to the central bank may increase the risk that short-term political considerations prevail over incentives to contain excessive exuberance in financial markets.<sup>17</sup>

**Figure 5. Response Time for Credit in Different Institutional Arrangements<sup>1</sup>**



Source: Fund staff calculations.

<sup>17</sup>See Nier et al (2011).

## V. RESPONSE TIME IN A MULTIVARIATE ANALYSIS

There may be other factors, in addition to institutional arrangements, that may affect the timely use of macroprudential instruments. The previous section illustrates the possible correlation between institutional arrangements and response time. This section investigates if response time is correlated with other factors. Monetary policy, for instance, may be one such factor—the availability of the interest rate as a policy tool and the willingness of the policymaker to use it may influence how quickly a macroprudential policy instrument is used. The depth of the financial sector may also have a bearing on the use of macroprudential policy instruments as countries with small and unsophisticated financial sectors, *ceteris paribus*, may tend to use these instruments as a first resort more frequently. To verify the possible effect of such factors, the following cross-country equation is estimated:<sup>18</sup>

$$\text{Response time}_i = \alpha + \beta_1 \text{MaPP}_i + \beta_2 \text{MiPP}_i + \beta_3 \text{MoF}_i + \beta_4 \text{INT}_i + \beta_5 \text{CGDP}_i + \varepsilon_i \quad (\text{a})$$

where  $i$  denotes country,  $\text{MaPP}_i$ ,  $\text{MiPP}_i$ , and  $\text{MoF}_i$  are the institutional indices representing the arrangement in place at the time of policy action,  $\text{INT}_i$  is the standardized cumulative change in the policy rate during the period corresponding to the response time of macroprudential policy,  $\text{CGDP}_i$  is the average credit-to-GDP ratio during 2008-2011 representing the depth of the financial sector.

Some caution is needed in interpreting the regression results. The sample size is so small that the regression results may be sensitive to small variations in the sample and to the influence of outliers.<sup>19</sup> The estimated model is also too simple to identify any causal relationship, and some of the right-hand-side variables may be endogenous. While the institutional indices can be considered exogenous as they reflect the arrangement at the time of policy action, there is no sure way to ascertain that monetary policy is truly exogenous.

The caveats notwithstanding, the regression results seem to confirm the negative correlation between response time and the MaPP index. The estimated coefficients of the MaPP index under both Approach 1 and Approach 2 are negative and statistically significant (Table 2). They are also similar in size (-2.6 under Approach 1 and -3.1 under approach 2), suggesting that for each increase in central bank involvement, the response time would be reduced by about three months. The result doesn't seem to be sensitive to the inclusion of other independent variables—the estimated coefficients of the MaPP index remain negative and

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<sup>18</sup>A panel estimation is not possible as response time is not continuous over time. The equation is estimated for Approach 1 and 2, but not for Approach 3 given its small number of observations. The estimation includes 37 countries for which data are available.

<sup>19</sup>Given the small sample size, the nonparametric, residual bootstrap method is used to obtain standard errors. The pairs bootstrap is also tried, where data (instead of residuals) are re-sampled to account for possible non-IID errors, but the test results do not change.

statistically significant.<sup>20</sup>

**Table. 2. Response Time and Institutional Arrangements**

	Constant	MaPP	MiPP	MoF	INT	CGDP	Adj. R <sup>2</sup>
<b>Approach 1</b>	10.8 (2.4) <sup>***</sup>	-2.6 (0.7) <sup>***</sup>	0.2 (0.7)	-0.6 (0.5)	2.5 (0.8) <sup>***</sup>	0.0 (0.0) <sup>***</sup>	0.47
<b>Approach 2</b>	15.1 (4.0) <sup>***</sup>	-3.1 (1.2) <sup>**</sup>	1.1 (1.1)	-0.9 (0.9)	2.0 (1.2)	0.0 (0.0)	0.09

Source: Fund staff calculations.

Note: Standard deviations are in parentheses, and \*\*\*, \*\*, \* denote significance levels of the coefficients at 1, 5 and 10 percent, respectively.

There seems to be no clear correlation between response time and the other two institutional indices. The estimated coefficients of the MiPP index are statistically insignificant under both approaches, although they have the same sign. This result seems consistent with Figure 4, indicating that response time may have little to do with whether the supervisory function is integrated in the central bank. Likewise, the estimated coefficients of the MoF index, though both negative, are statistically insignificant, providing inconclusive evidence on the role of the government.

The results are mixed for the control variables. The estimated coefficient of the policy rate change is positive and statistically significant under Approach 1 but not under Approach 2. A positive correlation perhaps indicates that adjusting interest rates reduces the need to use macroprudential instruments early, or country authorities tend to use macroprudential instruments quickly if, for some reason, their ability to conduct monetary policy is constrained.<sup>21</sup> This result provides some evidence, though inconclusive, that coordination between macroprudential and monetary policies is important in addressing risks associated with credit growth. The estimated coefficient of credit-to-GDP is also statistically significant under Approach 1 but not under Approach 2. One possible explanation for the significant coefficient under Approach 1 is that, as credit-to-GDP is used as a proxy for the depth of the financial sector, countries tend to use macroprudential instruments more quickly if the

<sup>20</sup>A few other variables are tried in the regression, including: (i) the output gap at the time of the macroprudential policy action representing the phase of the business cycle, (ii) the number of instruments used to account for the possible effect of the inclination to use such instruments on response time, and (iii) a dummy variable for the exchange rate regime. None of those variables has a statistically significant coefficient.

<sup>21</sup>Conversely, the availability of macroprudential policy may induce policymakers to use monetary policy less frequently. If so, monetary policy would be endogenous and its estimated coefficient would not be very meaningful. The estimated coefficients of the institutional indices, however, would not be affected.

financial markets are less developed. However, when per capita GDP and a few of the Worldwide Governance Indicators are tried in the regression in place of credit-to-GDP, none of the estimated coefficients is statistically significant.<sup>22</sup> Another explanation may be simply that the risk, as represented by credit-to-GDP, becomes greater the longer it takes for policymakers to react.

As a robustness check, an alternative specification with dummy variables is estimated for response time. Equation (a) assumes a particular subjective ranking of the institutional arrangements. To see if the negative correlation still holds even if this ranking does not, the institutional indices are replaced with dummy variables representing the most distinguishing feature of the indices, i.e., which agency is in charge, and the following equation is estimated:<sup>23</sup>

$$\text{Response time}_i = \alpha + \beta_1 D_{1i} + \beta_2 D_{2i} + \beta_3 D_{3i} + \beta_4 INT_i + \beta_5 CGDP_i + \varepsilon_i \quad (\text{b})$$

where

$D_1$  substitutes MaPP, and has a value of 1 if the central bank chairs the policy coordination body or is the sole agency with the financial stability/macprudential mandate and 0 otherwise;

$D_2$  substitutes MiPP, and has a value of 1 if banking supervision is inside the central bank and 0 otherwise;

$D_3$  substitutes MoF, and has a value of 1 if the ministry of finance chairs the policy coordination body and 0 otherwise;

Results of the alternative regressions corroborate the negative correlation between response time and the MaPP index. The estimated coefficients of the dummy variable for the role of the central bank,  $D_1$ , are negative and statistically significant under both approaches (Table 3). This confirms the result of the regression on the indices themselves, pointing to the importance of the role of the central bank in the macroprudential policy framework. On the other hand, the estimated coefficients of the dummy variables  $D_2$ , representing the integration of prudential supervision in the central bank, are statistically insignificant under both approaches. Similarly, the estimated coefficients of  $D_3$  are statistically insignificant under both approaches, consistent with the results of the regression on the indices themselves and providing inconclusive evidence on the role of the government.

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<sup>22</sup> The Worldwide Governance Indicators, compiled by D. Kaufman, A. Kraay and M. Mastruzzi (2010), include Government Effectiveness, Regulatory Quality, Rule of Law and Accountability.

<sup>23</sup> Equation (a) also assumes a linear relationship between the indices and response time. Assigning a dummy variable to each of the four index scores would allow a non-linear relationship, but it is not possible given the small sample size and the even smaller number of observations in each index score.

**Table 3. Response Time and Dummy Variables**

	Constant	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	INT	CGDP	Adj. R <sup>2</sup>
<b>Approach 1</b>	5.2 (1.7)***	-4.3 (1.5)***	0.7 (1.5)	-0.4 (1.7)	2.6 (0.9)***	0.0 (0.0)**	0.37
<b>Approach 2</b>	8.8 (2.6)***	-5.1 (2.4)**	2.6 (2.2)	-0.5 (2.5)	1.7 (1.3)	-0.0 (0.0)	0.03

Source: Fund staff calculations.

Note: Standard deviations are in parentheses, and \*\*\*, \*\*, \* denote significance levels of the coefficients at 1, 5 and 10 percent, respectively.

## VI. CONCLUSION

This paper finds a negative correlation between policy response time and the involvement of the central bank in the macroprudential framework. This seems to indicate that giving the central bank an important role is conducive to reducing policy response time. This finding is consistent with the Fund's position that "the central bank needs to play an important role," the benefit of which has been well documented:<sup>24</sup> the central bank is in a unique position to monitor macrofinancial linkages in its capacity as the monetary policymaker and the supervisor of payments systems; it has the expertise in systemic risk identification and monitoring; and it has the experience in communicating risks to markets and the general public through the publication of a financial stability report.

Monetary policy may affect the timing of the use of macroprudential instruments, although the evidence is inconclusive. The paper's finding of a possible positive correlation between macroprudential policy response time and changes in the policy interest rate suggests that coordination is important between macroprudential and monetary policies. Indeed, the positive correlation seems to suggest that smaller changes in the policy rate may necessitate a quicker response of macroprudential policy to mitigate risks generated by credit growth. While monetary policy should be used as the first line of defense, it is often constrained by a number of factors, including the exchange rate regime, the prevalence of foreign currency lending and an inefficient policy transmission mechanism. In those cases, macroprudential policy would be a useful complement.

A common risk "threshold" that would trigger policy actions probably does not exist. While a threshold estimated from panel data may be useful in raising a "red flag" and analyzing the likelihood of a future financial crisis, this paper finds that policy actions are often taken long before an arbitrary threshold is reached. Rather than taking action when credit growth crosses a certain threshold, policymakers are likely to monitor a range of indicators, including changes in risk variables and market intelligence, in considering policy options.

<sup>24</sup>See Nier et al (2011) and Claessens et al (2012) for more details.

Policymakers also rely on judgment that cannot be easily captured by the risk variables, and often take action only after a confluence of evidence suggests that action is needed.

Policy response time is only one aspect of an effective macroprudential policy framework. This paper has focused on the time dimension of systemic risk, i.e., how quickly policy has responded to changes in the credit cycle under various institutional arrangements. An effective institutional arrangement, however, should be equally capable of addressing the cross-sectional dimension of systemic risk, i.e., common exposures, linkages, and interdependencies that may be sources of contagion and spillover risks to the whole financial system. In addition, the results of a cross-country study will only hold “on average,” and country-specific factors may be important in determining the responsiveness of institutional arrangements. These factors include the quality of supervision, policy coordination mechanisms, and the approach to economic management, which cannot be easily captured in a cross-country study but should be given adequate attention in establishing macroprudential frameworks in individual countries.

**Table 4. Institutional Arrangement Indices**

	MaPP	MiPP	MoF		MaPP	MiPP	MoF
<b>Africa</b>				<b>Europe</b>			
Nigeria	3	2	2	Austria	2	2	4
<b>Asia</b>				Bulgaria	2	2	4
China, P.R.: Mainland	2	1	4	Croatia	4	2	1
China, P.R.: Hong Kong	2	2	4	Finland	2	1	2
India	2	2	2	Hungary	3	1	3
Indonesia	2	2	2	Netherlands	2	3	1
Korea, Republic of	2	1	4	Norway	2	1	4
Malaysia	4	3	2	Poland	2	1	2
Mongolia	2	2	2	Romania	3	2	2
New Zealand	4	3	1	Russian Federation	1	2	1
Singapore	2	4	4	Serbia, Republic of	4	3	2
Thailand	4	2	2	Slovak Republic	4	4	3
Vietnam	2	2	4	Sweden	2	1	1
<b>Western Hemisphere</b>				Turkey	2	1	2
Argentina	1	3	1	<b>Middle East &amp; Central Asia</b>			
Brazil	2	2	2	Israel	2	2	2
Canada	2	1	4	Kuwait	4	3	1
Chile	2	1	2	Lebanon	3	2	2
Colombia	2	1	4	Saudi Arabia	4	3	1
Mexico	2	1	2				
Peru	1	1	1				
United States	2	2	2				
Uruguay	2	4	2				

•The MaPP index:

1 – The financial stability/macprudential policy mandate is shared by multiple agencies including the central bank, but there is no coordination body,

2 – The mandate is shared by multiple agencies including the central bank, and the central bank is a member of a coordination body,

3 – The mandate is shared by multiple agencies including the central bank, and the central bank chairs the coordination body, and

4 – The central bank, or a committee of the central bank, is the sole owner of the mandate.

•The MiPP index:

1 – The central bank has no regulatory/supervisory functions,

2 – The central bank supervises the banking sector,

3 – The central bank supervises the banking sector and part of the nonbank financial sector, and

4 – The central bank supervises the entire financial sector.

•The MoF index:

1 – There is no macroprudential policy coordination body or the government is not a member,

2 – The government is a member/observer of the policy coordination body,

3 – The government co-chairs the policy coordination body with other agencies, and

4 – The government chairs the policy coordination body.

Note: The indices reflect *de facto* institutional arrangements, on which information is obtained from the 2010 IMF survey on Financial Stability and Macroprudential Policy, IMF country economists, the authorities' websites, and FSAP reports.

## Appendix. Changes in Macroprudential Policy Instruments

Argentina	
Loan-to-Value	
Debt Service-to-Income	
Capital Requirements/ Risk Weights	Jan 2004: higher risk weights for loans to buy unoccupied properties (depending on the LTV), May 2004: the risk weighting for transactions with institutions with the guarantee of its head office or parent bank in an OECD country would qualify for a zero weighting; Jun 2004: the regulations on minimum capital and valuation of public sector assets following the elimination of adjustments to loans using the wage variation coefficient was adjusted; Dec 2004: the basic minimum capital demand for functioning financial institutions were increased by \$10 million; Jun 2005: the basic requirements for minimum capital were modified; Jul 2006: the minimum capital requirements were adjusted to make it easier to grant fresh finance for mortgage loans up to \$100,000 for unique family owned housing; Aug: 2006 the weightings applicable to the new finance for mortgage loans up to \$200,000 for sole family housing for permanent occupancy was changed; Nov 2007: the credit risk weighting factors table for government securities, BCRA monetary regulation instruments, including those posted under "trading accounts" and in "Investments Accounts," were assigned a weighting of zero; Jan 2008: the minimum capital requirements for financial entities was adjusted; 2012: operational risk was added to the minimum capital requirement; the minimum capital requirement for opening branches was also adjusted; 2012: The BCRA also lowered the risk weights on some specific loans (e.g., loans granted to the public sector).
Provisioning Requirement	
Foreign Currency Lending Limits	Jul 2005: the possibility of applying lending capacity from foreign currency deposits to the purchase of central bank bills in dollars was eliminated from the regulation on credit policy (communication "A" 4395 July 2005); Sep 2005: the application of lending capacity in foreign currency for the financing of investment projects related to the manufacture of goods for export was added as an approved use of lending capacity (communication "A" 4423 September 2005); Dec 2005: lending to customers included in commercial and commercial loans assimilated to consumption categories seeking to import capital goods that will increase the production of goods for the domestic market was permitted (communication "A" 4453 December 2005).
Credit Growth Limits	
Reserve Requirements	June 2005: some capital inflows are subject to a 30 percent unremunerated reserve requirement to be deposited in a local bank for 365 days (eliminated in 2006 on capital inflows targeted for microcredit programs); Dec 2006: reserve requirement modified; Mar 2012: reserve requirement modified.
Limits on Maturity Mismatch	2008: the liquidity ratio was modified with the incorporation in the numerator of guaranteed loans and BOGAR 2020 used in liquidity window transactions at the BCRA (Communication "A" 4868 November 2008).
Limits on Net Open Position	Jun 2004: to determine the global net position in foreign currency the calculation was changed to include forward transactions performed within a framework agreement in the context of self-regulated domestic markets (communication "A" 4150 June 2004); May 2005: the enforcement of the positive limit on the position was suspended (30 percent of adjusted stockholders equity or own liquid resources, whichever is lower) and the additional short-term limit (Communication "A" 4350 May 2005); Sep 2006: the net global foreign currency position was limited to not more than 15 percent of the RPC (communication "A" 4577 September 2006); Nov 2006: the maximum limit for the negative foreign currency provision was increased by 15 percentage points under certain conditions (Communication "A" 4598 November 2006).
Restrictions on Profits	Jun 2004: the BCRA lifted the deferment on the distribution of earnings; Oct 2006: the BCRA prescribed the conditions under which financial institutions can distribute profits (Communication "A"4152 – June 04 and communication "A" 4589 October 2006); May 2010: the central bank implemented "capital conservation buffer" prior to profit distribution; Jan 2012: the additional "capital conservation buffer" prior to profit distribution raised from 30% to 75% (Financial entities showing profits are authorized to distribute dividends if their regulatory capital, after the distribution, remains, at least, 75% over such requirement)
Memorandum	
Tax	
Other	

	Australia	Austria
Loan-to-Value		
Debt Service-to-Income		
Capital Requirements/ Risk Weights	Oct 2004: risk weights for uninsured residential mortgage loans were raised.	
Provisioning Requirement		
Foreign Currency Lending Limits		Oct 2003: Minimum standards on FX loans and risk management introduced; June 2006: Information leaflet on risks of FX loans distributed via banks; Oct 2008: Urgent recommendation of FMA to refrain from new FX lending to households; Mar 2010: Strict criteria on granting new FX loans (by the OeNB and the FMA); Apr 2010: guiding principles on limiting new lending in foreign currency by Austrian subsidiaries in CESEE introduced; Jan 2013: Minimum Standards for the Risk Management and Granting of Foreign Currency Loans and Loans with Repayment Vehicles replaces 2003 measures: the information requirements previously applying to consumers have now been extended to include all borrowers, the conditions have also been clearly defined for determining when a change of currency or a prolongation must be considered equal to granting a new foreign currency loan; it is also stated clearly that credit institutions must not circumvent national legislation of other countries governing foreign currency loans by granting cross-border foreign currency loans.
Credit Growth Limits		
Reserve Requirements		
Limits on Maturity Mismatch		
Limits on Net Open Position		
Restrictions on Profits		
Memorandum		
Tax		
Other	2010: restrictions on foreign ownership reintroduced (foreigners prohibited from buying houses for investment purposes- rental or vacation property; foreigners temporarily residing in Australia are allowed to one house provided they sell it when they leave Australia).	Mar 2012: Guideline to Strengthen the Sustainability of the Business Models of Large Internationally Active Austrian Banks was introduced (will increase capitalization, strengthen the refinancing structure of banking subsidiaries; to ensure that it is well balanced, the supervisory authority will continually monitor and analyze – based on quarterly data (starting from end-2011) – the ratio of net new lending to local stable funding; ensure that, in the event of crisis, a bank can be reorganized swiftly, effectively and efficiently or, if need be, wound up in an orderly manner, parent institutions are required to submit groupwide recovery and resolution schemes to the supervisory authority by the end of 2012 to prepare for potential crisis situations).

	Brazil	Bulgaria
Loan-to-Value		Apr/Jun 2004: Introduction of a 70% LTV ratio for mortgages risk-weighted at 50%; Apr 2006: The risk weighting for mortgage loans used in the calculation of the capital adequacy ratio is effectively raised, by lowering the loan-to-value ratio from 70 percent to 50 percent.
Debt Service-to-Income		
Capital Requirements/ Risk Weights	Jul 2007: capital requirement on exchange exposure raised to 100% (from 50%); Aug 2007: Basel II capital rules introduced; Oct 2010: The risk weight for long-term consumer loans (e.g. individual persons' vehicle loans-between 24 and 36 months contractual maturities with LTV ratio over 80 %) was increased from 100 % to 150 %; Nov 2011: a recalibration of the measure revoked the previous rule and set the risk weights for consumer loan exposures according to the maturity of operations, removing loan-to-value ratio criteria (e.g. 150% for vehicle loans longer than 60 months maturity and 300% for personal loans longer than 60 months maturity).	Apr/Jul 2004: mortgage with LTV lower than 70% are risk-weighted at 50%, and by 100% for mortgages with LTV higher than 70%; Apr 2005: minimum CAR must be satisfied while excluding current profits for the capital base; Mar 2010: Introduction of lower risk weights for loans to households and mortgage loans (retail exposures from 100% to 75% and the risk weight for exposures secured by real estate from 50% to 35%)- to align the risk-weights under the credit risk standardized approach with EU standards. Nov 2005: more conservative requirements for loan provisioning introduced; Dec 2006: Provisions to cover impairment loss was loosened, provisioning rates for consumer loans and mortgage loans were equalized with corporate loans; Feb/Mar 2009: converging to international practice on classifying and provisioning against credit loss.
Provisioning Requirement		
Foreign Currency Lending Limits		
Credit Growth Limits		
Reserve Requirements	Oct. 2008: reserve requirement on demand deposits lowered from 45% to 42%, on rural savings from 20% to 15%, additional requirements on demand and time deposits from 8% to 5%; Nov. 2008: 70% of reserve requirement on time deposits became unremunerated; Jan. 2009: the ratio of unremunerated reserve requirement on time deposits lowered from 70% to 60%; Oct. 2009: reserve requirement on time deposits lowered from 15% to 13.5%; Feb-Jun 2010: many liquidity measures revoked; reserve requirement on rural savings increased to 16%, reserve requirement on demand deposits increased to 43%, additional reserve requirements on demand and time deposits-increased to pre-crisis levels; Dec. 2010: additional reserve requirement on demand and time deposits raised from 8% to 12%; Jan. 2011: banks are required to deposit in cash at the central bank 60% of their short position in U.S. dollars after deducting 3 billion or their capital base, whichever is smaller, at zero interest rate; Jul. 2011: deduction is lowered to 1 billion or the capital base; Jul. 2012: reserve requirement on demand deposits increased to 44%, and additional reserve requirement on demand deposits lowered from 12% to 6%; Oct. 2012: additional reserve requirements on demand deposits lowered from 6% to 0%; Nov. 2012: additional reserve requirement on time deposits lowered from 12% to 11%;	Apr 2005: reserve requirement for more aggressive lenders introduced (double the excess of all loans over the quarterly growth set by the central bank; credit growth cap); Nov 2005: reserve requirement for aggressive lenders tightened by introducing progressive scale; Jun 2006: progressive scale removed; Sep 2007: minimum reserve requirement on the deposit base raised from 8% to 12%; Dec 2008: reserve requirement cut to 10%; Jan 2009: reserve requirement cut to 5% on non-residents funds and to zero on central and local government funds.
Limits on Maturity Mismatch		
Limits on Net Open Position	Jun 2007: exchange exposure limit reduced to 30% (from 60%) of base capital.	
Restrictions on Profits		
Memorandum		
Tax	Oct. 2009: established a 2% tax rate as IOF on exchange operations on fund inflows (equities and fixed income assets) into the country; Nov. 2009: established a new tax rate of 1.5% of IOF in the new issues of depository receipts of shares of Brazilian companies, to be traded on foreign stock exchanges; Oct 2010: Fixed income foreign capital operations IOF rate (tax) was increased from 2% to 4% and then to 6%; Additionally, IOF rate on the margin requirements for foreign investment on stock exchanges, commodities and futures was increased from 0.38% to 6%, thus requiring the implementation of such measure to all future market operations; Mar 2011: IOF tax rose from zero to 6% for external loans and bond issuances up to 360 days and from 2.38% to 6.38% for credit card company obligation for client's purchase abroad; Apr 2011: 6% IOF rate was extended to external loans and bond issuances up to 720 days; Dec 2011: a 2% IOF tax on equities was eliminated; Mar 2012: a 6 % IOF tax extended on external loans and bond issuances up to 5 years; Jun 2012: the maturity of external loans and bond issuances with the 6% IOF tax was reduced back to 2 years; Dec 2012: the maturity of external loans and bond issuances with the 6% IOF tax was reduced back to 1 years.	
Other		

	Canada	Chile
Loan-to-Value	Mar 2004: CMHC "Flex Down" program broadened the eligible sources of funds for the minimum down payment (5%); Mar 2006: CMHC: 0% down payment, 30 years amortizations; April 2007: LTV limit for insured loans increased to 80% (from 75%); October 2008: Maximum LTV for insured loans was reduced (from 100% to 95%) and maximum amortization for new government backed insured mortgages was lowered (from 40 to 35 years); April 2010 : Maximum LTV for refinanced mortgages was lowered (from 95% to 90%) and Minimum down payment on properties not occupied by owner was raised (from 5% to 20%); March 2011: Maximum LTV for refinanced mortgages was lowered (from 90% to 85%) and maximum amortization for new government backed insured mortgages was lowered (from 35 to 30 years); June 2012 (implemented in November): Maximum LTV on HELOCs cut (from 80% to 65%); July 2012: Maximum LTV for refinanced mortgages was lowered (from 85% to 80%) and maximum amortization for new government backed insured mortgages was lowered (from 30 to 25 years).	Aug 2009: the possibility of funding mortgage loans through the issue of a new category of mortgage bill, which finance loans representing more than 75% of the value of the mortgage collateral, up to a limit of 100% (for banks with the highest solvency rating and debtors with the highest credit rating).
Debt Service-to-Income	October 2008: New loan documentation required; July 2012: a (fixed) maximum gross debt service ratio and maximum total debt service ratios of 39% and 44%, respectively.	
Capital Requirements/ Risk Weights		
Provisioning Requirement		
Foreign Currency Lending Limits		
Credit Growth Limits		
Reserve Requirements		Oct 2008: modified the constitution of reserves (banks were able to constitute reserves in foreign currency with no distinction between US dollars, euros and Japanese yen).
Limits on Maturity Mismatch		
Limits on Net Open Position		
Restrictions on Profits		
Memorandum		
Tax		
Other	October 2008: Minimum credit score requirement (of 620) was introduced; April 2010: More stringent eligibility criteria was introduced (all borrowers are required to meet the standards for a 5-year fixed-rate mortgage, even if they choose a mortgage with a variable interest rate and shorter term); March 2011: Government-backed insurance on lines of credit secured by houses (HELOCs) was withdrawn; June 2012: A bill prohibiting Canadian banks from issuing covered bonds backed by government-insured mortgages was submitted (sets strong eligibility criteria for mortgages in the cover pool); CMHC put under OSFI supervision; June 2012: A guideline for residential mortgage underwriting practices and procedures was issued .	

	China	Colombia
Loan-to-Value	Apr 2001: Reduction in maximum LTV ratio for mortgages to 80 percent; Mar 2005: LTV ratio set at 70 percent for properties in cities or regions with excessively fast housing price increase (decision up to banks); Jun 2006: Reduction in maximum LTV ratio from 80 percent to 70 percent for housing larger than 90m2 excluding purchases for own use by individuals; Sep 2007: Lower LTV to 60 percent for second mortgage. Minimum down payment ratio higher for third mortgage loans; Oct 2008: Higher LTV (80 percent); Apr 2010: The LTV on primary homes was lowered from 80 percent to 70 percent for the first home buyers of apartments over 90 square meters and to 50 percent on second homes; Sep 2010: lower the LTV ceiling to 70 percent for all first home buyers; Jan 2011: For mortgages of second homes, lowered the LTV cap to 40 percent; Mar 2013 (announced): LTV for mortgages of second homes lowered.	1999: Limiting the LTV ratio to 70 percent.
Debt Service-to-Income		1999: Maximum monthly debt service set to 30 percent of disposable income.
Capital Requirements/ Risk Weights Provisioning Requirement	Sep 2010: The BCBS set three minimum capital requirements (common equity at 4.5 percent, Tier I at 8 percent and total capital adequacy at 6 percent) and countercyclical capital buffer. Sep 2010: Dynamic provisioning	Jun 2007: Dynamic provisioning for commercial loans introduced; Jun 2008: dynamic provisioning for consumption loans introduced.
Foreign Currency Lending Limits Credit Growth Limits		
Reserve Requirements	Sep 2003–Nov 2006: Five hikes of reserve requirement from 6 percent to 9 percent; Dec 2006–Jun 2008: reserve requirement increased 16 times from 9 percent to 17.5 percent; Sep 2008– Dec 2008: three cuts of RR from 17.5 percent to 15.5 percent for large banks, and four cuts from 17.5 percent to 13.5 percent for small banks; Jan 2010–Nov 2011: reserve requirement increased to 21.5 percent and 19.5 percent for large and small banks respectively; Dec 2011–May 2012: RR cut three times for large and small banks respectively to 20 percent and 18 percent.	May 2007: Unremunerated reserve requirement on external borrowing and portfolio inflows introduced at 40 percent, a marginal reserve ratio was imposed on each type of local currency liability: 27 percent for checking accounts and other checkable deposit, 12.5 percent for savings accounts and similar deposits, 5 percent for certificates of deposit maturing in less than 18 months and similar time deposits; Jun 2007: a uniform required reserve ratio for checking and savings accounts was imposed: the ordinary ratio required for such deposits was unified at 8.3 percent, and the marginal ratio, at 27 percent. May 2008: URR tightened to 50 percent; Jun 2008: reserve requirement on deposits raised; Sep/Oct 2008: URR eliminated, but the ordinary reserve requirement raised by 10 percent, on average (11.5 percent for checking and savings accounts and 6 percent for time certificates of deposit); Nov 2008: A reduction in bank reserve requirements from 11.5 percent to 11 percent for current and savings accounts, and from 6 percent to 4.5 percent for term deposits under 18 months.
Limits on Maturity Mismatch		
Limits on Net Open Position		May 2007: A limit equal to 500 percent of technical capital was placed on the leveraged portion of derivative operations by exchange market intermediaries.
Restrictions on Profits		Dec 2008: Banks must retain a portion of their 2008 profits as an additional capital buffer (determined by systemic importance).
Memorandum		
Tax	Mar 2013 (announced): Homeowners who sell their properties will have to pay a capital gains tax of 20 percent on their profits.	
Other	Jan 2007: VAT on land transactions imposed; Apr 2008: imposed tax on capital gains on advanced payments of housing purchases; Jun 2008: imposed personal income tax on corporate purchasing properties for individuals; Aug 2008: loans for land purchases and for idle projects forbidden; Oct 2008: waive stamp duty on housing transactions and VAT on land transactions; Dec 2008: extend preferential policies for first and second home purchases; May 2009: reduce developers' capital requirement for economic and commodity housing investment; 2010: tax incentives reduced; eligibility criteria for land development projects tightened, state-owned enterprises and property development business required to exit the business if not core business; banks are banned from granting loans to speculators; restrictions on foreigners tightened: foreigners (must reside one year) can own only one residential property for their own use; Mar 2013: local governments are told to limit non-residents from buying more than one home.	

	Croatia	Estonia	Finland
Loan-to-Value			March 2010: FIN-FSA recommended (not binding) a maximum LTV ratio of 90% and max 25 years of amortization
Debt Service-to-Income			
Capital Requirements/ Risk Weights	Jun 2006: Capital adequacy risk weights applied to foreign currency or foreign currency-indexed loans to unhedged borrowers in the non-government sector are increased by 25 percentage points. The existing weights for foreign currency or foreign currency-indexed loans to unhedged borrowers (those without adequate foreign currency incomes/revenues) were increased from 50 percent to 75 percent and from 100 percent to 125 percent; Jan 2008: Introduction of higher (than 12 percent) capital requirements on banks whose growth rate of placements exceeds the maximum permissible growth rate of placements (about 12 percent), proportionate to the share of non-core deposits on the liability side of the balance sheet; risk weights for unhedged borrowers are increased by further 25 percentage points.	Mar 2006: Risk weights for mortgage loans were raised from 50 percent to 100 percent; Jan 2008: risk weights for mortgage loans reduced to 60 percent with Basel II implementation.	
Provisioning Requirement	Jan 2004: Banks have to form and maintain additional reserves for general bank risks, and retain any profits if the growth of specific items of their assets and specific items of their off-balance contingent liabilities exceeds 20 percent. Exceptionally, banks are not required to form reserves for general bank risks if they have the required capital adequacy ratio; Jul 2006-Jan 2009: The "20 percent" threshold for defining "high growth" in terms of additional reserves for general banking risks was replaced by "15 percent."		
Foreign Currency Lending Limits			
Credit Growth Limits	Apr 2003-Jan 2004: Credit growth ceiling 16 percent; Jan 2007-Dec 2009: credit growth ceiling 12 percent.		
Reserve Requirements	Jul 2001: General reserve requirement (GRR) ratio cut to 22 percent (from 23.5 percent) but FX loans added to FX RR base; Dec 2001: General reserve requirement ratio cut to 19 percent (from 22 percent), foreign currency reserves (FCR) paid in domestic currency increased to 25 percent (from 20 percent); Sep 2003: FCR increased to 35 percent; Nov 2003: FCR increased to 40 percent; Dec 2003: FCR increased to 42 percent; Aug 2004: Marginal reserve requirement (MRR) on net foreign borrowing introduced at 24 percent; Nov 2004: GRR cut to 18 percent; Mar 2005: MRR increased to 30 percent; Jun 2005: MRR increased to 40 percent, FCR increased to 50 percent; Jan 2006: GRR cut to 17 percent, MRR increased to 55 percent; Oct 2008: MRR abolished; Jan 2009: FCR increased to 75 percent; Feb 2010: GRR cut to 13 percent; Oct 2011: GRR increased to 14 percent; Jan 2012: GRR increased to 15 percent; May 2012: GRR cut to 13.5 percent.	Sep 2006: The reserve requirement increased from 13 percent to 15 percent; Sep 2010: minimum reserve requirement for credit institutions cut to 2 percent (due to EMU).	
Limits on Maturity Mismatch	Feb 2003: Foreign currency liquidity ratio (FCLR) cut to 35 percent (from 53 percent) but long term FX liabilities added to the FCLR base; Feb 2005: FCLR lowered to 32 percent; May 2008: FCLR lowered to 28.5 percent; Feb 2009: FCLR cut to 25 percent and then to 20 percent; Mar 2011: FCLR cut to 17 percent.		
Limits on Net Open Position	Apr 2003: Maximum allowed foreign currency exposure of a commercial bank at the end of any working day is capped at 20 percent of its regulatory capital; Mar 2010: Maximum exposure increased to 30 percent.		
Restrictions on Profits			
Memorandum			
Tax			
Other		2004: Mortgage interest tax deductibility reduced.	

	Hong Kong SAR	Hungary
Loan-to-Value	1991: Seventy percent LTV ratio for residential mortgages; Jan 1997: LTV for properties with a value of more than HK\$ 12 million lowered to 60 percent; Oct 2001: LTV restored to 70 percent; Oct 2009: For residential properties valued at \$20 million or more, the LTV ratio is capped at 60 percent; Aug 2010: Applying a maximum LTV ratio of 60 percent to properties with a value at or above \$12 million; Lower the maximum LTV ratio for properties which are not intended to be occupied by the owners to 60 percent; Nov 2010: Lowering the LTV ratio for residential properties with a value at HK\$12 million or above from 60 percent to 50 percent; Lowering the maximum LTV ratio for residential properties with a value at or above HK\$8 million and below HK\$12 million from 70 percent to 60 percent, but the maximum loan amount will be capped at HK\$6 million; Maintaining the maximum LTV ratio for residential properties with a value below HK\$8 million at 70 percent, but the maximum loan amount will be capped at HK\$4.8 million; Lowering the maximum LTV ratio for all non-owner-occupied residential properties, properties held by a company and industrial and commercial properties to 50 percent, regardless of property values; Jun 2011: LTV for real estate values Greater than or equal to HK\$10 million LTV 50 percent, Greater than or equal to HK\$7mn and less than HK\$10mn LTV 60 percent, and for properties valued Less than HK\$7mn remains the same at 70 percent subject to maximum loan amount of HK\$4.2mn; LTV cap lowered by further 10 percentage points for borrowers with main income from outside Hong Kong SAR; LTV cap for net-worth based mortgage loans lowered from 50 percent to 40 percent, irrespective of property value; Sep 2012: Lower the LTV limit to 30 percent for property mortgage loans assessed based on the net worth of mortgage applicants; Lower the applicable loan-to-value ratio (LTV) limits by another 10 percentage points for property mortgage loans to mortgage applicants whose income is derived mainly from outside Hong Kong; Feb 2013: the LTV nonresidential properties will be lowered by 10 percentage points.	Mar 2010: The maximum LTV ratio was set at 75, 60 and 45 per cent for forint, euro and other foreign currency loans. The relevant loan-to value limits are somewhat higher for vehicle financing loans and residential real estate leasing (80, 65 and 50 per cent respectively for forint, euro and other foreign currency loans).
Debt Service-to-Income	Aug 2010: Standardizing the limit on debt servicing ratios (DSRs) of mortgage applicants to 50 percent, instead of the current range of 50 percent to 60 percent; Sep 2012: Lower the debt servicing ratio (DSR) limit from 50 percent to 40 percent; and the maximum stressed DSR limit from 60 percent to 50 percent.	Mar 2010: Banks required to set up creditworthiness limits for individual loan applicants based on proportion to monthly income. The limit for euro-denominated loans is 80 per cent, while at loans extended in other foreign currencies the limit is 60 per cent of the creditworthiness limits of HUF-denominated loans.
Capital Requirements/ Risk Weights	Feb 2013: A 15 percent minimum risk weight on new residential mortgages is imposed for banks using the internal ratings-based approach.	
Provisioning Requirement		
Foreign Currency Lending Limits		Aug 2010: Foreign currency mortgage lending prohibited (it did not affect foreign currency-denominated lease structures).
Credit Growth Limits		
Reserve Requirements		
Limits on Maturity Mismatch		
Limits on Net Open Position		
Restrictions on Profits		
Memorandum		
Tax	Nov 2010: Special Stamp Duty raised to 15 percent for residential properties resold within first 6 months of purchase; 10 percent for properties resold between 6 months and 12 months; and 5 percent for properties resold between 12 months and 24 months. October 2012: Raise Special Stamp Duty to 20 percent for residential properties resold within first 6 months of purchases; 15 percent for properties resold between 6 months and 12 months; and 10% for properties resold between 12 months and 36 months. October 2012: introduced Buyer's Stamp Duty on residential properties acquired by any person (including a company incorporated) except a Hong Kong Permanent Resident. BSD is to be charged at a flat rate of 15 percent on all residential properties, on top of the existing stamp duty and the special stamp duty, if applicable; Feb 2013: Duties for all transactions exceeding HKD 2 mn will effectively double, taking the maximum rate to 8.5 percent. Below the HKD 2 mn threshold, a flat 1.5 percent duty will be introduced.	
Other	Banks should stress-test mortgage applicants' repayment ability, assuming an increase in mortgage rates of at least two percentage points, and limit the stressed DSR to a cap of 60 percent; lower the cap on the value of property that can be	2004: Housing subsidy reduced; 2010: ban on household foreign currency mortgage lending (ban on

	India	Indonesia
Loan-to-Value	Dec 2010: maximum LTV of 80 percent, for small value housing loans the LTV ratio should not exceed 90 per cent.; Dec 2011: banks are not allowed to take mortgage guarantee cover where the LTV ratio is more than 80 percent (for loans above Rs 2 million); for smaller loans the cutoff is 90 percent	Jun 2012: LTV on mortgages loans for houses and apartments that exceed 70 square meters was set at a maximum of 70 percent. Bank Indonesia (BI) also raised the minimum down payment (DP) on motor vehicles loans: (i) a minimum DP of 25 percent for two-wheeled vehicles; (ii) a minimum of 30 percent for four-wheeled vehicles; and (iii) a minimum of 20 percent for commercial vehicles of four wheels or more.
Debt Service-to-Income		
Capital Requirements/ Risk Weights	Jul 2005: The risk weight on exposure of banks to commercial real estate was increased from 100 per cent to 125 per cent; Apr 2006: risk weights increased to 150 percent; May 2008: loan with LTV less than 75 per cent and the loans up to Rs.30 lakh carry a risk weight of 50 per cent, whereas loans of higher amount would attract a risk weight of 75 per cent. The risk weight in the case of other loans, i.e., loans with LTV ratio of above 75 per cent, irrespective of the size, continue to attract 100 per cent risk weight; Nov 2008: risk weights reduced; Dec 2010: The risk weight for residential housing loans of 75 lakh and above, irrespective of the LTV ratio, is 125 per cent.	
Provisioning Requirement	Nov 2005: general provisioning increased; May 2006: general provisioning increased further; Jan 2007: general provisioning increased further, general provisioning on exposure to SIFIs increased; Nov 2008: the provisioning requirement was reduced to a uniform level of 0.4 per cent; Dec 2010: increased provisioning for housing loans with teaser rate (2 percent)	
Foreign Currency Lending Limits		
Credit Growth Limits		Sep 2005: to accelerate system loan growth, BI implemented an RR regulation related to load to deposit (LDR) in addition to the RR regulation; Mar 2011: high LDR but insufficient capital adequacy ratio penalized with higher reserve requirement ratio.
Reserve Requirements	Jul 2000: CRR increased to 8 percent (form 7 percent); Feb-Mar 2001: CRR cut to 7 percent; May 2001: CRR increased to 7.5 percent; Nov-Dec 2001: CRR cut to 5.5 percent; Jun 2002: CRR cut to 5 percent; CRR Nov 2002: CRR cut to 4.75 percent; Aug 2003: CRR cut to 4.5 percent; Sep-Oct 2004: cash reserve requirement increased by 50 basis points to 5 percent; Dec 2006: CRR cut to 5.25 percent; Jan 2007: CRR increased to 5.5 percent; Feb 2007-Nov 2007: CRR increased from 5.5 percent to 7 percent; Nov 2007-Sep 2008: CRR increased from 7 percent to 9 percent; Oct 2008-Jan 2009: the CRR reduced by 400 basis points (from 9 percent to 5 percent); Feb 2010: CRR increased to 5.5 percent; Mar 2010: CRR increased to 5.75 percent; Apr 2010: CRR increased to 6 percent; Jan 2012: CRR cut to 5.5 percent; Mar 2012: CRR cut to 4.75 percent; Sep 2012: CRR cut to 4.5 percent; Nov 2012: CRR cut to 4.25 percent; Feb 2013: CRR cut to 4 percent	Oct 2008: reserve requirement for foreign currency deposits cut from 3 percent to 1 percent and for rupiah deposits from 9.1 percent to 7.5 percent; Nov 2010: the primary rupiah reserve requirement raised to 8 percent; Jan 2011: statutory reserve requirement on foreign currency raised from 1 percent to 5 percent; Jun 2011: statutory reserve requirement on foreign currency raised from 5 percent to 8 percent
Limits on Maturity Mismatch		
Limits on Net Open Position		
Restrictions on Profits		
Memorandum		
Tax		
Other		

Ireland	Israel
Loan-to-Value	Nov 2012: LTV on mortgage loans set at 70 percent (75 percent for first time borrowers). LTV on a mortgage loan for the purpose of purchasing an investment apartment set at 50 percent.
Debt Service-to-Income	
Capital Requirements/ Risk Weights	October 2010: Higher risk weights (100percent instead of 35percent or 75percent) for housing loans with LTV higher than 60percent with a principal value of over NIS 800,000; Jan 2013: Housing loans with a LTV up to 45 percent weighted at 35 percent for capital requirements (unchanged from current weighting); with LTV between 45 percent and 60 percent will be weighted at 50 percent for capital requirements (instead of 35 percent); and with LTV of greater than 60 percent will be weighted at 75 percent for capital requirements; a reduction in the capital allocation required in respect of Sale Law guarantees (weighted with a credit conversion coefficient factor of 10 percent, instead of the current 20 percent), in cases where the residential property has already been transferred to the buyer
Provisioning Requirement	May 2006: Higher risk weight for mortgage loans (from 50 to 100percent, on the portion exceeding 80percent LTV)
Foreign Currency Lending Limits Credit Growth Limits	July 2010: A requirement for a supplementary loan-loss provision at a rate of 0.75 percent in respect of loans with an LTV exceeding 60 percent; Jan 2013: increase the allowance for credit losses in respect of housing loans (to at least 0.35 percent)
Reserve Requirements	
Limits on Maturity Mismatch	
Limits on Net Open Position	
Restrictions on Profits	
Memorandum	
Tax	2011: Tax of the second property raised.
Other	2009: Banks to tighten their risk management, scrutinize the mortgage loans to households, and enhance disclosure, particularly with respect to loans carrying floating interest rates that were extended to households; May 2011: the adjustable-interest-rate component of housing loans limited to 1/3 of the total loan; the supply of land by Israel Land Authority increased; Detailed reporting requirement on residential mortgage loans introduced; supervision of banks practices enhanced;

<b>Korea</b>	
Loan-to-Value	Sept 2002: LTV of 60percent introduced; Jun 2003: LTV reduced to 50percent for loans of 3 years and less maturity to buy a house in speculative zones; Oct 2003: LTV reduced to 40percent for loans of 10 years and less maturity to buy a house in the speculative zone; Mar 2004: LTV raised to 70percent for loans of 10 years and more maturity and less than one year of interest-only payments; Jun 2005: LTV reduced to 40percent for loans of 10 years and less maturity to buy a luxury house in the speculative zone; Nov 2006: LTV set to 50percent for loans of 10 years and less maturity to buy a luxury house in the speculative zone and originated by nonbank financial institutions such as mutual credits, mutual savings banks and credit-specialized institutions; Nov. 2008: Removed all areas except the three Gangnam districts off; Jul 2009: LTV reduced to 50percent for loans to buy a luxury house in the metropolitan area; Oct. 2009: LTV regulation expanded to all financial institution for the metropolitan area (most of them designated previously as speculative zones); May 2012: The three up-market districts in Seoul (Gangnam, Seocho and Songpa) are no longer classified as overheated speculative zones, and their LTV is raised to 50percent.
Debt Service-to-Income	Aug 2005: DTI ceiling of 40percent introduced for loans to buy a house in speculative zones, if the borrower is single and under age of 30 or if the borrower is married and spouse has debt; Mar 2006: DTI of 40percent for loans to buy a luxury house in the speculative zone; Nov 2006: DTI regulation extended to the speculative zones in the metropolitan area; Feb 2007: DTI set to 40percent-60percent for loans to buy any house; Aug 2007: DTI set to 40percent-70percent for loans originated by nonbank financial institutions; Nov. 2008: Removed all areas except the three Gangnam districts off the list of speculative zones; Sep 2009: DTI regulation extended to the non-speculative zones in Seoul and the metropolitan area; Aug 2010: Loans to buy a house in the non-speculative zones of the metropolitan area are excluded from the DTI regulation if the debtor owns less than two houses; May 2012: The three up-market districts in Seoul (Gangnam, Seocho and Songpa) are no longer classified as overheated speculative zones, and their DTI caps is raised to 50percent.
Capital Requirements/ Risk Weights	Nov 2002: The risk weighting for mortgage loans related to capital requirement was raised from 50 percent to between 60 and 70 percent, with due consideration given to borrowers' credit history and debt repayment ability.
Provisioning Requirement	Nov 2002: The banks' minimum loan loss reserve ratios for household loans classified as both normal and precautionary were pushed up from 0.5 percent to 0.75 percent and from 2 percent to 8 percent, respectively. For loans classified as doubtful, the provisioning ratio was raised from 50 percent to 55 percent; Dec 2006: the minimum loan loss reserve ratios for household loans classified as both normal and precautionary were further raised from 0.75 to 1.0 percent and from 8 to 10.0 percent, respectively.
Foreign Currency Lending Limits	Aug 2007: The BoK allowed FX loans only to meet financial needs to foreign lenders and to build business-related facility investments; Jul 2010: ban on giving FX loans to local companies for domestic use, even for domestic facility investment; Jul 2011: The BoK prohibited financial institutions from buying FX denominated bonds issued by domestic companies for domestic use.
Credit Growth Limits	
Reserve Requirements	Nov 2006: Increase in reserve requirement ratio from 3.0percent to 3.8percent of deposits on average; Dec 2006: reserve requirement raised on short-term deposits from 5percent to 7percent
Limits on Maturity Mismatch	
Limits on Net Open Position	Aug 2011: The levy is imposed on the balance of banks' non-deposit foreign currency liabilities (The levy of up to 0.5 percent will be imposed according to debt maturity, with 0.2 percent for less than one-year ones, 0.1 percent for those between one and three years, 0.05 percent for three to five year debts, and 0.02 percent for more than 5 year debts); Oct 2010: The ceiling on FX derivatives position was set at 50percent of equity capitals for domestic banks at the end of the previous month, and at 250percent for foreign bank branches; Jul 2011: the ceilings on including positions were lowered, from 50percent to 40percent for Korean domestic banks, and from 250percent to 200percent for foreign bank branches; Dec 2012: limits on the amount of currency forward positions banks are allowed to hold tightened: the authorities cap transactions at branches of overseas lenders at 150 percent of equity, compared with 200 percent currently; the ceiling for domestic banks will be cut to 30 percent from 40 percent.
Restrictions on Profits Memorandum	
Tax	2011: Reintroduction of a withholding tax on foreign purchases of treasury and money stabilization bonds.
Other	

	Kuwait	Latvia	Lebanon
Loan-to-Value		Jul 2007- Jun 2008: Maximum LTV for all residential mortgages introduced at 90percent.	Jul 2008: LTV on real estate loans set at 60percent.
Debt Service-to-Income		Jul 2007: Borrower's official income statement compulsory for loans that exceed 100 monthly wages.	
Capital Requirements/ Risk Weights Provisioning Requirement		Mar 2009: Provisioning methodology changed to comply with the IAS.	
Foreign Currency Lending Limits			
Credit Growth Limits	Jul 2004: Loan to deposit ratio set at 80percent; Oct 2007: LDR tightened (banks were required to adhere to the limit for the month average rather than just at the end of the month); Nov 2008: LDR loosened to 85percent; May 2012: Central Bank eased further LTD requirements; LTD between 75percent (funding of loans due less than 3 months) and 100percent (funding of loans due more than one year), depending on maturities.		
Reserve Requirements		Nov 2005: Reserve ratio for banks and branches of foreign banks increased from 6percent to 8percent	Jun 2009: Reserve requirement reduced (if banks extend loans in Lebanese pounds to certain sectors).
Limits on Maturity Mismatch			
Limits on Net Open Position			
Restrictions on Profits			
Memorandum			
Tax		Apr 2007-Jul 2008/Jan 2009: Stamp duty on speculative transactions introduced.	
Other		2007-2008: Land and mortgage registration fees were increased; and income certification requirement implemented.	

	Malaysia	Mexico	Mongolia
Loan-to-Value	Nov 2010: Maximum 70percent LTV limit on the 3rd outstanding housing loan; Dec 2011: residential property loans taken by non-individual borrowers were also subjected to an LTV ratio of 60 percent.		
Debt Service-to-Income	Mar 2011: The eligibility requirements for credit cards were adjusted (e.g. the requirements for credit cards for individuals earning a monthly gross income of RM3,000 and below; limits were imposed on the number of credit cards and credit limits extended to these individuals).		
Capital Requirements/ Risk Weights	Apr 2005: Risk weights on non-performing residential mortgage loans was increased from 50 to 100percent, Jan 2011: capital charges on banks were increased (to 100percent) for residential property loans with LTVs exceeding 90percent; also risk weights were raised on personal loans with tenure more than 5 years.	2001: Banks have the obligation to deduct from their capital those assets that have no capacity to absorb losses, such as investments in other financial entities.	Dec 2011: CAR increased from 12percent to 14 percent.
Provisioning Requirement		Sep 2009: Expected loan loss provisioning introduced (for rating the revolving consumer credit portfolio); March 2011: the same rules introduced for non-revolving consumer loans (such as loans for the acquisition of durable consumer goods, payroll and personal loans) and mortgage loans came into effect.	Aug 2010: Loss provisions regulation reissued.
Foreign Currency Lending Limits			
Credit Growth Limits			
Reserve Requirements			Feb 2007: Reserve requirement cut from 14percent to 5percent; Mar 2011: reserve requirement increased to 9percent; Aug 2011: reserve requirement increased from 9percent to 11percent.
Limits on Maturity Mismatch			
Limits on Net Open Position	Apr 2007: Abolish the net open position limit of licensed onshore banks. Previously, the open position limit was capped at 20percent of the banks' capital base.		Jul 2010: BOM regulations allow banks a net-open position not to exceed 15percent of capital for one currency and 40percent for all currencies.
Restrictions on Profits			
Memorandum			
Tax	2010: Reimposed the Real Property Gains Tax (RPGT): fixed at 5percent on the gains from the disposal of real property within 5 years of purchase; 2012: For properties held and disposed within 2 years, the (Real Property Gain Tax) RPGT rate has been raised to 10percent from 5percent. For properties held and disposed within a period exceeding 2 years and up to 5 years, the rate is 5percent. Properties held and disposed after 5 years are not subject to RPGT; 2013: The RPGT for the disposal of properties within 2 years from the date of purchase is raised to 15percent from 10percent and for the disposal of properties within a period of 2-5 years; the rate will increase to 10percent from 5percent.		
Other	1997: Exposure to property lending was restricted to 20percent; 2012: minimum price for house purchases by foreigners was raised from RM 250,000 to RM 500,000.	Oct 2012: To avoid the transfer of assets and liabilities between banks operating in Mexico and related parties at prices deviating from market values, banks are required to seek previous authorization from the Central Bank of Mexico whenever these transfers exceed 25 percent of basic capital within a year.	

	Netherlands	New Zealand	Nigeria
Loan-to-Value	Jan 2007: Mortgage Lenders' Code of Conduct introduced; Aug 2011: strict 104percent (plus transfer tax) LTV reinforced; Jan 2013: gradual decrease of the maximum LTV by 1 percent over year from 106percent to 100percent in 2018.		
Debt Service-to-Income	Jan 2007: Maximum gross housing costs equal to around 30 percent of gross income.		
Capital Requirements/ Risk Weights		Jan 2013: Basel III capital requirements came into effect (CET1 4.5percent. Tier 1 6percent, Total capital 8percent).	Jan 2013: The CBN circular requires banks to increase risk weights for public sector loans to 200percent, from 100percent and for sectors greater than 20percent of the loan book to 150percent from 100percent. Credit transactions between bank holding companies and their subsidiaries will also be regulated and risk-weighted to enhance regulation of a banking group.
Provisioning Requirement			Nov 2009: One percent of general provision on performing loans waived.
Foreign Currency Lending Limits			
Credit Growth Limits			Jun 2007: Loan to deposit ratio of 80percent introduced to limit excessive credit growth; May 2010: limiting capital market lending to a set proportion of a bank's balance sheet.
Reserve Requirements			June 2008: Cash reserves increased from 3percent to 4percent; Sep 2008: Cash reserve requirement reduced from 4percent to 2percent; Apr 2009: Cash reserve requirement reduced from 2percent to 1percent; Feb 2011: Raised the CRR ratio from 1.0 to 2.0 per cent; Jun 2011: increase in CRR from 2.0 per cent to 4.0 per cent; Oct 2011: Increased CRR from 4.0 to 8.0 per cent; Jul 2012: CRR increased to 12 percent.
Limits on Maturity Mismatch		Apr 2010: Core funding ratio set at 65 percent; Jul 2011: CFR increased to 70 percent; Jan 2013: CFR increased to 75 percent.	Sep 2008: Liquidity ratio reduced from 40 to 30 percent; Apr 2009: reduced liquidity ratio from 30percent to 25percent; Mar 2011: raised the Liquidity Ratio (LR) from 25.0 to 30.0 percent.
Limits on Net Open Position			Dec 2008: Bank net foreign exchange open position limits reduced from 20 to 10 percent; Jan 2009: NOP limit reduced to 5percent; April 2009: NOP limit reduced to 1percent; Apr 2009: NOP limit increased to 2.5percent; Jul 2009: net open position increased to 5percent; Oct 2011: Reduced the NOP from 5.0 per cent to 3.0; July 2012: the NOP reduced to 1percent.
Restrictions on Profits			
Memorandum			
Tax	2007: Transfer tax (set at 2percent from 6percent); 2013: Tax deductibility on mortgage interest rates restricted to amortizing 30 year mortgage loans and excludes interest-only mortgage loans). Existing mortgages will continue to benefit from the earlier regime of full deductibility.		
Other	2011: Interest-only mortgages are now only allowed up to 50percent of the market value of the house.		

	Norway	Peru
Loan-to-Value	Mar 2010: LTV limit set at 90 percent (not a hard cap), LTVs on home equity loans should generally not exceed 75 percent; Dec 2011: LTV 85 percent, lowering the maximum LTV on home equity loans to 70 percent.	
Debt Service-to-Income	Mar 2010: Loan-to-income (LTI) ratios on mortgages should generally not exceed 300 percent.	
Capital Requirements/ Risk Weights	1998: Risk weights on loans with LTV higher than 60 percent were raised from 50 to 100 percent.	Jul 2010: The CCB, a capital requirement for concentration risks, market concentration and interest rate risk introduced, an additional capital requirement on the FX exposures; Nov 2012: higher risk weights for mortgages with high LTV ratio depending on maturity.
Provisioning Requirement		Dec 2008: Dynamic provisioning.
Foreign Currency Lending Limits		
Credit Growth Limits		
Reserve Requirements		Feb 2008: General reserve requirement (GRR) increased from 6 percent to 7 percent, minimum reserve requirement in current account (RRCA) from 1 percent to 2 percent, marginal reserve requirement in domestic currency (MRRDC) from 6 percent to 15 percent, marginal reserve requirement in USD (MRRUS) from 30 percent to 40 percent, reserve requirement on FX liabilities (maturity <2 years, RRF2) increased to 40 percent (from 30 percent); Apr. 2008: GRR increased to 8 percent, MRRDC to 20 percent (and to 40 percent for non-residents); May 2008: GRR increased to 8.5 percent, MRRDC to 25 percent (and to 120 percent for non-residents), MRRUS and RRF2 to 45 percent; Aug 2008: GRR increased to 9 percent, MRRUS and RRF2 to 49 percent; Oct 2008: MRRDC for residents cut to 9 percent, MRRUS and RRF2 to 35 percent; Nov 2008: RRF2 cut to zero; Dec 2008: GRR cut to 7.5 percent, MRRDC to 7.5 percent for residents and to 35 percent for non-residents, MRRUS for residents to 30 percent; Mar 2009: GRR cut to 6 percent; Feb 2010: RRF2 increased to 35 percent; Jul 2010: GRR increased to 7 percent, MRRDC for non-residents to 40 percent, MRRUS for residents to 35 percent and RRF2 40 percent; Aug 2010: GRR increased to 8 percent, MRRDC for non-residents to 50 percent, MRRUS for residents to 45 percent and RRF2 to 50 percent, MRRDC for residents increased to 12 percent; Aug 2010: the average RR (ARR) increased by 0.1 percent; Sep 2010: GRR increased to 8.5 percent, ARR by 0.3 percent, MRRDC for non-residents to 120 percent, MRRUS for residents to 50 percent and RRF2 to 65 percent, MRRDC for residents increased to 15 percent; Oct 2010: GRR increased to 9 percent, MRRUS for residents to 55 percent and RRF2 to 75 percent, MRRDC for residents increased to 25 percent; Jan 2011: RRF2 cut to 60 percent; May 2012: MRRDC for residents increased to 30 percent, RRF2 replaced by reserve requirement on FX liabilities with maturity <3 years (60 percent), RRF3 and with maturity >3 years (20 percent); Feb 2011-Nov 2012: The average rate of reserve requirement was raised by 375bps on both domestic and foreign currency; Feb 2013: RRF2 with maturity >3 years increased to 25 percent; Jan 2013: ARR increased in dom. (foreign) currency increased by 25 (75) bps; Mar 2013: the average reserve requirement for foreign currency deposits increase by 50 bps- For financial institutions with mortgage and automobile credit growth higher than 10 (20) percent, the increase is 75 (150) bps.
Limits on Maturity Mismatch		Dec 2012 (approved): A liquid asset requirement as a percent of short-term liabilities (20 percent in foreign currency and 8 percent in domestic currency) is applied. These ratios would increase to 25 and 10 percent respectively if concentration (measured as the percentage of liabilities with highest 20 depositors) is higher than 25 percent. A liquid investment ratio in domestic and foreign currency (defined as the share of most liquid instruments to liquid assets) at 5 percent also applies. A short-term liquidity coverage ratio is established at 100 percent.
Limits on Net Open Position		Jan 2011: Limit on the net derivative position of either 40 percent of assets or 400 million (whichever is higher); Oct 2011: limit reduced to 30 percent or 350 million; 2012: The limit on the net position in derivatives in foreign currency is 20 percent of net worth or S/. 300 million, whichever is higher (Resolution 9076-2012.R).
Restrictions on Profits		
Memorandum		
Tax		
Other		

	Poland	Romania
Loan-to-Value		Feb 2004: Loan-to-value limited by maximum 75 percent; Mar 2007: creditors were permitted to establish the LTV in their internal regulations (subject to NBR validation). 2011: specific maximum LTV levels for housing purposes are set, differentiated by currency and type of loan: 85 percent for Romanian lei denominated loans, 80 percent for FX credits granted to hedged borrowers, 75 percent for euro denominated loans, and 60 percent for loans granted in other currencies to unhedged borrowers.
Debt Service-to-Income	Feb/Dec 2010: Debt service should not exceed 50 percent of net income in case of borrowers with income below the average level. For others, this threshold should not exceed 65 percent; Jan/Dec 2011: DTIs were set at 42 percent for newly extended FX mortgage loans.	Feb 2004 – Mar 2007: Debt-to income limited to maximum 30 percent for consumer loans, and 35 percent for mortgage loans (Sep 2005: total debt service of 40 percent); Mar 2007: creditors were permitted to establish maximum DTIs (subject to NBR validation).
Capital Requirements/ Risk Weights	Apr/Dec 2007: Higher risk weights for FX mortgages (75 percent risk weight; 35 percent risk weight if the currency of exposure is the same as the currency of borrower's income); Dec 2011: risk weights for FX den. retail exposures were increased to 100 percent (to be implemented by June 2012).	2008: The NBR increased the capital adequacy ratio for individual banks, typically to 10 percent.
Provisioning Requirement		Sep 2005: Increased specific provisions for credit risk coming from foreign currency denominated loans granted to unhedged borrowers; 2012: IFRS provisioning was introduced and a prudential filter was added (deducted from own funds) in order to bring IFRS provisions broadly in line with those under the previous (RAS) regime.
Foreign Currency Lending Limits	Jun 2006: Good Practices Regarding Mortgage-Secured Credit Exposures (Recommendation S) introduced requiring higher creditworthiness when customers apply for a residential loan in a foreign currency; sets a high standard for disclosing FX-related risks; Dec 2008/Jul 2009: Recommendation S (II): banks which advance foreign-currency-denominated loans should furnish their clients with reliable information on how they use foreign-exchange spread and of its impact on the loan cost; loan agreements should contain precise provisions on specifics of the loans; clients are allowed to change the method of repaying FX-indexed loans and repay them in the indexing currency.	Sep 2005: Limit the exposure of a credit institution to 300 percent of its own funds when granting foreign currency denominated loans to unhedged borrowers.
Credit Growth Limits		
Reserve Requirements		Aug 2004: Reserve requirements ratio on foreign currency liabilities increased from 25 percent to 30 percent; Jan 2006: reserve requirement ratio on foreign currency liabilities increased to 35 percent; Mar 2006: reserve requirement on foreign currency denominated liabilities raised to 40 percent; Jul 2006: reserve requirement on domestic currency denominated liabilities raised to 20 percent from 16 percent; Nov 2008: reserve requirement on domestic currency liabilities cut to 18 percent; July 2009: reserve requirement on domestic currency liabilities cut to 15 percent, while reserve requirements on foreign currency liabilities with maturity of less than 2 years were reduced from 40 percent to 35 percent in July 2009, 30 percent in August 2009, 25 percent in November 2009, to 20 percent in April 2011; June 2011: removing reserve requirements for deposits with residual maturities over 2 years which have been rolled over.
Limits on Maturity Mismatch		
Limits on Net Open Position		
Restrictions on Profits	Jan 2009: Following the activities of PSFA, the NBP and the management boards of banks, it was possible to convince shareholders that it would be appropriate to retain almost the entire profit for 2008 in banks; 2011 and 2012: The supervisor (KNF) recommended banks to retain profits based on criteria set by the KNF.	Apr 2009: Power for NBR to forbid or contain profit distribution until the financial standing is improved.
Memorandum		
Tax		
Other		

	Russian Federation	Saudi Arabia
Loan-to-Value		
Debt Service-to-Income		
Capital Requirements/ Risk Weights	Feb 2009: Increase in the minimum authorized capital of banks to RUR 90 million (Jan 2010) and further to RUR 180 million (Jan 2012); Oct 2011: requirement of higher capital coverage of risk for banks engaging in non-transparent transactions or in transactions with non-transparent counterparties; Dec 2011: increase in the minimum authorized capital of newly established (Jan 2012) and existing (Jan2015) banks to RUR 300 million; Jul 2013: increased risk weights for unsecured consumer loans carrying high interest rates.	
Provisioning Requirement	Oct 2008: The maximum term for the provision of asset-backed loans was extended; Mid-2009. Easing of loan classification and provisioning requirements in response to a banking crisis. Restructured loans were allowed to remain in their original classification; Dec 2008-Jun 2010: countercyclical/dynamic provisioning; Mar 2013: Increased minimum provisions for unsecured consumer loans without overdue payments and with overdue payments for no more than 30 days; and increased (100 percent) provisions against loans with overdue payments for more than 360 calendar days.	
Foreign Currency Lending Limits		
Credit Growth Limits		Sep 2006: Loan to deposit limit increased to 85 percent (from 60 percent); Jan 2013: Basel III leverage ratio introduced
Reserve Requirements	Apr 2004: The required ratios reduced from 10 percent to 9 percent; Jun/Jul 2004: the reserve ratios were reduced further to 7 percent and 3.5 percent respectively; Jul 2007: reserve requirements (on obligations to non-resident banks in Russian and foreign currency, on obligations to individuals in Russian currency, on obligations on other liabilities; until Oct 2008) raised; Oct 2007: required reserve ratio reduced from 4.5 percent to 3.5 percent for obligation to non-resident banks in rubles and foreign currency; Mar 2008: required reserve ratios increased; Jul 2008: required reserve ratios increased to 0.5 percent; Sep/Oct 2008: required reserve ratios reduced; May-Aug 2009: required reserve ratios increased to 2.5 percent; Feb-Apr 2011: Differentiated reserve requirements. Phased increases of required reserve ratios to 4 percent for bank liabilities to domestic parties and 5.5 percent for liabilities to corporate nonresidents, respectively; Feb 2013: unification of reserve requirements at 4.25 percent.	Nov 2007: SAMA raised the statutory reserve requirement for banks from 7 percent to 9 percent of their demand deposits; Jan 2008: SAMA raised the statutory reserve requirement for banks on demand deposits from 9.0 percent to 10.0 percent; Then, during the second quarter of 2008 it decided to raise it from 10 percent to 13 percent of total demand deposits and from 2 percent to 4 percent of time and savings deposits. Fall 2008: reserve requirements on demand deposits cut many times from 13.0 percent to 7.0 percent.
Limits on Maturity Mismatch		
Limits on Net Open Position	Nov 2008-Jun 2009: Recommendations on limits on net balance sheet position in foreign currencies as well as on the amount of foreign assets.	
Restrictions on Profits		
Memorandum		
Tax		
Other	2008: Using the interest rate policy to "mitigate the risk of a sudden capital outflow; 2013: Plan to impose higher contributions to the Deposit Insurance Fund for risky banks that offer overly aggressive deposit rates.	

Serbia	
Loan-to-Value	Dec 2004: A minimum 20 percent down payment; Jul 2008: The compulsory down payment or deposit to be provided upon loan approval is raised from 20% to 30% (with the exception of housing loans, dinar loans that are not foreign currency linked and credit card loans); Feb 2009: 30% deposit of the approved loan amount abolished; May 2011: 80% loan-to-value ratio for housing loans indexed to euro (indexing to other currencies abolished); mandatory 30% down payment for all FX or FX-indexed loans.
Debt Service-to-Income	Dec 2004: Maximum 30 (mortgage loan not included) -50 (mortgage loan included) percent monthly payment to net income ratio; May 2010: DTI set to 40% - 60% for mortgage loans if currency denomination of a loan and a salary is the same.
Capital Requirements/ Risk Weights	2006: Capital adequacy requirement set at 12%; Jul 2006: a bank is required to apply the 125% weight in the calculation of risk-weighted assets to foreign currency- or dinar-denominated receivables that are indexed to a foreign currency clause or otherwise, and that amount to at least RSD 10,000,000 in the dinar equivalent value, if the borrower did not protect such receivables against changes in the exchange rate of the dinar against a given foreign currency or against changes in the value of any other form of indexation; Jun 2008: Capital rules relaxed by excluding household dinar loans that are not foreign currency-indexed and intended for investment in agricultural production and dinar loans that are not foreign currency-indexed and approved to entrepreneurs for investment in the production of goods or services within their line of business from gross household lending; Jul 2008: Amendments to regulations on risk weights applied to calculating riskweighted assets and off-balance sheet items. A 50% risk weight applies to dinar claims secured by a mortgage; 75% to mortgage-secured foreign currency and foreign currency-indexed claims on unhedged borrowers; 125% to foreign currency and foreign currency-indexed claims on unhedged borrowers. The RSD 10 million limit with regard to the 125% risk weight is abolished; Dec 2012: The Basel II accord was implemented; risk weights for FX-unhedged mortgage secured/unsecured loans (75%/125%, respectively) were reduced to 35%/75%. Total loan-loss provisions are subtracted from both the regulatory capital and the RWA.
Provisioning Requirement	Dec 2009: Banks are no longer required to allocate special reserves for estimated losses on receivables classified in category A.
Foreign Currency Lending Limits	
Credit Growth Limits	Jul 2006: Obligation was introduced for banks to maintain the ratio of household lending to core capital at 200%. 2007: the prescribed ratio of gross lending to households to share capital was lowered from 200% to 150%, cash loan repayment period was limited to 24 months (the requirement was abolished in 2011); Dec 2008: Loans for agriculture and investment into other activities are exempt from the gross household lending-to-banks' share capital ratio (150%); Feb 2009: the ratio of gross household lending to share capital was raised from 150% to 200%; 15% asset growth cap abolished; 24 month rule abolished; Jun 2009: 200% ratio of gross household lending to banks' share capital is abolished.
Reserve Requirements	2005: Introduction of a higher required reserve ratio (RRR) on FX base relative to the dinar base (RSD 20%, FX 26%); Jan 2005: Broadened the reservable base to include commercial banks' foreign borrowing (the entire stock of banks' foreign borrowing was included in three steps during the period September 2005–November 2005); Sep 2005/Feb 2006: the central bank took over the authority for regulating and supervising the leasing industry (September 2005) and subjected leasing companies to a 10 percent reserve requirement on foreign borrowing (February 2006); Apr 2006: foreign currency base extended; May 2008: 10% of calculated FX reserve is allocated in domestic currency (20% in October and 40% in December); Oct 2008: the NBS freed banks from RR on foreign borrowing and subordinated loans, as well as domestic financial leasing companies from reserve requirements on foreign borrowing; Feb 2009: Foreign liabilities incurred from October 1, 2008, to December 31, 2009, are exempt from the calculation of reserve requirements until their maturity, the required reserve base can be reduced by the amount of loans to enterprises and households approved in line with the Government Program to Ease the Effects of the Global Crisis; May 2009: 35% of the RR for FX liabilities may be allocated in domestic currency; Jun 2009: banks do not have to allocate required reserves for Serbian dinar- and FX-denominated foreign liabilities in respect of deposits and loans in the period from October 1, 2008, to December 31, 2010, until the initial maturity of such liabilities; Jul 2009: 30% of the RR for FX liabilities may be allocated in Serbian dinar; Oct/Nov 2009: 25%/20% of the RR for FX liabilities may be allocated in Serbian dinar; Mar 2010: streamlined and reduced the RR on both Serbian dinar and FX liabilities; Jan 2011: differentiation of RR ratios on Serbian dinar and FX reserve bases depending on the maturity of liabilities and sources of funding; Apr 2012: FX RR were reduced by 1pp and 3pp, to 29% on FX liabilities with the agreed maturity of up to two years, and 22% on FX liabilities with the agreed maturity of over two years. The share of FX required reserve allocated in dinars increased by 5 percentage points to 20% for liabilities with maturity of up to two years and 15% for liabilities with maturity of over two years; June 2012: RR on FX-indexed liabilities increased to 50% for all maturities. The share of FX required reserve allocated in dinars increased to 27% for liabilities with maturity of up to two years and 19% for liabilities with the agreed maturity of over two years; Aug 2012: Increase in the share of FX RR allocated in dinars for 5pp to 32% for liabilities with the agreed maturity of up to two years and 24% for liabilities with the agreed maturity of over two years.
Limits on Maturity Mismatch	December 2012: Introducing a narrow liquidity ratio that excludes maturing credit claims and should be at least 0.7 on a monthly basis; not lower than 0.6 in three consecutive days; and not lower than 0.5 on any day.
Limits on Net Open Position	Jul 2008: The limit on the net open foreign exchange position is reduced from 30% to 20%; Jan 2009: the limit is further reduced to 10%; Jun 2009: A bank has to maintain its assets/liabilities ratio in such a way so as to ensure that its total net open foreign currency position, including the absolute value of the net open position in gold, does not exceed 20% of its capital at the end of each business day, notwithstanding provisions of the decision governing bank risk management.
Restrictions on Profits	2005: Ban on paying out dividends by undercapitalised banks – still in effect; 2007: Banks that had inadequate loan loss provisions (this being equal to total regulatory provisions less accounting/IFRS provisions) could not pay out dividends or bonuses – abolished in 2011; 2011: If banks CAR ratio falls below 14.5% they cannot pay out dividends.
Memorandum	
Tax	
Other	Sep 2009: The interest absorption scheme (which allowed some deferment of principal payments) and interest-only housing loans were disallowed; Caps banks' loan exposures to the property sector (excluding residential mortgages for owner occupation) at 35 % of total non-bank exposure; 2010: Increased the release of land by the government for property developers in

	Singapore	Slovak Republic
Loan-to-Value	Jul 2005: Banks may grant housing loans of up to 90 percent of the property value (up from 80 percent); Feb 2010: LTV was lowered from 90 percent to 80 percent; August 2010: LTVs were lowered from 80 percent to 70 percent for buyers with one or more outstanding housing loans, the minimum cash payment was increased from 5 percent to 10 percent; January 2011: LTVs were lowered to 60 percent for individuals with one or more outstanding loans and to 50 percent for nonindividuals; Oct 2012: An absolute limit of 35 years for all new housing loans; if the loan tenure exceeds 30 years, or the sum of the loan tenure and the age of the borrower exceeds 65 years, the LTV limit will be reduced to 40 percent from 60 percent if the borrower has one or more outstanding housing loans, or reduced to 60 percent from 80 percent if the borrower has no outstanding housing loans; the LTV limit is reduced to 40 percent from 50 percent for new housing loans to entities such as corporations; Jan 2013: LTVs on 2nd and 3rd loan tightened; Feb 2013: The MAS introduced financing restrictions on motor vehicle loans granted by financial institutions (The maximum motor vehicle loan amount will depend on the open market value of the motor vehicle purchased: e.g. for a motor vehicle with OMV of more than \$20,000, the maximum LTV is 50 percent); The financing restrictions will not apply to loans for the purchase of commercial vehicles <sup>3</sup> . They will also not apply to loans for the purchase of motorcycles.	
Debt Service-to-Income	Jan 2013: Mortgage servicing ratio capped at 30 percent of gross monthly income (only for the buyers of HDP apartments); servicing ratio for loans granted by the HDB lowered from 40 percent to 35 percent.	Jan 2012: Core Tier 1 ratio of at least 9 percent.
Capital Requirements/ Risk Weights Provisioning Requirement		
Foreign Currency Lending Limits		
Credit Growth Limits	Jul 2001: Limit to the property sector exposure of a bank to no more than 35 percent of its total non-bank loans, debt instruments and contingent liabilities (from 30 percent).	
Reserve Requirements		
Limits on Maturity Mismatch		Jan 2009: New liquidity ratio introduced.
Limits on Net Open Position		
Restrictions on Profits		Apr 2009: Restrictions on profit distribution based on stress testing; Jan 2012: dividend distribution restriction as a function of CET1 ratio.
Memorandum		
Tax	Feb 2010: Seller's stamp duty was introduced on all private properties sold within one year of purchase at the rate 1 percent for the first S\$180,000, 2 percent for the next 180,000S\$ and 3 percent for the remaining balance; August 2010: The SSD was extended to sales within three years of purchase, with rates of 3 percent, 2 percent, and 1 percent depending on the length of the holding period; January 2011: The SSD was extended to sales within four years and rates raised to 16 percent for sales within a year, decreasing gradually thereafter to a minimum of 4 percent in the fourth year; December 2011: A buyer's stamp duty was imposed with a rate of 10 percent on foreigners and corporate entities buying any residential property, and of 3 percent on permanent residents buying second or subsequent residential property or Singapore citizens buying their third residential property; Jan 2013: higher buyer's stamp duty for permanent residents (1st property) and Singapore citizen (2nd property); for industrial properties, seller's stamp duties were introduced; Feb 2013: Some new tax measures were announced in the 2013 Budget, mainly targeted at the non-owner-occupied residential properties (let-out residential properties will be taxed at progressive rates between 10–20 percent as opposed to the flat 10 percent; the revised rates will be phased in over 2 years; removed the property tax refund concession for vacant properties, effective January 2014; The owner-occupied residential properties also had some tax revisions, in particular increasing the progressivity of the property tax system.	
Other	Sep 2009: The interest absorption scheme (which allowed some deferral of principal payments) and interest-only housing loans were disallowed; Caps banks' loan exposures to the property sector (excluding residential mortgages for owner occupation) at 35 percent of total non-bank exposure; 2010: Increased the release of land by the government for property developers in private residential housing market; Jan 2013: public housing measures (maximum floor area capped etc).	Jan 2012: The maximum loan-to-stable-funding (LTSF) ratio of 110 percent was implemented.

	Spain	Sweden	Switzerland	Thailand
Loan-to-Value		Oct 2010: Loan collateralised by a home may not exceed 85 percent of the market value of the home.		Dec 2003: LTV of 70 percent for high-end real estate loans; Apr 2009: LTV limit for high value property (more than 10 mil baht) increased to 80 percent and impose higher risk weight capital charge for loan with LTV greater than 80%; Jan 2011: introduced LTVs (90%) for mortgage on high-rise building; Jan 2012: introduced LTVs (95 percent for mortgage on low-rise building).
Debt Service-to-Income				Apr 2004: Increased minimum monthly payments from no less than 5 percent to 10 percent of outstanding debt for new cardholders (for existing cardholders from Apr 2007); Jan 2005: the line of credit of personal loans limited at no more than 5 times of average monthly income or cash flows circulated in deposits accounts
Capital Requirements/ Risk Weights	Jun 2008: Higher risk weights under the standardized approach of Basel II for mortgages that exceed an LTV of 95 percent for residential property and 80 percent for others.		2008: FINMA, in strengthening capital adequacy requirements, introduced a minimum leverage ratio under Pillar 2 of Basel II solely for two largest banks; June 2012: higher risk weights for high LTV mortgage loans from January 2013; Central bank given power to activate countercyclical capital buffer from July 1, 2012 (activated for the first time in Feb 2013, set at 1 percent).	Apr 2009: Impose higher risk weight capital charge (75 percent from 35 percent) for loan with LTV greater than 80 percent; Jan 2011: Higher risk weight for mortgage (less than 10 million baht) on high-rise building that has LTV greater than 90 percent; Jan 2012: Higher risk weight for mortgage (less than 10 million baht) on low-rise building that has LTV greater than 90 percent.
Provisioning Requirement	Jul 2000: Dynamic provisioning introduced.			
Foreign Currency Lending Limits				
Credit Growth Limits				
Reserve Requirements				
Limits on Maturity Mismatch				
Limits on Net Open Position				
Restrictions on Profits				
Memorandum				
Tax				
Other			June 2012: A revision of the self-regulation rules for mortgage lending was announced (to be implemented from July 2012).	

	Turkey	United Kingdom
Loan-to-Value	Jan 2011: residential mortgage loans LTV set at 75 percent ; mortgages on commercial real estate properties are limited to LTV of 50percent .	
Debt Service-to-Income		
Capital Requirements/ Risk Weights	Jun 2007: banks are required to hold additional capital for operational risk; Jan 2008: risk weights for letter of guarantee and letters of credit increased; Mar 2008: risk weights on installment credit card receivables increased; Jun 2011: other consumer loans with maturity of 1-2 years are assigned a risk weight of 150percent and 200 percent if their maturity is longer than 2 years.	The FPD's powers to set the countercyclical capital buffer and sectoral capital requirements will not formally kick in until CRD-IV takes effect (expected in early 2014).
Provisioning Requirement	Mar 2010-Mar 2011: banks with CARs above 16percent are allowed to lower their general provisioning rate; Jun 2011: banks with a ratio of consumer loans to total loans above 20percent and banks with a ratio of NPLs in other consumer loans to total other consumer loans above 8percent had to set aside 4percent or 8 percent general provision.	The FPC's March 2013 recommendation is that banks provision for three-year ahead credit losses and conduct costs.
Foreign Currency Lending Limits	Jun 2009: non FX earnings companies allowed to borrow in FX from local banks, provided that FX loan amount is greater than US\$5 million and average maturity date is longer than a year; consumer not allowed to take out FX linked loans.	
Credit Growth Limits		
Reserve Requirements		
Limits on Maturity Mismatch		
Limits on Net Open Position		
Restrictions on Profits	Oct 2008 (extended in 2010 and 2011): banks require approval from the supervisor before distributing profits (maximum dividend payout depend on the CAR level).	
Memorandum		
Tax		
Other		2009-2011: tightened mortgage regulation, focusing on borrower affordability assessment and improving the distribution and disclosure process.

	United States	Uruguay	Vietnam
Loan-to-Value			
Debt Service-to-Income	Jan 2014: For qualified mortgages the borrower has a debt-to-income ratio no greater than 43%.		
Capital Requirements/ Risk Weights		Jul 2006: Higher capital requirements for foreign currency loans (a 125 percent weight).	
Provisioning Requirement		Sep 2001: Dynamic loan loss provisioning introduced.	
Foreign Currency Lending Limits			
Credit Growth Limits			Feb 2011: The credit growth target cut to below 20 percent from 23 percent; Sep 2011: credit ceiling set to 15-17 percent; Feb 2012: The State Bank of Vietnam divided banks into four groups, which have maximum loan growth rates of 17 percent, 15 percent, 8 percent and zero respectively; Jul 2012: credit ceiling increased to 25-30 percent.
Reserve Requirements		Jun 2008: Reserve requirement on domestic and foreign currency deposits raised to 25% (from 17%) and 35% (from 25%) respectively; Oct 2009-Jul 2010: reserve requirements on domestic and foreign currency deposits lowered a couple of times reaching 12% on domestic deposits and 15% on foreign; May 2011: prior to May the average reserve requirements (RRs) on domestic and foreign deposits were set according to the maturity of the deposit; average RRs rates on domestic and foreign deposits are set at 15 and 18 percent, respectively, and independently of the maturity of the deposit; marginal RRs are introduced and set at 15 and 27 percent; Jun 2011: reserve requirement on peso deposits raised to 15% (from 12%) and on foreign currency deposits to 18% (from 15%); Aug 2012: marginal RRs are tightened and set at a rate of 20 and 40 percent.	
Limits on Maturity Mismatch			
Limits on Net Open Position			
Restrictions on Profits			
Memorandum			
Tax			
Other			

Note: Countries used in the analysis are Argentina, Austria, Brazil, Bulgaria, Canada, Chile, China, Hong Kong SAR, Colombia, Croatia, Finland, Hungary, India, Indonesia, Israel, Korea, Kuwait, Lebanon, Malaysia, Mexico, Mongolia, Netherlands, New Zealand, Nigeria, Norway, Peru, Poland, Romania, Russian Federation, Saudi Arabia, Serbia, Singapore, Slovakia, Sweden, Thailand, Turkey, Uruguay, United States and Vietnam. Limits on maturity mismatch, limits on net open positions and the memorandum items are not used in the analysis.

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