



# IMF Working Paper

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## Developments in Financial Supervision and the Use of Macroprudential Measures in Central America

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**IMF Working Paper**

Western Hemisphere Department

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**Abstract**

Improvements in financial regulation and supervision in the Central American region (CAPDR) have strengthened financial stability. Prudential instruments with potential macroeconomic effects have been introduced. Nonetheless, compared with the larger Latin American and selected industrial countries, there is still important scope for CAPDR to enhance financial supervision and regulation. Based on two surveys, and the analysis of the Basel Core Principles, the paper determines that some weaknesses exist in risk-based supervision, and that macroprudential measures have scarcely been deployed.

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## I. INTRODUCTION

This paper analyzes financial supervision and macroprudential instruments in Central America<sup>1</sup>, Panama, and the Dominican Republic (CAPDR). It evaluates the strengths and weaknesses of each CAPDR country in terms of main supervisory practices; analyzes their use of prudential measures with potential macroprudential impact; and draws country-specific recommendations.

Despite substantial progress, financial regulation and supervision in CAPDR lag behind the larger emerging countries in Latin America (LA5)<sup>2</sup> and international best practices. Using two indexes built from the Basel Core Principles (BCP) assessments and a survey conducted among the seven financial superintendencies during the last two months of 2010, the paper finds that risk-based supervision techniques are only partially used and the training of supervisors in this area is limited. In some countries, cross-border consolidated supervision is hampered by an inappropriate legal and regulatory framework. Effective supervision is also limited by the fact that nonbank institutions frequently are outside the supervisory perimeter. As a result of these weaknesses, the accuracy and completeness of financial soundness indicators and compliance ratios could be impaired in some cases, and the financial stability risks faced by the region could be higher than implied by these indicators. It is important to mention, however, that the regional banking system coped well with the global financial crisis of 2008–09, in part due to improved regulatory and supervisory frameworks and the lessons learned in recent banking crisis in the region.

Prudential measures—that have the potential to be used with macroprudential objectives—have been generally introduced for microprudential purposes. The survey conducted among the financial superintendencies and IMF desk economists of CAPDR and LA5 from November 2010 until January 2011, shows that traditional instruments (such as reserve requirements or limits on a borrower’s leverage) are prevalent in CAPDR. The increase in exposure to foreign exchange risk in some countries resulted in a rapid implementation of prudential regulations aimed at limiting this risk mainly at the micro level. However, only liquidity regulations seem to have been used countercyclically as part of a macroprudential policy.

The region would benefit from structural reforms to improve the financial systems’ legal and regulatory frameworks, increase transparency and strengthen supervisory institutions to bring it up to best international regulatory and supervisory practices. Full introduction of risk-based supervision techniques will take several years, and require considerable resources. Although cross-border consolidated supervision is largely being applied, legal reforms to allow for the full exchange of information and better intraregional coordination are needed. Monetary and supervisory authorities could consider calibrating and, in some cases, expanding the

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<sup>1</sup> Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

<sup>2</sup> Brazil, Chile, Colombia, Mexico, and Peru.

macroprudential toolbox ahead of potentially destabilizing increases in capital inflows, rapid credit growth, and asset price bubbles.

The paper has four sections. Section II describes recent developments and current strengths and weaknesses of financial regulation and supervision in CAPDR. Section III examines recent developments and the current usage of prudential measures with a countercyclical potential in CAPDR in comparison with LA5. Section IV concludes with policy recommendations.

## **II. FINANCIAL SUPERVISION AND REGULATION IN CAPDR**

### **A. Financial Regulation and Supervision<sup>3</sup> According to BCP Assessments**

#### **The BCP compliance index**

The Basel Committee on Banking Supervision of the Bank for International Settlements (BIS) has defined a methodology to determine the degree of compliance of a country's bank regulation and supervision with international best practices. This methodology has been tested extensively since the BCP principles were first issued in 1997. The methodology was revised in 2006—changes were introduced to ensure efficient assessment of supervision of both advanced and less advanced banking systems. The methodology was adjusted to better reflect cross-border and cross-sectoral trends, and also to stress the importance of the independence, accountability and transparency of bank supervisory authorities. However, changes were kept to a minimum and comparability with the 1997 principles was preserved by developing a document (Basel Committee on Banking Supervision, 2006a) to facilitate a direct comparison of each part of the criteria between the two versions.<sup>4</sup> BCP are ranked according to four categories: non-compliant, materially non-compliant, largely compliant, and compliant (Basel Committee on Banking Supervision, 2006b).

In order to compare BCP compliance across countries and over time, we constructed an index by assigning numeric values to the assessments and grouping the 30 principles into four broad categories. We assigned a value 1 to “compliant” principles; 0.75 to “largely compliant,” 0.25 to “materially non-compliant”; and 0 to “non-compliant”. This produces a

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<sup>3</sup> This paper focuses mainly on banking supervision. The banking sector intermediates over 85 percent of total assets in CAPDR. Only three countries (Costa Rica, El Salvador, and Panama) have active—but relatively small—equity markets. In general, the quality of supervision of nonbanks is lower than in the banking system, given the lack of resources and smaller systemic implications. Also, for simplicity, we use “financial supervision” as short for “financial regulation and supervision,” except when distinction between the regulatory and supervisory frameworks is of essence.

<sup>4</sup> Ratings of BCP assessments conducted under the 1999 methodology have been adapted to be compared with those under the 2006 methodology by either repeating the rating in those cases where the 2006 is more detailed (principles 7, 13, 14, 15, and 16) or combining them when the 2006 methodology is more synthetic (principles 21, 24, and 25). In all cases, we use the principles as defined in the 2006 methodology.

value ranging from zero (all principles are non-compliant) to 30 (all principles are compliant). The BCP compliance index is obtained by normalizing this value on a range from zero to 100, representing the weighted percentage of compliance with the BCP. In order to compare compliance between main supervisory practices and other characteristics, the 30 BCP are grouped into four categories: those mainly related to risk-based supervision, cross-border consolidated supervision, institutional factors, and governance.<sup>5</sup>

The way the BCP compliance index is constructed allows comparing average compliance across categories, despite the fact that the number of principles included in each category varies. While we used the latest available BCP assessment<sup>6</sup>, it is important to note the year differs across countries. Thus, this index should be seen as a proxy for the current situation that likely penalizes countries with dated BCP assessments to the extent that progress in recent years is not taken into account.

According to the BCP compliance index, supervisory practices are relatively homogeneous within the region, with some significant gaps compared with best international practices. Assessments rank most principles in CAPDR between “materially non compliant” and “largely compliant.” As a result, on average, countries comply with 56 percent of the principles. Compliance ranges from 61 percent for institutional factors (objectives, independence, powers—including corrective and remedial powers, transparency and cooperation of the supervisory body), to 48 percent for risk-based supervision (Table 1).

Table 1: Compliance with BCP for Effective Banking Supervision  
(In percent; 100=fully compliant with all principles)

	Costa Rica 2008	Honduras 2009	El Salvador 2010	Guatemala 2006	Dominican Republic 2009	Panama 2007	CAPFR 1/
Risk-Based Supervision	44	44	38	31	50	81	48
Cross-Border Consolidated Supervision	33	48	80	33	50	93	56
Institutional Factors	29	50	67	75	67	79	61
Governance	35	50	75	45	65	90	60
Country Average	37	48	66	44	57	87	56

Source: IMF staff based on country BCP assessments. The year cited after the country correspond to the latest available BCP assessment.

1/ Unweighted average. Excludes Nicaragua.

<sup>5</sup> Risk-based supervision includes principles 7, 8, 9, 13, 14, 15, 16 and 18; cross-border consolidated supervision comprises principles 6, 10, 11, 12, 19, 20, 21, 22, 24, and 25; institutional factors includes principles 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 and 23; and governance includes principles 2, 3, 4, 5 and 17. For a list of the BCP, see Basel Committee on Banking Supervision (2006b).

<sup>6</sup> BCP assessments in the region have been conducted in the context of the Financial Sector Assessment Program (FSAP) of the IMF and the World Bank, except in the case of Panama, where they were stand-alone exercises performed by IMF staff. Data is available for all countries, except for Nicaragua, which is excluded from the BCP index.

### **Progress in financial regulation and supervision in CAPDR**

Financial supervision has strengthened in CAPDR countries over the last decade. The first round of BCP assessments, conducted between 2000 and 2005, showed that, on average, countries were compliant with only about one-third of the principles (12 out of 30). Five years later, between 2006 and 2010, the second round of BCP assessments showed average compliance of more than half of the principles (17 out of 30). All countries have strengthened their financial regulation and supervision, albeit to different degrees (Figure 1).

The strengthening of financial supervision during the last decade has been relatively homogeneous between categories, but unequal by category within each country. In absolute terms progress has been more marked on cross-border consolidated supervision, where the BCP compliance index increased by 21 points to 56, compared with an average increase of 19 points. In particular, supervisory reporting and techniques—on site and off site supervision, were improved in Honduras, Guatemala, Panama, Dominican Republic and El Salvador. Also, legal changes allowing the exchange of information with foreign supervisory agencies in Guatemala fostered compliance with key principles for cross-border consolidated banking supervision. In relative terms, risk-based supervision improved by the same proportion as consolidated supervision, with an increase of 60 percent in BCP compliance. In addition to starting from a lower compliance level, most of the improvement (up to 40 percent) in this category was due to approval by congress of anti-money laundering laws in Guatemala, and Honduras which, although connected to a greater control of banks' risk, is not strictly part of the risk-based supervision practice. Legal reforms in Guatemala and the Dominican Republic increased superintendencies' responsibilities, focused objectives, and improved legal protection for supervisors. These reforms were the main drivers behind the region's strengthening of institutional factors, which continue to show the highest level of compliance with an index value of 65. Widespread strengthening of internal controls and audits of banks thorough the region, along with a legal reform ensuring that corporate affiliations or structures do not expose banks to undue risks or hinder effective supervision in Panama, contributed to the regional strengthening in governance.

### **Comparison of compliance levels with the LA5, Spain, and Canada**

In addition to the ordinal ranking the region's gap vis-à-vis best international standards could be assessed by comparing compliance levels against some relevant benchmarks. We have chosen a group of large Latin American economies (LA5) because the institutional structure of the financial system is very similar to that of CAPDR countries and their supervisory institutions have strong links, including supervisory associations.<sup>7</sup> We also compare the

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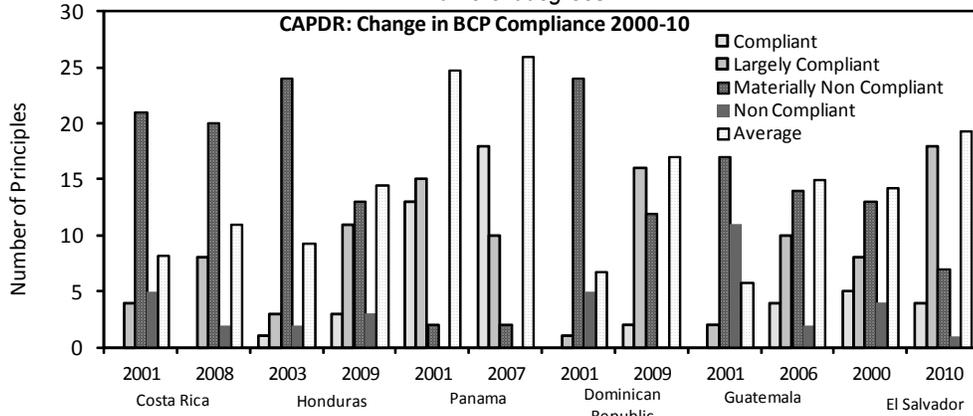
<sup>7</sup> CAPDR and LA5 superintendencies belong to the Association of Banking Supervisors of the Americas (ASBA). This parallelism widely holds for financial supervision practices, despite differences in the institutional setting of the final supervision agency. While all the countries in CAPDR have separate superintendencies (in most cases, more than one), in some of the LA5 countries financial supervision is conducted by the central bank. This institutional difference, however, seems to be significant in terms of the implications for the institutional arrangements for macroprudential policies (IMF, 2011).

compliance levels of CAPDR countries against two industrial countries considered to be leaders in the field: Canada, whose financial system was remarkably successful in weathering the recent global crisis, and Spain, the first country in introducing countercyclical provisioning and has a tradition of strong banking supervision.

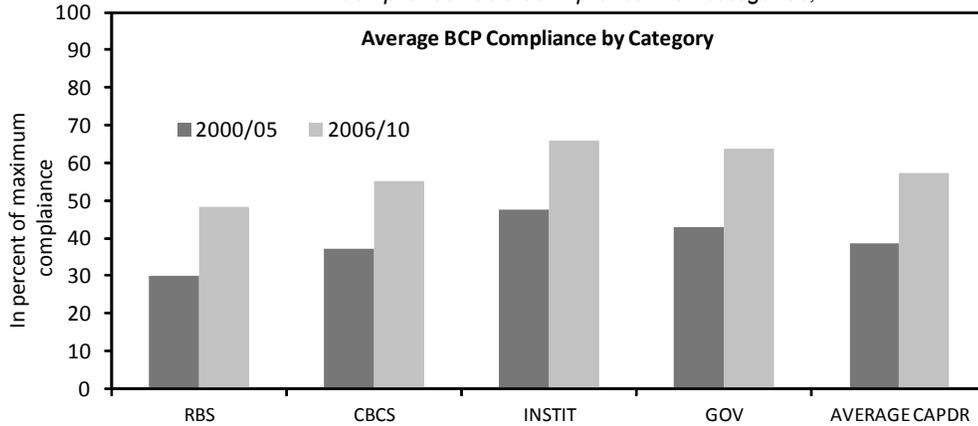
**Figure 1. Progress in Financial Regulation and Supervision in CAPDR**

There has been substantial improvement in compliance with BCP for effective banking supervision during the last decade.

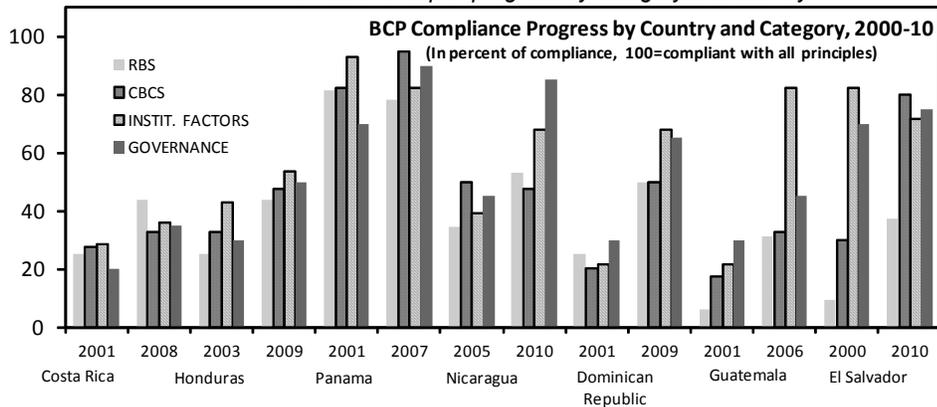
*All countries have strengthened their financial regulation and supervision, albeit to different degrees...*



*... compliance has also improved in all categories, ...*

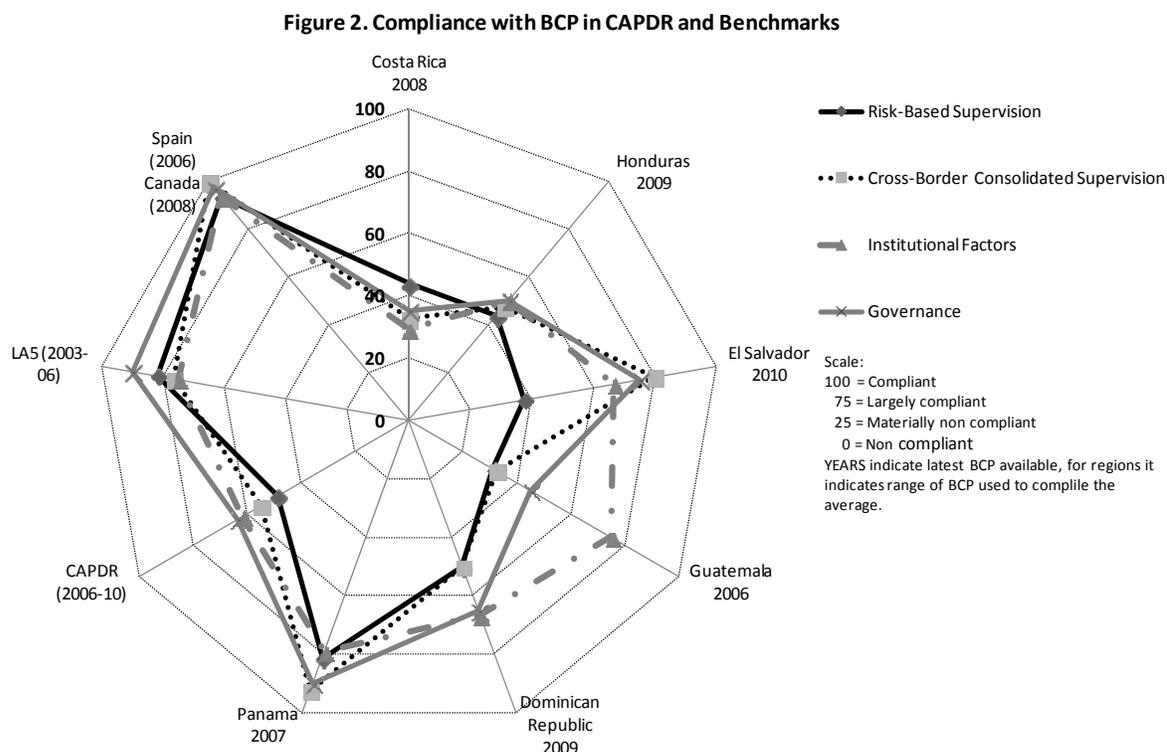


*... with rather unequal progress by category and country.*



Source: IMF staff estimates.

Despite the strengthening of supervisory practices, the region remains at 56 percent compliance with the BCP. Even in the countries registering the strongest improvement, such as the Dominican Republic (between 2001 and 2009) or Guatemala (between 2000 and 2006), the BCP compliance index is still at about 50 percent. The BCP compliance index in the LA5 ranges from 80 to 90, while it is close to 100 in Spain and Canada. The LA5 countries, Spain, and Canada are well above the CAPDR average in all four categories, but the gap is particularly wide in cross-border consolidated supervision and risk-based supervision (Figure 2).<sup>8</sup>



Source: IMF staff based on country BCP assessments.

1/ Excludes Nicaragua.

On a country by country basis, Panama leads the region in BCP results, with a level of effective supervision close to the LA5 average. Governance and cross-border consolidated supervision are assessed very favorably, while risk-based supervision and institutional aspects present a gap of about 20 percent vis-à-vis full compliance with BCP principles, mainly because of a lack of legal protection for supervisors, some weaknesses in the institutional supervisory set up for nonbanks, limitations in corporate governance rules, and

<sup>8</sup> As mentioned, the levels of compliance are not fully comparable due to the different periods when they were measured. Nonetheless, the dates of the BCP for most countries of the CAPDR region are more recent than for the LA5, Spain and Canada benchmarks and, thus, the gaps are probably larger than the ones shown.

deficiencies in the measurement of actuarial risk in supervisory activities on fiduciaries.<sup>9</sup> All CAPDR countries, with the exception of Costa Rica and Honduras, share a relatively high level of institutional supervisory strength.

The weaknesses in supervisory practices are concentrated mainly in risk-based supervision, where all countries, with the exception of Panama, are at 50 percent compliance or below. Risk-based supervision practices are relatively new in the region and, given the change in focus, supervisory procedures, and additional regulatory framework that are required, it may take a few more years to be fully implemented. Costa Rica's assessment suffers from the inadequacy of its legal framework for risk-based supervision and cross-border consolidated supervision. Guatemala's relatively old 2006 BCP assessment does not reflect progress in recent years, particularly in the cross-border consolidated supervision and, to a lesser extent, risk-based supervision practices. In El Salvador, the low compliance with risk-based supervision contrasts with an overall performance that is higher than the regional average.

This is due to the inadequate regulatory framework, including standards for risk management, and credit, market, liquidity, operational and interest rate risk in the banking book, which is being addressed after the last FSAP. Despite the presumed good practices of the large international banks operating in El Salvador, the lack of regulatory standard limits enforcement by the superintendency.<sup>10</sup>

## **B. Self-Assessment Index of Supervisory Practices**

### **Gap with best international practices according to the self-assessment index**

The region's seven banking superintendencies surveyed their supervisory practices in three main areas: risk-based supervision, cross-border consolidated supervision and the supervisory perimeter. A self-assessment index (SAI) of compliance with best international practices was prepared based on the survey responses. Each question (30 in total, 10 per category) was ranked from zero (best international practices were not being applied at all) to 10 (full compliance with best international practices).<sup>11</sup> The result was weighted according

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<sup>9</sup> Panama's BCP assessment reflects progress beyond the Superintendency's own assessment, particularly in the area of risk-based supervision, as explained in the following section.

<sup>10</sup> An update of the implementation status of the FSAP recommendations is included in each country's IMF Article IV reports. Detailed recommendations for compliance with the BCP are included in the BCP assessments of each country.

<sup>11</sup> The survey template and the answers from the superintendencies are available from the authors upon request. Appendix 1 contains a table with the weights of each question, the rating assigned to each question after weight, and the value of the SAI assigned to each country and main supervisory practice. Subjective judgment on the extent to which the description provided by each superintendency was more or less near best international practices was based on the authors' experience and consultation with experts in the field.

the relative relevance of the question and the final result normalized in a range of zero to 100, where 100 would represent total compliance with best international practices.

The surveys confirm to a large extent the results obtained through the BCP compliance index (Table 2), despite differences in methodology and timeframe. In particular, the survey results confirm that there is a need to continue strengthening risk-based supervision practices throughout the region. At the aggregated regional level, the quantitative SAI elaborated from the results of the survey reflect an order of magnitude of the gap in the areas of risk-based supervision practices (slightly below 50 percent vis-à-vis a theoretical perfect level of compliance with international best practices) and cross-border consolidated supervision (almost 70 percent compliance with international best practices) in line with BCP compliance index. Finally, the survey finds that the region has a relatively poor performance with regard to the definition of the supervisory perimeter. This is an element that is only marginally covered by the BCP, making it impossible to compare with the SAI.<sup>12</sup>

Table 2: SAI - Self-Assessment Index of Compliance with International Best Practices in Main Supervisory Practices (Scale from 0 to 100, 100 = best international practices)

	Guatemala	Honduras	Costa Rica	El Salvador	Nicaragua	Panama	Dominican Republic	CAPDR Average
<b>Risk-Based Supervision</b>	54.3	44.6	48.3	42.0	38.0	47.4	57.1	<b>47.4</b>
<b>Cross-Border Consolidated Supervision</b>	82.9	71.2	64.1	61.8	74.1	77.6	42.4	<b>67.7</b>
<b>Supervisory perimeter</b>	37.2	30.6	66.1	17.8	38.6	45.0	43.1	<b>39.8</b>
<b>TOTAL</b>	<b>58.1</b>	<b>48.8</b>	<b>59.5</b>	<b>40.5</b>	<b>50.2</b>	<b>56.7</b>	<b>47.5</b>	<b>51.6</b>

Source: IMF staff assessment based on supervisory authorities' responses to questionnaires.

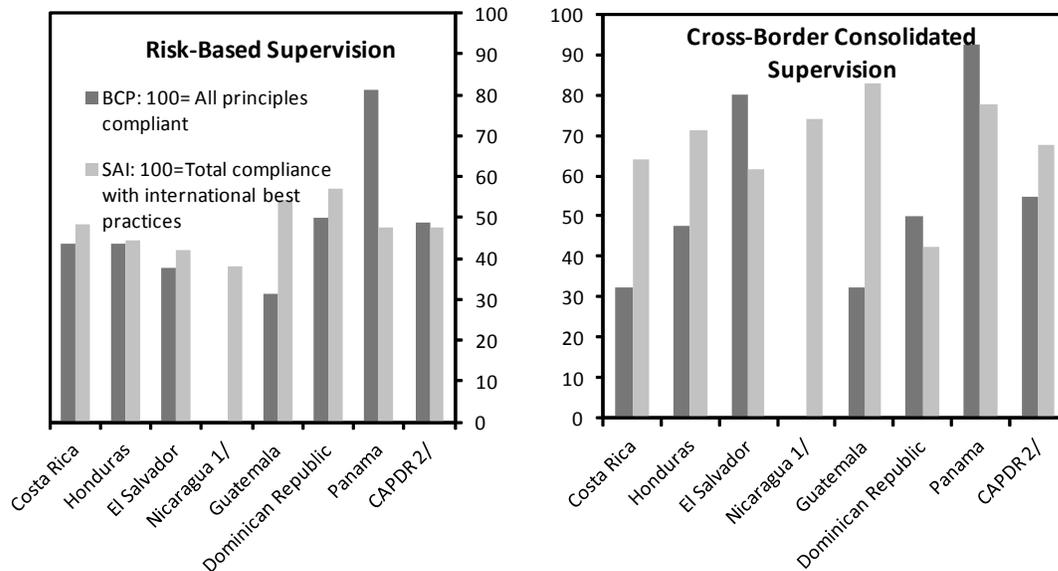
On a country by country basis (Figure 3), however, there are differences between the BCP compliance index and the SAI. These are largely explained by the different timing (i.e., in the above-mentioned case of Guatemala), the different methodological approaches<sup>13</sup> and, in some cases, the fact that BCP are an impartial evaluation while the surveys reflect the facts as seen by the superintendencies. The discrepancy between the values of the SAI and BCP compliance index for Panama is particularly noteworthy. While the supervisory authorities believe that there are still substantial improvements to be made, particularly in the area of

<sup>12</sup> There is no BCP on the comprehensiveness of the oversight function, and the concept of “supervisory perimeter” is not mentioned in the methodology. However, the practical considerations in conducting a BCP assessment require “at a minimum, mention [of] those activities where nonbanks have an impact on the supervised banks and the potential problems which may arise as a result of nonbank activities.” (BIS 2006, paragraph 19).

<sup>13</sup> BCP assessments tend to focus on the legal and regulatory framework, although they also take into account practical implementation aspects. The survey focused more on actual practices, which could explain the differences in Costa Rica’s assessment.

risk-based supervision, the 2007 BCP ranked Panama very highly in this and all the other areas of banking supervision and regulation. The high value obtained in the BCR compliance index might reflect in part differences of criteria with the superintendency self-assessment, but also the evolving understanding of the nature and scope of risk-based supervision and other supervisory practices and, possibly, some inconsistencies between the assessment and the final rating.<sup>14</sup>

Figure 3. CAPDR: BCP vs. SAI



Source: Fund staff based on BCP country assessments and supervisory authorities' responses to questionnaires.

1/ Data on BCP compliance for Nicaragua is not available.

2/ Excludes Nicaragua from the BCP compliance index.

### Self-assessment of compliance by supervisory category

The regulatory and operational aspects of risk-based supervision need to be improved throughout the region. Risk-based supervision objectives are well defined and generally well understood. Nonetheless, the regulatory framework is at different stages of development and implementation is mostly embryonic. All countries in the region need to continue training supervisory staff on how to analyze the broad spectrum of financial risks and on the

<sup>14</sup> Panama received a high rating in the 2007 BCP assessment despite having “underdeveloped processes for the measurement and monitoring of market risk” and no capital adequacy requirement for market risks (IMF 2007, p. 20). The BCP assessment also notes that the superintendency “requires that supervised entities establish policies for country risk (e.g., transfer risk, political risk, and sovereign risk) and market risk. However, [the superintendency] has not developed its own risk parameters. The regulations for country and market risks fall short given the increasing cross-border activities and complexity of activities by some banks.” (IMF 2007, pp. 23).

implementation of risk-based supervision techniques. In some countries, this effort has been delayed by the institutional transformation of the supervisory authorities, such as in El Salvador.<sup>15</sup> The use of vulnerability indicators is particularly limited. For instance, in Costa Rica no indicators are used to measure the systemic impact of an institution, and in Nicaragua the only indicator applied is market share.

In general, the region has advanced in the introduction of cross-border consolidated supervision. Adequate reporting systems are in place and the definition of related parties is sound. Areas where further strengthening is necessary are the legal framework, the scope of cross-border consolidated supervision, and intraregional coordination. In particular, the Dominican Republic lacks legislation defining the structure of financial conglomerates, which may encumber identification and enforcement of cross-border consolidated supervision. Work is in progress to pass a financial groups law to address this weakness. The scope of cross-border consolidated supervision is mostly limited to financial activities (i.e., not including the potential industrial or commercial activities of a financial group) with the exception of El Salvador, where financial conglomerates are not allowed industrial participations, and Panama, where the law enables regulators to request any necessary information from any company pertaining to an economic group. Intraregional coordination is being fostered by the work of the Central American Council of Financial Supervisors. However, national legislation still hampers the exchange of critical information between supervisors, and the institutional structure of the Council is not designed to carry on this task at a supranational level.

There are several weaknesses regarding the definition and implementation of the supervisory perimeter in the region. In particular, the legal definition of financial institution/financial activity has weaknesses in all countries except in Costa Rica and Panama, creating opportunities for circumventing effective financial supervision. There are no size limits for financial institutions, and only in Costa Rica is intensified supervision mandated when growth exceeds a predetermined threshold. The types of risks and operations under the purview of the supervisor are limited. Only a few countries have begun to map operational risks, and regulations on market risk and risk management are only now being developed. Finally, micro-finance, credit cooperatives, savings banks and mutual institutions, even of a relatively large size, are not effectively regulated and supervised in many cases. Legal reforms are being prepared in this area in Guatemala, Honduras, and Nicaragua.

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<sup>15</sup> Focus at the superintendency of El Salvador was directed for some time to the merge of the three financial superintendencies into one and the transfer of the regulatory function to the central bank, which was scheduled to take place in August 2011. Nonetheless, the government has made progress in 2011 with the approval of the risk management and corporate governance regulations. Pending regulation on credit risk is also in the final stages of development.

### III. THE USE OF MACROPRUDENTIAL INSTRUMENTS

#### A. Macroprudential Instruments: A Review of the Literature

Even a perfect compliance with best international practices in financial supervision and regulation could not ensure macrofinancial stability, as highlighted by the recent global financial crisis. The lack of a comprehensive analytical framework and the gaps in policy tools reignited interest in macroprudential policies.<sup>16</sup> Macroprudential policy and macroprudential instruments, are broadly defined as the set of measures that aim to monitor, prevent, and address system-wide risks, and minimize the cost of systemic crises. The scope of this paper is limited to the set of macroprudential instruments. To be effective, macroprudential policy needs as well a coherent institutional framework for effective surveillance and policy design and implementation.<sup>17</sup>

There is no standard taxonomy for macroprudential instruments.<sup>18</sup> Some authors emphasize the time-series dimension of financial stability as opposed to its cross-sectional dimension. Thus, macroprudential tools could be divided between those which are primarily intended to mitigate the procyclicality of the financial system and those oriented to reduce the risk of the common exposures that arise owing to balance sheet interlinkages at a given point in time.<sup>19</sup> Countercyclical capital and provisioning requirements and maximum loan-to-value ratios are some of the macroprudential tools in the first group which are analyzed in this paper. Other measures of this type which are not included are, for instance, countercyclical variations in margins and haircuts in securities financing and derivative transactions. Some macroprudential tools included in the second group are the net stable funding ratio and limits for maturity mismatches. However, the fact that most macroprudential instruments could be

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<sup>16</sup> The origin of the term “macroprudential” dates back to the 1970s, in the context of internal documents of the Cooke Committee (the precursor of the Basel Committee on Banking Supervision), as mentioned by Clement (2010). As noted by Galati and Moessner (2011), public references to macroprudential policy started in the mid-1980s and received new impetus in the early 2000s.

<sup>17</sup> A forthcoming publication of the Monetary and Financial Sector Department of the IMF (IMF, 2011b) analyzes macroprudential institutional settings in a number of countries, assessing strengths and weaknesses of existing and emerging institutional models for macroprudential policy and to providing some general guidance for institutional arrangements supporting macroprudential policies in advanced and emerging market countries. This is a topic for further research in CAPDR, which is not included in this paper.

<sup>18</sup> See Galati and Moessner (2011) for a literature review of types, analytical underpinnings, and the effectiveness of macroprudential instruments.

<sup>19</sup> IMF (2011a), in particular, discusses two categories: (a) instruments specifically tailored to mitigate time-varying or cross-section dimensions of risk; and (b) those not originally developed with systemic risk in mind, but that can be modified to be part of the toolkit provided that (i) they target explicitly and specifically systemic risk; and (ii) the chosen institutional framework is underpinned by the necessary governance arrangements to ensure there is no slippage in their use.

used countercyclically, and that most countercyclical measures have spillover effects that reduce balance sheet interlinked exposures, reduces the value of this classification.

Other authors classify macroprudential tools based on whether they are rule-based (e.g., automatic stabilizers)<sup>20</sup> or discretionary;<sup>21</sup> or whether they introduce quantity restrictions or price restrictions. The BIS has used a classification linking macroprudential measures with microprudential categories<sup>22</sup>, to a large extent (Table 3). This is a pragmatic approach, as macroprudential measures reduce risks at the microeconomic level as well and, at the opposite end, some traditional microprudential measures could be considered macroprudential instruments when their aim is to address systemic risks.

## **B. Developments and Type of Macroprudential Instruments in CAPDR**

We will consider as macroprudential instruments any macro or microprudential measure that can be used to address systemic risk,<sup>23</sup> regardless of whether it is being used or has been used in the past for such purposes.<sup>24</sup> Note that only regulations, and not intensified surveillance tools or capital controls, will be considered macroprudential measures.<sup>25</sup>

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<sup>20</sup> For instance, loan loss provisions, capital requirements and surcharges, and loan-to-value ratios could be designed in such a way.

<sup>21</sup> Hilbers et al. (2005) illustrate how microprudential instruments could be used to address excessive credit growth. In this vein, adjusting the calibration of microprudential instruments discretionally in a countercyclical way has been a common practice in emerging markets well before such actions were considered part of macroprudential policies. McCauley (2009) mentions the example of the Reserve Bank of India's decision to raise weights on mortgages and other household credit in 2005.

<sup>22</sup> Microprudential measures are defined as prudential measures concerned with the stability of individual financial institutions. These range from minimum capital requirements, fit and proper test for managers and auditors of financial institutions, rules on what assets can be held by whom, to measures of the value and riskiness of assets and provisioning requirements. Financial superintendencies establish microprudential regulations with a view to ensure the stability of individual entities and protect depositors.

<sup>23</sup> Note our classification of macro vs. microprudential instruments differs from Ostry et al. (2011), pp. 10-12, in some important aspects. Reserve requirements, which are primarily monetary policy instruments, have microprudential effects and potential macroprudential uses. Due to the fact that it has been in place for a long time before the development of specific macroprudential instruments, and taking into account this mutable macro/microprudential nature, we grouped it with other traditional macro & microprudential measures. Further, we classify foreign exchange regulations as macroprudential measures as long as there is no distinction in the treatment of residents and nonresidents.

<sup>24</sup> For a discussion on the role of macroprudential instruments in the policy mix to contain the risk of boom-bust cycles in Latin America, see Eyzaguirre et al. (2011).

<sup>25</sup> Instruments such as Colombia's liquidity "requirements", which are considered by Terrier et al. (2011), are thus excluded from the analysis.

<b>Table 3: Macroprudential Instruments</b>	
<b>1. Risk measurement methodologies</b>	
By banks	Risk measures calibrated through the cycle or to the cyclical trough.
By supervisors	Cyclical conditionality in supervisory ratings of firms; develop measures of systemic vulnerability (e.g. commonality of exposures and risk profiles, intensity of inter-firm linkages) as basis for calibration of prudential tools; communication of official assessments of systemic vulnerability and outcomes of macro stress tests.
<b>2. Financial reporting</b>	
Accounting standards	Use of less procyclical accounting standards; dynamic provisions.
Prudential filters	Adjust accounting figures as a basis for calibration of prudential tools; prudential provisions as add-on to capital; smoothing via moving averages of such measures; time-varying target for provisions or for maximum provision rate.
Disclosures	Disclosures of various types of risk (e.g. credit, liquidity), and of uncertainty about risk estimates and valuations in financial reports or disclosures.
<b>3. Regulatory capital</b>	
Pillar 1	Systemic capital surcharge; reduce sensitivity of regulatory capital requirements to current point in the cycle and with respect to movements in measured risk; introduce cycle-dependent multiplier to the point-in-time capital figure; increased regulatory capital requirements for particular exposure types (higher risk weights than on the basis of Basel II, for macroprudential reasons).
Pillar 2	Link of supervisory review to state of the cycle.
<b>4. Funding liquidity standards</b>	Cyclically-dependent funding liquidity requirements; concentration limits; foreign exchange lending restrictions; foreign exchange reserve requirements; currency mismatch limits; open foreign exchange position limits.
<b>5. Collateral arrangements</b>	Time-varying Loan-to-value ratios; conservative maximum loan-to-value ratios and valuation methodologies for collateral; limit extension of credit based on increases in asset values; through-the-cycle margining.
<b>6. Risk concentration limits</b>	Quantitative limits to growth of individual types of exposures; (time-varying) interest rate surcharges to particular types of loans.
<b>7. Compensation schemes</b>	Guidelines linking performance-related pay to ex ante longer-horizon measures of risk; back-loading of pay-offs; use of supervisory review process for enforcement.
<b>8. Profit distribution restrictions</b>	Limit dividend payments in good times to help build up capital buffers in bad times.
<b>9. Insurance mechanisms</b>	Contingent capital infusions; pre-funded systemic risk insurance schemes financed by levy related to bank asset growth beyond certain allowance; pre-funded deposit insurance with premia sensitive to macro (systemic risk) in addition to micro (institution specific) parameters.
<b>10. Managing failure and resolution</b>	Exit management policy conditional on systemic strength; trigger points for supervisory intervention stricter in booms than in periods of systemic distress.

Source: Galati and Moessner (2011), adapted from BIS (2008).

Out of the universe of macroprudential tools, we analyze a sample of 20 which, at the macroprudential or microprudential level, have been used in Central or South America, or are likely to be implemented in the future. Regarding classification, we use a pragmatic approach similar to BIS (2008), dividing the instruments into six categories: traditional measures; sectoral measures; maturity mismatches; credit growth limits; foreign exchange risk and capital inflows; and countercyclical measures (Table 4).

Traditional measures encompass long-used microprudential tools which have been frequently calibrated to mitigate the procyclicality of the financial sector. Sectoral measures have been used to address rapid credit growth and asset prices bubbles in specific economic sectors. Maturity mismatches are also traditional microprudential measures which, given their macroprudential potential, we have grouped with new macroprudential measures such as core funding ratios. Credit growth limits were used at some point as countercyclical tools. However, they are generally seen as a last resource when market-based instruments are ineffective due to their strong and proven negative effects on the effective allocation of financial resources.<sup>26</sup> Most measures to limit foreign exchange risks have a clear double microprudential and macroprudential usage and also address a very specific type of risk. Finally, countercyclical measures include the new type of macro-prudential tools developed in the 2000s and that have gained prominence with the recent global financial crisis. It is important to note that all 20 measures have the potential to be used as countercyclical instruments, and not only the ones included in this last category. Thus, when we analyze the different use of countercyclical measures in the CAPDR and LA5 countries we refer to the specific measures included in this category, and not to any other measure which might have been used for countercyclical purposes.

The analysis in this section is based on the results of a survey conducted among financial superintendencies and IMF desk economists from November 2010 until January 2011.<sup>27</sup> The survey covered the evolving use of the sample of 20 macroprudential instruments in the CAPDR countries from 2000 to 2010. It also covered the LA5 countries for 2010, in order to have a benchmark for the region.

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<sup>26</sup> The exception is loan-to-deposit limits which, although included in this category because of their ability to limit the expansion of banks' balance sheets, have lesser potentially distorting effect on the management of banks' asset-liability structure and have been used to mitigate risk at the microprudential level.

<sup>27</sup> Summary results of the survey are included in Appendix 2, Table A (CAPDR) and Table B (LA5).

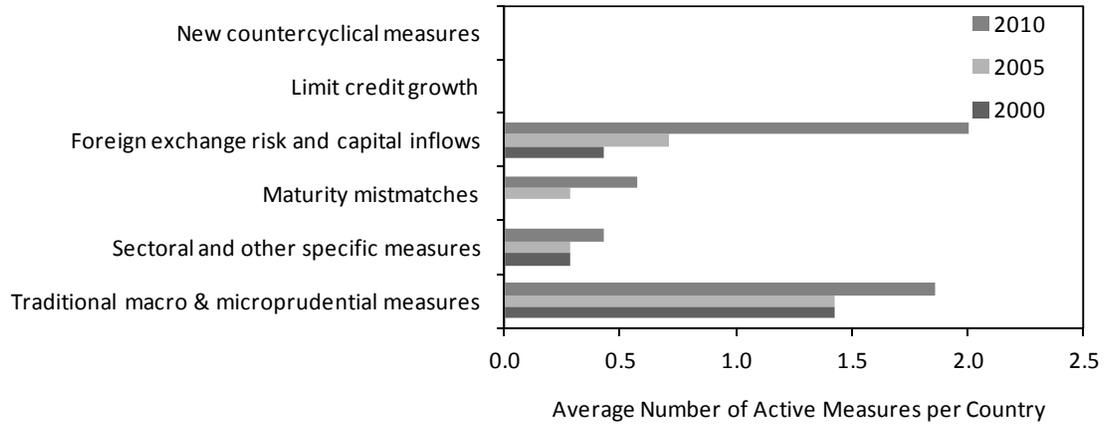
**Table 4. Classification of Macroprudential Tools Sampled**

Type of measure	Measure
<b>Traditional macro &amp; microprudential measures</b>	Maximum limit on loan to value ratios Debt to income ratio caps Reserve requirements
<b>Sectoral and other specific measures</b>	Limits on credit concentration with respect to specific sectors Mandatory provisions on exposures to specific sectors Special capital requirements for exposures to specific sectors
<b>Maturity mismatches</b>	Limits on maturity mismatches on bank balance sheets Limits on net non-core funding dependence ratio Minimum core funding ratio
<b>Limit credit growth</b>	Bank-specific caps on credit growth Credit ceilings Loan-to-deposit limits
<b>Foreign exchange risk and capital inflows</b>	Limits on open foreign exchange positions Specific capital requirements for net open foreign exchange Reserve requirements on external credit lines to banks Special capital requirements for foreign exchange lending to Limits to foreign investment by domestic pension funds Tax on capital inflows
<b>New Countercyclical measures</b>	Dynamic (cyclically based) loan loss provisioning rules Cyclically based capital adequacy ratios

Most macroprudential measures in the region are traditional microprudential instruments; there are no new countercyclical or leverage-related measures in place (Figure 4). On average, the countries of the region had 1.9 active traditional macroprudential measures in place at end-2010. The most widespread instrument is the reserve requirement, which serves to adjust the money multiplier and to reduce liquidity risk. Other macroprudential measures are present only marginally (about 0.5 instruments on average for sector-specific and maturity mismatches), or not at all, such as with the more macro-oriented mechanisms (credit growth limits and countercyclical measures). The exception to the predominance of traditional microprudential measures is the growing use of limits on net open foreign exchange positions and related measures, which have increased four-fold during the last decade. This reflects mainly the need to protect against increased exchange rate volatility in some countries (Costa Rica and Guatemala), indirect foreign exchange risk in other highly dollarized countries (Guatemala, Honduras, and Nicaragua), and liquidity risk in foreign

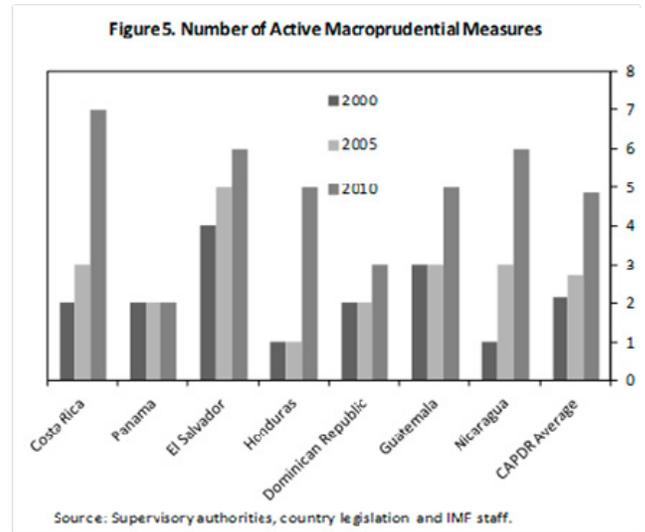
exchange in El Salvador.<sup>28</sup> In addition to the foreign exchange-related measures, some countries (Dominican Republic and Nicaragua) have strengthened their microprudential measures following domestic banking crises. A few measures (mainly liquidity) were relaxed to accommodate pressure on the banking sector during the global financial crisis but, in most cases, these have returned to their pre-crisis levels.

**Figure 4. Macprudential Measures per Group**



Source: Supervisory authorities, country legislation, and IMF staff.

As a result of the introduction of microprudential measures to address foreign exchange risks, the average number of instruments that could be used as macroprudential measures has more than doubled in the region during the last decade (Figure 5). Countries in the CAPDR region are applying 4.9 measures in 2010, up from 2.1 measures on average in 2000. Costa Rica (foreign exchange-related measures) and Nicaragua (traditional microprudential measures) are the countries with the fastest growth in the number of measures. The large increase in Honduras is also related to the increase in foreign exchange-related measures.



Source: Supervisory authorities, country legislation and IMF staff.

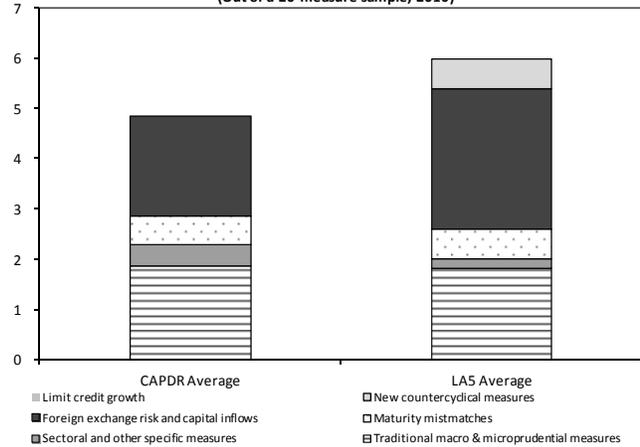
<sup>28</sup> Having adopted the U.S. dollar as the official currency, the central bank of El Salvador cannot operate as a lender of last resort in the traditional way. As a result, the authorities have introduced measures to limit the liquidity risk of financial institutions.

### C. Use of Macroprudential Instruments in CAPDR vs. LA5

Despite increases in the introduction of macroprudential measures, the region is still somewhat below the LA5 average (Figure 6).<sup>29</sup> However, the large emerging economies of the continent have not applied many macroprudential measures. Total average instruments applied per country in the LA5 group is six, barely over one-fourth of the 20 instruments surveyed and only one instrument more than the CAPDR countries. However, the number of macroprudential measures is not necessarily correlated with the effective protection against systemic risk. In this sense, the most relevant difference between the CAPDR and LA5 countries is that the latter have already started introducing new countercyclical measures. The survey provided partial information on the range of values for the limits and requirements being applied. However, comparisons of such ranges provide only a very broad sense of the level of intensity of macroprudential measures, and the available information does not allow one to obtain a weighted average per country. For more information on the ranges of macroprudential measures (see Appendix 2).

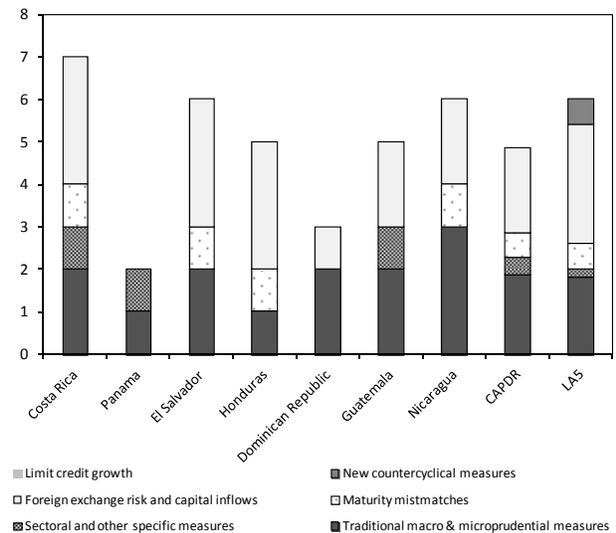
At the country level, there is room to broaden the toolkit in most of the categories considered (Figure 7). Some countries could introduce or improve the calibration of existing microprudential measures with a potential macroprudential dimension, including limits on borrowers' leverage (mortgages and consumption credit) to prevent the accumulation of risks in household balance sheets. Other macroprudential tools should be introduced as precautions in case of macrofinancial distress due to capital

Figure 6. Number of Macroprudential Measures Applied: CAPDR vs. LA5 (Out of a 20-measure sample, 2010)



Source: Supervisory authorities and IMF staff.

Figure 7. CAPDR: Number of Macroprudential Measures Applied per Country (Out of a 20-measure sample, 2010)



Source: Supervisory authorities and IMF staff.

<sup>29</sup> For an overview of the use of macroprudential instruments in LA5 and other countries, see Terrier et al. (2011).

inflows. There is no clear way to determine the number and type of macroprudential measures that reduces the risk best suited to preserve systemic stability. The case should be analyzed country by country, based on the existing regulatory framework and the potential sources of systemic risk.<sup>30</sup>

#### **D. Strengthening the Macroprudential Toolkit**

Measures to reduce foreign exchange risk, particularly limits on net open foreign exchange positions, are now generalized. Costa Rica and Nicaragua introduced specific capital requirements for net open foreign exchange positions; Guatemala, Honduras, and Nicaragua implemented special capital requirements for foreign exchange lending to unhedged borrowers; and El Salvador has a reserve requirement on banks' external credit lines (Appendix 2, Table A). Still, measures other than limits to net open foreign exchange position are relatively rare in the region and could help mitigate direct and indirect foreign exchange risk. Following Eyzaguirre et al. (2011), "always-desirable macroprudential policies should continue being developed and intensified, with the focus on segments prone to bubbles, to contain financial vulnerabilities and reduce credit procyclicality" (Eyzaguirre et al, 2011, p.4). Thus, should the countries of the region be subjected to foreign exchange and overheating pressures similar to some LA5 countries, the authorities may consider introducing additional measures pertaining to this category, including specific capital requirements for net open foreign exchange positions and for foreign exchange lending to unhedged borrowers, reserve requirements on banks' external credit lines and eliminate restrictions to capital outflows, such as liberalizing foreign investment by domestic pension funds. In the most extreme cases, legislation to introduce a tax on capital inflows could also be considered as a precautionary tool against large and potentially unstable capital inflows.

Measures to limit maturity mismatches serve several objectives. While mainly used in the region as microprudential measures to ensure that financial institutions have adequate liquidity, they also have an effect on credit growth. The Dominican Republic, Guatemala, and Panama do not have regulatory limits on maturity mismatches. Although microprudential control of liquidity risk could be effectively addressed through risk-based supervision oversight, limits on maturity mismatches could prove useful as macroprudential instruments in case the term transformation function of the banking system is fuelling a bubble in real estate or other long-term assets. Currently, no country in the CAPDR region has regulated the core funding. Liquidity macro and microprudential regulation could also be strengthened by

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<sup>30</sup> Recent work on this area includes Lim C. et al. (2011), which provides a comprehensive empirical study of the effectiveness of macroprudential instruments to date. It reviews country experiences with macroprudential policy, focusing on the objectives, types of instruments and how they have been chosen and applied. Using data from 49 countries (none from the region), the paper evaluates the effectiveness of macroprudential instruments in reducing systemic risk over time and across institutions and markets. The paper also identifies conditions under which macroprudential policy is most likely to be effective, as well as conditions under which it may have little impact.

establishing limits on the degree to which the bank is financing longer-term assets with noncore funding, ensuring the appropriate stability of the banking system's core funding base.

Sectoral and other specific measures are rare<sup>31</sup> and, except for Costa Rica,<sup>32</sup> they are of a precautionary nature, allowing the supervisor to introduce sector-specific mandatory provisions if necessary. Although there is plenty of room to increase the number of precautionary regulations in this area, they should be applied only sparingly due to their potential undesirable effects on the market's allocation of financial resources. While limits to credit growth are not desirable per se, the absence of regulations that allow their introduction under specific circumstances detracts from an important last-resort tool. This is particularly true in countries where passage of this type of regulation takes a long time.

Developing the new countercyclical measures will further benefit the macroeconomic policy framework. These measures introduce relatively few distortions to the financial markets, and are mainly aimed at systemic risk but also have positive spillover effects at the micro level. The new Basel III standards include a countercyclical capital buffer among the instruments available to superintendents and macroprudential regulators.<sup>33</sup>

There is very limited empirical analysis of the effectiveness of macroprudential measures. Lack of data and the heterogeneity of tool definitions make it very difficult to compare the results of macroprudential measures controlling for their calibration. It seems clear, however, that having a broader set of macroprudential tools does not necessarily make for a better macroprudential framework. Just one measure, if correctly calibrated, could be sufficient at any given time. Comparing the macroprudential frameworks of different countries becomes very difficult, as the only information readily available pertains to the existing types of macroprudential measures. Information on their regulatory calibration, which is usually available, does not permit a comparison as it would be necessary to gather granular data on the balance sheet items to which they apply. Thus, using the number and type of macroprudential measures as a proxy to analyze comparative intensities on the use of macroprudential instruments could be misleading and conclusions should be drawn carefully.

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<sup>31</sup> Only Panama and Guatemala have the ability to introduce sector-specific mandatory provisions.

<sup>32</sup> Costa Rica has a limit on banks' public sector credit concentration equivalent to 30 percent of capital.

<sup>33</sup> For an analysis of the capital buffers in CAPDR and the effect of bringing minimum regulatory capital adequacy requirements up to Basel III on short-term growth in the region, see Delgado and Meza (2011).

#### IV. CONCLUSIONS

This paper has shown that despite important progress in recent years, there is ample scope for strengthening further supervisory practices in countries of the CAPDR region. In particular, there is a need to make solid improvements in the area of risk-based supervision, and to expand the region's supervisory perimeter. At the country level, Guatemala and Panama lead the region in the implementation of consolidated supervision, while there is a need to strengthen this area in Costa Rica and the Dominican Republic. Risk-based supervision is still lagging behind in the region, with little difference among countries. Costa Rica has a wider supervisory perimeter, while El Salvador appears to have a particularly weak supervisory perimeter, in terms of financial entities and risks outside the purview of supervisory institutions. Prompt and sound implementation of the law recently approved that merges all financial superintendencies would help to resolve these issues. In the Dominican Republic, approving a legal reform to regulate the structure of financial conglomerates is critical to strengthen consolidated supervision and broaden the supervisory perimeter. Despite noteworthy progress in reducing the off-shore banking sector to two relatively small institutions, a legal reform is key in the case of Costa Rica in order to fully apply cross-border consolidated supervision and risk-based supervision. Further progress in intraregional coordination, including by strengthening the Executive Secretariat of the Central American Council of Financial Supervisors and eliminating the legal barriers for information exchange, would also positively impact cross-border consolidated supervision in the region. Country-by-country recommendations to strengthen financial regulation and supervisory capacity can be found in their detailed BCP assessments.

The relatively large gap with best international practices and the strongly interrelated regional banking sector makes it a priority to improve the supervisory practices in the areas of risk-based supervision and cross-border consolidated supervision. The focus should be on strengthening the regulatory and supervisory framework and improving the quality and reliability of financial sector indicators. The latter would also benefit from the implementation of the International Accounting Standards. Furthermore, strong competition from the private sector and the superintendencies' limited independence and resources makes it difficult to retain supervisors with experience, resulting in the need to offer frequent training programs. The superintendencies of the region will continue requiring technical assistance and training programs that could be leveraged through coordination among technical assistance providers. In this sense, the recent decision by the Central American Council of Financial Supervisors to create a permanent executive secretariat in charge of, among other things, raising technical assistance funds, prioritizing technical assistance needs, and coordinating the regional technical assistance strategy is a positive development.

The region should continue expanding its macroprudential toolbox on a precautionary basis to increase its capacity to deal with increased foreign exchange instability, destabilizing capital inflows, credit booms, and asset price bubbles. Preferably, macroprudential instruments should be market-friendly and have reinforcing microprudential effects.

Depending on the speed of credit recovery, CAPDR countries could consider strengthening traditional leverage ratios, sectoral credit and provisioning limits, and maturity mismatches. Countries currently facing large capital inflows (e.g., Costa Rica) should consider further strengthening certain macroprudential measures to mitigate risks from a sudden rise in short-term capital inflows including by limiting domestic credit growth through indirect, market-based macroprudential tools. Careful consideration should also be given to the introduction of countercyclical measures, in conjunction with the new Basel III capital requirements, to continue reinforcing banking soundness with a minimal impact on the credit cycle.

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### Appendix 1. Main Supervisory Practices - Self Assessment Index (SAI)

(Scale from 0 to 100, 100 = best international practices)

COUNTRY		Guatemala	Honduras	Costa Rica	El Salvador	Nicaragua	Panama	Dominican Republic	Regional Average
Questions	Weight								
<b>Risk-Based Supervision</b>	<b>8.75</b>	<b>54.3</b>	<b>44.6</b>	<b>48.3</b>	<b>42.0</b>	<b>38.0</b>	<b>47.4</b>	<b>57.1</b>	<b>47.4</b>
Methodology	1.00	5.7	4.6	8.0	2.3	5.7	2.3	6.9	5.1
Scope	1.00	3.4	4.6	3.4	5.7	2.3	3.4	3.4	3.8
Regulatory framework	0.50	1.7	1.7	2.9	0.0	2.9	2.3	2.3	2.0
Ex-ante risk indicators	0.75	6.0	5.1	3.4	2.6	0.9	5.1	6.0	4.2
Objectives	1.00	9.1	8.0	8.0	8.0	6.9	8.0	9.1	8.2
Risk factor focus	0.75	7.7	4.3	6.0	4.3	4.3	6.0	6.9	5.6
Quantitative/qualitative indicators	0.75	3.4	2.6	5.1	4.3	2.6	4.3	4.3	3.8
Vulnerability indicators	1.00	3.4	2.3	0.0	2.3	1.1	3.4	3.4	2.3
On site focus	1.00	8.0	5.7	3.4	5.7	5.7	6.9	9.1	6.4
CAR definition	1.00	5.7	5.7	8.0	6.9	5.7	5.7	5.7	6.2
<b>Cross-Border Consolidated Supervision</b>	<b>8.50</b>	<b>82.9</b>	<b>71.2</b>	<b>64.1</b>	<b>61.8</b>	<b>74.1</b>	<b>77.6</b>	<b>42.4</b>	<b>67.7</b>
Legal framework	0.50	5.3	2.9	4.1	5.3	3.5	4.7	0.0	3.7
Ownership	1.00	11.8	3.5	11.8	8.2	7.1	7.1	0.0	7.1
Fit and proper	0.50	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Scope	1.00	1.2	1.2	1.2	11.8	5.9	11.8	4.7	5.4
Financial conglomerates	1.00	11.8	11.8	5.9	1.2	8.2	11.8	3.5	7.7
Financial reporting	1.00	11.8	11.8	11.8	4.7	11.8	10.6	5.9	9.7
Related parties	1.00	11.8	11.8	8.2	5.9	11.8	9.4	8.2	9.6
Supervisory presumption	0.50	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Institutional coordination	1.00	9.4	7.1	3.5	7.1	7.1	4.7	3.5	6.1
Specific risks	1.00	8.2	9.4	5.9	5.9	7.1	5.9	4.7	6.7
<b>Perimeter</b>	<b>9.00</b>	<b>37.2</b>	<b>30.6</b>	<b>66.1</b>	<b>17.8</b>	<b>38.6</b>	<b>45.0</b>	<b>43.1</b>	<b>39.8</b>
Definition	1.00	3.3	3.3	5.6	1.1	1.1	7.8	2.2	3.5
Scope	1.00	10.0	6.7	7.8	2.2	7.8	10.0	6.7	7.3
Mutual type institutions	0.50	0.0	0.0	3.9	2.2	0.0	1.7	2.8	1.5
Size limits	0.75	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.5
Regulatory framework	1.00	4.4	6.7	8.9	0.0	7.8	4.4	6.7	5.6
Risk management	1.00	2.2	0.0	8.9	1.1	5.6	2.2	2.2	3.2
Corporate governance	1.00	4.4	5.6	8.9	2.2	3.3	7.8	7.8	5.7
Market risk	1.00	2.2	0.0	8.9	2.2	0.0	4.4	4.4	3.2
Operational risk	0.75	1.7	1.7	0.0	0.0	4.2	3.3	2.5	1.9
Financial resolution framework	1.00	8.9	6.7	10.0	6.7	8.9	3.3	7.8	7.5
<b>TOTAL</b>		<b>58.1</b>	<b>48.8</b>	<b>59.5</b>	<b>40.5</b>	<b>50.2</b>	<b>56.7</b>	<b>47.5</b>	<b>51.6</b>

Source: Fund staff elaboration based on supervisory authorities' responses to questionnaires.

**APPENDIX 2. MACROPRUDENTIAL SURVEY RESULTS**

Appendix 2. Table A: CAPDR—Macroprudential Measures, 2010

Type of measure	Measure	YES/NO (values)							CAPDR Percent Average	Comments
		Costa Rica	Panama	El Salvador	Honduras	Dominican Republic	Guatemala	Nicaragua		
Traditional macro & micro prudential measures	Maximum limit on loan to value ratios	NO	NO	YES 80	NO	YES 100	YES 70-80	YES	57 1/85 2/	Costa Rica: Haircuts for the value of guarantees considered for risk mitigation for debt instruments and real estate, respectively. Panama: Non binding self regulatory norm suggested by banks. Honduras: Caps are based on the policies of the institutions, according to the appraisal of collateral or guarantees. Dominican Republic: only for home mortgage loans. El Salvador: loans against fixed assets. Guatemala: loans subject to real collateral will not exceed 70 percent of the value of the collateral, nor 80 percent of the mortgage guarantee.
	Debt to income ratio caps	YES 30	YES 75	NO	NO	NO	NO	YES	43 52.5	Costa Rica: maximum of 30 percent of consumer's monthly gross income that goes toward paying debts. Applied only to individuals over cumulative debt system-wide. Panama: in percent of monthly wage.
	Reserve requirements	YES 15-32	NO	YES 1-25	YES 18-24	YES 10-17.5	YES 14.6	YES 16.25	86 16.5	Costa Rica: 15 percent of all banks' non-financial sector deposits, plus 17 percent of private banks' deposits up to 30 days (development bank system). El Salvador: Ratios vary depending on type of liability. Honduras: 18 percent on local currency deposits and 24 percent on foreign currency deposits. Dominican Republic: 10 percent for foreign currency deposits, 17.5 percent for domestic currency deposits.
Sectoral and other specific measures	Limits on credit concentration with respect to specific sectors	YES 30	NO	NO	NO	NO	NO	NO	14 30	Costa Rica: In percent of capital. Applies only to exposure to central public government.
	Mandatory provisions on exposures to specific sectors	NO	YES 1-100	NO	NO	NO	YES	NO	29 50.5	Guatemala: Sectoral provisions could be established, without limit, when special risk factors guarantee it at the criterion of the superintendent.
	Special capital requirements for exposures to specific sectors	NO	NO	NO	NO	NO	NO	NO	0	
Maturity mismatches	Limits on maturity mismatches on bank balance sheets	YES 85-100	NO	YES 70-100	YES	NO	NO	YES 100-200	57 135	Costa Rica: 100 percent for assets maturing 1 month and 85 percent for assets maturing 3 month is required in order to obtain the maximum CAMEL regulatory classification. El Salvador: Ratio of assets maturing within 30 days to liabilities maturing with 30 days of at least 100 percent; at least 70 percent for 90 day horizon. Nicaragua: Maturity mismatching up to 30 days cannot surpass one time the base capital; up to 90 days cannot surpass two times base capital
	Limits on net non-core funding dependence ratio	NO	NO	NO	NO	NO	NO	NO	0	
	Minimum core funding ratio	NO	NO	NO	NO	NO	NO	NO	0	
Limit credit growth	Bank-specific caps on credit growth	NO	NO	NO	NO	NO	NO	NO	0	Costa Rica: There are no regulatory caps, but institutions growing at more than 1.5 times nominal GDP are subject to intensified supervision.
	Credit ceilings	NO	NO	NO	NO	NO	NO	NO	0	
	Loan-to-deposit limits	NO	NO	NO	NO	NO	NO	NO	0	
Foreign exchange risk and capital inflows	Limits on open foreign exchange positions	YES SP -100	NO	YES SP -10	YES SP -5	YES SP -100	YES SP -20	NO	71 SP -52.5 LP 55 3/	Costa Rica: In addition to the limit, there is a cap of 4 percent of own resources to the daily change in net open position.
	SP (LP): short (long) net positions	LP100		LP 10	LP 50	LP 100	LP 60			
	Specific capital requirements for net open foreign exchange positions	YES 10	NO	NO	NO	NO	NO	YES 10	29 10	Costa Rica: There is a capital requirement on exchange rate risk equivalent to the absolute value of net position multiplied by a risk factor of 10 percent.
	Reserve requirements on external credit lines to banks	NO	NO	YES 5	NO	NO	NO	NO	14 5	
	Special capital requirements for foreign exchange lending to unhedged borrowers	NO	NO	NO	YES 150	NO	YES 140	YES 125	43 137.5	Honduras: 150 percent weight for loans to unhedged borrowers. Guatemala: loans to unhedged borrowers are weighted at 140 percent.
New countercyclical measures	Limits to foreign investment by domestic pension funds	YES 50	NO	YES 20	YES 15	NO	NO	NO	57 4/35 3/	Costa Rica: In percent of total investment assets. Honduras: In percent of total resources. El Salvador: In practice, less than 1 percent of investment is in foreign securities
	Tax on capital inflows	NO	NO	NO	NO	NO	NO	NO	0	
	Dynamic (cyclically based) loan loss provisioning rules	NO	NO	NO	NO	NO	NO	NO	0	
	Cyclically based capital adequacy ratios	NO	NO	NO	NO	NO	NO	NO	0	

Sources: Supervisory authorities and IMF staff.

1/ Percentage of countries applying each specific macroprudential measure

2/ Mid-point between the lower and higher bounds of the range for the region. Higher limits tend to imply less stringent regulations. On the contrary, higher requirements tend to make the regulation more conservative.

3/ Higher limits on long foreign exchange positions (and on foreign investment by pension funds) may counterbalance the effects of inflows on exchange rate and credit growth. As they work opposite to the rest of limits, mid point of the range is pooled with requirements.

4/ Limits on foreign investment by domestic pension funds prevent capital outflows and avoid counterbalancing the effects of inflows on exchange rate and credit growth. As they work opposite to the rest of limits in the table, percentage of "no" is calculated.

Appendix 2. Table B: LA5—Macroprudential Measures, 2010

Type of measure	Measure	YES/NO (values)					LA5 Percent Average	Comments
		Chile	Peru	Brazil	Colombia	Mexico		
Traditional macro & micro prudential measures	Maximum limit on loan to value ratios. (in percent of collateral value)	YES 60-100	NO	NO	YES 70-80	YES	60 1/ 80 2/	Chile: 60 percent limit applies to foreign exchange-denominated mortgages. Most mortgages in domestic currency are subject to a 75 percent limit. Under specific circumstances, the latter limit could go up to 100 percent of collateral value. In all cases, these limits apply to loans funded with letters of credit. Further, an 80 percent limit exists for mortgages funded with "mutuos endosables." Colombia: limit for regular mortgages is 70 percent, 80 percent for low income people's houses. Mexico: applies for mortgages.
	Debt to income ratio caps	YES 25	NO	NO	YES 30	NO	40 27.5	Chile: For mortgages (loans funded with letters of credit) where value of house is below UF3.000, payments cannot exceed 25 percent of borrower's income. Colombia: The first payment on a mortgage loan is limited at most to 30 percent of the family income.
	Reserve requirements	YES 0-9	YES 6-32	YES 8-43	YES 0-11	NO	80 21.5	Chile: Depends on type of deposit and currency. A rate of 9 percent applies to sight deposits in domestic currency, a rate of 3.6 percent is applied to all time deposits, and a rate of zero percent applies to liabilities over one year in domestic currency and repos with Treasury and Central Bank securities. For foreign currency, a 9 percent rate applies to sight deposits, and a 3.6 percent rate is applied to time deposits. Peru: domestic/foreign currency deposits. Brazil: depending on the type of deposit (current deposits/time deposits/rural banking/other deposits). Colombia: depending on maturity and type of liability (0/4.5/11 percent); marginal reserve requirements were eliminated in 2008.
Sectoral and other specific measures	Limits on credit concentration with respect to specific sectors	YES 100	NO	NO	NO	NO	20 100	Chile: investments in foreign banks should not exceed the bank's capital and reserves. In addition, investments in time deposits of foreign banks can not be higher than 30 percent of regulatory capital ("patrimonio efectivo"), and investments in securities issued or guaranteed by States, foreign Central Banks, or international organizations that Chile has adhered to can not be higher than 50 percent of regulatory capital.
	Mandatory provisions on exposures to specific sectors	NO	NO	NO	NO	NO	0	
	Special capital requirements for exposures to specific sectors	NO	NO	NO	NO	NO	0	
Maturity mismatches	Limits on maturity mismatches on bank balance sheets	YES 100-200	NO	YES	NO	YES	75 150	Chile: up to 30 days, 100 percent of capital; up to 90 days, 200 percent of capital. Colombia: Minimum ratio that applies only for foreign exchange positions. Colombia: A ratio (IRL) compound of liquid assets (ALM) - the net requirements of liquidity (RLN), measures liquidity gaps in the short term (7, 15, 30 & 90 days) and assures that financial entities keep a positive liquidity cushion.
	Limits on net non-core funding dependence ratio	NO	NO	NO	NO	NO	0	
	Minimum core funding ratio	NO	NO	NO	NO	NO	0	
Limit credit growth	Bank-specific caps on credit growth	NO	NO	NO	NO	No	0	
Foreign exchange risk and capital inflows	Credit ceilings	NO	NO	NO	NO	NO	0	
	Loan-to-deposit limits	NO	NO	NO	NO	NO	0	
	Limits on open foreign exchange positions	NO	YES SP -15	YES SP -15	YES SP -5	YES SP -15	80 SP -17.5	Chile: A limit of 20 percent of capital for short and long foreign exchange positions was replaced by a specific capital requirement five years ago. Currently, regulatory capital must be higher than the addition of risk-weighted assets and the sum of interest risk and foreign currency risk exposures. Peru: The position refers to the spot plus derivative positions. There is an additional limit on the net foreign exchange derivative position: the absolute value of the net position in foreign exchange derivatives cannot be greater than 40 percent of capital or 400 millions of nuevos soles, whatever is greater.
	SP (LP): short (long) net positions		LP +75	LP +30	LP +20	LP +15	LP +47.5 3/	Brazil: In percent of capital. It's calculated on a net basis subtracting total liabilities from total assets. Colombia: In addition, foreign currency position in cash cannot exceed 50 percent of the bank's risk weighted capital and cannot be negative, and gross position cannot exceed 550 percent of risk weighted capital. Mexico: In addition, liquid foreign exchange assets should cover 100 percent of net foreign exchange cash outflows for the following 60 days, and banks' medium-term foreign exchange liabilities cannot exceed 1.83 times their capital.
	Specific capital requirements for net open foreign exchange positions	YES 8-10	NO	NO	NO	NO	20 9	Chile: Open foreign exchange positions beyond 8 percent of capital (minus any potential interest risk exposures) are subject to a capital requirement equal to risk-weighted assets (8 percent) of capital, which could be increased up to 10 percent.
	Reserve requirements on external credit lines to banks	YES 3.6	YES 60	NO	YES 0	NO	60 30	Peru: Includes credit channeled through off-shore domestic financial institutions. Applies to liabilities with maturity of less than 2 years. Colombia: There is a reserve requirement but the rate has been reduced to zero.
	Special capital requirements for foreign exchange lending to unhedged borrowers	NO	NO	NO	NO	YES	25	Peru: a generic provision for foreign exchange losses of 0.25 to 1 percent is set on all foreign exchange loans that have not been evaluated, regardless of whether borrowers are unhedged.
	Limits to foreign investment by domestic pension funds	YES 80	YES 30	NO	YES 60	YES 30	20 4/ 55 3/	Chile: limits were raised to 80 percent of assets under management. Peru: A bill has been sent to Congress to increase this limit to 50 percent.
	Tax on capital inflows	NO	NO	YES 6	NO	NO	20 6	Brazil: in percent of gross flow.
	New countercyclical measures	Dynamic (cyclically based) loan loss provisioning rules	NO	YES	NO	YES	NO	40
Cyclically based capital adequacy ratios		NO	NO	YES	NO	NO	20	Peru: No, but shadow capital requirements apply. The authorities are considering introducing it. Brazil: de facto, not the jure. Colombia: at end-2008, banks reached agreement with the superintendency to retain a portion of their 2008 profits as an individual capital buffer.

Sources: Supervisory authorities and IMF staff.

1/ Percentage of countries applying each specific macroprudential measure

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4/ Limits on foreign investment by domestic pension funds prevent capital outflows and avoid counterbalancing the effects of inflows on exchange rate and credit growth. As they work opposite to the rest of limits in the table, percentage of "no" is calculated.