# Macroprudential Regulations in Andean Countries

**Arturo J. Galindo, Liliana Rojas-Suarez, and Marielle del Valle**

## Abstract

Together with a handful of countries at the global level, a number of economies in the Andean region stand out by their innovative and rapid advances in the design and implementation of macroprudential financial regulations, that is, regulations that take into account financial risks generated at the systemic level. This paper focuses on three regulatory tools utilized in the region: countercyclical capital requirements, countercyclical loan-loss provisioning requirements, and liquidity requirements. In each case, the specifics of the policy instrument is described and compared across countries. Among the Andean countries, Colombia and Peru have been the most active in terms of implementation of countercyclical macroprudential regulations.

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Arturo J. Galindo
Inter-American Development Bank

Liliana Rojas-Suarez
Center for Global Development

Marielle del Valle
Inter-American Development Bank

**Center for Global Development**
**1800 Massachusetts Ave., NW**
**Washington, DC 20036**

202.416.4000
(f) 202.416.4050

**www.cgdev.org**

# Contents

# I.  Introduction

This policy brief deals with advances in the Andean countries regarding the implementation of macro-prudential financial regulations; that is, regulations that take into account risks at the systemic level.

The importance of having in place a financial regulatory framework that includes macro-prudential regulations was fully recognized during the recent global financial crisis. A central lesson from that episode was that relying on regulations that *solely* assessed the risks that financial institutions were taking on their individual balance sheets (a micro-prudential approach) was inadequate to preserve financial system stability. The crisis revealed that regulations need to deal with both idiosyncratic (micro) and systemic (macro) risks.

While there are many definitions of what constitute macro-prudential regulations, the main goal of the approach is to minimize the macro costs of a crisis; that is, to limit the eruption of credit crunches derived from a systemic financial crisis. By avoiding credit crunches, macro-prudential regulations aim at minimizing contractions in economic growth. Under this view, aggregate risk depends on the collective actions of financial institutions. A popular conceptualization of the approach, defines systemic risk as having two components: a cross-sectional dimension and a time dimension.[1]

The cross-sectional dimension recognizes that interconnectedness of the activities of financial institutions and markets generates risk that surpasses the risk characteristics of individual firms. For example, if financial difficulties force an important bank in the system (or a group of banks) to quickly sell assets at fire-sale prices to obtain needed liquidity, the resulting decline in asset prices will hurt the balance sheets of other financial institutions holding those same assets. If the linkages are strong enough, the contraction in assets' values will result in a significant decline in capital and a credit squeeze will follow[2]. What is the macro-prudential approach recommendation to deal with this issue? The answer is for financial institutions to hold large amounts of assets that are not prone to fire-sales; that is, that do not lose liquidity in bad states of the world. Under Basel III, the Basel Committee on Banking Supervision has translated this recommendation into well-defined ratios for *liquidity requirements*, providing a list of assets that qualify as h*igh-quality liquid assets*.

The time-dimension of the macro-prudential approach acknowledges that aggregate risk varies over time: in good times, when the economy is growing, borrowers' balance sheets

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[1] See Borio (2009).

[2] Further discussion of this issue can be found in Hanson et al (2010).

[3] The threshold established by Mendoza and Terrones is 1.75 times the standard deviation of the cyclical component. Further discussion of this issue can be found in Hanson et al (2010).

[4]  The emphasis of the analysis in Izquierdo, Loo-Kung and Rojas-Suarez (2012) is on Central American

look healthy, non-performing loans tend to be low and capital increases. Under these conditions, banks have the incentive to expand credit at a pace that might turn to prove unsustainable when the good times end; that is, unsustainable credit booms might materialize. Likewise, in bad times, non-performing loans increase, capital decreases and banks face financial difficulties, leading to a credit crunch. Sharp reductions in credit growth are associated with economic recessions.

What is the macro-prudential approach recommendation to deal with the problem of time-varying risk? The response is counter-cyclical regulations. Operationally, this recommendation translates into counter-cyclical capital requirements and counter-cyclical provisioning requirements. That is, the recommendation is to accumulate additional (beyond minimum requirements) capital and loan-loss provisions during good times—to contain the build-up of excessive credit risk-- to be used during times of financial difficulties—therefore, limiting credit crunches. Along these lines, banks' capital requirements under Basel III recommendations include a *counter-cyclical buffer*. Although not included in Basel III, the Financial Stability Forum (2009) supports the implementation of counter-cyclical loan-loss provisioning requirements.

Interestingly enough, a number of Andean countries are among those emerging markets that have made most progress in reforming their regulatory frameworks to introduce macro-prudential regulations. This document tracks those advances by focusing precisely on the three regulatory tools mentioned above: liquidity requirements, counter-cyclical capital requirements and counter-cyclical loan-loss provisioning requirements. For this purpose the rest of the paper is organized as follows: Section II describes the characteristics of credit cycles in the Andean countries and compares them to cycles in other emerging markets. The analysis in this section provides strong support to the relevance of implementing macro-prudential regulations in Andean countries. Section III constitutes the core of the paper. This section discusses in detail the specifics of the macro-prudential regulations already in place. When available, the section presents data to show whether observed capital and liquidity ratios meet current recommendations of the Basel Committee of Banking Supervision. Comparisons between Andean countries regarding the design of macro-prudential regulations are also included in this section. Finally, Section IV concludes the paper.

## II. Credit cycles in the Andean Countries

As discussed in the introduction, macro-prudential regulations can support financial stability and economic growth by playing a significant role in avoiding the formation of unsustainable credit booms and limiting credit crunches. Therefore, a starting point to analyze the use of macro-prudential tools in the Andean countries is to understand the characteristics of credit cycles in the region. As shown in Claessens et al (2011), recent literature has made important advances in developing methodologies to characterize credit cycles, and has shown that in emerging economies, credit cycles tend to be of longer duration, of higher intensities, and lead to credit collapses and stronger output contractions than in the advanced ones.

**Figure 1: Credit Cycles in the Andean Region**
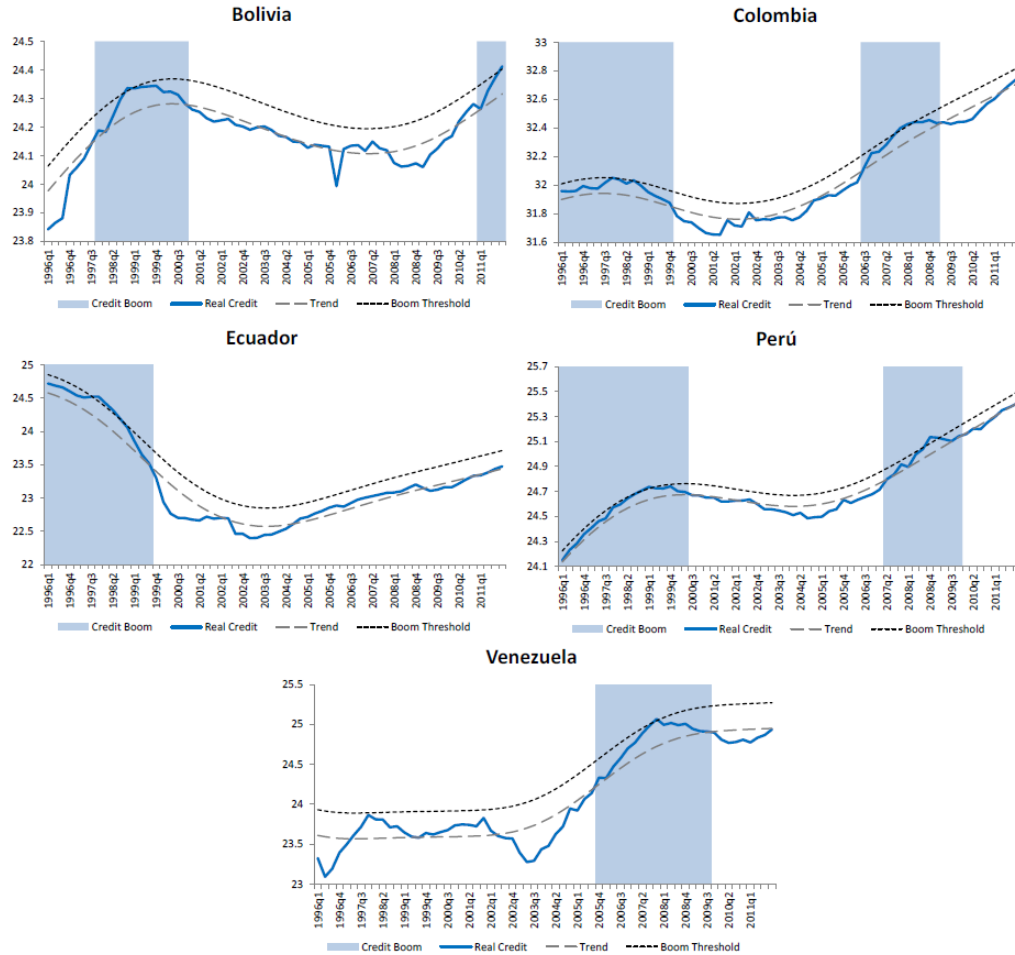


Source: Own calculations based on IMF/IFS(2012)

In order to characterize credit cycles in the Andean economies we follow the methodology developed by Mendoza and Terrones (2008) to identify credit booms in Bolivia, Colombia, Ecuador, Peru and Venezuela. This methodology uses the Hodrick Prescott filter to identify the trend and the cyclical components of real credit, and identifies a boom in credit as an episode in which real credit is growing above its trend by more than a certain threshold[3]. The advantage of this methodology is that unlike procedures that disregard idiosyncratic determinants of volatility, it establishes thresholds that are proportional to a country's own volatility, which means that a credit boom is only identified when real credit grows beyond a limit that is consistent with the country's own history.

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[3] The threshold established by Mendoza and Terrones is 1.75 times the standard deviation of the cyclical component.

**Figure 2: Credit Booms**



**Average (log) Deviations from HP-Trend**

**Duration of Credit Booms**
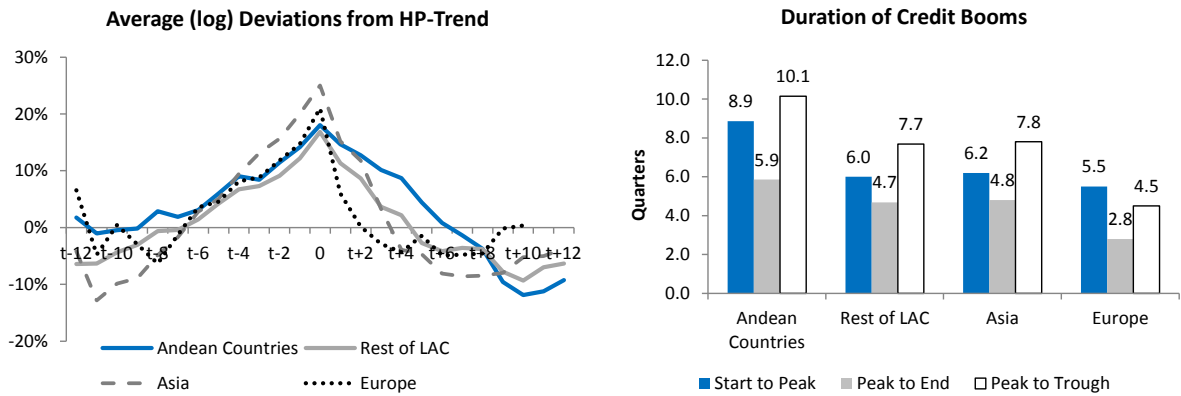
Source: Own calculations for the Andean countries and for the rest of LAC based on IMF data. Data for Asia and Europe is taken from Izquierdo, Loo-Kung, and Rojas Suarez (2012).. Andean countries: Bolivia, Colombia, Ecuador, Peru and Venezuela. Rest of LAC: Argentina, Bahamas, Barbados, Brazil, Chile, Costa Rica, El Salvador, Guyana, Honduras, Jamaica, México, Nicaragua, Panamá, Paraguay, Dominican Republic, Suriname, Trinidad and Tobago, and Uruguay. Asia: Thailand, Malaysia, Indonesia, Korea, and Philippines. Europe: Poland, Czech Republic, Hungary, Russia, and Turkey.

Figure 1 reports the dynamics of real credit in the five Andean countries studied, where the trend and threshold are computed using the Mendoza and Terrones methodology. The shaded areas identify the boom periods. Credit booms are defined as the period between the quarter in which the real growth rate of credit surpasses the trend and the quarter when it returns to trend, passing through a sub-period in which real credit growth is higher than the threshold. The figure is constructed using quarterly data ranging from the first quarter of 1996 up to the last quarter of 2011. Real credit is defined as the stock of bank credit to the private non-financial sector from the IMF's International Financial Statistics (line 22d) deflated by the consumer price index (line 64).

According to this methodology, there were 8 credit booms in our sample. Two were identified in Bolivia, Colombia and Peru, and one in Ecuador and Venezuela. The timing of the credit booms is relatively similar. At the end of the 1990s, a boom was identified in all countries except Venezuela. The second boom identified in Colombia and Peru, and the one in Venezuela took place in the last part of the first decade of the 21st century. The peak of these booms occurred in the pre-Lehman's period.

Figure 2 provides a summary of the credit booms identified in our sample and compares the findings to those of Izquierdo, Loo-Kung and Rojas-Suarez (2012) that use the same methodology to explore credit cycles in other regions of the World.[4] In the figure we plot

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[4] The emphasis of the analysis in Izquierdo, Loo-Kung and Rojas-Suarez (2012) is on Central American countries.

the cross-country mean of the cyclical component of real credit in a six-year event window centered at the peak of credit booms in each of the regions considered. Our results suggest that the *duration* of the boom (understood as the time elapsed since real credit leaves the trend and returns to it after passing through a peak) in Andean countries is longer than in other regions of the world. In Andean countries the duration of a credit boom is 14.8 quarters, while in the rest of LAC it is 10.7 quarters, in Asia 11 quarters, and in Emerging Europe 8.3. This means that in the Andean countries credit booms are about a year longer than in the rest of LAC. Also, both the *upturn* phase (from the start to the peak) and the *downturn* phase (from the peak to the end) are longer in the Andean countries relative to other regions in the world.

An additional result is that, in spite of longer duration, at the peak of the boom the average deviation of real credit above trend in Andean countries is smaller than in Asia and Europe. At the peak, real credit is about 15 percent higher than the trend in Andean countries, while the corresponding values for Europe and Asia are 20 percent and 23 percent respectively. The value for the rest of Latin America and the Caribbean is slightly lower than for Andean countries.

A very interesting result for the purpose of this paper is that the size of credit adjustments that follows a credit boom is larger in Andean countries (reaching nearly 13 percent below the trend) than in other regions of the World.

The finding that the duration of credit booms is relatively longer than in other regions and that the size of credit adjustment following a boom is also more profound than in other parts of the developing world are indicative of the particular importance for Andean countries of having mechanisms in place to mitigate the formation of booms. The fundamental reason is that there is a strong correlation between real credit and real GDP cycles. Figure 3, plots the cyclical component of real credit growth and the cyclical component of real GDP growth computed using the same methodology.

While no causal inference can be drawn from these patterns, Figure 3 shows a strong correlation between these variables. Real credit and real GDP cycles move very similarly. Real credit cycles may affect GDP cycles by leading to expansions (contractions) in consumption, investment, and trade when abundant credit is available (scarce). In turn, GDP cycles can also lead credit cycles through demand or risk valuation impacts.

Figure 4, plots the correlation coefficient between the cyclical components of credit and of GDP for a sample of Latin American countries including the Andean ones (in a darker shade). In most countries the correlation between these two variables is high (over 30%) and, as denoted by an asterisk, statistically significant at the 5% significance level. Among the 6 countries in Latin America with the higher correlation coefficients, 4 of them are Andean.

**Figure 3: Real Credit and Real GDP Cycles in the Andean Region**



Bolivia



Colombia



Perú



Ecuador



Venezuela
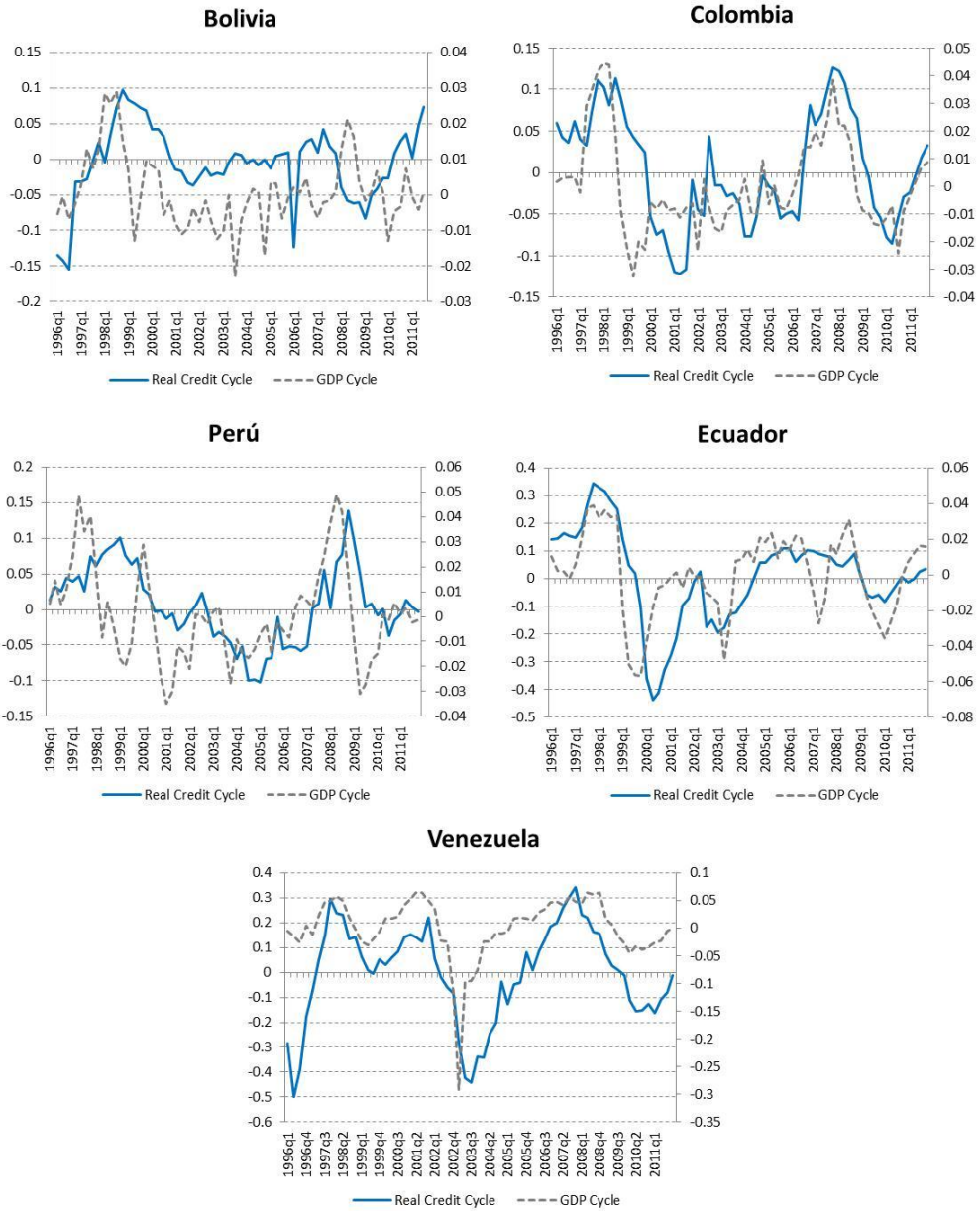
Source: Own calculations based on IMF/IFS(2012)

**Figure 4: Correlation Coefficients of Real Credit and GDP Cycles**
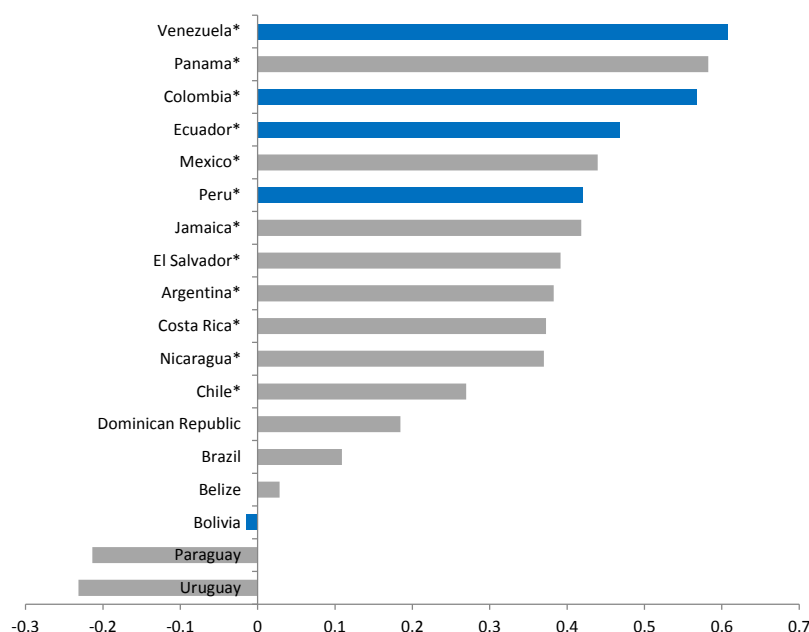


Source: Own calculations based on IMF/IFS(2012)

The fact that credit cycles around booms are particularly long in Andean countries and that the correlation between credit cycles and GDP cycles is quite strong in this region leads naturally to the question of what policy instruments have been designed to prevent the formation of credit booms. In the following section we present a summary of the main policy tools available in these countries. Most of these have been put in place recently and hence it cannot be inferred that, given the information above, they have been ineffective. Their effectiveness should be assessed in the years to come.

## III. Macro-prudential Rules in Andean Countries

Albeit important differences between countries, the Andean region has made significant progress in the implementation of macro-prudential regulations. This section focuses on the application of the three most important macro-prudential regulations recommended by international standard-setting bodies[5]: counter-cyclical capital buffers, counter-cyclical loan-loss provisioning (also known as dynamic provisioning) and liquidity requirements. These prudential measures, as described in Table 1, have been adopted in Bolivia, Colombia, Ecuador and Peru. Table 1 also shows advances in implementing other macro-prudential regulations not fully discussed in this section.

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[5] Specifically, the Basel Committee on Banking Supervision and the Financial Stability Board.

This section constitutes the core of the paper. The section presents advances in the Andean countries in implementing each of the three macro-prudential regulations mentioned above. The section also presents differences between Andean countries in the design of the regulations. Similarities and differences with recommendations from Basel III are also highlighted[6]. Moreover, when data availability allows, the section also assesses whether banks meet the macro-prudential regulations in place. This section concludes with a brief discussion on two other macro-prudential policies that some Andean countries have incorporated to their macro-prudential toolkit: loan-to-value ratios and reserve requirements.

**Table 1. Macro-prudential regulations implemented in the Andean countries**

|  | Bolivia | Colombia | Ecuador | Peru | Venezuela |
|---|---|---|---|---|---|
| Counter-cyclical capital buffer |  |  |  | ✓ |  |
| Dynamic provisioning | ✓ | ✓ | ✓ | ✓ |  |
| Liquidity requirements |  | ✓ | ✓ | ✓ |  |
| Reserves requirements | ✓ | ✓ | ✓ | ✓ | ✓ |
| Loan-to-value ratios | ✓ | ✓ | ✓ |  | ✓ |
| Limits to currency mismatches |  | ✓ |  |  |  |

## A. Countercyclical Capital Buffer Requirements

The Basel Committee on its third Accord[7] has developed a countercyclical capital buffer proposal as a measure to protect the banking sector from periods of excessive credit growth. The recommendation is to build up additional capital buffers to cover future potential losses. This buffer is essentially a disclosed requirement that sits on top (*add-on*) of the capital conservation buffer and the minimum capital requirement. A positive buffer would be required in normal states of the world, rising during periods of aggregate credit growth and falling in downturns, while a zero buffer will be allowed in all states of the cycle other than in periods of excess aggregate credit growth.

The proposal defines the credit-to-GDP ratio as the reference indicator to activate the buffer buildup. It does not take any aggregate macroeconomic variable (like GDP growth) as an indicator of the cycle. The argument for this preference relies on the fact that fluctuations in output have higher frequency than those of financial cycles associated with serious financial distress, and therefore taking a GDP growth reference could result in unnecessary buffer buildups.

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[6] The Basel III accord provides proposals for the capital cyclical buffer and the liquidity requirements.

[7] The Basel III proposal is taken from "Basel III: Countercyclical Capital Buffer Proposal" (BIS, June 2010), and "Basel III: Guidance for National Authorities Operating the Countercyclical Capital Buffer" (BIS, December 2010).

The activation and deactivation rule proposed for the countercyclical buffer depends on the value of the gap between the actual credit-to-GDP ratio and its trend, as follows:

$$GAP_t = \frac{Credit_t}{GDP_t} - \left(\frac{Credit}{GDP}\right)_{trend}$$

Where the trend is the sustainable average ratio of credit-to-GDP based on historical experience and calculated through the Hodrick-Prescott filter. The buffer takes a value of zero when $GAP_t$ is below a certain threshold ($L$), and increases up to a maximum level when $GAP_t$ exceeds an upper threshold $H$. Basel III proposes a discretional countercyclical buffer between 0 and 2.5% of the risk weighted assets ($RWA$) which should be composed by common equity Tier 1 capital, and gap threshold values of $L=2\%$ and $H=10\%$, based on historical banking crises[8].

As the thresholds depend on the trend estimations, and therefore can differ among methodologies, Basel III proposes general criteria for setting them up: when the credit-to-GDP guide starts to indicate a need to build up capital, $L$ should be low enough so that banks are able to build it up in a gradual fashion before a potential crisis, and high enough so that no additional capital is required during normal times. Conversely, when the credit-to-GDP guide shows no need for additional capital, $H$ should be low enough so the buffer would be at its maximum before a major banking crisis. Finally, Basel III recommendations do not suggest restrictions on distributions of the capital surplus created when the buffer rule is turned off.

Among the Andean countries, only Peru has established the guidelines for a countercyclical capital requirement. Although based on Basel III recommendations, the rule follows a GDP growth reference guide, which adjusts better to the financial system characteristics. This regime is described below.

## 1. Peru

The cyclical capital buffer (*requerimiento de patrimonio efectivo por ciclo económico*) was approved by the Supervisory Authority (*Superintendencia de Banca, Seguros y AFPs, SBS*) in July 2011. Under this regime banks are required to build up additional regulatory capital above the minimum requirement to offset losses from loan portfolios during the contractive phase of the economic cycle. Its objective is aligned to the Basel III proposal to implement a buffer add-on during periods of excess aggregate credit growth.

The methodology applied by each bank to estimate the buffer depends on its availability of models to assess the different parameters needed to calculate the minimum regulatory capital

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[8] However, this depends on the choice of the smoothing parameter used in the Hodrick-Prescott filter, the length of the credit and GDP data and the exact setting of $L$ and $H$.

due to credit risk: default probability (*DP*), loss given default (*LGD*) and exposure at default (*ETD*). There are three possible methodologies: the standard methodology is applied when the bank does not have models to estimate none of these parameters, in which case the *SBS* applies standards to calculate the minimum regulatory capital required due to credit risk. The basic *IRB* (*Internal Rating Based*) methodology is applied when the bank has models to estimate the *DP*, so the *SBS* applies standards to assess the *LGD* and the *EAD*. The advanced IRB methodology is applied when the bank has models to assess all three parameters.

When the standard methodology is applied, the *SBS* provides marginal "stress" weights (*ponderadores marginales de estrés*) that account for the increase in the risk weighted assets (*RWA*) during a stress scenario. Then the cyclical capital buffer is estimated as the minimum regulatory capital ratio[9] (*MRC*) times the increase in the *RWA* after applying the stress weights.

Under the basic *IRB* model, banks assess the stress *RWA* using their own estimates for the *DP* related to the contractive phase of the economic cycle, and the standards for the stress *LGD* and *ETD* provided by the *SBS*. When the advanced *IRB* model is applied, the three parameters for the stress scenario are estimated individually by each bank. For both models, the cyclical capital buffer is defined as the minimum regulatory capital (*MRC*) times the difference between the *RWA* estimated under the stress scenario, $RWA_S$, and the one estimated through the standard rule for the regulatory capital requirement due to credit risk, $RWA_R$:

$$Cyclical\ capital\ buffer = MRC * (RWA_S - RWA_R)$$

For example, if a bank has risk weighted assets $RWA_R = 100$ million of Nuevos Soles, then no matter which method is used the risk weighted assets under stress scenario, $RWA_S$, should be higher given that it accounts for extra risk. Assuming that $RWA_S = 150$ million of Nuevos Soles for this bank and given that the actual minimum regulatory capital as percentage of the risk weighted assets, *MRC*, is 10%, then the cyclical capital buffer that this bank would be required to build is equal to:

$$Cyclical\ capital\ buffer = 10\% * (150 - 100) = 5 \text{ million of Nuevos Soles}$$

Under this methodology, the cyclical capital buffer of each bank does not need to fall within the range proposed by Basel III (0-2.5% of the risk weighted assets).

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[9] Defined as the ratio of minimum regulatory capital to risk weighted assets, where the last ones are estimated through the standard rule for the regulatory capital requirement due to credit risk.

### a) Activation and Deactivation Rule

The activation and deactivation rules are the same as those of the cyclical provisioning rule described in the following section: banks should accumulate additional capital during the expansionary phase of the economic cycle and are allowed to use a share of it during contractions. In this sense, it differs from the Basel III proposal which involves a credit to GDP guide for activation, which would make the buffer buildup more subject to specific-bank's loan portfolio status than to the economic cycle. The argument of the Peruvian authorities to take a different guide relies on the low banking penetration of Peru compared to the developed world. Under these circumstances, a significant increase in the rate of credit growth does not necessarily mean an excess of credit that justifies implementing a cyclical buffer, which in the end would raise the cost of credit, discouraging a healthy expansion. Another difference between Basel III and the Peruvian rule is that the former focuses on individual banks' global exposure of their portfolio (in and outside the country) while the Peruvian rule is based only on developments in local systemic risk (the country's economic cycle).

### b) Buildup of the cyclical capital buffer

When the rule activates, banks need to build the cyclical capital buffer up to reach 100% of its value. However, they can request to accumulate only up to 75% of the estimated buffer, under the commitment of capitalizing at least 50% of the net income generated in that year. The buffer estimations should be updated every month while the rule is active. The rule is currently active: A cyclical capital buffer has been legally required since July 2012, and it is expected to be fully met (or 75% under special request) by July 2016 under the following schedule:

|  | Up to 100% of requirement | Up to 75% of requirement |
|---|---|---|
| July 2012 | 40% | 30% |
| July 2013 | 55% | 41% |
| July 2014 | 70% | 53% |
| July 2015 | 85% | 64% |
| July 2016 | 100% | 75% |

### c) Usage of the cyclical capital buffer

When the rule is deactivated, banks should extinguish their cyclical provisions before reducing the cyclical capital buffer stock. After consuming the cyclical provisions, 60% of the cyclical capital buffer can be used, provided that the bank has previously accumulated 100% of the buffer while the rule was active. This means that for these banks, 40% of the buffer stock is always held, unless they made a special request for further use to the *SBS*. If the bank requested to accumulate only 75% of the buffer, then it can only be used until the stock reaches 40% of the total estimated buffer during the last month the rule was active.

Table 2 summarizes the comparison between Basel III proposal and the Peruvian regime for cyclical capital buffer:

**Table 2. Cyclical capital buffer: Basel III and Peruvian regime comparison**

| I. Similarities | Objective | Protect banking sector from periods of excess credit growth by building up additional capital buffers to cover future potential losses. | |
|---|---|---|---|
| | Treatment | Disclosed requirement that sits on top (add-on) of the capital conservation buffer and the minimum capital requirement. | |
| **II. Differences** | | **Basel III** | **Peru** |
| | Activation rule reference indicator | Credit to GDP ratio | GDP growth |
| | Buffer range (as % or RWA) | 0%-2.5% | Could go higher than Basel III range as its estimation depends on stress scenario parameters calculated individually by banks |
| | Risk type focus | Individual banks ' global exposure | Systemic risk |
| | Treatment of capital surplus when buffer returns to zero | Unfettered: no restrictions in distribution | Only up to 60% of the buffer after extinguishing dynamic provisions |

In the Peruvian financial system, all institutions have widely exceeded the minimum Tier 1 capital currently required by Basel III (6%, which comprises 4.5% in common equity): no institution has ratios lower than 7.9%. However, the new regulatory regime which not only requires a countercyclical buffer but also a conservation buffer, both composed by common equity Tier 1 capital, might put pressures over some of these institutions to accumulate extra Tier 1 capital. The Basel III Accord proposes a mandatory capital conservation buffer of 2.5% and a discretionary countercyclical buffer, which allows national regulators to require from 0% to 2.5% of the $RWA$ during time of high credit growth. Assuming these requirement levels for the Peruvian financial system, institutions would require to build up a minimum regulatory Tier 1 capital of 8.5% (2.5% extra for the conservational buffer and 0% for the cyclical buffer) of the $RWA$ during economic downwards, that could go up to 11% (2.5% extra for countercyclical buffer) in the expansionary part of the cycle[10] (Table 3).

At the system level, all Peruvian financial institutions, regardless of size, have already exceeded the actual minimum requirement (6%) up to a point that Tier 1 is already over 8.5% of the $RWA$. This means that they also have no problem in complying with the conservation buffer (Table 3). However, under the assumption that the countercyclical buffer is set up as 2.5% as recommended by Basel III, a number of institutions would need

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[10] Taking into account the 2% Tier 2 capital requirement, the Basel III accord would require a total regulatory capital of 8.5% of $RWA$ during downturns and a maximum of 11% during credit expansion.

to build up more Tier 1 capital in order to satisfy the overall 11% maximum Basel III recommendation.

**Table 3. Peru: Average capital to risk weighted assets requirements by institution size**

|  | Basic | Basic + conservation buffer | Basic + conservation buffer + max. countercyclical buffer |
|---|---|---|---|
| Tier 1 Basel Requirement | 6.0% | 8.5% | 11.0% |
|  | Actual | Extra Tier 1 required | Extra Tier 1 required |
| Banks | 10.8% | 0.0% | **0.2%** |
|   - Big size | 10.6% | 0.0% | **0.4%** |
|   - Medium size | 10.4% | 0.0% | **0.6%** |
|   - Small size | 14.0% | 0.0% | 0.0% |
| Financial enterprises | 12.7% | 0.0% | 0.0% |
|   - Big size | 10.4% | 0.0% | **0.6%** |
|   - Small size | 16.9% | 0.0% | 0.0% |
| Municipal saving & lending institutions | 14.5% | 0.0% | 0.0% |
|   - Big size | 14.3% | 0.0% | 0.0% |
|   - Small size | 14.6% | 0.0% | 0.0% |
| Rural saving & lending institutions | 9.3% | 0.0% | **1.7%** |

Size is defined by the value of assets. For banks: big banks are those with assets greater than 4% of GDP, medium size between 1% and 4% of GDP, and small size lower than 1% of GDP. Big size financial enterprises and municipal saving and lending institutions are those with assets higher than 0.4% of GDP. Rural saving and lending institutions are all small.
Source: SBS, own calculations.

At the individual institutions level, only one bank and one rural saving and lending institution will have to accumulate extra Tier 1 capital to satisfy the conservation buffer, as shown in Figure 5. Under the assumption that the countercyclical buffer is established at 2.5%, as recommended by Basel III, most institutions would already meet those recommendations. However, some other institutions would need to build up more Tier 1 capital during the expansionary phase of the cycle in order to satisfy the overall 11% maximum Basel III recommendation. This group comprises 7 banks, 3 financial enterprises, 1 municipal and all rural saving and lending institutions.

13

**Figure 5. Institutions currently fulfilling the capital buffer requirements under the assumption of a 2.5% countercyclical buffer (Basel III recommendation)**
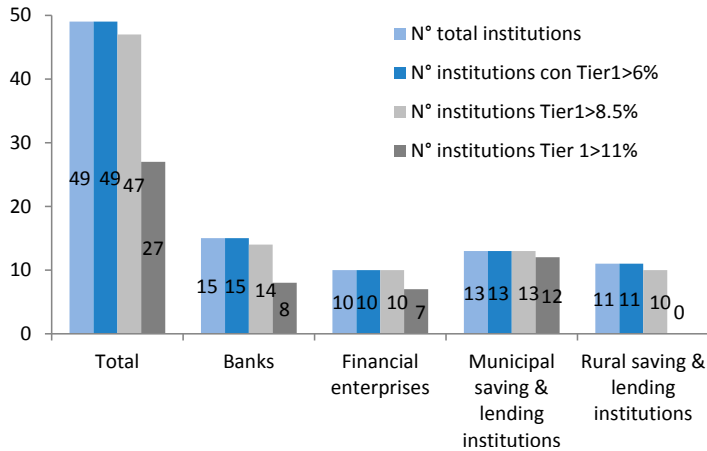


Source: *SBS,* own calculations.

Figure 6 shows more details of the exercise that compares current accumulation of Tier 1 capital with the recommendations of Basel III for building both conservation and countercyclical buffers. While the Figure shows that most financial enterprises have already surpassed the recommended accumulation of capital, some other institutions would need to build up extra Tier 1 capital in excess of 1.5% of *RWA*. These numbers, however, are given for reference only since, as discussed above, the Peruvian regulation for countercyclical capital has important differences from the recommendations in Basel III.

**Figure 6. Gap between current Tier 1 capital and Basel III recommendations by institution***
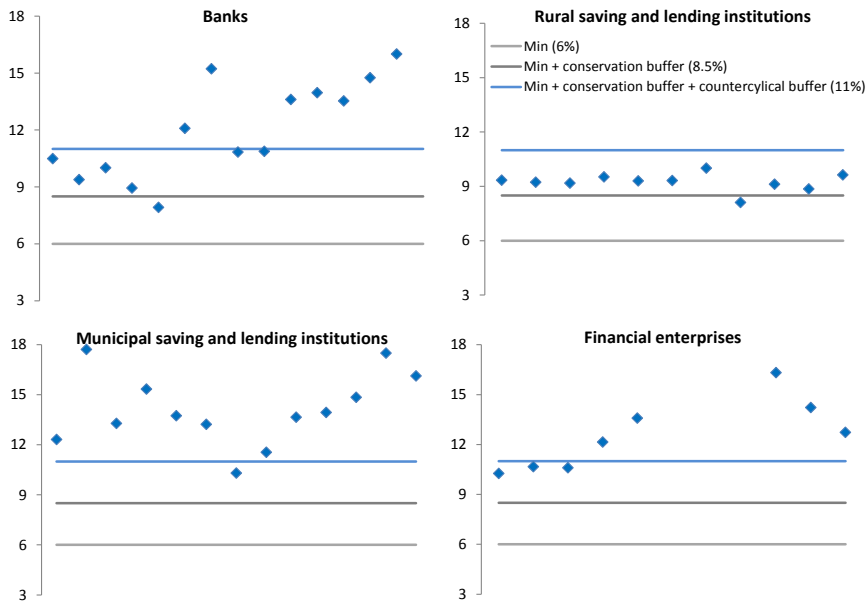


Source: *SBS,* own calculations*Ratios over 18% not reported

## B. Countercyclical (Dynamic) Loan-Loss Provisioning Requirements

The dynamic provisions regime allows banks to build up loan loss provisions when their profits are growing, to provide a cushion during economic downturn. The underlying principle is that provisions should be set in line with long-run, or through-the-cycle expected losses, which are estimated based on past experience and not in terms of the current credit risk.

Under a regular provisioning system, provisions are a function of non-performing loans. Figure 7 shows this feature. During the expansionary phase of the cycle, credit growth accelerates and debtors can easily serve their debt, which translates in low non-performing loans and therefore of regular provisions. Low provisioning efforts reduces even more banks' risk aversion which fuels credit growth. Conversely, during downturns increased risk aversion translates in credit contractions, higher non-performing loans and consequently greater provisioning efforts which feed credit contraction.

Dynamic provisioning breaks this cyclicality by creating a countercyclical provisions buffer which requires accumulating provisions during credit expansions that can be used later during downturns. Hence, dynamic provisions make provisioning efforts more stable and less dependent on the cycle.

**Figure 7: The role of dynamic provisioning**
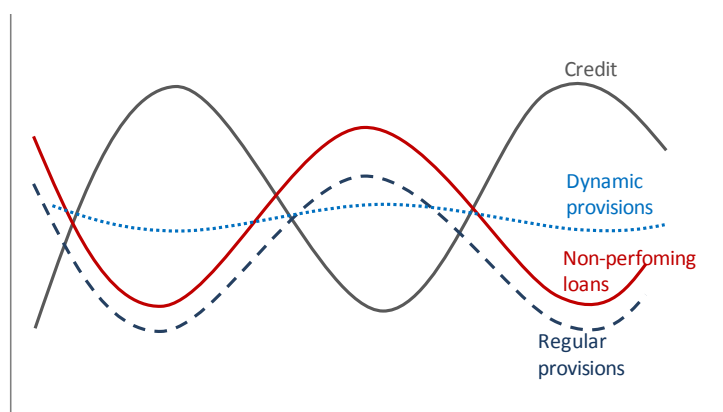


Dynamic provisioning rules differ not only in how cycles are identified (based on systemic or bank-specific factors), but also in the speed at which cyclical provisions are accumulated and used. In the Andean region, Bolivia, Colombia and Peru[11] established dynamic provisions in 2008, while Ecuador has recently introduced them.

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[11] Brief discussion of the cyclical provisioning rules for Bolivia, Colombia and Peru can be found in Wezel (2010) and Chan-Lau (2011).

### 1. Bolivia

In December 2008, the Supervisory Authority (*Autoridad de Supervisión del Sistema Financiero, ASFI*) established a dynamic provisioning regime (*Previsiones Cíclicas*) that requires banks to maintain additional provisions which range from 1.05% to 5.80% of total loans depending of the type of debtor and currency denomination. Dynamic provisions are accumulated during good- quality loan performance periods of time, and can be accessed when loan quality significantly deteriorates. Loan quality performance is measured through the Required Ratio of Provisions (*Ratio de Previsión Requerida*) of the total loan portfolio ($RRP_T$) and of the loan portfolio for the productive sector[12] ($RRP_P$), defined as the average of specific provisions for loans in each risk category weighted by their corresponding shares in the loan portfolio:

$$RRP_T = \sum_{k=A}^{F} \alpha_k \, C_k \qquad\qquad RRP_P = \sum_{k=A}^{F} \beta_k \, CP_k$$

Where   k: loan risk category ranging from $A$ (performing loans) to $F$ (defaulted loans)

$C_k$: share of loan $k$ in total loans

$CP_k$: share of loan $k$ in the loan portfolio to the productive sector

$\alpha_k$ y $\beta_k$: actual rates of specific provisions applied to loans of category $k$

Given that accumulation and use of the dynamic provisions buffer depend on the evolution of ratios calculated at the individual bank level, some banks can be building up their buffer at the same time that others are using them. In this sense, systemic risk is not taken into account.

#### a) Activation rule

*B*anks can request to access dynamic provisions provided the buffer has been fully fulfilled and any of the two specific provisions ratios increase for 6 consecutive months. Otherwise, banks should maintain the dynamic provisions buffer.

#### b) Buildup of buffer

Banks need to accumulate dynamic provisions for all performing loans (risk category A) and corporate loans up to C risk category when the 6-month moving average of both ratios start to decrease. The dynamic requirement is established as a percentage of each loan, depending on its type, currency denomination, and risk category for credits to the business sector: the

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[12] Bolivian regulation defines the productive sector as those activities in agriculture and livestock, hunting, forestry and fishing, crude oil, natural gas and mineral extraction, manufacturing, production and distribution of electricity and construction.

riskier the credit the higher the proportional requirement of dynamic provisioning. Hence, the dynamic provisions buffer is set according to the table 4 percentages:

**Table 4. Cyclical provision requirements (% of total loans)**

| Loan Classification | Local currency denominated loans | | | | Foreign currency denominated loans | | | |
|---|---|---|---|---|---|---|---|---|
| | Corporate | Consumption | Mortgage | Microcredit | Corporate | Consumption | Mortgage | Microcredit |
| A | 1.90 | 1.45 | 1.05 | 1.10 | 3.50 | 2.60 | 1.80 | 1.90 |
| B | 3.05 | - | - | - | 5.80 | - | - | - |
| C | 3.05 | - | - | - | 5.80 | - | - | - |

For example, if a bank has provided corporate credits with loan classification B in domestic currency for 100 million of Bolivianos and consumption loans in foreign currency for 200 million of dollars, then the cyclical provision buffer that this bank is required to accumulate is equal to:

$$Cyclical\ provision\ buffer = (100 \times 3.05\%) + (200 \times 2.60\% * ER)$$

Where $ER$ is the exchange rate of dollars to Bolivianos.

### c) Usage of buffer

When loan quality deteriorates, specific provisions requirements increase. If deterioration takes place for 6 consecutive months, the stock of dynamic provisions can be used to cover up to 50% of the additional specific provisions during the first 12 months and up to 100%, thereafter. Usage stops when the 6 month moving average of both $RRP_T$ and $RRP_P$ start to increase. Since then, banks need to replenish 100% of the buffer within a time period equal to the percentage of the buffer used times 51 months.

Figure 8 shows that since 2007 regular provisions, specific and generic, have decreased together with non-performing loans, displaying their cyclical condition. Conversely, one year after its implementation dynamic provisions reached around 1% of total loans and since then they have been sustained at this level, acting as a buffer to smooth cyclicality.

**Figure 8. Bolivia: Dynamic and regular provisions (% of loans)**
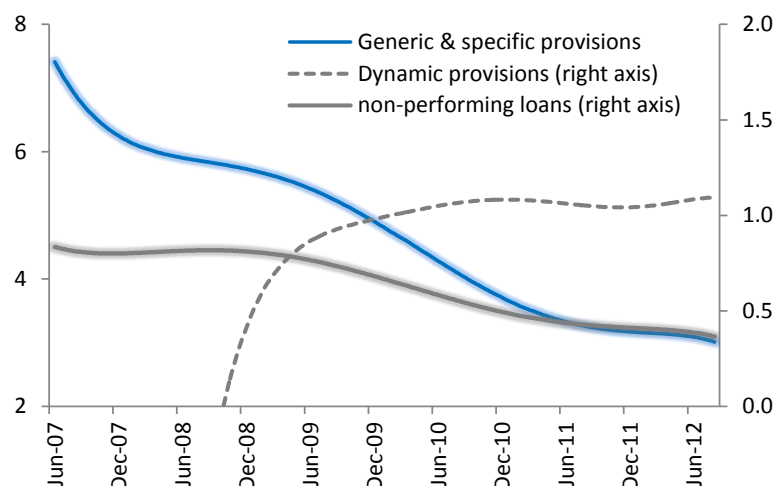
Source: ASFI, own calculations

## 2. Colombia

The dynamic provisioning framework (*Componente Individual Contracíclico de Provisiones*) was established for commercial loans in 2007 and for consumption loans in 2008, which, together, represent about 90% of total banking credit. Under this regime, the Supervisory Authority (*Superintendencia Financiera de Colombia, SFC*) requires banks to accumulate additional specific provisions for these two types of credit in order to be accessed during episodes of loan quality deterioration. The dynamic provisions are individually assessed by loan and bank, so that each bank builds them up when its own loan portfolio shows good quality and uses them when quality declines, independently from the country's economic context or other banks' performance. Besides, Colombian regulation also requires generic provisions for at least 1% of the total loan portfolio, which can be used to meet the dynamic provisions requirement.

The loan quality performance is measured by four indicators built at the bank level: (a) the real quarterly change on the B, C, D and E[13] loan portfolio specific provisions, as a measure of portfolio deterioration; (b) the quarterly cumulative specific provisions as percentage of the quarterly cumulative income from interests on loans and leasing, as a measure of efficiency; (c) the quarterly cumulative specific provisions as percentage of the quarterly cumulative gross financial margin, as a measure of fragility; and (d) the year-on-year (yoy) real growth of the gross loan portfolio.

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[13] The B, C, D and E portfolios are comprised by defaulted loans for 30 or more days.

### a) Activation rule

A bank can access the dynamic provisions buffer if all of the following happen simultaneously for three consecutive months: a≥9%, b≥17%, c≤0% or c≥42%, and d<23%; and should accumulate cyclical provisions otherwise.

### b) Buildup of buffer

In times of good loan performance, dynamic provisions should be accumulated, calculated for each loan[14] and defined by the sum of two components. The pro-cyclical individual component (*Componente Individual Procíclico*, *PIC*) is defined as the expected loss during good performance and calculated as the product of the default probability when loans show good performance (*DPA*), the loss associated to default (*LD*) and the asset exposure (*Exp*) [15]:

$$PIC = DP_A \times LD \times Exp$$

The second component of the cyclical provisions, a countercyclical (Componente Individual Contracíclico, CIC), is calculated as the maximum value between the previous month's countercyclical component value adjusted by the change in the loan stock in the same lapse[16], and the difference between the expected losses during low loan performance times (EL_B) and the expected losses in times of good loan performance (EL_A).

$$CIC_{i,t} = \max\left\{CIC_{i,t-1} \times \left(\frac{Exp_{i,t}}{Exp_{i,t-1}}\right); (EL_B - EL_A)_{i,t}\right\}$$

It should be noticed that the accumulation rule allows for reductions on the CIC component of the dynamic provisions if there were loan prepayments which would reduce the asset exposure.

A bank is required to comply with the additional provisions within 6 months after activation of the rule.

### c) Usage of buffer

When a bank shows significant loan quality deterioration (the four indicators mentioned above showed a value in the range established simultaneously), usage of the dynamic

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[14] The two components are calculated by loan, and added up to the bank level to set the cyclical buffer.

[15] The default probabilities and the liability exposure have been established by the Supervisory Authority differing by type of portfolio and borrower (size of the borrowing firm in case of commercial loans and usage of the credit in case of consumption). The probability for each type of borrower and credit can have two possible values defined by Matrix A (in times of good loan performance) and Matrix B (in times of low performance)

[16] Both the countercyclical component and the liability exposure are calculated on the base of guidelines models authorized by the Supervisory Authority and adapted by each bank.

provisions buffer is allowed through a different methodology to calculate the pro-cyclical and countercyclical components, where the last one allows for reductions in the stock of dynamic provisions. Hence, during a loan quality deterioration cycle, the *PIC* is calculated separately for grade A loans and lower quality loans, imposing higher accumulation for the last ones:

$$PIC = DP_A \times LD \times Exp$$

$$PIC = DP_B \times LD \times Exp$$

Where DP$_B$ is the default probability in times of low performance.

The CIC is defined as the difference between the CIC accumulated until last month and the maximum value between the CIC adjusted by the loan stock and the stock reduction factor (SRF):

$$CIC_{i,t} = CIC_{i,t-1} - \max\left\{SRF_{i,t}, CIC_{i,t-1} \times \left(1 - \frac{Exp_{i,t}}{Exp_{i,t-1}}\right)\right\}$$

The stock reduction factor represents the "contribution" that each borrower makes to compensate for bank's expenditure in provisions (40% of the PIC corresponding to the loan). This contribution is proportional to each borrower's savings in banks' total savings through CIC:

$$SRF_{i,t} = \left(\frac{CIC_{i,t-1}}{\sum CIC_{i,t-1}}\right) * (40\% \times Prov_{PIC})$$

If a bank decides to use the dynamic provisions, it can do so for 6 months independently of the indicators' values over this term.

After dynamic provisioning was established it was difficult to distinguish between specific and dynamic provisions given that both were accounted together[17]. Furthermore, given that Colombian regulation allows using generic provisions to meet the dynamic provisions requirement, the implementation of the rule translated in a reduction of the generic provisions similar to the increase in the specific provisions. Figure 9 shows how dynamic provisions fell from 1.0% to 0.4% of the total loans on July 2007 when dynamic provisions for commercial loans were introduced, while the specific provisions increased from 3.1% to 3.7% of total loans. Similar effect had the introduction of the dynamic rule for consumption credits in July 2008.

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[17] Banks only started to report dynamic provisions as a separate balance account on 2010. Before that, they were accounted together with the specific provisions.

**Figure 9. Colombia: Dynamic rule implementation (% of loans)**
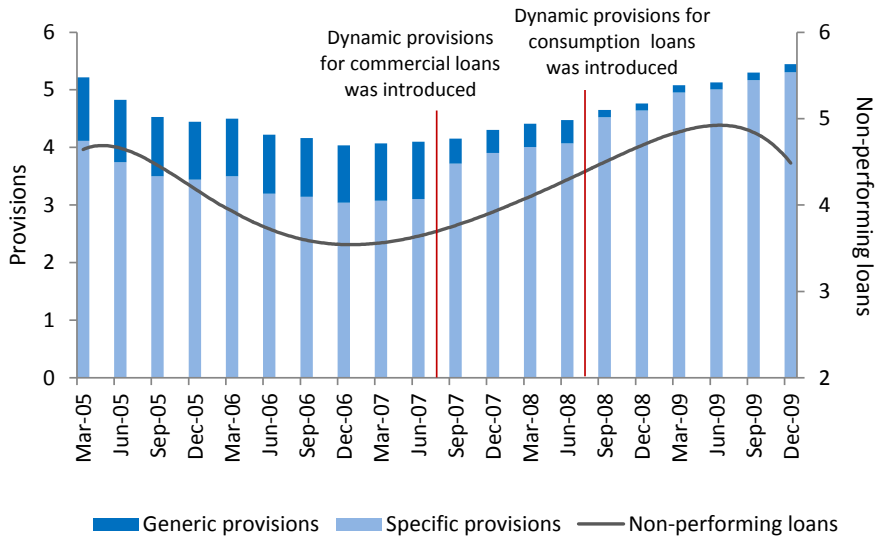


Source: Supervisory Authority, own calculations.

After the financial crisis, credit expansion was followed by a drop of non-performing loans which reduced specific provisions. However the dynamic rule activation has assured a buffer which compensated this reduction and led to maintain total provisions at a relative stable level in case of a downturn scenario (Figure 10). Hence, dynamic provisions have been close to 1% since 2010, achieving the goal of making provisions more independent from the cycle.

**Figure 10. Colombia: Dynamic rule post crisis (% of loans)**
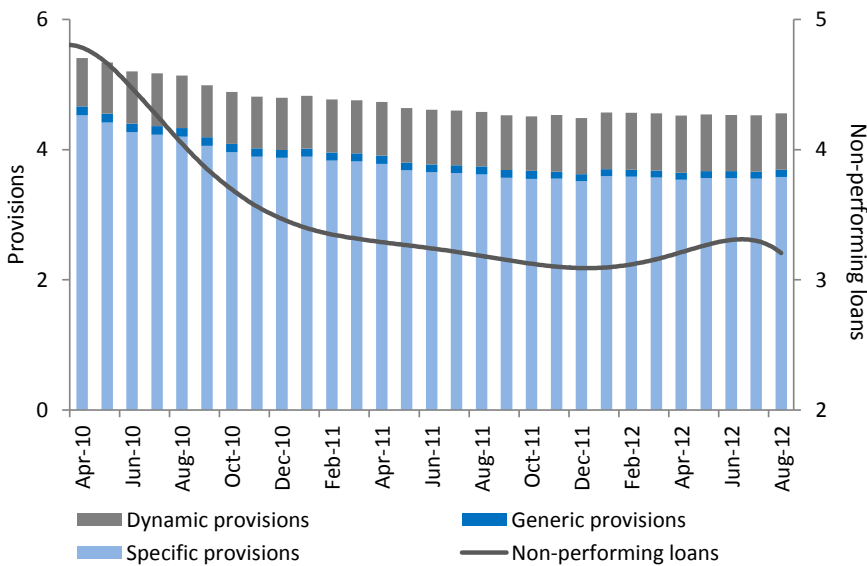


Source: Supervisory Authority, own calculations.

### 3. Ecuador

The dynamic provisions were approved by the Supervisory Authority (*Superintendencia de Bancos y Seguros del Ecuador, SBS*) in June 2012, establishing a buffer (*Fondo de Provisión Anticíclica*) that should be individually set by banks in order to offset the pro-cyclical profile of the loan portfolio specific and generic provisions.

#### a) Buildup of buffer

The dynamic provisioning regime requires banks to accumulate additional provisions to constitute the buffer during the expansionary phase of the economic cycle, and that can be accessed later during the downturn. The buffer, which follows the Colombian model (based on loan expected loses), has been defined as the difference between the unrealized losses (*Pérdidas Latentes, UR*) and non-performing loans specific provisions (*PR*):

$$Buffer = UR - PR$$

The unrealized losses are defined as the product of a factor $\alpha$ and the gross loan portfolio (GLP) of the bank:

$$UR = \alpha \times GLP$$

The $\alpha$ coefficient is an average value of the ratio of non-performing loans provisions to loans during the different economic cycle's phases. It also takes into account the ability of different financial institutions to accumulate additional provisions. Hence, these coefficients have been defined for each type of financial institution by the Supervisory Authority according to table 5.

**Table 5. Values of $\alpha$ by financial institution (%)**

| | |
|---|---|
| Bancos | 3.57 |
| Mutualistas | 1.91 |
| Sociedades Financieras | 4.49 |
| Cooperativas | 1.73 |

Financial institutions started to build up their dynamic provisions buffers in July 2012. The Supervisory Authority has established a calendar to fulfill the requirements by October 2015. By the end of 2012, the buffers should reach 21% of their total requirement.

#### b) Activation Rule

The dynamic provisions buffer will be accessed to cover the excess of specific provision requirements during the contractive phase of the cycle, when the specific provisions overcome the unrealized losses. However, further regulation has not been established yet, as the financial institutions are currently building up their buffers.

### c) *Usage of the buffer*

The procedures for accessing the dynamic provisions in the contractive phase of the economic cycle have not been established yet, given that the buffer is only planned to be phased in fully by 2015.

## 4. Peru

The dynamic provisioning regime (*Régimen General de Provisiones Pro-cíclicas*) was established in November 2008. Under it, the Supervisory Authority, *SBS*, requires banks to accumulate additional generic provisions[18] during the expansionary phase of the cycle in anticipation to expected loan losses that typically increase during downturns.

In contrast to other Andean countries' reference for rule activation based on loan quality performance, the Peruvian dynamic provisions regime is activated when GDP growth surpasses a threshold associated with potential output growth. A GDP based-rule is systemic, which means its activation does not depend on a bank's behavior, but on the economy's as a whole. For this reason the effect could be asymmetric on banks: it could be the case that a more prudent bank would have to increase generic provisions[19].

When the rule is deactivated banks are allowed to use the dynamic provisions buffer to cover additional provisions required by the authorities due to the deterioration of the credit portfolio. The initial rule required banks to fulfill the dynamic provisions buffer by February 2009.

### a) *Activation Rule*

*B*anks should accumulate dynamic provisions if any of the following events happens:

- The average yoy GDP growth over the last 30 months goes from a level below 5% to one above this threshold.
- The average yoy GDP growth over the last 30 months is already above 5%, and the last 12 months average yoy GDP growth is higher than the value registered one year before by 2 percentage points.
- The average yoy GDP growth over the last 30 months is already above 5%, and the rule has been deactivated by at least 18 months by the event described in (b).

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[18] Generic provisions are applied to all performing loans, currently at a 1% rate. They differ from specific provisions which are applied to non-performing loans with differentiated rates by overdue lapse of time.

[19] Fernandez de Lis and Garcia-Herrero (2010).

### b) Deactivation Rule

The cyclical provisioning rule is deactivated if any of the following events happens:

- The average yoy GDP growth over the last 30 months goes from a level above 5% to one below this threshold.
- The average yoy GDP growth over the last 12 months is lower than the value registered one year before by 4 percentage points.

In any of these cases banks should extinguish their dynamic provisions buffer before using the cyclical capital buffer.

### c) Buildup of buffer

When the rule activates, banks should accumulate dynamic provisions in the form of additional generic provisions (i.e. dynamic provisions are only accumulated over performing loans) in percentages that differ by type of credit and debtor. Banks are required to comply with these additional provisions within 6 months after rule activation, according to the following time schedule:

**Table 6: Minimum % increase on generic provision to buildup dynamic buffer**

| Type of credit | 2 months | 4 months | 6 months |
|---|---|---|---|
| Credit to corporates | 0.15% | 0.30% | 0.40% |
| Credit to large firms | 0.15% | 0.30% | 0.45% |
| Credit to medium firms | 0.10% | 0.20% | 0.30% |
| Credit to small firms | 0.20% | 0.40% | 0.50% |
| Microcredit | 0.20% | 0.40% | 0.50% |
| Consumption, revolving | 0.50% | 1.00% | 1.50% |
| Consumption, non revolving | 0.40% | 0.70% | 1.00% |
| Mortgage | 0.15% | 0.30% | 0.40% |

For example, if a bank has provided credits to corporates and consumption non revolving credits that require to hold generic provisions of 50 and 100 million of Nuevos Soles, respectively, then the bank is required to accumulate additional generic provisions of:

$Cyclical\ provision\ buffer = (50 \times 0.4\%) + (100 \times 1.0\%) = 1.2$ million of Nuevos Soles

### d) Usage of the buffer

When the rule is deactivated, the cyclical provisions stock can be used to cover additional specific provisions (i.e. provisions for loans with overdue payments).

The average yoy GDP growth over the last 30 months has been over 5% since October 2005, and consequently this indicator has never ruled the activation or deactivation of the

dynamic provisioning regime. Since implementation, the key meter has been the difference between the average of the yoy GDP growth rate of the last 12 months and the same indicator one year before. Under the rule, banks should accumulate dynamic provisions when this difference goes over 2 percentage points and deactivates if falls under 4 percent points.

The dynamic provisioning rule was activated in December 2008 although by that time the annual difference in the GDP growth rate of the last 12 months was already under 2% (Figure 11). Given the economic deceleration of 2009 this difference went to -4% on June of the same year, and although dynamic provisions should have deactivated since then by rule 2b, it only did in September 2009. With the economic recovery, activation rule 1b was fulfilled in July 2010, and the dynamic rule was activated in October of the same year.

**Figure 11. Peru: Dynamic provisioning rule activation and deactivation**
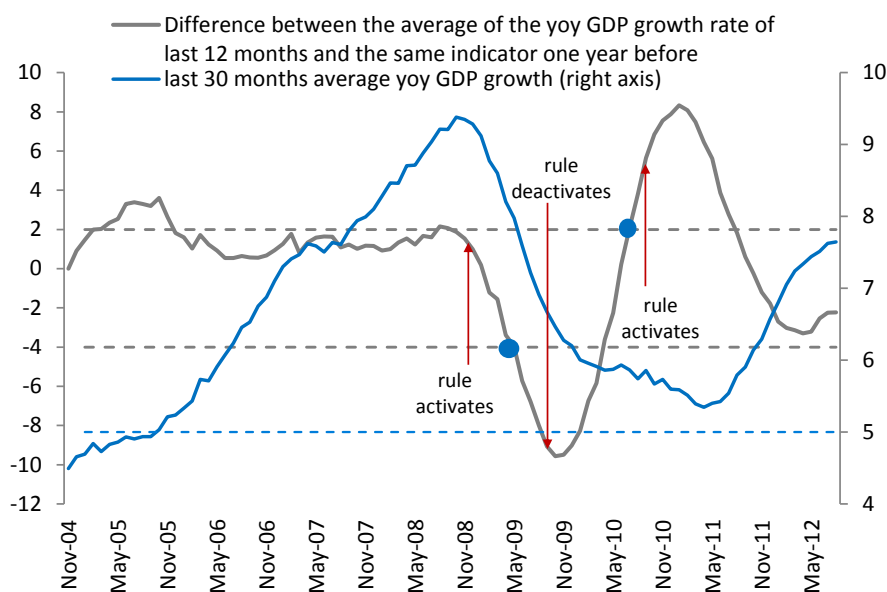


Blue circles represent the months when one of the activation or deactivation rules was fulfilled while arrows show the months when dynamic provisioning was effectively activated or deactivated.
Source: Central Bank of Peru, own calculations.

Given that the economic deceleration of 2008-2009 did not have the expected negative effects on the banking system, a part of additional provisions (which include both voluntary and dynamic) accumulated during December 2008 - September 2009 were not used during the deactivation phase (October 2009-October 2010). Hence, when the rule was reactivated these provisions accounted for a buffer of US$318 million (22.7% of total provisions).

Table 7 summarizes the characteristics of each country's dynamic provisions regime.

**Table 7. Dynamic provisions regime in Andean countries**

| | BOLIVIA | COLOMBIA | ECUADOR | PERU |
|---|---|---|---|---|
| 1. Activation rule: | | | | |
| - Reference indicator: description and type | Loan quality: specific provisions ratios (relative values) | Loan quality: specific provisions ratios and rate of growth, loan portfolio growth (relative and absolute values) | Loan quality: non performing loans provisions (absolute values) | Economic cycle: GDP growth (absolute values) |
| - Rule to start using the buffer | Any of the two loan quality ratios increases for 6 consecutive months | All 4 ratios surpass predetermined levels simultaneously | Non-performing loan provisions overpass unrealized losses | 30 months average GDP growth falls below certain limit (and others, see text) |
| 2. Type of credit for which dynamic provisions are required | Only performing loans, except for loans to the business sector (categories A, B, C) | Only commercial and consumption loans | All | Only performing loans |
| 3. Build up methodology | | | | |
| - Rule to start build-up the buffer | 6 month moving average deterioration of both loan specific provisions ratios | Any of the 4 ratios overpasses predetermined levels | Unrealized losses overpass non-performing loan loss provisions | 30 months average GDP growth overpass certain limit (and others, see text) |
| - Buffer size determination | Percentage of each loan, depending on the type of debtor an currency denomination | Difference between expected losses during good and bad loan performance periods of time | Difference between expected losses during good and bad loan performance periods of time | Rate of growth of generic provisions, depending on type of credit and size of debtor |
| - Accumulation rate differentiation | By credit sector and currency denomination | By loan | By type of financial institution | By credit sector and size of the borrower |
| 4. Period of time to use the buffer | Non-specific: when the 6 month moving average of both ratios start to increase | 6 months | Not established yet | N.A. |
| 5. Period of time to build or replenish the buffer | % buffer used x 51 months | 6 months | First time deadline: October 2015 | 6 months |

## C. Liquidity Requirements

The Basel Committee on its third accord[20] has developed two standards, each with separate but complementary objectives, to be used in liquidity supervision:

The **Liquidity Coverage Ratio (LCR)** promotes short-term resilience of a bank's liquidity risk profile by ensuring that it has sufficient high-quality liquid assets to survive a significant stress scenario lasting 30 calendar days. The recommendation requires the following ratio to be equal or greater than 100%:

$$\frac{Stock\ of\ high-quality\ liquid\ assets}{Total\ net\ cash\ outflows\ over\ the\ next\ 30\ calendar\ days} \geq 100\%$$

Basel III suggests that all high-quality liquid assets should ideally be central bank eligible for intraday liquidity needs and overnight liquidity facilities. There are two categories of assets included in the stock: "Level 1" assets included without limit, and "Level 2" assets that can only comprise up to 40% of the overall stock after applying haircuts.

Level 1 assets are limited to cash; central bank reserves (provided they can be drawn down in times of stress); and marketable securities representing claims on or guaranteed by sovereigns, central banks, non-central government public sector entities (*PSEs*), the BIS, the IMF, the EC, or multilateral development banks and satisfying all of the following conditions: (a) have been assigned a 0% risk-weight under the Basel II Standardized Approach, (b) traded in large, deep and active repo or cash markets characterized by a low level of concentration, (c) proven record as a reliable source of liquidity in the markets even during stressed market conditions, and (d) not an obligation of a financial institution or any of its affiliated entities.

Level 2 assets are limited to (a) marketable securities representing claims on or guaranteed by sovereigns, central banks, non-central government *PSEs* or multilateral development banks that have satisfied the same conditions as Level 1 assets but have been assigned a 20% risk weight under the Basel II Standardized Approach; and (b) corporate bonds and covered bonds that have not been issued by a financial institution or any of its affiliated entities, have not been issued by the bank itself or any of its affiliated entities, have a credit rating from a recognized external credit assessment institution of at least AA- or do not have a credit assessment and are internally rated as having a probability of default corresponding to a credit rating of at least AA-, traded in large, deep and active repo or cash markets characterized by a low level of concentration, and proven record as a reliable source of liquidity in the markets even during stressed market conditions.

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[20] The Basel III proposal is taken from "Basel III: International framework for liquidity risk measurement, standards and monitoring" (BIS, December 2010).

Total net cash outflows are calculated as the difference between the outstanding balances of various types of liabilities and off-balance sheet commitments multiplied by the rates at which they are expected to run off or drawn down[21] under a stress scenario, and the outstanding balances of various categories of receivables multiplied by the rates at which they are expected to flow in, up to an aggregate cap of 75% of total expected cash outflows (capped in order to prevent banks from relying solely on anticipated inflows to meet their liquidity requirement):

$$Total\ net\ cash\ outflows\ over\ the\ next\ 30\ calendar\ days = outflows - \min\{inflows; 75\%\ of\ outflows\}$$

Basel III recommends specific run-off factors for each type of liability and drawn down rates for each type of committed credit and liquidity facilities (off-balance sheet commitments) to calculate outflows under stress scenario. The last ones are defined as explicit contractual agreements and/or obligations to extend funds at a future date to retail or wholesale counterparties. Run-off and drawn down factors are described in Appendix 1.

The **Net Standing Funding Ratio (NSFR)** promotes more medium and long term funding of banks' assets by creating additional incentives for banks to fund their activities with more stable sources. This metric establishes a minimum acceptable amount of stable funding based on the liquidity characteristics of an institution's assets and activities over a one year horizon. The *NSFR* aims to limit over-reliance on short-term wholesale funding during times of buoyant market liquidity and is defined as the ratio of the available amount of stable funding to the required amount of stable funding. The Basel III Agreement recommends this ratio to be over 100%:

$$NSFR = \frac{Available\ amount\ of\ stable\ funding}{Required\ amount\ of\ stable\ funding} > 100\%$$

Stable funding is defined as the portion of equity and liability financing expected to be reliable source of funds over a one-year time horizon under a stress scenario. The required amount of stable funding for a specific institution is a function of the liquidity characteristics of various types of assets held, off-balance sheet exposures incurred and the activities pursued by the institution.

The available stable funding (*ASF*) is defined as the total amount of a bank's capital, preferred stock with maturity equal to or greater than one year, liabilities with effective

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[21] Run-off factors are the estimated rates at which liabilities (such as deposits) are expected to be withdrawn, while drawn down factors are estimated rates at which committed credit and liquidity facilities (off-balance sheet commitments) are expected to be cancelled under stress scenario. Committed credit and liquidity facilities includes contractually irrevocable ("committed") or conditionally revocable agreements to extend funds in the future.

maturities of one year or greater, the portion of non-maturity deposits, term deposits, and wholesale funding with maturities of less than one year that would be expected to stay with the institution for an extended period under a stress scenario. Extended borrowing from central bank lending facilities outside regular open market operations are not considered in this ratio. Each source of funding is assigned to one of five categories depending on its probability to be available under a stress scenario. The amount assigned to each category is multiplied by its probability (*ASF* factor), and the total *ASF* is the sum of the weighted amounts. The *ASF* factors by category are described in Appendix 2.

The required stable funding (*RSF*) is calculated as the sum of the assets' value held and funded by the bank, multiplied by a specific *RSF* factor assigned to each asset type, added to the amount of off-balance sheet activity multiplied by its associated *RSF* factor. The *RSF* factor applied to each asset or off-balance sheet exposure is the amount of that item that supervisors believe should be supported with stable funding. For example, assets that are more liquid and available to act as a source of extended liquidity in the stress environment, receive lower *RSF* factors (require less stable funding). Each asset is assigned to one of seven categories and multiplied to the *RSF* factor applied to that category, as described in Appendix 2. The total *RSF* is the sum of the weighted amounts.

Among the Andean countries, Colombia, Peru and Ecuador have established liquidity requirements. While Colombia and Peru follows Basel III recommendations, the Ecuadorian regime was established in 2002, much earlier than the third Accord, and consequently it differs from its proposal. These rules are described below.

### 1. Colombia

Liquidity requirements for the financial system were established by the Supervisory Authority (*SFC*) in November 2009 under the "*Sistema de Administración de Riesgo de Liquidez*" (*SARL*) aimed to measure and control the liquidity risk associated to each bank's activities, both in and off-balance sheet. Under this regime, the *SFC* has established two equivalent liquidity risk indicators (*Indicadores de Riesgo de Liquidez, LRI*), both of them monitored every 7 and 30 calendar days. The first one (*LRI$_A$*) is set as the difference between liquid assets adjusted by "market liquidity" and exchange risk (*ALA*), and the estimated net liquidity requirement (*NLR*) for 7 and 30 calendar days. The accumulated *LRI$_A$* for 7 and 30 days cannot be negative. The second indicator (*LRI$_R$*) is the ratio between these two components, and it is equivalent to the *LCR* recommended by the Basel III Accord, with some country specific adjustments. The regulation establishes that this ratio has to be equal to or greater than 100%.

$$LRI_A = ALA - NLR \geq 0 \qquad\qquad LRI_R = \frac{ALA}{NLR} \geq 100\%$$

The Colombian liquidity requirements aim to assure banks' short-term funding over a stress scenario, but does not control for medium term liquidity. Hence, Colombia does not have an

indicator equivalent to the net standing funding ratio (*NSFR*) proposed by the Basel III Accord.

**Table 8. Basel III and Colombian high-quality liquid assets definitions**

| Basel III | Colombia |
| --- | --- |
| *Level 1 liquid assets (up to 100%)*<br>- Cash<br>- Central bank reserves<br>- Marketable securities with 0% risk weight, traded in large and proven as source of liquidity in markets, representing claims on or guaranteed by:<br>    Sovereigns<br>    Central banks<br>    PSEs<br>    BIS, IMF and EC<br>    Multilateral development banks | *High liquidity assets (up to 100%)*<br>- Cash<br>- Central bank reserves<br>- Marketable securities representing claims on central banks |
| *Level 2 liquid assets (up to 40%)*<br>- Marketable securities with 20% risk weight, traded in large and proven as source of liquidity in markets, representing claims on or guaranteed by:<br>    Sovereigns<br>    Central banks<br>    PSEs<br>    BIS, IMF and EC<br>    Multilateral development banks<br>- Corporate bonds with certain credit rating | *Other liquid assets (up to 3/7)*<br>- Marketable securities traded in large representing:<br><br>    Sovereign debt<br>    Others, as long as they are proven as source of liquidity in markets transactions |

The adjusted liquid assets (*ALA*) are composed by two categories: high quality liquid assets included without limit, and other liquid assets that can only comprise up to 3/7 of the overall *ALA* stock after applying market and exchange risk haircuts.

The high quality liquid assets category is equivalent to the Basel III "Level 1" liquid assets, although it is a more restrictive indicator since it is limited to cash, central bank reserves and marketable securities representing claims on the central bank. Marketable high quality securities, including sovereign bonds of any maturity, adjusted by 30 days haircuts for exchange rate risk (applied to those assets denominated in foreign currency) and market risk[22] (to control for potential raises in the interest rate or liquidity risk) are only included as other assets in *ALA*. The definition of high quality liquid assets used to be even more restrictive until December 2011 when the *SFC* allowed reserves held in the Central Bank to

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[22] Equal to the haircuts applied by the Central Bank different securities used for its repo operations equivalent to 30 and 33 calendar days, which are updated and published in its website. For other securities, banks should apply a run-off factor of 20% over their market value.

be accounted. It is also important to mention that Basel III "Level 1" and "Level 2" assets only include marketable securities if they have been assigned a 0% and 20% risk weight, respectively, under the Basel II Standardized approach, or corporate bonds as long as they achieve certain credit rating level. The Colombian regime doesn't mention these restrictions and place all high quality marketable securities as "other liquid assets", except for those from the central bank. Table 8 summarizes the differences between Basel III and Colombian legislation for the $LRI_R$ numerator:

The estimated net liquidity requirement ($NLR$) is calculated for 7 and 30 calendar days and is equivalent to the Basel III total net cash outflows. It is defined as the difference between the outstanding balances of various types of liabilities and off-balance sheet commitments multiplied by the rates at which they are expected to run off or drawn down in a stress scenario, and the outstanding balances of various categories of receivables multiplied by the rates at which they are expected to flow in up to an aggregate cap of 75% of total expected cash outflows.

$$Total\ net\ cash\ outflows\ over\ the\ next\ 30\ calendar\ days$$
$$= outflows - \min\{inflows; 75\%\ of\ outflows\}$$

Unlike the Basel III proposal, the $NLR$ is estimated by using non-fixed and non-source depending run-off factors to adjust the non-fixed term liabilities or off-balance sheet commitments. These factors are estimated by each bank based on the historic monthly variation of its liabilities (or commitments) stock since 1997. For those institutions with a shorter data base than 10 years, the run-off rates applied cannot be lower than 10%.

The run-off factors definition does not follow the Basel III recommendations as the latter would have implied run-off rates of 75% or 100% for those banks which have public entities or big firms as main sources of funding. However, previous stress scenarios for Colombia system have shown that those deposits are stable, and therefore should not be subject to high run-off factors.

Over the last years, Colombia has fulfilled the liquidity requirements, as can be seen in Figure 12. The 30 days $LRI_A$ has been positive, and showed an increase on December 2011 when the legislation changed to add reserves held in the Central Bank as part of the high-quality liquid assets. After that episode, the $LRI_A$ has decreased but it is still above 10% of the illiquid assets. Furthermore, a stressed $LRI_A$ built by the Central Bank, under the assumption of maximum historic run-off drawn-down factors since 2009, also shows enough liquid assets to satisfy the 30 days liquidity requirement.

**Figure 12. Colombia: 30 days LRI evolution and stress scenario**
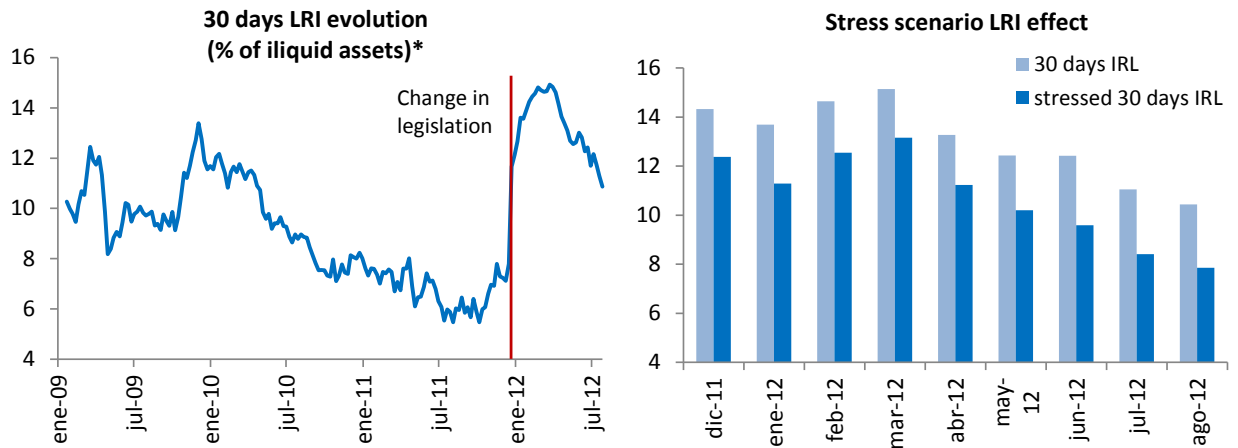


The left hand graph shows the last 4 weeks moving average values for the 30 days *LRI*, while the right hand graph shows the values for the *LRI* at the end of the month. Source: Central Bank Stability Financial Report (September 2012).

## 2. Peru

Before the Basel III Accord, the Peruvian financial regulation was limited to liquidity risk control over daily ratios of liquid assets to short-term funding, both in domestic and foreign currency. However, the *SBS* has recently pre-published a new rule for liquidity risk management (*Reglamento de Gestión de Riesgo de Liquidez*) which introduces two new indicators: the Liquidity Coverage Ratio (*Ratio de Cobertura de Liquidez, LCR*) to assure enough high quality liquid assets over a 30 calendar days stress scenario, and the Net Stable Funding Ratio (*Ratio de Fondeo Neto Estable, NSFR*) to prevent banks from covering medium and long term assets with short term funding. The high-quality liquid assets, expected inflows and outflows for the next 30 days, limits and implementation calendar for the *LCR* have been defined on the pre-published norm, while the *NSFR* has only been set as reference and without defined dates for implementation. Hence, the new liquidity risk management for the Peruvian financial system involves the following meters:

**Liquidity coverage ratio** (*LCR*): this ratio aims to assure an adequate level of high quality liquid assets that can be cashed to satisfy liquidity needs on a 30 calendar day's horizon under a stress scenario. The *LCR* involves the same concepts as the Basel III proposal, but the ratio is differently set. The *SBS* has established a minimum *LCR* requirement of 100%:

$$LCR = \frac{high - quality\ assets + next\ 30\ days\ inflows}{next\ 30\ days\ outflows} \geq 100\%$$

The first implementation phase for the *LCR* is programmed from December 2013 to December 2014, with a less restrictive minimum requirement of 80%, which will progressively rise to 100% by January 2016. Furthermore, this requirement does not apply to

the public banking system, financial institutions for small and medium enterprises (*EDPYMES*) and those institutions with a ratio of deposits to total liabilities lower than 15%, unless their assets represent more than 1% of the total system assets.

In contrast to the Basel III proposal, high-quality assets are not divided by levels and are composed by cash, reserves in the central bank and other institutions of the financial system with residual maturity shorter than 30 days, overseas reserves in foreign banks, and marketable high quality securities from the central bank and sovereigns with investment grade qualification. The Peruvian definition might be less restrictive than that of the Basel III proposal as it includes other reserves than those in the central bank, but more restrictive as it does not include marketable securities from corporates but only from central bank and sovereigns. However, it is important to mention that banks currently hold zero reserves other than those in the Central Bank, making the Peruvian definition *de facto* more restrictive than the Basel III one. Table 9 presents a summary of the differences on high-quality assets definition:

**Table 9. Basel III and Peruvian high-quality liquid assets definitions**

| Basel III | Peru |
|---|---|
| - Cash (Level 1)<br>- Central bank reserves (Level 1) | - Cash<br>- Central bank reserves<br>- Reserves in other financial institutions<br>- Overseas reserves in foreign banks |
| - Marketable securities with 0% (Level 1) or 20% (Level 2) risk weight, trade in large and proven as source of liquidity in markets, representing claims on:<br>    Sovereigns<br>    Central banks<br>    PSEs<br>    BIS, IMF and EC<br>    Multilateral development banks<br>- Corporate bonds with certain credit rating | - Marketable securities representing claims on:<br>    Sovereigns<br>    Central bank |

Not only the definition of high-quality liquid assets in Peru is more restrictive relative to Basel III, but also most of the liquid assets of Peruvian banks are composed by cash and reserves in the Central Banks (76%). Table 10 shows that only the big banks have a considerable part of their liquid assets in marketable securities (27%), while foreign banks and banks associated with retail stores hold most of them as reserves in the Central Bank.

**Table 10. Peru: High-quality liquid assets composition**

|  | Cash | Central Bank Reserves | Marketable securities representing claims on governments and central bank | Total |
|---|---|---|---|---|
| Big size banks | 9.8 | 63.2 | 27.0 | 100.0 |
| Foreign banks 1/ | 2.1 | 88.1 | 9.8 | 100.0 |
| Banks associated to a Retail Store | 16.8 | 83.2 | 0.0 | 100.0 |
| Others | 16.5 | 76.0 | 7.5 | 100.0 |
| **Total banking system** | **9.5** | **66.5** | **24.0** | **100.0** |

1/Does not comprise Scotiabank and BBVA as they are included within the big banks category. Source: *SBS*

The second component on the *LCR* numerator, next 30 days inflows, comprises income from performing loans and any other accounts receivable with residual maturity shorter than 30 days, while the next 30 days outflows comprises those liabilities and accounts payable with due date in the next 30 days, and off-balance sheet commitments regardless of their due date. This set up differs from Basel III as outflows are not estimated for a stress scenario using run-off and drawn down rates, but are calculated taking into account the actual expected outflows from commitments due in the next 30 days. In addition, all off-balance commitments regardless of its maturity are considered outflows while Basel III allows for drawn down rates lower than 100% for specific off-balance commitments (Appendix 1).

Keeping in mind the differences in each component, we can compare the *LCR* ratio for the banking system as implemented by the Peruvian regulation to that which Peru would have had if it had *exactly* adopted the Basel III *LCR*. In the first place, table 11 shows that all the banks but those associated with a retail store have already fulfilled the *LCR* requirement as stated by the Peruvian regulation. Although banks associated with a retail store are below the requirement, it is important to clarify that these banks are subject to additional requirements (beyond those imposed on the rest of the banking system) to prevent downturn effects. As such, dynamic provisions for their credits are the highest of the system.

**Table 11. Peru: Liquidity Coverage Ratio**

|  | LCR Peru | LCR as of Basel III |
|---|---|---|
| Big size banks | 158.6 | 180.9 |
| Foreign banks 1/ | 146.3 | 163.6 |
| Banks associated to a Retail Store | 79.9 | 70.7 |
| Others | 121.0 | 134.4 |
| **Total banking system** | **151.5** | **172.1** |

1/Does not comprise Scotiabank and BBVA as they show in the big size banks category.
Source: *SBS*

If the *LCR* is converted to meet the Basel III proposal, then the ratio would be even higher than 100% for all the banks, with the exception of those associated with retail stores.

Therefore, the Peruvian banking system fully complies with the Basel III - 30 day liquidity requirement defined by the *LCR*. This result is even stronger when considering that the Peruvian high-quality liquid assets definition is more restrictive than that of Basel III and the 30 days outflows definition is broader as it assumes 100% draw down rates for all off-balance commitments.

**Net stable funding ratio** (*NSFR*): its objective is to assure long term assets to be funded with at least a minimum proportion of stable liabilities. It has been defined as the Net Stable Funding Ratio recommended by Basel III, but its components and requirements have not been defined yet.

$$NSFR = \frac{Available\ stable\ funding}{Required\ stable\ funding}$$

It is important to mention that other liquidity requirements, implemented previous to the new rules for liquidity risk management, are still enforced as part of the actual regulation. These requirements involve the following meters:

**Liquidity ratio**: both in domestic ($LR_{DC}$) and foreign ($LR_{FC}$) currencies, calculated on a daily basis and defined as liquid assets over short term funding. The minimum requirements for these ratios are 8% and 20%, respectively. These limits increase to 10% and 25%, respectively when the deposits concentration (debt with 20 main clients as percentage of total deposits) is higher than 25%.

$$LR_{DC} = \frac{liquid\ assets_{DC}}{short\ term\ funding_{DC}} \geq 8\%$$

$$LR_{FC} = \frac{liquid\ assets_{FC}}{short\ term\ funding_{FC}} \geq 20\%$$

High liquidity in the Peruvian financial system has led institutions to widely fulfill these requirements both in domestic and foreign currency (table 12), mainly in the banking system, but also in other financial institutions:

**Table 12. Peru: Liquidity ratios in domestic and foreign currency\***

|  | Banks | Financial enterprises | Municipal Lending & Savings Institutions | Rural Lending & Savings Institutions |
|---|---|---|---|---|
| $LR_{DC}$ | 45.5% | 29.8% | 32.4% | 34.5% |
| $LR_{FC}$ | 44.4% | 38.5% | 49.1% | 71.0% |

\*Source: SBS with information from August 2012.

**Liquid investment ratio**: both in domestic ($LIR_{DC}$) and foreign currency ($LIR_{FC}$), calculated on a daily basis and defined as the sum of the overnight deposits in the Central Bank (O*D*

*BCRP*), the investment in short term securities issued by the Central Bank (*CD BCRP*, only denominated in domestic currency) and public sovereign bonds (or global bonds in case of foreign currency denomination), as percentage of the liquid assets. The limit for the minimum requirement in domestic currency is 5% while the one in foreign currency is not specified.

$$LIR_{DC} = \frac{OD\ BCRP + CD\ BCRP + sovereign\ bonds}{liquid\ assets_{DC}} \geq 5\%$$

$$LIR_{FC} = \frac{OD\ BCRP + global\ bonds}{liquid\ assets_{FC}}$$

Like the *LCR*, limits to the *LIR* does not apply to the public banking system, financial institutions for the small and medium enterprises (*EDPYMES*) and those institutions which ratio of deposits to total liabilities is lower than 15%, unless their assets represent more than 1% of the total system assets.

Table 13 displays a summarized comparison for liquidity measures between Basel III and the Colombian and Peruvian regulation:

**Table 13. Basel III, Colombian and Peruvian liquidity measures**

| Basel III | Colombia | Peru |
|---|---|---|
| - High-quality liquid assets classified in two levels with restrictions in their shares | - High-quality liquid assets classified in two levels with restrictions in their shares | - Only one level of high-quality liquid assets |
| - Short term liquidity measure: 30 days | - Short term liquidity measures: 7 and 30 days | - Short term liquidity measure: 30 days |
| - Medium term liquidity measure: 1 year | - No medium term liquidity measure | - Medium term liquidity measure: 1 year |
| - Cash outflows calculated under fixed and defined run-off and drawn down factors by category | - Cash outflows calculated under individual bank's run-off and drawn down factors defined by historic data | - No factors applied but counts any expected otflow during next 30 days |
| - Off balance commitments subject to different drawn down rates | - Off balance commitments subject to different drawn down rates | - All off-balance commitments drawn down at 100% rate |

## 3. Ecuador

The liquidity risk management for financial institutions was approved by the Supervisory Authority (*SBS*) in 2002 with further modifications in 2003 and 2005. Being established earlier, these requirements are far from Basel III recommendations. The regime establishes minimum requirements to the "Liquidity Structural Index" (*Índice Estructural de Liquidez, LSI*), a ratio of liquid assets to short term funding. The index has two versions: the first level *LSI* (*Índice Estructural de Primera Línea, LSI_{IL}*) which controls for liquidity up to 90 days, and the

second level *LSI* (*Índice Estructural de Primera Línea, LSI₂ₗ*) which controls for liquidity up to 180 days. Unlike Basel III, none of these indicators is based on liquidity stress scenario estimations and do not control for short term liquidity.

$$LSI_{1L} = \frac{LA_{90d}}{STF_{90d}} \qquad LSI_{2L} = \frac{LA_{180d}}{STF_{90+d}}$$

For the first level *LSI*, the numerator $LA_{90d}$ is composed by cash, Central Bank reserves, and marketable and unrestricted securities which represent claims on government and the private sector with maturity up to 90 days. The second level index's numerator, $LA_{180d}$, adds to $LA_{90d}$ marketable and unrestricted securities which represent claims on the government and the private sector with maturity from 91 days to 180 days, and held-to-maturity securities with maturity up to 180 days. Both definitions differ from Basel III high-quality liquidity assets which do not comprise marketable securities from the private sector, unless they have certain credit rating, and held-to-maturity securities.

The first level *LSI's* denominator, $STF_{90d}$, is composed by call deposits, term deposits with maturity up to 90 days, wholesale funding from financial corporates, multilateral developments banks, *PSEs*, and subordinated debt with maturity up to 90 days. The second level *LSI's* denominator, $STF_{90+d}$, adds to the first level one restricted deposits, term deposits with maturity longer than 90 days, as well as wholesale funding from financial corporates, multilateral developments banks, PSEs, and subordinated debt with maturity longer than 90 days.

As a previous step to *LSI₁ₗ* and *LSI₂ₗ* requirements, the *SBS* defines the weighted average volatility of a bank's main funding sources (*V*). The main funding sources stock (*Stock*) is composed by call, savings, term and restrictive deposits, wholesale funding from financial corporates, multilateral development banks and *PSEs*. *V* is calculated as the standard deviations of a 30 days series of the natural logarithm of this *Stock*'s 90 days percentage change, as follows:

$$V = s.d._{30d}\left[\log(\Delta\%_{90d}Stock)\right]$$

The regime establishes that *LSI₁ₗ* and *LSI₂ₗ* should be greater than 2 and 2.5 times the weighted average volatility of a bank's main funding sources, respectively. Minimum requirements over the two indexes have to be simultaneously met. Additionally, the second level liquid assets ($LA_{180d}$) should be equal or greater than 50% of the term deposits with maturity up to 90 days held by the main 100 banks' clients. This requires banks with high deposit concentration to have a bigger buffer to face liquidity risk.

If a bank's weekly average of *LSI₁ₗ* does not meet the requirement, the bank cannot increase its loans portfolio. If it does not meet the *LSI₂ₗ* requirement for two consecutive weeks, or for four weeks during a 90 days period of time, the bank should elaborate a contingency plan to show *SBS* concrete actions aimed to meet the requirement. Table 14 displays the main differences between this regime and Basel III proposal:

**Table 14. Basel III and Ecuadorian liquidity requirements**

| Basel III | Ecuador |
|---|---|
| - Ratios: high-quality liquid assets/net cash outflows available stable funding/required stable funding | - Ratio: liquid assets/ short term funding |
| - Liquidity measures for 30 days and 1 year | - Liquidity measures for 90 and 180 days |
| - High-quality liquid assets comprise marketable securities from sovereigns, central bank, PSEs and multilaterals Level 2 high-quality assets also comprises corporate as long as they satisfied several liquidity conditions | - Liquid assets comprises marketable securities from the public and private sector as long as they have maturities up to 90 or 180 days, depending on the ratio |
| - High-quality liquid assets do not comprise any type of held-to-maturity securities | - High-quality liquid assets comprise held-to-maturity securities from private and public sector when maturity is under or equal to 180 days |

## D. Other macro-prudential regulations implemented in the Andean countries

Banking systems in the Andean region have been subject to other regulations which have allowed offsetting procyclicality. Though not an essential part of this document, the following tables summarize characteristics of two instruments: legal reserves requirements and loan-to-value limits. The first one has been subject to changes, becoming in some cases a countercyclical instrument, while the second one, although set as a fixed ratio, has imposed limits to credit expansion.

**Table 15. Legal reserves requirements in Andean counties**

| | Bolivia | Colombia | Ecuador | Peru | Venezuela |
|---|---|---|---|---|---|
| From | 1998 | 1923 | 2000 | 1959 | 1990 |
| Term | 14 days | 14 days | 1 week | 1 month | 1 week |
| Authority responsible | Central Bank of Bolivia (*BCB*) | Banco de la Republica (*BANREP*) | Banco Central del Ecuador (*BCE*) | Banco Central de Reserva del Peru (*BCR*) | Banco Central de Venezuela (*BCV*) |
| Currency denomination of liabilities subject to reserves | Domestic and foreign currency, and fixed value domestic currency with respect to US dollars and UFV (Unidad de Fomento de Vivienda) with maturity up to 360 days | Domestic currency with maturity up to 18 months | Foreign currency | Domestic and foreign currency with maturity up to 3 years | Domestic currency of any maturity |
| Holding modality | Deposits in *BCB* (cash legal reserves) and invested in sovereign bonds (legal reserves in securities) | Cash in the bank or deposits in *BANREP* | Cash, deposits in *BCE* and securities issued by the Central Government | Cash in the bank or deposits in *BCR* | Deposits in the *BCV* |
| Use during the financial crisis (2008-2009) | *BCB* increased foreign currency reserves requirement to internalize cost associated to dollarization and reduced the domestic currency reserves to promote banking credit in local | A marginal reserve requirement was established over increases in deposits with respect to their stock on May 7, 2007 (base date) | No | BCR increased marginal reserves before Lehman bankrupcy to offset credit expansion due to capial inflows, and allowed banks to use reserves to provide liquidity after Lehman bankrupcy | BCV has been reducing reserves requirements since 2008 to stimulate credit expansion |

**Table 16. Loan-to-value limits**

|  | Bolivia | Colombia | Ecuador | Venezuela |
|---|---|---|---|---|
| From | 1999 | 2000 | 2011 | 2005 |
| Responsible authority | *ASFI* | *BANREP* | *SBS* | *SUDEBAN* |
| Credit type affected | Consumption | Mortgage | Consumption | Mortgage |
| Rule | Credits' monthly payments cannot be greater than 15% of the monthly average of the borrower's income for the last three months | - Loans cannot exceed 70% of the property's value (80% for social housing programs) <br> - Ratio of family income to first mortgage credit quota cannot exceed 30% | Credits' monthly payments cannot be greater than 50% of the monthly average of the borrower's income | Credits' annual payments cannot be greater than 20% of the anual borrower family's income |
| Change with cycle | Fixed limit, does not change with cycle | Fixed limit, does not change with cycle | Fixed limit, does not change with cycle | Fixed limit, does not change with cycle |

# IV. Concluding Remarks

Albeit significant differences between countries, the Andean region stands out as relatively well advanced in the implementation of macro-prudential regulations. The dynamics of their credit cycles—where credit booms are relatively of longer duration and credit contractions are deeper than in other parts of the developing world—support their choice for this type of financial regulations.

An important feature of the macro-prudential regulatory framework implemented by Andean countries is that these countries have adapted the recommendations of international setting bodies, such as the Basel Committee on Banking Supervision, to their countries' particular characteristics. For example, in implementing countercyclical capital requirements, the Peruvian authorities have set a rule that is conditioned to the behavior of GDP growth. This differs from Basel III, where the recommendation is that the rule be determined by the behavior of credit to GDP ratio. The Peruvian choice is justified on the basis of very low levels of financial intermediation; a situation very different from that in advanced economies.

The concept and utilization of liquidity requirements, another key macro-prudential regulation, is not new in the region. Indeed, countries like Colombia, Ecuador and Peru have been using this type of policy as a tool for ensuring financial stability for a long time now. What is new is the incorporation of Basel III recommendations regarding the definition of what constitutes high-quality liquidity; that is, assets that don't lose value during times of financial difficulties. The process of reform in this area has just started in the region. Data availability is limited to assess whether countries in the region meet the Basel III standard on liquidity. As this paper shows, however, Peru and Colombia fully comply with the Basel recommendations.

Countercyclical (dynamic) loan-loss provisioning is utilized by four of the five countries in the region: Bolivia, Colombia Ecuador and Peru. Indeed, the region leads Latin America in the implementation of this regulation. There is no such a thing as a *typical* design for dynamic provisioning in the Andean region. Indeed, as shown in this paper, countries' rules differ significantly. Whether any given system is superior to the others is a topic beyond the scope of this paper, but one that certainly needs to be better understood.

These findings are quite encouraging, in addition to those highlighted by Galindo, Rojas Suarez and del Valle (2011) that show that in the region the quality of capital also follows the suggestion of the Basel committee in its third accord, but there is still a long way to go, especially since not all countries have implemented all regulations. In addition, an important reason to avoid complacency is that most of the new regulations are yet untested precisely because they have been recently implemented. To a certain extent, the exception is dynamic provisioning, which have been in place in several countries since 2008 (2007 in Colombia). However, there is not sufficient empirical work to assess the efficacy of this type of regulation. Additional research in this area is certainly needed. By presenting and comparing the current state of macro-prudential regulations in the Andean countries, we hope that this paper motivates further analysis.

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# Appendix 1

**Liabilities run-off factors under stress scenario**

|  | Run-off factor |
|---|---|
| I. Retail deposits (by natural persons) | |
|   - Stable desposits | 5% and higher |
|   - Less stable deposits | 10% and higher |
| II. Unsecured wholesale funding (not collateralized to specifically designated assets owned by the borrowing institution in case of bankrupcy, insolvency, liquidation or resolution | |
|   - Provided by small business customers | |
|     - Stable desposits | 5% and higher |
|     - Less stable deposits | 10% and higher |
|   - Customers with operational relationships to the bank | 25% |
|   - Provided by non-financial corporates and sovereigns, central banks and PSEs | 75% |
|   - Provided by other legal entity customers | 100% |
| III. Secured funding (collateralized to specifically designated assets owned by the borrowing institution in case of bankrupcy, insolvency, liquidation or resolution | |
|   - Backed by Level 1 assets | 0% |
|   - Backed by Level 2 assets | 15% |
|   - Secured funding transactions with PSEs that are 20% or lower risk-weighted | 25% |
|   - All others | 100% |
| IV. Additional requirements | |
|   - Derivatives payable | 100% run-off |
|   - Increased liquidity needs related to downgrade triggers embedded in financing transactions, derivatives and other contracts | 100% of contractual cash outflow generated by downgrade |
|   - Increased liquidity needs related to the potential for valuation changes on posted collateral securing derivative and other transactions | 20% of the value of non-Level 1 posted collateral |
|   - Loss of funding on assets-backed securities, covered bonds and other structured financing instruments | 100% of the funding maturing 30 day period |
|   - Loss of funding on assets-backed commercial papers, conduits, securities, investment vehicles and other such financing facilities | 100% of maturing amount and 100% of returnable assets |

**Off-balance sheet commitments drawn down factors under stress scenario**

|  | Drawn down factor * |
|---|---|
| I. To retail and small business customers | |
|   - Comitted credit and liquidity facilities | 5% |
| II. To non-financial corporates, sovereigns and central banks, public sector entities and multilateral development banks | |
|   - Committed credit facilities | 10% |
|   - Committed liquidity facilities | 100% |
| III. To other legal entities (financial institutions) Committed credit and liquidity facilities | 100% |
| IV. Other contingent funding obligations | An national discretion |
| V. Other contractual cash outflows | 100% |

\* Factors applied to the undrawn portion of the facilities within the 30-day period of time required by the LCR.

# Appendix 2

**Available stable funding categories and factors**

| Category | Available Stable Funding Components | ASF Factor |
|---|---|---|
| I | - Tier 1 and Tier 2 Capital<br>- Preferred stocks not included in Tier 2 with a remaining maturity of one year or greater<br>- Secured and unsecured borrowings and liabilities with remaining maturities of one year or greater, ecluding any instruments with explicit options to reduce the expected maturity to less than one year | 100% |
| II | - Stable non-maturity and term deposits with residual maturities of less than one year provided by retail and smal business customers | 90% |
| III | - Less stable non-maturity and term deposits with residual maturities of less than one year provided by retail and smal business customers | 80% |
| IV | - Unsecured wholesale funding, and non-maturity and term deposits with a residual maturity of less than one yearm provided by non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs | 50% |
| V | - All other liabilities and equity categories not included above. | 0% |

Required stable funding categories and factors

| Category | Available Stable Funding Components | RSF Factor |
|---|---|---|
| I | - Cash inmediately available to meet obligations, not encumbered as collateral and not held for planned use<br>- Unencumbered short-term unsecured instruments and transactions with outstanding maturities of less than one year<br>- Unencumbered securities with remaining maturities of less than one year with no option to increase maturity to more than one year<br>- Unencumbered non-renewable loans to financial entities with remaining maturities of less than on year | 0% |
| II | - Unencumbered marketable securities with residual maturities of one year or greater representing claims on or guaranteed by sovereigns, central banks, BIS, IMF, EC, PSEs or multilateral development banks assigned a 0% risk-weight under the Basel II | 5% |
| III | - Unencumbered corporate bonds or covered bonds rated AA- or higher with residual maturities of one year or greater satisfying all of the conditions for Level 2 assets (LCR)<br>- Unencumbered marketable securities with residual maturities of one year or greater representing claims on or guaranteed by sovereigns, central banks, BIS, IMF, EC, PSEs or multilateral development banks assigned a 20% risk-weight under the Basel II | 20% |
| IV | - Unencumbered gold<br>- Unencumbered equity securities not issued by financial institutions<br>- Unencumbered corporate bonds and covered bonds not issued by financial instituions, that have central bank elegibility for intraday liquidity needs and overnight liquidity shortages, low credit risk, and are traded in low level of concentration large markets<br>- Unencumbered loans to non-financial corporate clients, sovereigns, central banks and PSEs with remaining maturity of less than one year | 50% |
| V | - Unencumbered residential mortgages and loans (excluding those to financial institutions) with remaining maturity of one year or greater, that would qualify for the 35% or lower risk weight for credit risk under Basel II | 65% |
| VI | - Unencumbered loans to natural persons and small business having a remaining maturity of less than one year (except for those qualifying for 65% RSF) | 85% |
| V | - All other liabilities and equity categories not included above. | 100% |