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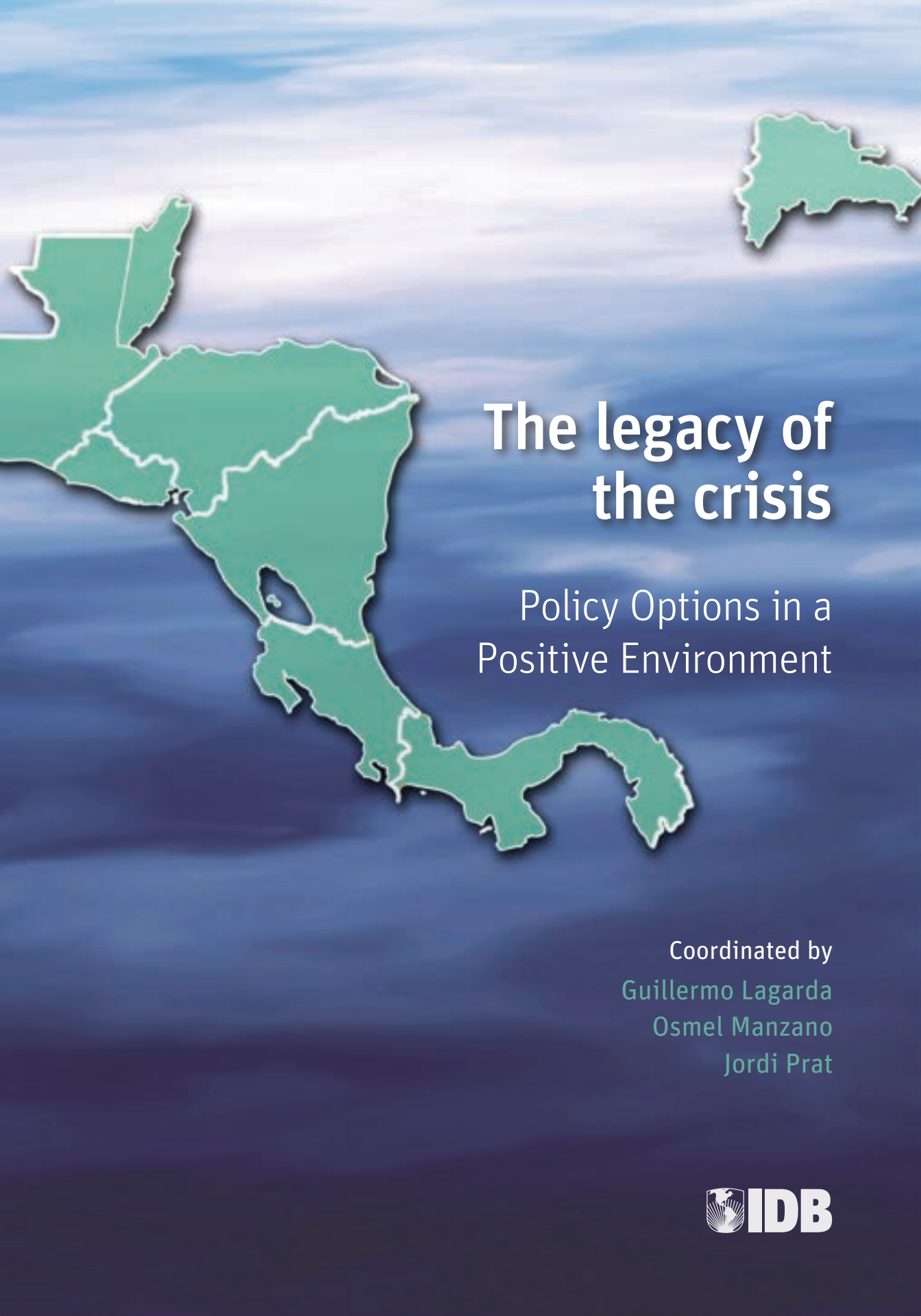
## **The Legacy of the Crisis: Policy Options in a Favorable Environment**

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Inter-American Development Bank

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# The legacy of the crisis

Policy Options in a  
Positive Environment

Coordinated by  
Guillermo Lagarda  
Osmel Manzano  
Jordi Prat



# THE LEGACY OF THE CRISIS

Policy Options in a Positive Environment

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# FOREWORD

The current prospects for the global economy, shaped by economic recovery in the United States and the significant drop in oil prices, are likely to favor Central America, Panama and Dominican Republic. This new environment provides a suitable moment to reflect on the legacies of the crisis and ponder what has been achieved, the lessons learned, and remaining challenges. Let us recall that in the years prior to the crisis the countries of the region succeeded in strengthening their fiscal position and policy frameworks, including in the monetary sphere. With these foundations they succeeded in mitigating the negative effects of the crisis through the application of counter-cyclical policies, taking advantage of better access to international markets.

However, the improved access to international markets and expansionary fiscal policy have been reflected in larger deficits and growing debt, both public and private, a trend that has not reverted. This report examines the current vulnerability of the region to possible new crisis episodes, and leads us to consider policies, which might reduce the exposure to these risks.

The improvement in the global economic environment is an opportunity for the countries of the region to strengthen their vision of macroeconomic stability; one which recognizes that the credit standing of a country depends on many factors beyond the level of debt, and that imbalances in a particular sector can have effects on the rest of the economy. That is why the 2015 Macroeconomic Report focuses on identifying the structural variables that can determine credit-worthiness and explores the vulnerability of the economy from a multi-sector perspective. The aim of this document is to promote dialogue and assist the formulation of strategies and policies that will lead the economies of the region toward a path of stability and growth.

***Gina Montiel***

General Manager

Country Department for

Mexico, Panama and the Dominican Republic

Inter-American Development Bank





# ACKNOWLEDGEMENTS

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# EXECUTIVE SUMMARY

In the years prior to the financial crisis, the countries of Central America, Panama and Dominican Republic undertook the task of creating fiscal space with the aim of setting the region on the path to growth and providing some protection against possible external shocks. These achievements were tested during the last financial crisis, when the region was able to relax its fiscal stance and successfully lessen the impacts of the crisis. More than four years after the crisis, however, fiscal deficits of the countries of the region remain high, eroding their room to maneuver and steadily increasing public debt. The region needs to rebuild its fiscal space and strengthen economic growth. The economic recovery of the United States, the region's key partner, and the decline of oil prices seen since June 2014, provide a window of opportunity to increase growth and reduce the vulnerabilities inherited from the financial crisis.

This report explores two of the main legacies of the financial crisis in the context of the current favorable environment. The first is the increase in public debt as a result of larger fiscal deficits. This in turn has eroded the fiscal space to maneuver in response to any future downturn in the economic cycle, implying higher risk perceived by international investors. Chapter 2 analyzes how the region could take advantage of the favorable environment to improve the risk perception of international investors. It highlights the importance of the fiscal agenda for the achievement of this end, but also emphasizes the need to undertake a broader agenda of institutional reforms, and to grasp the opportunity provided by the current favorable phase of the cycle. As the credit profile of the region improves, the more likely it will have access to at lower rates. Thus, making it easier to finance counter-cyclical fiscal policies to mitigate the effects of negative shocks.

The crisis also triggered significant changes in the patterns of external flows. Greater access to external sources of finance at lower rates led to increased external debt and multiplied domestic financial flows between sectors. Chapter 3 shows how this new dynamic makes the financial systems of the region more complex, increasing the probability that negative shocks will spread from one economic sector to the others. The chapter also portrays how authorities may react to the negative impacts of a reversal in external financial flows, either by permitting an economic contraction or by generating liquidity fiscally. Furthermore, chapter 3 spells out a series of policy options for the

new international financial environment geared to minimize the costs of a possible future international financial shock.

If the winds were to change? It is always possible that the benign prevailing conditions might change, transforming the region's prospects. Chapter 4 of the Macroeconomic Report 2015 provides a brief analysis of the impact that a less favorable outlook could have on growth prospects in the next two years. It examines the effects of different shocks on the region: oil prices rising at a faster pace than expected; an economic slowdown in the United States; an increase in financial volatility; and finally, all three shocks combined. The results of the simulations suggest the region would need to adapt to lower growth. Thus, this chapter shows the importance for the countries in the region of reducing their vulnerability to changes in the external environment, reinforcing the analysis and arguments of earlier chapters.



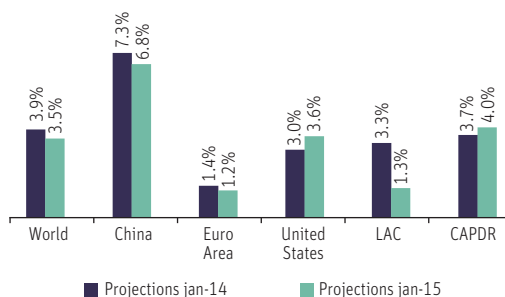
# THE MACROECONOMIC CHALLENGES FOR THE REGION

The substantial opening of the countries of Central America, Panama and the Dominican Republic (CAPDR or the region) makes them especially vulnerable to external shocks, as the international financial crisis of the past decade has revealed. This has presented major macroeconomic challenges to the region in recent years. After the international crisis, the expansive monetary policy of developed countries produced an environment of high liquidity in which leverage was possible at lower cost. Although the region is progressively recovering to its former levels of economic growth; yet, it has not been enough. The countries appear to be converging towards a new equilibrium of low growth at the cost of high fiscal and external deficits. However, the international context is changing, creating opportunities for the region.

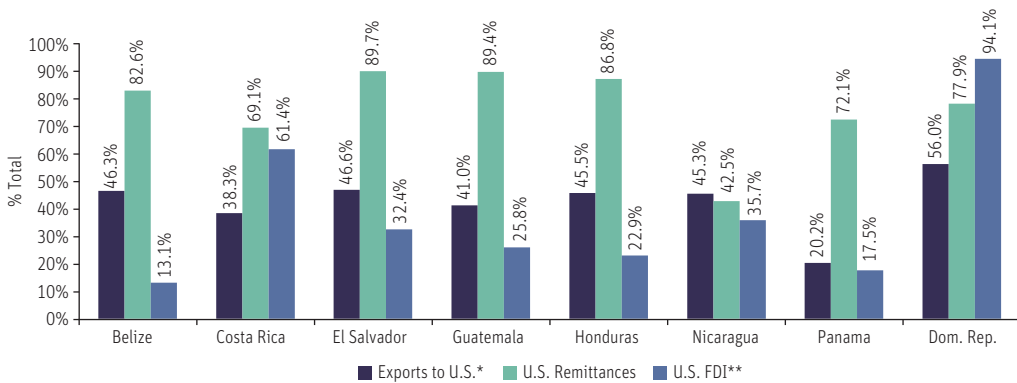
The Graph 1.1 shows that growth forecasts for the United States, the biggest trade and financial partner of CAPDR, have improved to 3.6% in 2015 (0.8 percentage points more than the actual growth in 2014) in a context in which the growth expectations for the largest economies in the rest of the world were downgraded. This explains the improvement in the forecast growth for CAPDR in 2015 (to 4%) despite the decline in the growth expectations for Latin America and the Caribbean (LAC).

The CAPDR's high degree of dependence on the United States economy (see Graph 1.2 and Graph 1.3) could provide a lift to the region, through its stimulus to external demand, transfers of remittances and foreign direct investment (FDI) flows, which continue to be the main source of financing for its current account deficits (which represent 5% of the regional Gross Domestic Product, GDP, in 2010–2014, the post-crisis period). In particular, Graph 1.3 shows that, on average, 27.1% of regional GDP is attributable to the bilateral relationship between

**GRAPH 1.1 Annual Real GDP Growth Prospects by Economic Zones, 2015**



Source: Latest Departmental Forecasts (International Monetary Fund, January 2014 and 2015).

**GRAPH 1.2 CAPDR Dependence on U.S., by Totals, 2012**

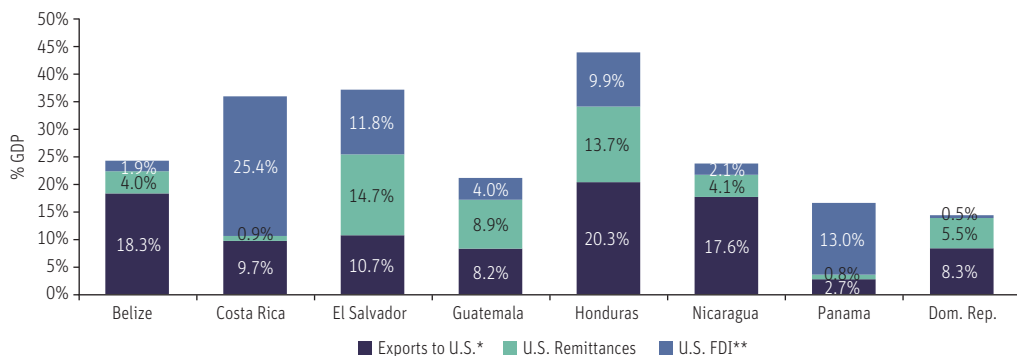
Source: World Bank, UN Comtrade and UNCTAD.

Note: \*does not include services. \*\*refers to the stock of FDI.

the region and the United States, of which approximately 12% of GDP is represented by exports, 8.6% by the stock of FDI and remittances accounting for the remainder. The most dependent economy is Honduras (43.9% of GDP), and the less dependent is Dominican Republic (14.3% of GDP).

At the same time, the world seems to be heading towards a lower level of commodity prices. Graph 1.4 shows that, despite a slight increase in the coffee price, the overall trend since 2011 is downward. This might cast doubt on the region's trade recovery, but it should be noted that the significant fall in oil prices in 2015 could produce a significant price-related improvement in the region's trade balance (as oil represented approximately 20% of total CAPDR expenditure on goods imports in 2014).

Graph 1.5 shows the net oil import position of the region, as well as the important weight that the oil trade balance has on the regional GDP (6.4%) and its close relationship with the total trade

**GRAPH 1.3 CAPDR Dependence on U.S., by GDP, 2012**

Source: World Bank, UN Comtrade and UNCTAD.

Note: \*does not include services. \*\*refers to the stock of FDI.

balance (which, in 2014, recorded a deficit of 17.3% of regional GDP). Considering this circumstances, an international environment of low oil prices could therefore facilitate a reduction in the region's import bill, producing a favorable impact on the external trade balance.

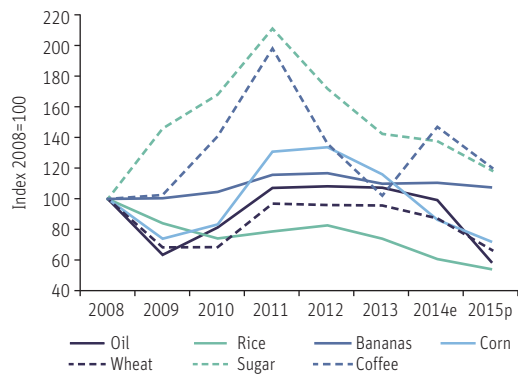
However, there are also risks arising from the international environment. The economic recovery in the United States has led to the reversal of their expansive monetary policies, which is affecting the interest rates and calling into question the sustainability of emerging countries' public debt. As a result, the perception of risk in CAPDR countries has worsened, leaving little space to mitigate the effects of future crises and questioning the sustainability of the deficit until higher level of growth are achieved. In spite of this, there is still an opportunity to introduce gradual reforms that prepare the countries for an external environment always dynamic.

The reversal of loose monetary policies and the higher perception of credit risk in the region are set against an environment that is leaning towards lower oil prices and stronger economic growth of the main trade partner, United States. Consequently, the region could set off on a path of enhancing its macroeconomic policy framework, taking advantage of the window of opportunity that remains open.

## THE MACROECONOMIC OUTLOOK OF THE REGION IN A NEW CONTEXT

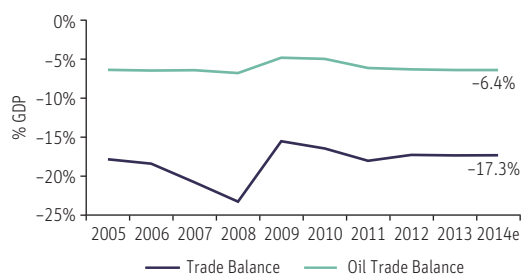
The behavior of the main macroeconomic indicators of CAPDR in 2014 was very similar to 2013. The gradual descent of international commodity prices eased pressure on the overall level of local prices; so that inflation ended 2014 at 3.6% (see Graph 1.6). This made it possible for monetary policy to be less focused on the inflation target and more favorable to promote economic growth.

**GRAPH 1.4 Price of Commodities**



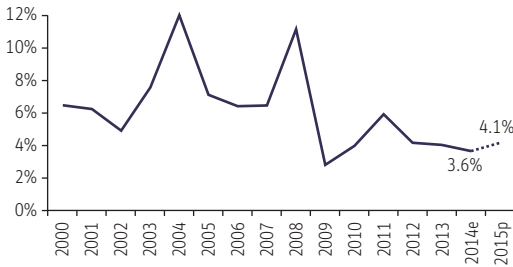
Source: Commodity Prices (International Monetary Fund).  
Note: e = expected, p = projected.

**GRAPH 1.5 Total Trade Balance and the Oil Balance for CAPDR**



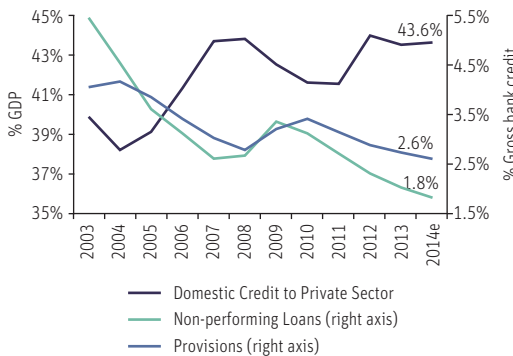
Source: World Economic Outlook (International Monetary Fund, October 2014).  
Note: e = expected.



**GRAPH 1.6 Inflation: CAPDR**

Source: World Economic Outlook (International Monetary Fund, October 2014).

Note: e = expected, p = projected.

**GRAPH 1.7 Quality of the Loan Portfolio: CAPDR\***

Source: World Bank, SECMA and IDB Staff.

Note: \*does not include Belize. e = expected.

Similarly, the region's banking system remains solid. Graph 1.7 shows how the domestic credit maintained a similar level of leverage in private economic activity compared to previous years, with loans to private sector averaging 43.6% of regional GDP in 2014. In addition, there was a reduction in non-performing loans and therefore in bank provisions to cover them. This reflects the average credit quality in the region after having deteriorated during the global crisis. This achievement is mostly attributable to lower inflation and exchange rate management which has provided stability in local nominal interest rates.

Meanwhile, the current account position is also relatively favorable. It is possible that the trends in external conditions are likely to improve the regional balance (see Graph 1.8). In 2014, CAPDR countries had an average external deficit of 6.7% of GDP; exports and imports of goods around 21.3% and 39% of GDP, respectively; and remittance receipts equivalent to 8.5% of GDP (USD 20,415.7 million in total).

Now, given that: a) the United States, the main CAPDR trade partner, has improved its growth outlook to 3.6% in 2015, b) the unemployment rate of Latinos or Hispanics in the U.S. is expected to fall from 7% in 2014 to 6.4% in 2015, and c) the international oil price is likely to remain close to lower levels as experienced at the beginning of the year, being clearly lower than those of 2014;<sup>1</sup> the region's current account deficit could shrink from 6.7% to 3.2% of GDP, not only because of the increase in exports of goods and fall in imports (to 23.7% and 37.3% of GDP, respectively), but also thanks to a continued rise in remittance income (forecast to rise by 5.7% in 2015).

In this relatively positive environment, the fiscal position continues to be the main challenge. In 2014, the regional fiscal deficit averaged 3.5% of GDP, close to its 2013 level, with central government

<sup>1</sup> Taking an average of the oil price estimates from different commodity price sources, the reduction for 2015 could take the price to USD 57.4 per barrel (see, for instance, U.S. Energy Information Administration and Commodity prices – International Monetary Fund).

revenue and expenditure also remaining at similar levels of 19.6% and 23%, respectively. Despite the new growth environment and lower oil prices, the fiscal impacts are only marginally positive. So, a fiscal deficit of 3.2% of GDP is expected in 2015, compared to 3.5% in 2014 (see Graph 1.9).

To translate higher economic activity into higher fiscal revenues, CAPDR need to recognize its dependency on tax incentives to attract FDI. Clearly, the region faces pressure from international tax competition and, traditionally, fiscal incentives in the free economic zones have been an important tool to attract FDI. These systems of incentives to subsidize exports have proven to be very costly for the region and have constrained the tax base.<sup>2</sup> Therefore, unless the new revenues are complemented by measures to review institutional channels and by alternative mechanisms to attract investment, the recovery of economy will not be sufficient to prevent deterioration in the public finances of the region, which will continue to affect its creditworthiness. Thus the main challenge that the region continues to face is fiscal consolidation.

In this environment, a growth rate of 4.0% is expected for 2014, higher than in previous year but still below the average growth rate of 5.6% in the period 2004–2007. Therefore, the region seems to be converging to a growth path that would be between the long-term rate of 3.6% in 1980–2013 and the 4.3% averaged during the past decade (see Graph 1.10). This implies that the regional recovery after the financial crisis was only a first step towards narrowing the gaps, and is advancing with mixed results. Although lessons have been learned from past mistakes, risks remain.

In particular, it is evident that the region is not immune from the impact of the withdrawal of monetary stimulus in the United States on global interest rates and financial flows. This may persuade investors to keep their assets in the U.S., constraining the supply of short and long-term funds to the region. In this scenario, the risk of encountering a new external shock could increase

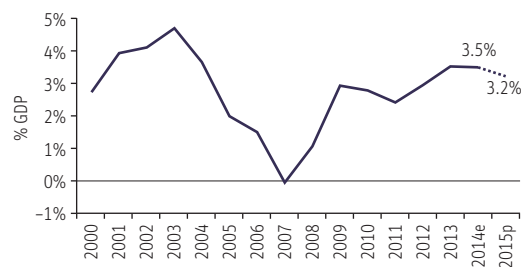
**GRAPH 1.8** Current Account Deficit in a Better Outlook: CAPDR



Source: U.S. Bureau of Labor Statistics, World Economic Outlook (International Monetary Fund, October 2014); Commodity Prices (International Monetary Fund); and IDB Staff.

Note: e = expected, p = projected.

**GRAPH 1.9** Fiscal Deficit in a Better Outlook: CAPDR

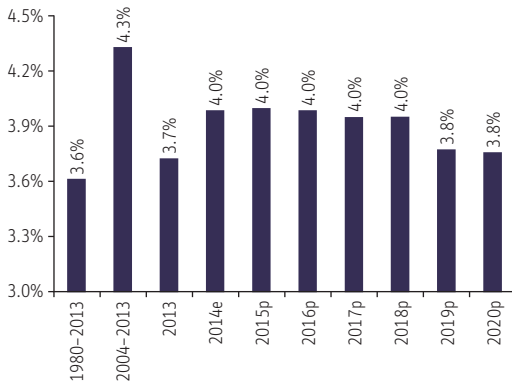


Source: World Economic Outlook (International Monetary Fund, October 2014) and IDB Staff.

Note: e = expected, p = projected.

<sup>2</sup> See Barreix and Velayos (2012).

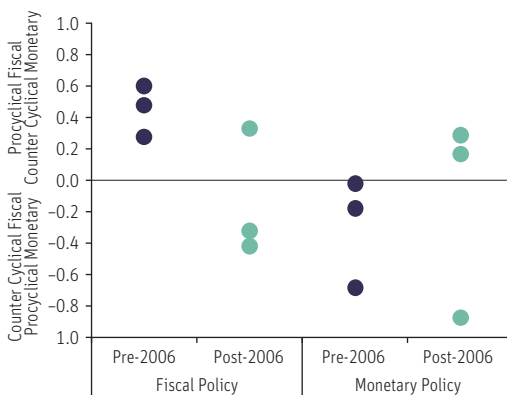
**GRAPH 1.10 Real GDP Growth in the Long Term: CAPDR**



Source: World Economic Outlook (International Monetary Fund, October 2014) and Latest Departmental Forecasts (International Monetary Fund, January 2015).

Note: e = expected, p = projected.

**GRAPH 1.11 Cyclicity of Economic Policies During Crises: CAPDR\***



Source: IDB Staff based on data from Central Banks, CEPALStat, International Monetary Fund, Latin Macro Watch and SECMCA.

Note: \*Results for Belize, Costa Rica and the Dominican Republic.

to the point where CAPDR countries are obliged to react via fiscal policy.

## LESSONS FROM THE CRISIS

The recent financial crisis confirmed that CAPDR is not isolated from business cycles in international dynamics and, still more importantly, revealed that the majority of the countries of the region have learned to avoid procyclical fiscal policies. Studying the cyclicity between economic policies and real GDP, the responses during the crisis episodes is detailed in Graph 1.11. In the graph is presented the responses of fiscal and monetary policy to crises<sup>3</sup> for the 2000–2005 and 2006–2012 periods. For fiscal policy, a positive sign of the indicator indicates procyclical policy; when the sign is negative, policy is countercyclical. For monetary policy, the opposite applies. Of the eight countries in CAPDR, only three suffered several episodes of output crisis which allow a comparison between policy before and after a given time.<sup>4</sup>

Distinguishing between the region's responses to external shocks before and after 2006,<sup>5</sup> it emerges that the crises prior to

<sup>3</sup> To obtain the results shown, quarterly seasonally adjusted data were used and the cyclical component of the real GDP series, real fiscal spending (the fiscal instrument) and of the short-term interest rate (the monetary instrument) were calculated. Rolling correlations were also calculated, at one year prior to and after a production crisis period, between the cyclical components of each policy instrument with that of GDP. In this analysis, a production crisis starts at the moment at which real GDP is below its moving average for the previous year for at least two quarters, and ends when its value exceeds the level of real GDP immediately before the beginning of the crisis.

<sup>4</sup> Belize, Costa Rica and the Dominican Republic.

<sup>5</sup> The year 2006 was chosen as a period without crisis in the region and to be able to compare whether there was effectively some learning process in policy orientation during the region's crises. The study was carried out for Belize, Costa Rica and the Dominican Republic.

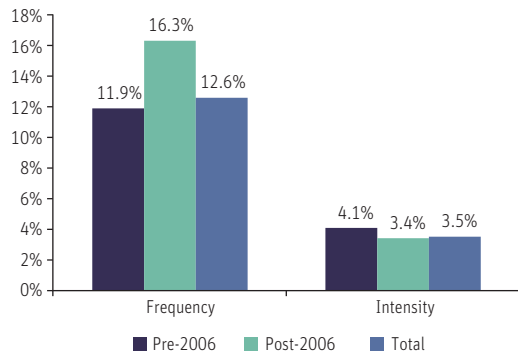
2006 were mainly tackled through the adoption of procyclical economic policies. By contrast, after 2006, particularly during the global crisis, the fiscal policy stance was countercyclical (an expansive response). For its part, the monetary response was generally less restrictive than before. That is, it would appear that the region “has graduated” in the application of countercyclical policies.

At the same time, past experience suggests that the fiscal and monetary policy orientation of CAPDR countries can affect the scale of the crises, and that a response to downturns in the cycle can mitigate its volatility. Indeed, this seems to have been the case, although CAPDR spent an average of 16.3% of its time in crisis (measured in quarters) in the post-2006 period, its output was less affected than in past crises (3.4% the biggest average contraction, Graph 1.12). This was possible because before the crisis, adjustment policies and debt forgiveness had allowed CAPDR countries to progressively reduce their public debt, improve the near-term credit profile for investors and increase the fiscal space for countercyclical policies.

Graph 1.13 confirms that before the crisis, the CAPDR region was already gaining credibility among investors and improving the perception that the countries could meet their debt obligations. At the same time, total public debt fell, from 55% of regional GDP in 2003 to 28.7% of GDP in 2008, in line with the region’s progress in reducing the fiscal deficit experienced by the region.

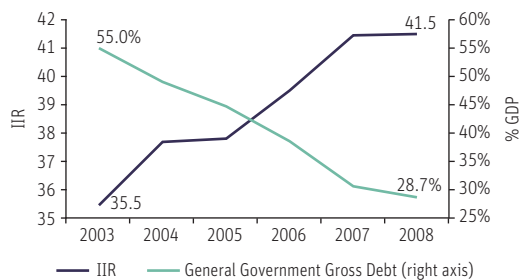
This event has helped to change the structure or composition of the region’s public financing. CAPDR has been gradually restructuring its total public debt portfolio, increasing the share of domestic liabilities, in the hands of local creditors, in national currency and long-term. Table 1.1 shows the region’s debt emissions during the last five years. In summary, two aspects can be appreciated. Firstly, the terms have been lengthening. Between the years 2009 and 2011, the average issue had a maturity of about 10 years. Between the years 2013 and 2014, the average maturity for debt issuance was 18 years. Secondly, the costs are lower. Between the years 2009 and 2011, the average 10 year issuance paid a yield of 6.20%. Between the years 2013 and 2014, the average yield for 10 year debt issuance was 5.49%.

**GRAPH 1.12 Characteristics of the Crises: CAPDR**



Source: IDB Staff based on data from Central Banks, National Statistical Institutes and SECMCA.

**GRAPH 1.13 Creditworthiness (Institutional Investors Rating, IIR) and Public Debt: CAPDR\***



Source: *Institutional Investor Magazine* and *World Economic Outlook* (International Monetary Fund, October 2014).

Note: \*does not include Belize. IIR is an index that associate a value between 0 to 100 to the credit quality.

**TABLE 1.1 International Bond Issues by Governments in CAPDR\***

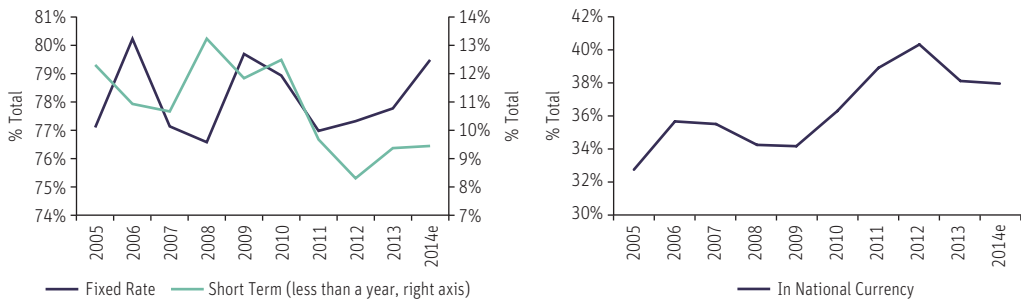
Country	Issue date	Maturity	Term (years)	Coupon
Costa Rica	11/21/2012	1/26/2023	10	4.25%
	4/30/2013	4/30/2025	12	4.38%
	4/30/2013	4/30/2043	30	5.63%
	4/4/2014	4/4/2044	30	7.00%
Dominican Republic	6/5/2010	6/5/2021	11	7.50%
	4/18/2013	4/18/2024	11	5.88%
	10/28/2013	1/28/2024	10	6.60%
	4/30/2014	4/30/2044	30	7.45%
El Salvador	1/12/2009	1/12/2019	10	7.38%
	1/2/2011	1/2/2041	30	7.63%
	5/12/2012	1/30/2025	12	5.88%
	9/18/2014	1/18/2027	12	6.38%
Guatemala	6/6/2012	6/6/2022	10	5.75%
	2/13/2013	2/13/2028	15	4.88%
Honduras	3/15/2013	3/15/2024	11	7.50%
	12/16/2013	12/16/2020	7	8.75%
Panama	11/23/2009	1/30/2020	10	5.20%
	6/24/2011	6/15/2018	7	5.00%
	1/30/2012	7/25/2022	10	5.63%
	4/29/2013	4/29/2053	40	4.30%
	9/22/2014	9/22/2024	10	4.00%

Source: Bloomberg (December, 2014).

Note: \*Risk rated international debt issues. Does not include Nicaragua, which reported issuance of only short-term domestic Central Bank notes.

This implies that after the crisis, the share of short-term debt has diminished (to represent 9.5% of total public debt in 2014, as can be seen in Graph 1.14).<sup>6</sup> In principle, this suggests a lower average risk for debt refinancing, although the amount of short-term debt remains significant for the region (at around 4.2% of regional GDP). In addition, after a fall provoked by the financial crisis, the public debt profile regained the share that was financed at fixed interest rates (in 2014, this represent 80% of the total), which gives the region a buffer against increases in international interest rates. Finally, the share of debt in national currency increased, reducing the risks of mismatches between the currency composition of debt and the composition of production, which tend to exacerbate the fiscal impacts of an external shock.

<sup>6</sup> Short-term public debt is associated with public sector liabilities, whose maturity is less than or equal to one year (for instance, domestically issued Treasury notes).

**GRAPH 1.14 Profile of the Total Public Debt: CAPDR\***

Source: Central Banks and National Ministries.

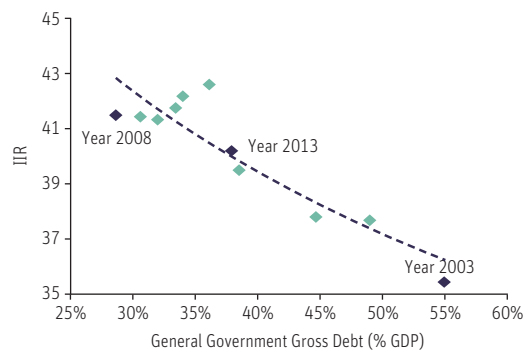
Note: \*includes Costa Rica, Honduras, Panama and the Dominican Republic. e=expected.

Therefore, the region built up sufficient credibility before the financial crisis to be able to adopt countercyclical policies. In addition, it took advantage of international financial conditions to improve its debt profile. However, it generated some risks, which are analyzed in detail below.

## THE RISKS INHERITED FROM THE CRISIS

The fiscal position is one of the main risks inherited from the financial crisis. CAPDR used its fiscal space to mitigate the impacts of the crisis and stimulate economic activity through higher spending. Unfortunately, the spending increase was concentrated on current spending, most of which is rigid, making it difficult to bring spending back down. This is reflected in the high fiscal deficits recorded in the years subsequent to the crisis.<sup>7</sup>

Between 2003 and 2007, investors perceived the performance of CAPDR countries as positive, encouraged by the reduction in public debt and the advances in fiscal consolidation processes. But the response by CAPDR to the financial crisis of 2008–09 bore witness to the countries' macroeconomic weaknesses.

**GRAPH 1.15 Relationship between Debt and Creditworthiness: CAPDR (2003–2013)\***

Source: *Institutional Investor Magazine* and *World Economic Outlook* (International Monetary Fund, October 2014).

Note: \*does not include Belize.

<sup>7</sup> See Graph 1.9.

Now there has been a deterioration in the region's creditworthiness. Graph 1.15 shows how the public debt in 2013 which was, on average, around 55% of GDP, was associated with a higher perception of risk by investors than the results at 2008, of 28.7%, where the debt reaches its lowest value in the decade. From that moment until 2013, the region increased its liabilities, eroding its fiscal space to respond to economic downturns.

This situation reinforces the need to tackle the fiscal agenda once more. The international context for this task is favorable. Higher growth will allow higher fiscal revenues. Moreover, lower oil prices can improve the fiscal balance. Izquierdo and Manzano (2012) explain that, on average, the previous increase in the oil prices had created an additional fiscal burden of more than 1% of GDP, related to subsidies and reductions in tax rates. The extent to which the fiscal burden can be eased in response to the new lower price levels will depend on the amount by which these subsidies are adjusted and tax revenues restored.

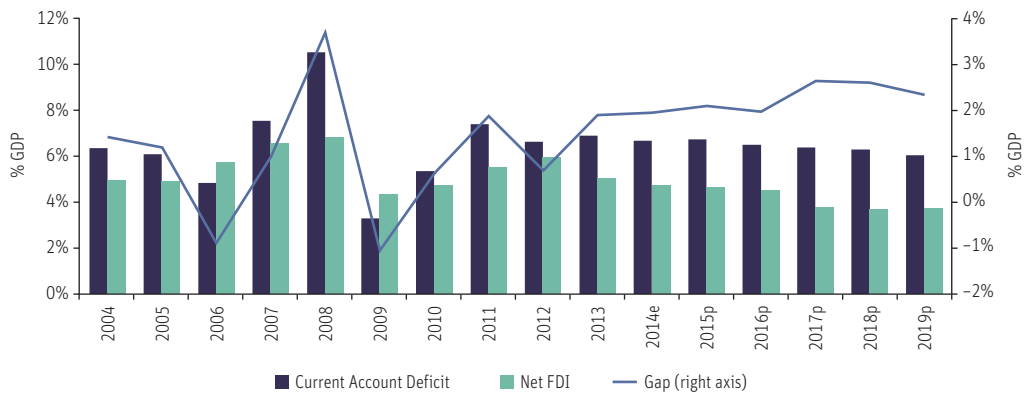
As analyzed in Chapter 2 of this publication, this favorable environment could be used to improve international financial agents' perception of the region. This would give the region more balanced access to international financial markets (between periods of crisis and growth) and facilitate the implementation of more effective countercyclical policies. As this chapter highlights, the fiscal agenda is important in terms of its impact on perceptions, but a broader agenda of institutional reforms, which could be implemented in this favorable phase of the cycle, is also necessary.

Regarding the fiscal agenda, as highlighted by Izquierdo et al. (2013), the countercyclical policy of the region was successful, but the problem was the instrument used. As they stress, much of the increase in spending was in the form of rigid expenditures, such as salaries and transfers, making it difficult to withdraw the fiscal stimulus once the economy had recovered. This points to an agenda focused on reducing subsidies, civil service reform, and improvements in public service efficiency, among other things.

Finally, it is important to restore tax revenues. Although nominal fiscal revenues have recovered by 43.1% since 2010, their growth as a share of GDP has been modest (an increase of just 0.5 percentage points, to a 19.6% of GDP), in spite of the fact that the region implemented reforms which, on average, should have yielded 1.4% of GDP (Izquierdo and Manzano, 2012). Two areas of erosion are identified: firstly, there is the approval of tax reforms to "replace" the end of exemptions given to countries of the region so that fiscal benefits used to boost exports (tax-free zones). As analyzed by Gutiérrez and Manzano (2014), these measures have high fiscal costs with few benefits for development. Secondly, there are deficiencies in tax administration, and solving these is one of the pending tasks for the region.

Similarly, the crisis caused significant changes in the patterns of external flows. As was argued by Gutiérrez and Manzano (2014) and can be seen in Graph 1.16, the region went from financing its current account deficit mainly with FDI to a greater dependence on financial portfolio flows. As discussed in Chapter 3, the total external debt of the region increased.

However, not only did external debt increase, but also internal financial flows multiplied. This makes the financial systems of the region more complex and increases the probability of contagion

**GRAPH 1.16** Deficit on Current Account and Foreign Direct Investment Flows to CAPDR

Source: World Economic Outlook (International Monetary Fund, October 2014).

Note: e = expected, p = projected.

between the different actors in the system. As a result, a reversal of external financial flows could have a significant impact on local economies, presenting governments with a dilemma: to allow an economic contraction or create liquidity via fiscal instruments. As analyzed by Izquierdo and Manzano (2012), credit booms in Central America are followed by a drastic reduction in growth rates; therefore, the pressure to look to fiscal remedies to mitigate the crisis.

In this regard, Izquierdo and Manzano (2012) argue that after the global financial crisis, the focus of debate has shifted towards the inclusion of an additional dynamic component in the design of financial regulation. Dynamic provisioning schemes require banks to build a provisional fund (additional to the static component) during the “good times” in anticipation of losses on unpaid loans that materialize during “bad times”. Beyond this, Chapter 3 presents a series of policy options to reduce the costs of a potential international financial shock in the new international financial environment.

The region is at a propitious moment, in which it needs to recognize its strengths, threats and risks and be able to respond accordingly. In general, the environment is positive, as shown in Chapter 4. A scenario of higher growth in the United States and lower oil prices could have a significant positive impact on the region’s growth. However, the financial picture is uncertain and interest rates are likely to increase. This would negatively affect the growth gains derived from low oil prices and recovery in the United States. It is necessary to take advantage of this particular window of opportunity, not seen in the region on a long time. The region need to pay attention to this context to improve the conditions for fiscal and external support, rethink the incentives used to attract capital and move ahead with sustainable growth strategies where prevail a greater fiscal, monetary and financial coordination.





# II

## DEBT AND CREDIT QUALITY

**D**uring the years prior to the international financial crisis (2008–09), the countries of Central America, Panama and Dominican Republic (from here on, CAPDR or the region) conducted processes of fiscal consolidation, which enabled them to reduce their levels of public debt and create some fiscal room for maneuver. This allowed the authorities to carry out an expansionary fiscal policy to mitigate the effects of the financial crisis. As the CAPDR Macroeconomic Report 2013 of the Inter-American Development Bank (IDB) set out, the increase in spending in response to the crisis was biased toward rigid current spending in the majority of countries of the region. This dynamic, combined with a reduction in tax revenues, produced persistent fiscal deficits from 2009 onwards, and, consequently, significant growth in public debt.

The continuous growth in debt, without clear signs of fiscal consolidation, and given the lack of reforms to rebuild fiscal space to withstand future crises, has caused investors to increase their perception of risk in the region. This dynamic could raise financing costs and limit access to the international resources needed to resolve the social and productive investment gaps the region faces.

This chapter analyzes the relationship between debt levels and credit ratings of the region and identifies the factors which affect this relationship. Recommendations and policy guidelines based on this analysis are presented for the region.

### WHAT DETERMINES INVESTORS' VIEW?

Traditionally, it has been thought that lower levels of indebtedness in an economy are related to a better risk rating in financial markets, as less debt is associated with greater public sector capacity to meet obligations. However, different studies have found that this negative relationship is not always true, and instead it depends on a large number of factors. For instance, studies based on the debt intolerance<sup>1</sup> approach find that the ability of a government to manage

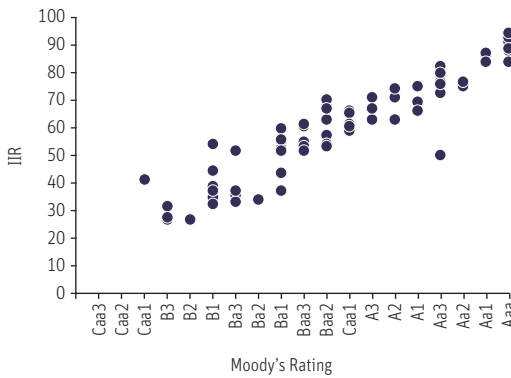
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<sup>1</sup> Developed initially by Reinhart *et al.* (2003) and recently revised by Bannister *et al.* (2011).

a given level of public debt (or its *debt tolerance*) is explained by differences in the economy's structural variables, such as per capita income and credit and inflation history. This analytical framework seeks to clarify why economies such as Japan enjoy lower financing costs despite having a debt-to-gdp ratio in excess of 200%, while others, with a much lower debt burden, have to pay higher interest rates.

In this chapter the Institutional Investor Rating (IIR)<sup>2</sup> is used as a proxy for credit quality, given that it has a high correlation with the risk ratings published by ratings agencies such as

**GRAPH 2.1 The IIR And Credit Ratings**

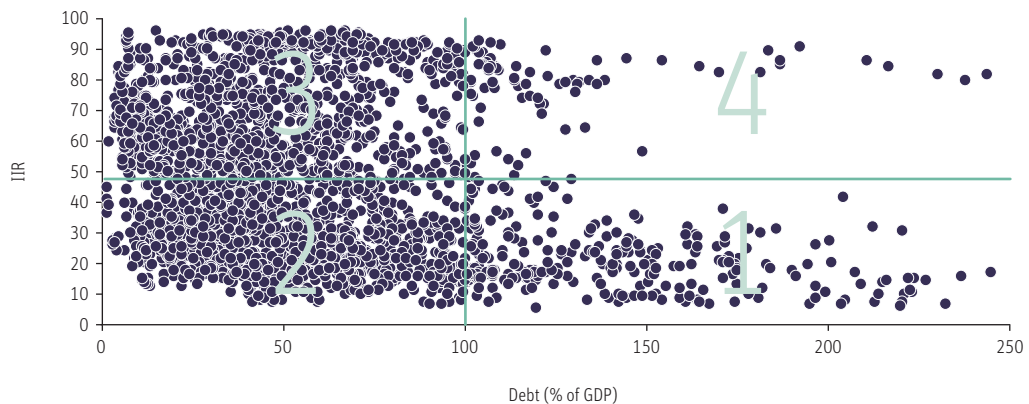


Source: IDB staff based on debt data for each country and *Institutional Investor Magazine*.

Moody's (see Graph 2.1). Examining the relationship between the IIR and the stock of debt for a sample of 104 countries between 1989 and 2013, it can be seen that the relationship between these variables is not uniform (see Graph 2.2).

Which are the characteristics, beyond the level of debt, that explain the differences in the credit perception? To answer this question, the sample is first divided into groups (or clusters) based on debt levels and credit ratings. At the same time other variables, such as institutional strength,<sup>3</sup>

**GRAPH 2.2 Apparent Inverse Relationship and Regions 1989–2013**



Source: IDB staff based on Moody's and *Institutional Investor Magazine*.

<sup>2</sup> The IIR is an index constructed by *Institutional Investor Magazine* from semi-annual surveys of economists and sovereign risk analysts from different institutions that assign a score of between 1 and 100 per country in accordance with the perceived probability of cessation of payments. The valuations are weighted according to their participating institution's global exposure.

<sup>3</sup> Measured by the control of corruption index from the World Bank's Governance Indicators.

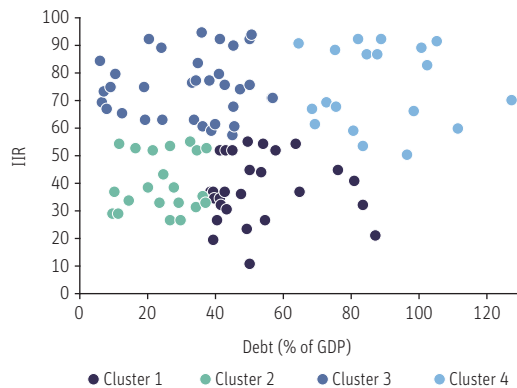
productive structure,<sup>4</sup> income,<sup>5</sup> financial development, as well as their history of inflation and bankruptcy, are examined to approximate economic fundamentals in various dimensions.

Four groups are formed based on the available statistical information. These implicitly respond not just to disparities in debt and credit quality, but also to measurements of economic fundamentals in each country. Graph 2.3 shows clusters identified for the five year period of 2009–2013 and Table 2.1 presents the basic statistics of each group.<sup>6</sup>

- i. Countries with high levels of debt as a percentage of GDP (between 40% and 80%) and low credit rankings. Egypt, Vietnam, Nicaragua and Belize<sup>7</sup> are countries belonging to this group.
- ii. Countries with average credit ratings and lower levels of debt (averaging 24% of GDP). Paraguay, Bulgaria, Costa Rica, Honduras, El Salvador, Guatemala and Dominican Republic would belong to this group.
- iii. Countries with high credit ratings and low levels of debt (32% of GDP, on average). Emerging economies such as Mexico, Colombia, Chile and Panama would belong to this group.
- iv. Countries with solid economic fundamentals (low levels of inflation, good credit history and high per capita income) with a good credit rating but with high levels of debt (equivalent to 84% of GDP, on average). The United States and Japan would belong to this group.

Table 2.2 illustrates the relative difference between groups and clusters in terms of some economic fundamentals. Comparing Clusters 1 and 2, we find that both have a similar perception of credit quality, in spite of the fact that the second group has significantly lower debt levels than the first. Analyzing the structural characteristics, it can be observed that the higher level of debt

**GRAPH 2.3** Relationship Between Debt and Credit Rating Clusters—2009–2013



Source: IDB staff based on debt data from each country and from *Institutional Investor Magazine*.

<sup>4</sup> Quantified by the industrial complexity index from the Atlas of Industrial Complexity constructed by the John F. Kennedy School at Harvard. The index extrapolates the value added of exports to a measure of industrial complexity for the country.

<sup>5</sup> Approximated by per capita Gross Domestic Product.

<sup>6</sup> To create these groups a type of k-means clustering was used.

<sup>7</sup> The subsequent analysis does not include Belize, given that its IIR data is available only for 2012 and 2013.

**TABLE 2.1 Statistical Summary** (Averages in % of GDP, Except Where Otherwise Indicated)<sup>a</sup>

Indicator	Cluster 1	Cluster 2	Cluster 3	Cluster 4
IIR <sup>b</sup>	36.9	40.0	74.3	76.7
Debt	49.4	23.9	32.1	83.8
Balance Current Account	-4.6	-1.7	3.8	-0.3
Tax Burden	30.0	25.0	34.5	40.1
Complexity	-0.3	-0.6	0.7	1.0
Depth	47.8	37.5	75.8	191.9
Integration	-44.9	-30.3	21.3	-26.4
Control of Corruption <sup>b</sup>	-0.5	-0.6	0.7	1.2

Source: IDB staff with data from *Institutional Investor Magazine* and the International Monetary Fund (2014).

Note:

<sup>a</sup> "Tails" were eliminated in each indicator (per cluster) to avoid outliers' effects.

<sup>b</sup> Index

in group 1 (relative to group 2) seems to be offset by greater financial depth and a more complex productive structure. On the other hand, the institutional strength of both clusters seems similar.

The countries of Cluster 3 exhibit credit valuations above those of group 2, despite having higher public indebtedness. This greater capacity to tolerate debt is associated with greater institutional strength, measured by control of corruption, rule of law, accountability, safety, and transparency. Group 3 also has a more diversified productive structure.

**TABLE 2.2 Relevance of Factors Between Clusters to Improve the IIR**

		Cluster 1 Cluster 2	Cluster 2 Cluster 3	Cluster 3 Cluster 4	Cluster 1 Cluster 4
Governance	Corruption	Medium	High	Low	High
	Rule of Law	Medium	High	Low	High
	Accountability	Medium	High	Low	High
	Security	Medium	High	Medium	High
	Transparency	Medium	High	Medium	High
Productive Structure	Complexity	Medium	High	Medium	High
Financial Sector	Financial Depth	High	Medium	Medium	High
Importance*		Minimum	Low	Medium	High

Source: IDB staff.

\* Low correspond to a statistical significance between 10% and 15%, Medium between 5% and 9.9%; and High between 0% and 4.9%.

Finally, comparing groups 3 and 4, the importance of structural factors in the perception of credit quality can be seen. Both groups have similar credit rankings despite the higher average levels of debt of group 4 (32.1% and 83.8% of GDP, respectively). This suggests that investors appear to be incorporating in their valuation of credit quality greater institutional strength, higher GDP per capita, and a more diversified productive structure of the countries in group 4.

## BUT YOU DON'T LIVE ON DEBT ALONE...

The documented differences suggest that the debt level is one of many factors, which determines creditworthiness and its impact varies between different groups of countries. We, therefore, conjecture that economic fundamentals have a different impact on risk perception, in accordance with the group to which the country belongs, which might ease pressure on the debt adjustment necessary to improve creditworthiness. Consequently, there are two types of approaches countries could focus on to improve credit quality. On one hand, there are a set of actions which could be carried out in the short-run to move within a particular group or cluster. On the other, there are actions which in the medium-term may enable a country to move to a group with better credit perception.

In this section, we present estimations for each cluster with the aim of quantifying potential differentiated effects of the debt levels and economic fundamentals on creditworthiness. This builds on the model proposed by Bannister *et al.* (2011) by including variables that represent economic fundamentals.<sup>8</sup>

In general terms, we find the existence of an inverse relationship between debt and creditworthiness. The results also suggest that the observed distinctions between clusters are reflected in the way in which adjustments in the debt have differentiated effects on creditworthiness. Such differences are supported by results which confirm how other characteristics of the economy—namely control of corruption, depth of the financial system or the complexity of the productive structure—maintain a positive relationship with the IIR.

In addition, the estimations confirm the existence of differentiated degrees (by cluster) of sensitivity between creditworthiness and the level of public indebtedness, with the following conclusions derived from the analysis (see Table 2.1 and Graphs 2.4–2.7):

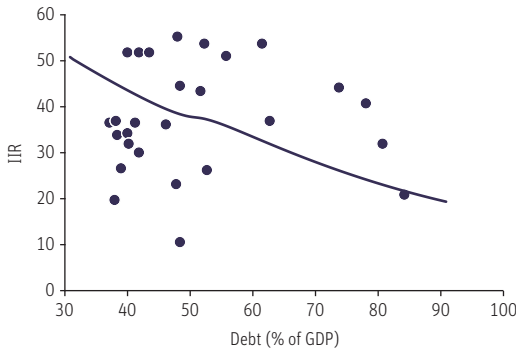
- For the countries in Cluster 1, it is found that each reduction in debt equivalent to 1% of GDP produces, on average, an increase of 0.5% in the creditworthiness index (IIR).<sup>9</sup>

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<sup>8</sup> See Annex 1 for greater detail on the methodology.

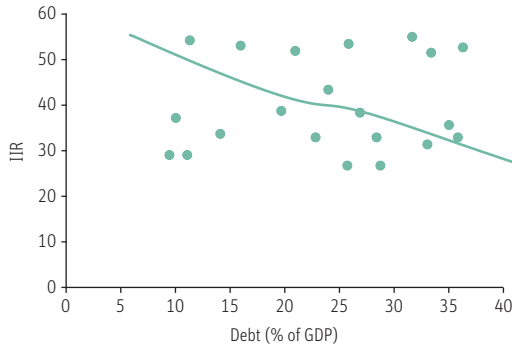
<sup>9</sup> It is important to take into account that the impacts reported here are calculated for the average country in each cluster. In accordance with the model employed, the impact depends on the stock of debt specific to each country. Therefore, the heterogeneity in each group produces varying effects. For example, in the case of cluster 1, the impact of a debt adjustment of 1% of GDP on the IIR varies by between 0.4% and 1.1%.

GRAPH 2.4 Cluster 1



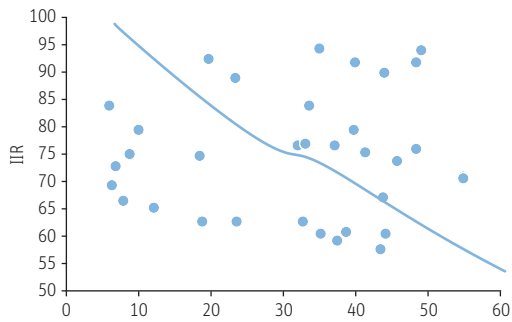
Source: IDB staff.

GRAPH 2.5 Cluster 2



Source: IDB staff.

GRAPH 2.6 Cluster 3



Source: IDB staff.

- For the countries in Cluster 2, the sensitivity of the IIR to changes in the level of indebtedness is similar. In this group, debt cuts of 1% of GDP improve creditworthiness by 0.6%.
- In Cluster 3 countries, the creditworthiness index rises, on average, by 0.4% when debt is adjusted by 1% of GDP. This suggests that, compared to previous cases, the relative importance of other factors, such as institutional quality and the development of the financial system, is greater.
- Finally, in Cluster 4, the estimations show that the sensitivity of the IIR to changes in the debt is even smaller: for each point of GDP adjustment in debt, the IIR increases by 0.1%.

It is important to evaluate how easy it is for a country to move from one cluster to another, given that the estimations above reveal that there are groups that would have a higher tolerance of debt, which could diminish the costs of rising indebtedness. Using the transition matrix (Table 2.3),<sup>10</sup> the following observations are made:

- Clusters 1 and 2: as seen in Table 2.1, countries in Cluster 1 and 2 are not, on average, very different in their structural indicators. Indeed, it can be observed that the countries of cluster 1 have a higher tax burden, as well as slightly better control of corruption. However, the greater difference between both clusters is observed in

<sup>10</sup> Five-yearly observations are used to historically evaluate in which cluster a country is found in one period, compared to the cluster in which it was found in an earlier period.

TABLE 2.3 Probability of Cluster Change

Cluster in Current Period	Cluster in Next Period			
	1	2	3	4
1	73.80%	15.70%	7.90%	2.60%
2	22.20%	65.30%	12.50%	0.00%
3	5.30%	2.10%	81.00%	11.60%
4	3.40%	0.00%	18.60%	78.00%

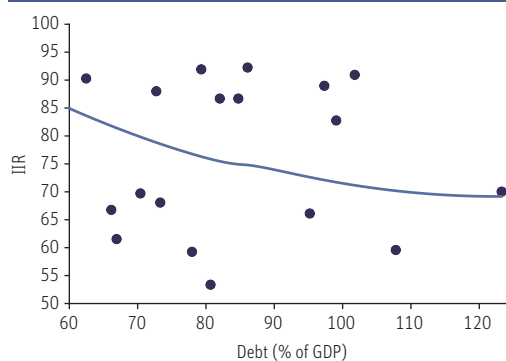
Source: IDB staff.

debt levels. In this regard, the average country of Cluster 2 has 50% less debt than the average in Cluster 1. Given that this is the only important difference between the variables in the exercise, the average country of Cluster 1 could gain access to cluster 2 and improve its credit rating by adjusting its debt.<sup>11</sup> Indeed, given that changes in fiscal indicators could be seen as short-term ones compared to the other variables considered here, the transition between cluster 1 and

2 is more common than the majority of other transitions between clusters (see Table 2.3).

- Clusters 2 and 3: transition between Cluster 2 and Cluster 3 is more costly and takes longer, because structural changes have direct results in the medium or long term. To move between Clusters 2 and 3, fiscal changes would not seem to be sufficient by themselves. To achieve the objective it would also be necessary to carry out a series of important adjustments in the level of integration, productive structure or control of corruption, or in all the indicators at the same time.<sup>12</sup>
- Clusters 3 and 4: for the transition between clusters 3 and 4, a similar pattern can be observed to that in clusters 1 and 2. For example, a transition from Cluster 3 to Cluster 4 is more probable (11.6%) than one from Cluster 3 to 2 (2.1%). This is because the average country in Cluster 3 has a series of solid structural indicators and debt tolerance is greater than in Cluster 2. Indeed, given that the average country in Cluster 4 has a debt of 84% of GDP, it would be possible to cross from cluster 3 to 4 with a near tripling of

GRAPH 2.7 Cluster 4



Source: IDB staff.

<sup>11</sup> This does not imply that improvement in the structural indicators would not help to make the transition more rapid.

<sup>12</sup> Later in this chapter it will be seen that this is precisely the case of successful countries of the region in the last two decades.



debt. This implies that once Cluster 3 is reached, structural variables become fundamental when the time comes for “graduation” to Cluster 4.<sup>13</sup>

It should be stressed that implementing policies aimed at improving economic fundamentals usually takes time, although there can be short-term benefits. For example, long processes of political dialogue are often needed to shape reforms and the subsequent institutional adjustments for their implementation. However, although implementation can take time, the legal formulation of these reforms can yield short-term benefits, since it might create positive expectations on future economic performance.

The next section explores the different options that the authorities in CAPDR might want to consider, including structural measures that could have positive effects on investors’ credit perception. Debt adjustment policies combined with policies geared toward strengthening structural areas of the economy are examined.

## PENDING TASKS FOR CAPDR

Among the policy instruments that a country has to improve its creditworthiness, we find the possibility of changing its debt level and/or adjusting its economic fundamentals. In the previous section, we pointed out that reducing debt in the short term could create the necessary fiscal space to mitigate the adverse effects of a crisis and improve credit quality, while improving the country’s economic fundamentals would have longer-term effects. Therefore, the availability of these two mechanisms to improve creditworthiness presents an interesting dilemma when choosing which combination of measures would be most appropriate. To understand the magnitude of the challenges among CAPDR countries and the possible approaches that might be used to confront them, the analysis that follows presents a quantitative assessment of the impact of different policies on credit perceptions.

On the basis of the results obtained from the estimations, two policy scenarios are evaluated. In the first, the only instrument of adjustment is the debt, while no other economic fundamentals are altered. The second scenario involves a combination of policy measures, including debt adjustments and measures aimed at improving fundamentals. In both scenarios, the immediate impact on creditworthiness before debt adjustments is quantified.

For Cluster 2 countries, such as Honduras, Costa Rica, Dominican Republic, El Salvador, and Guatemala, implementing policies focused on debt reduction, in conjunction with improving economic fundamentals, would yield important benefits (see Graph 2.8). In the first scenario, in which there is no structural improvement in the economy, lowering the debt by 1% of GDP, would lead to

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<sup>13</sup> This does not imply that a deficient handling of the fiscal accounts cannot take a country from cluster 3 to 2.

**GRAPH 2.8 CAPDR in the Clusters**  
(2009–2013)<sup>a</sup>



Source: IDB staff based on *Institutional Investor Magazine* and from the International Monetary Fund (2014).  
<sup>a</sup> Owing to the lack of data for the IIR index in recent years, the Belize data is only for 2013.

an improvement in the creditworthiness index of 0.5%. If, on the other hand, this fiscal adjustment is accompanied by actions that improve economic fundamentals (for example where these economies climb up by one position in the ranking of each one of the structural variables),<sup>14</sup> the effect on the IIR almost triples (1.4%).<sup>15</sup> It is worth highlighting that for this group of countries, improving control of corruption would yield the highest benefits. Thus, implementing measures in the countries in the region that would improve this indicator<sup>16</sup> to the Latin American average could yield an increase of 17.5% in the IIR for each 1% of GDP decline in debt.

In the particular case of Nicaragua, a country which lies in Cluster 1, under scenario 1 creditworthiness would improve by 1.1% for each 1% of GDP adjustment in debt. This change has a higher yield than that for the other countries in the region, which belong to Cluster 2. In addition, the impact on the IIR of accompanying the fiscal adjustment with improvements in structural factors such as the indicator of financial sector depth or industrial complexity of exports (so that the country climbs by one position in the ranking for each indicator<sup>17</sup>) is 1.6%.<sup>18</sup>

It is important to note that Nicaragua has substantially reduced its debt levels in recent years with the help of Debt Forgiveness as a part of the Heavily Indebted Poor Countries (HIPC) Initiative, and structural reforms such as the Fiscal Equity Law (2009) and Tax Harmonization Law (2012) as well as the elimination of exemptions to VAT for some goods consumed by high income households

<sup>14</sup> This change assumes that the value of the indices for the other countries remains unchanged.

<sup>15</sup> It is important to remember that the adjustment would have to be carried out in a period of five years.

<sup>16</sup> In this exercise Costa Rica is excluded given that it is above the Latin American average for control of corruption.

<sup>17</sup> Maintaining the value of the indicators for other countries.

<sup>18</sup> The gains from structural reforms are lower in the cluster to which Nicaragua belongs to than for the cluster to which the majority of CAPDR countries belong to.

and changes in personal income tax (2012). By continuing with this pace of reforms and fiscal discipline,<sup>19</sup> it might be expected that in the near future the country will cross the line to Cluster 2 of the classification, alongside the rest of its CAPDR peers.

In Panama's case, besides the positive effects which debt reduction entails, improvements in transparency and rule of law would contribute to raising the country's credit rating. Panama is the only CAPDR country in Cluster 3, with a low level of debt and high (investment grade) credit rating and, unlike the rest of the countries of the region, it has a deep financial system. Yet it shares some of their deficiencies, such as a low level of industrial complexity and weak institutional indicators. The country should press ahead with reforms to preserve its privileged position and be able to draw closer to the countries of Cluster 4. Bad public debt management or a deterioration in economic fundamentals could lead to scenarios in which a fall from investment grade could happen. Therefore, in the absence of improvements in fundamentals, an increase in debt of 1% of GDP would be reflected in a worsening of creditworthiness by 0.4%. If in addition there is a retreat in fundamentals (equivalent to a fall of one position in the ranking of each variable used here),<sup>20</sup> the negative impact on creditworthiness would be of 0.6%.

Evaluating the results for the CAPDR countries, it is clear that setting guidelines for short- and long-term actions would benefit the region. While in the short term reductions in public debt would improve creditworthiness, the creation of a medium and long-term agenda to improve fundamentals would translate into higher credit ratings, which would be reflected in a transition, for example, from Cluster 2 to Cluster 3. In summary, better fundamentals would allow access to financing at lower rates. In the future, besides counting on debt reduction as a policy instrument, the CAPDR agenda ought to be capable of identifying which medium and long-term structural measures would offer the highest returns.

Although the region has achieved major advances in recent years (see Box 2.1), there is still plenty of room for improvement, particularly in terms of institutional capacity.<sup>21</sup> For example, as Graph 2.9 shows all the countries of the region, with the exception of Costa Rica, are at least 44 positions below the typical Cluster 3 country (a total of 210 countries)<sup>22</sup> in terms of the control of corruption. The region's score in the index that approximates a country's control of corruption could be improved with measures aimed at eliminating payments irregularities for imports, exports or contracts that require any type of government authority as an intermediary. In addition, improving the use of public resources and the quality of auditing would raise the transparency indices.

Strengthening accountability is another area in which the majority of these countries have room for institutional improvements. Four of the five countries of Cluster 2 lie at least 24 positions below the median of Cluster 3 (see Graph 2.10). Strengthening performance on this indicator

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<sup>19</sup> In particular, it is necessary to implement reforms aimed at reducing the vulnerability to external factors and to complete the debt relief program.

<sup>20</sup> Keeping the value of the indicators for all other countries.

<sup>21</sup> Annex I presents a box which reflects the position of CAPDR in each element of institutional strength covered in this chapter.

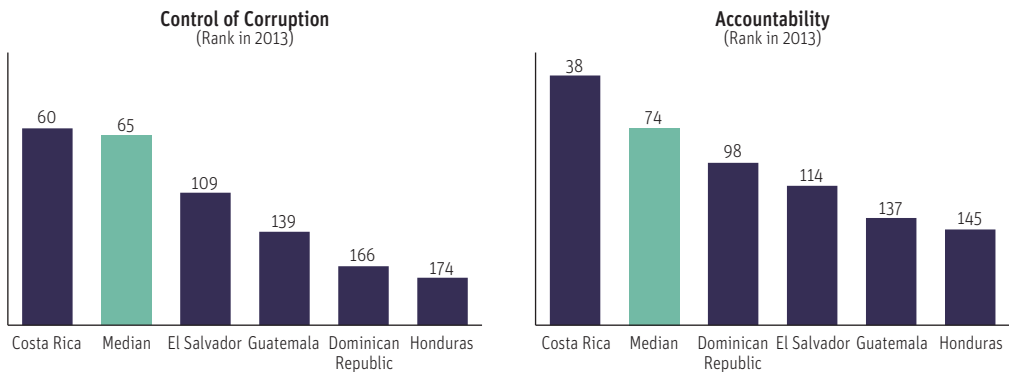
<sup>22</sup> Costa Rica is in a similar position to that of Cluster 3 countries for the control of corruption indicator.

### BOX 2.1 HISTORY OF REFORMS IN CAPDR AND THE CASE OF PANAMA

During the past 25 years, CAPDR governments carried out several reforms with the objective of improving their economic and institutional indicators that enhanced their IIR. Reforms have involved different areas of the economy such as the financial, fiscal and international trade sectors. During this period, fiscal reforms were high on the agenda in El Salvador, Guatemala, Dominican Republic, Honduras, Nicaragua and Panama. The fiscal space created by these adjustments served as a buffer during the financial crisis in 2008–09, so that the region was not as severely affected by the economic downturn as it had been in previous crises. For example, the authorities of the region were in a position to expand expenditure with the aim to counterbalance the negative impacts of the crisis. In addition, some countries undertook structural reforms that allowed them to improve their fundamentals. For instance, Panama improved its financial depth index and, thus, became a leader in the region. Costa Rica, on the other hand, improved its industrial complexity index moving forward with expanding its trade openness and diversifying its exports.

Furthermore, the countries in the region have also carried out structural reforms. Lora (2012) developed an index of structural reforms for the years of 1986, 1999 and 2009. This index includes: (i) trade policy data, where all the countries of the region benefited by implementing trade tariff reductions; (ii) finance policy, where El Salvador, Guatemala and Honduras opened up their financial sector in recent years; (iii) tax policy, with a wide range of reforms in the last decade; and (iv) privatizations and labor legislation. Note that only marginal changes can be observed for the last two indicators. Hence, countries have implemented a set of reforms in the financial sector that has implied improving creditworthiness: the reform of the Organic Law of the Central Bank and the Worker Protection Law in Costa Rica (1995 y 2000, respectively), approval and implementation of the Organic Law for Supervision of the Financial System and the Commercial Banks Privatization Law (1990 and 1995, respectively) and the Law of Banks and their reforms in El Salvador (1999 y 2002), the Securities and Commodities Law, and the Law against money laundering and other assets in Guatemala (1996 and 2001, respectively). Other achievements in the financial sector were the liberalization of interest rates, the reform of the Central Bank Law and Deposit Insurance Fund Law in Honduras (1992, 1996 y 2001, respectively); the Organic Law of the Central Bank, the Guarantee of Deposits in System Institutions Law and Pensions Supervision Law in Nicaragua (1999 y 2001, respectively); and the Securities Market Law and Law against asset laundering in the Dominican Republic (2000 and 2002, respectively).

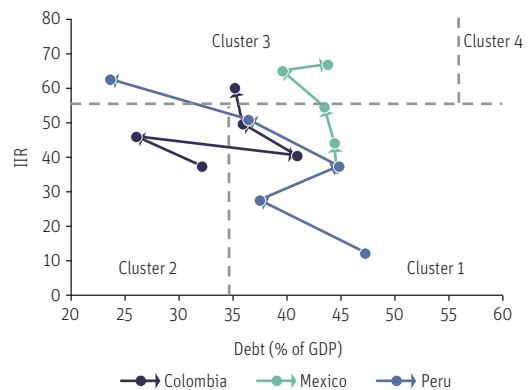
Simultaneously, Panama pushed forward crucial changes, where the country has moved from suspending its debt servicing in 1988 to its current investment grade position in cluster 3. Compared to its regional competitors Panama enjoys a credit rating as well as growth rates well above those of the rest of the region. To achieve this, the country carried out a series of structural reforms, which laid the foundations for a significant improvement in the country's risk rating. These reforms sought to reduce inflation, raise economic growth, improve social conditions and increase competitiveness. To meet these goals, budgetary cuts were carried out, the permitted level of the fiscal deficit was capped, state enterprises were privatized, and tax institutions such as the general revenue office and the customs were strengthened. There were also reforms to social security, trade liberalization, improvements in financial regulation, and supervision and restructuring of government, among other things. The reforms brought the country to a privileged position in terms of credit standing. Panama is, not only a model to follow because of its high regional ranking, but also because these reforms were implemented in the past two decades.

**GRAPH 2.9** Distance to Indicators of Institutional Strengthening of Cluster 3

Source: IDB staff with data from Worldwide Governance Indicators (2014).

would be achieved through actions aimed at improving government procedures, both internal ones and those offered as services to the rest of the economy. Finally, a valuable step to improve accountability would be opening up to externally validated auditing processes.<sup>23</sup>

It is important to stress that there are countries in Latin America which have improved their creditworthiness by implementing both debt adjustments and policies focused on improving economic fundamentals. For example, Colombia, Mexico and Peru belonged to Clusters 1 and 2 during the 1990s (see Graph 2.10). From 1997 onwards, these countries began to implement fiscal consolidations and structural reforms which enabled them to achieve more solid fundamentals today, while allowing them to gain access to international debt markets at relatively low rates.<sup>24</sup> Currently, all three are considered investment grade and are in Cluster 3 of our classification. Though not synchronized, the trajectory of these three countries toward Cluster 3 showed the same pattern. Initially they focused on actions in the fiscal sphere, implementing measures such

**GRAPH 2.10** Success Stories in Latin America Transition in Five Years




Source: IDB staff with data from *Institutional Investor Magazine* and from the International Monetary Fund (2014).

Note: Each curve shows 5 points in time corresponding to a five-year period. The arrows indicate their chronological order.

<sup>23</sup> Idem.

<sup>24</sup> The reduction in financing costs could be attributed to at least two factors: (i) better creditworthiness and (ii) low international interest rates, a product of the recent expansive monetary policies in developed countries.

TABLE 2.4 Reforms in Colombia, Mexico, and Peru

Sectorial and Structural Reforms			Fiscal Reforms
		1995	Countercyclical funds
		1998	Financial Transactions Tax
Local Government restrictions Decentralization of Administration of Education		2000	
		2001	Tax Restrictions to Local Governments Consolidation of system of transfers of intra- government revenues
Senator Elections		2003	
Financial Sector Consecutive Presidential Election		2005	
Financial Sector		2009	
		2012	Tax Reform
Sectorial and Structural Reforms			Fiscal Reforms
		1998	Countercyclical funds
Regulatory Framework		2000	Law of Fiscal Responsibility Law of Public Debt and Indebtedness ceilings
		2002	Countercyclical Funds Reform through Automatic Stabilizers
Law of Career Reform Financial System Reform		2006	
		2007	Public Sector Pensions Reform
Labor Reform, Professional Career System, Education, Competition and Regulation, Energy and Telecommunications Elections and Politics		2010–2013	Fiscal Reform
Sectorial and Structural Reforms			Fiscal Reforms
		2000	Fiscal Responsibility Fiscal ceilings Pluriannual Frameworks Tax revenues stabilization
Regional Scope of Government		2001	
Municipal Elections Period		2002	Increase to the tax revenues stabilization funds Fiscal Transparency
Interest rates		2003	
Law of Acreditations		2004	

Source: IDB staff.

as financial responsibility legislation, debt ceilings, and debt management, which constrained the level of public debt. While their fiscal positions improved, reforms were gradually incorporated to strengthen institutions and the financial sector (see Table 2.4). The combination of debt reduction and structural improvements enabled them to respond successfully to the last international crisis. Although the three countries increased spending, and therefore their debt ratios, their respective credit rating did not deteriorate at all and, in some cases, even improved.<sup>25</sup> As these countries continue to work on their respective development agendas, they are success stories which could provide guidelines for the policy agendas of CAPDR countries.

## CONCLUSIONS

The analysis of this chapter suggests two types of policy measures for CAPDR countries. First, it is reasonable to begin with quick gains<sup>26</sup> on the fiscal side, given the greater return they generate on the IIR and their immediate impact. This type of fiscal action could also build confidence to facilitate subsequent areas of change for the longer term. However, it is important not to neglect measures specifically aimed at improving medium and long-term fundamentals, which could have positive short-term effects through their impact on expectations. That is, it is recommendable for CAPDR countries to simultaneously emphasize progress in debt reduction policies and improvements in institutional quality, the productive structure and the financial sector.

Second, the successful implementation of a program of fiscal and more structural measures could, after a time, enable the country to “graduate” from a particular type of cluster. In any case, countries of the region would most likely need to increase their creditworthiness from their current level in order to shift to a better composition of fundamentals. In return, governments would be able to achieve a larger fiscal space at lower cost in periods of consolidation, while in times of crisis, they would enjoy greater flexibility of response.

With focused efforts, CAPDR countries could achieve targets for consolidation and higher credit quality. Although the agenda of plans and measures to be implemented is broad, the region has advanced on many of its key points and is today the region in a better position than in the 1990s. The steps taken by other Latin American countries, such as Colombia, Mexico or Peru, offer possible guidelines to follow. The CAPDR region has major strengths which, channeled in the right direction, provide opportunities for the development of its economies.

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<sup>25</sup> Mexico’s case includes the issue in 2013 of a Perpetual Bond in the markets. At the same time, a set of second and third generation structural reforms were approved, which led to improvement in creditworthiness.

<sup>26</sup> The comparison is with medium and long-term policies, such as control of corruption.



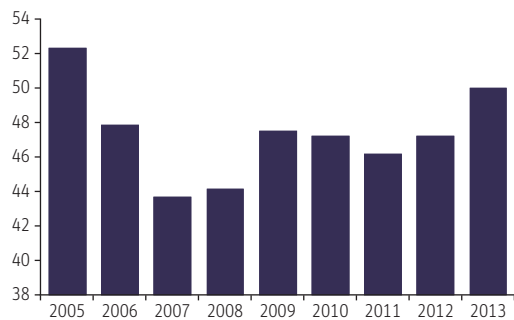
# THE NEW CHALLENGES OF GREATER FINANCIAL COMPLEXITY

Between 2008 and 2013 external financing flows to the region increased due to higher liquidity in international markets and low financing costs, and also thanks to the region's stability relative to developed economies. These flows included foreign direct investment (FDI), bank loans, and in some cases, portfolio investment. This increase in international capital flows to CAPDR was associated with an accumulation of external debt (public and private), which rose from an average of 44% of GDP in 2008 to 50% of GDP in 2013 (see Graph 3.1).

Although greater access to external resources can be beneficial (since it can complement internal savings and improve the viability of productive investment), it can also increase financial vulnerability if it leads to excessive risk-taking. For example, a depreciation of the exchange rate can trigger liquidity and solvency problems in the non-tradable sector whenever they build up liabilities in foreign currency. This in turn may put at risk the ability to meet their obligations to other sectors, thereby affecting the chain of payments. This example illustrates that, in order to evaluate the financial vulnerability of the economy, it is important to determine not only the sectors in which debt is accumulating, but also the financial linkages between them, as this makes it possible to see the importance of one sector in the economy for the financing of others.

Excessive dependence implies greater exposure to insolvency risks caused by shocks that affect the primary source of financing. In turn, the possibility of contagion increases as the integration between sectors rises. Thus, the liquidity management practices of mutually invested funds can create contagion effects if, for example, "leveraged" investors, facing demands for repayment, are forced to sell their assets- potentially at a lower market price than available under normal conditions.

**GRAPH 3.1 CAPDR: Gross External Debt (% of GDP)**



Source: International Monetary Fund and Central American Monetary Council.

Note: Simple average of the debt to GDP ratios of CAPDR countries. Includes public and private debt.



This chapter offers a preliminary analysis of these vulnerabilities. The initial section analyzes the composition of sectorial balances in CAPDR before and after the crisis. The second part of this chapter then examines the vulnerabilities originating from credit and debit patterns between the main sectors of the economy and explores the options for mitigating them.

## CAPDR IN BALANCES: BEFORE AND AFTER

Besides being reflected in the increase in external debt, inflows to CAPDR also changed the composition of balances within the economy. The direct effect of the influx of flows from outside was a higher level of external liabilities. However, within the economy it produced a great variety of operations between the different sectors, and this was reflected in their net positions. This chapter analyzes these by focusing on six broad sectors: the public sector, including its financial and non-financial component; the private sector, consisting of firms and households; the financial sector; the monetary authority; and, finally, the external sector, formed by non-residents.<sup>1</sup> Each of these sectors has a balance of assets and liabilities that, when consolidated (excluding the external sector), make up the aggregate balance of the economy.

Graph 3.2 presents the structure of liabilities of the five domestic sectors for the average country of the region.<sup>2</sup> For 2008 and 2013 period, two stylized facts can be identified. First, the imbalances in the public sector have led to an accumulation of public debt. Second, both banks and firms accumulated external liabilities. In this regard, for the average CAPDR country, public sector liabilities grew by 13% of GDP, from 42% to 55% of GDP.<sup>3</sup> In addition, banks' and firms' liabilities rose by 9% and 20%, respectively. In the case of the banks, the external funds were mainly used to acquire public sector assets,<sup>4</sup> which rose from 1.6% to 3.5% of GDP. Finally, firms increased their liabilities, with which they covered their operating costs and invested in both public sector and bank assets.<sup>5</sup>

It is important to highlight the recent role that firms and the external sector have played in financing the rest of the economy. The private sector has increased its share of holdings of public liabilities (excluding external funds). Indeed, while external credit to the public sector rose from 20.8% to 26.7% of GDP, public securities held by firms increased from 9% to 15% of GDP,

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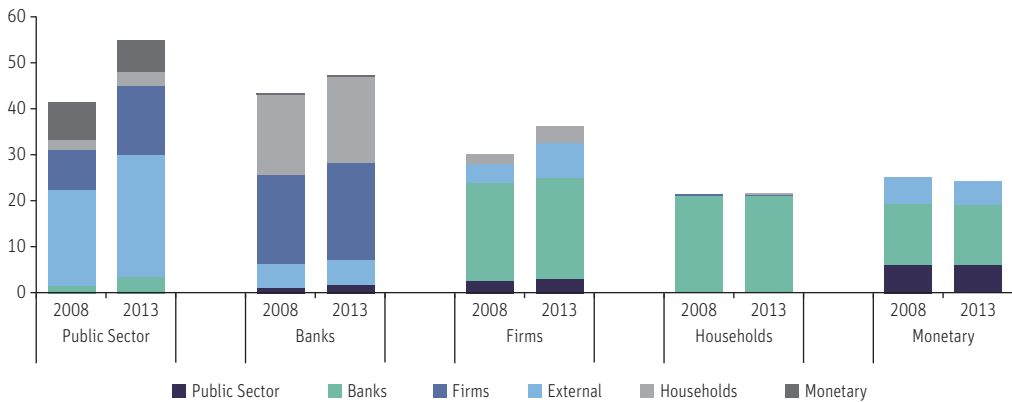
<sup>1</sup> Financial institutions are consolidated with the monetary authority in accordance with the monetary survey manual of the International Monetary Fund.

<sup>2</sup> Belize is excluded from the analysis due to limitations regarding the historical figures in this chapter.

<sup>3</sup> This includes central government, government agencies, and the financial public sector. Belize is excluded from the analysis.

<sup>4</sup> This pattern can be observed in Graph 3.2: liabilities of the public sector owned by the banking sector correspond to the assets that banks obtained from the public sector.

<sup>5</sup> The corporate sector balance does not allow visualizing the position within the sector, given that its net balance is zero. However, what is shown here is the position of the corporate sector compared to other sectors and, therefore, its liabilities reflect firms' demand for assets of the public sector, banking sector, etc.

**GRAPH 3.2 CAPDR: Liabilities of the Sectoral Balances (% of GDP)**

Source: IDB staff based on data from central banks, SECMCA, IMF IIP and the Finance Ministries.

thereby continuing to be the second largest source of domestic financing for the public sector (see Graph 3.2). Similarly, the major component explaining the increase of banks' liabilities was the acquisition of financing supplied by firms, which rose from 19% to 21% of GDP. In contrast, external financing received by the banks increased from 5.3% to 5.6% of GDP. Finally, unlike other sectors, the liabilities of private corporations (see Graph 3.2) grew mainly through external financing credit lines, which increased from 4.0% to 7.5% of GDP between 2008–2013.

There are two reasons why the financial health of the private sector is important for banks. The first mainly originates from the fact that local firms may be financing through short-term portfolio investment (from abroad) and depositing these external resources in national banks (therefore denominated in local currency). In a scenario in which market conditions worsen suddenly, large-scale withdrawals may occur and liquidity problems could potentially arise. Second, variations in the exchange rate could also affect the balances of these firms in the case of a currency mismatch.

In summary, various trends emerged as a result of the influx of international capital to CAPDR. First, the increase in external indebtedness has been mainly attributable to the public and banking sectors, though perhaps the more striking trend has been the greater role of the corporate sector as a recipient of external flows. Second, the inter-relationships between the external inflows to the region and the new financing dynamics within the domestic economy highlight, in particular, the growing role of firms as providers of financing to the rest of the economy.

## THE SECTORAL LINKS BEHIND THE SCENES

It is clear that financial balance sheets offer vital information on the financial position of the economy, but there are certain vulnerabilities associated with credit and debit operations that are not captured by these net balances. The intensified financing operations between sectors could be increasing exposure to risks inherent in the greater inter-relationship between agents.

Thus, the distinction between net balances and the evolution of credits and debits among agents is crucial, in particular in the context of the greater influx of external financing. In general terms, the greater liquidity observed in the market could have stimulated the formation of new patterns of intermediation within the economy. This may have led to the creation of new financial agreements between market participants,<sup>6</sup> increasing exposure to counterparty risks.

The entirety of debit and credit operations between economic agents can be conceived as a grid of flows. From this viewpoint, credits and debits represent inter-sectoral links, which create a network in the economy. The greater the number of credits and debits between sectors, the greater the integration between its members and, therefore, each agent finds himself exposed to the risks and issues of his counterparties. The usefulness of representing the flows as a network is that it makes it easier to examine the degree to which the sectors of the economy are tied together and to extract from that the vulnerabilities to which they are exposed.

Credit and debit flows can generate two kinds of vulnerabilities. The first arises from the allocation and frequency of financing and investment operations. Through these, information on the concentration of flows between sectors is revealed, making the insolvency or illiquidity problems that may arise should shocks affect the pattern of flows immediately apparent. The second kind of vulnerability is associated with the use of flows in multiple secondary operations and the risks of contagion inherent in a more complex structure of flows.<sup>7</sup>

Within the network of credit and debit operations, repeated transactions between some sectors imply a greater concentration of flows. This is indeed a vulnerability for the network, as in the case of an adverse event in a sector with a high level of concentration, a substantive reduction in flows would seriously affect financing for the rest of the economy.<sup>8</sup> Moreover, the linkages between sectors make it possible to identify when one sector in the economy is key for the financing of another. Thus, higher concentration implies greater exposure to insolvency risks caused by shocks to the primary source of financing.

On the other hand, the increase in financing linkages can carry risks associated with bad management of assets and contagion. Inter-sectoral flows are similar to bank deposits, in which a sum of deposits is converted into multiple loan contracts. After entering a sector, flows splinter and become part of other intra- and inter-sectoral operations. These flows have the positive trait of generating multiplier effects by increasing the supply of funds in the economy. However, when they are

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<sup>6</sup> With the aim of increasing the return on external flows through financial intermediation, the banks created and employed new instruments such as securitized assets, guarantees, credit notes, mutual funds or notes collateralized by other instruments. These securities have been acquired, in their turn, by the private sector and re-used as financial investments.

<sup>7</sup> An example of this is the use on the part of the private financial and non-financial sector of new instruments and financing and investment mechanisms not covered by prudential regulation and which might not be appropriately backed.

<sup>8</sup> The concentration relationship is normally linked to measures of centrality. The effects that an adverse shock in sectors with high concentration would have on the rest of the economy have been explored, for instance, by Allen and Gale (2000), Babus (2014), Acemoglu (2012), Acemoglu *et al.* (2013), and Elliot *et al.* (2014).

not adequately backed or regulated, adverse events can generate multiplier effects in the opposite direction; that is, they can transmit the negative effects to all sectors of the economy.

The extent to which CAPDR countries are exposed to these risks depends on the dynamics of the credit and debit flows between sectors. The evolution of the network of credit and debit operations determines where the funds come from and where they have been directed. They also track the volume of the financing operations between sectors. The following section focuses on describing the main characteristics of the network of flows in CAPDR and quantifies the degree of exposure to these vulnerabilities.

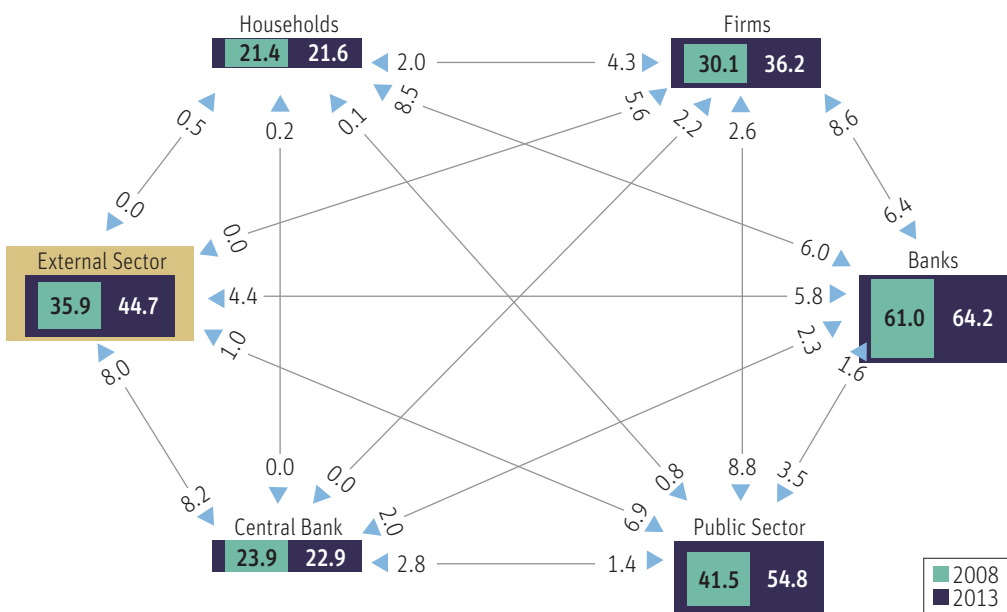
## THE FLOWS IN CAPDR: CHALLENGES AND POLICY OPTIONS

Graph 3.3 depicts the flows of funds between sectors of the economy between 2008 and 2013. As before, the figures summarize the values for the average economy in CAPDR. The boxes indicate the liabilities in these two years, while the arrows show the flows of credits and debits between sectors.

The following patterns in CAPDR can be extracted from the information shown in the diagram:

- Firms were net recipients of financing.** Between 2008 and 2013, firms in the region received a (net) average inflow of 6.1% of GDP. Of this, 36% originated from banks, to give

**GRAPH 3.3** Average Financing Flows in CAPDR 2008–2013 (% of GDP)



Source: IDB staff based on data from central banks, Finance Ministries, SECMCA and the IMF.

Note: Totals may not add due to rounding.

net credits totaling 2.2% of GDP; and gross external flows to finance firms doubled between 2008 and 2013, accounting for 5.1% of GDP. It is worth stressing that external financing came through contracts or commercial agreements, with portfolio investment only common in countries with a more integrated financial system, such as Panama.

- b. **The public sector of the average CAPDR economy increased its net debt.** Between 2008 and 2013, net flows to the public sector amounted to almost 13.3% of GDP,<sup>9</sup> increasing its liabilities from 41.5% to 54.8% of GDP. Until 2010, the public sectors of the region distributed their liabilities between bank credit lines, local market instruments and financing from international financial organizations. After 2010, although the local market continued to be the main provider of funds, the public sector absorbed, on average, about 6.9% of GDP<sup>10</sup> from abroad, equivalent to 24.7% of external credit. The latter was either in the form of official development assistance, other credit agreements<sup>11</sup> or portfolio investment.<sup>12</sup>
- c. **The banking sector remained a net lender in the economy.** In order to finance their operations, on average, banks received flows from overseas of 5.8% of GDP, doubling the amount observed before the crisis. Nevertheless, the domestic market continues to be the main source of financing: firms deposited 6.4% of GDP, households about 6%, the monetary authority 2.3% and the public sector 1.6%. In this regard, the main mechanism for raising funds was the issuance of securities in domestic markets. In addition, inter-bank lending became a recurrent source to meet repayments on short-term liabilities.<sup>13</sup> Meanwhile, credit granted by banks to the rest of the economy totaled 29% of GDP, mainly distributed to firms (8.5% of GDP) and households (8.6% of GDP).

In addition, the analysis shows that in the average CAPDR country there is a significant concentration of flows in the banking and public sectors.<sup>14</sup> This is quite evident in the case of the banks, given that their role as financial intermediaries means they channel a large volume of flows to the entire economy. The importance of the public sector is associated with the government's role as a supplier of safe assets to banks and the rest of the private sector. Moreover, the public banks, contribute to higher concentration of the public sector, given the amount of credit and debit operations

<sup>9</sup> It is worth highlighting that this pattern has not been uniform: for instance, Nicaragua has had negative net flows throughout this period; however, in the other countries this sector stands out as a net recipient of flows.

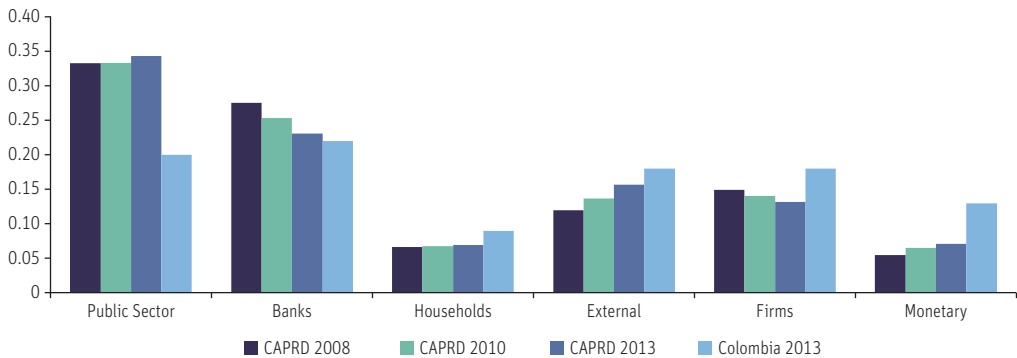
<sup>10</sup> Gross flows from abroad.

<sup>11</sup> They include loans, credit cards, purchase and sale agreements for goods and services documented in the financial account of the balance of payments as "other financing".

<sup>12</sup> Flows of a more volatile nature, such as portfolio investment, were captured by those countries with access to the markets. By contrast, financing schemes different to portfolio investment were commonly used in all countries of the region.

<sup>13</sup> Interbank lending also showed higher activity. However, this is not observable in the aggregated banking balance. On average, from 2009 on, the region made 3.5 times more use of bank credit than in 2008 and 2009.

<sup>14</sup> Calculations regarding the concentration of flows uses the methodology of networks; for more on it see the Annex II.

**GRAPH 3.4 Relative Importance in CAPDR**

Source: IDB staff estimates extracted from the matrix of average flows for the region.

Note: The index is on a scale from 0 to 1.

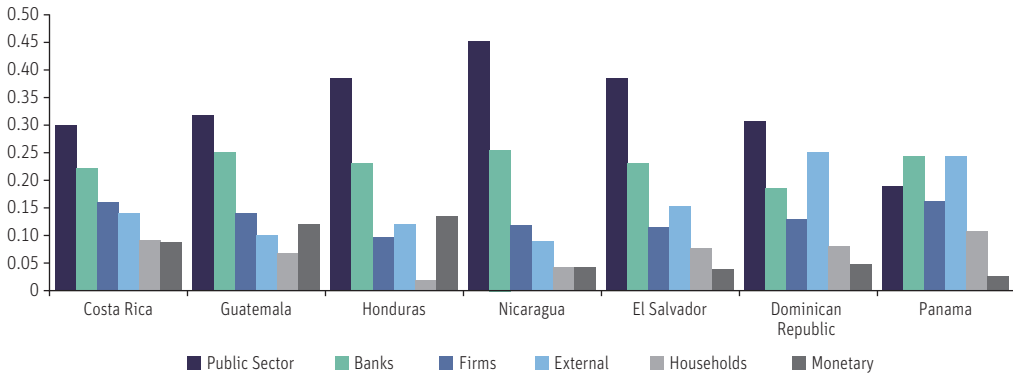
they have with the private sector.<sup>15</sup> In fact the index of relative importance confirms their high dependency on both the banking and public sectors.<sup>16</sup> The index is derived from information on credits and debits, the number of links and the volume of operations. It is constructed to assign a higher relative (or systemic) importance to a sector the more it intervenes in credit and debit transactions. Graph 3.4 shows the evolution of this indicator for the average CAPDR country between 2008 and 2013. The graph also includes the index for Colombia,<sup>17</sup> a benchmark for the region. Colombia suits this task particularly well since its financial system has developed substantially over the past decade. In addition, it has carried out important fiscal consolidation policies and prudential reforms. As can be observed in the graph, the current flow structure of CAPDR shows an exceptional concentration in the public and banking sectors. In contrast, Colombia has a relatively more uniform systemic importance across sectors, apart from the household sector. However, it should be stressed that the systemic importance of the banking sector in CAPDR has tended to diminish and is closer to the level seen in Colombia for 2013. The same graph also reveals some other differences between the region and Colombia. One is the greater systemic importance of the public sector in CAPDR than in Colombia. As Graph 3.5 shows, this public sector dominance is most acute in countries with less developed financial and capital markets,<sup>18</sup> such as Honduras and Nicaragua. Panama is the only country in the region with a private sector with systemic importance similar to that of other sectors. This fact is consistent with the indicators of firms' and households' access

<sup>15</sup> Public banks are relatively small in CAPDR, for example, the liabilities in the average CAPDR country are less than 3.5% of GDP; in flows, the figure for these credits is less than 1% of GDP.

<sup>16</sup> A sector with great relative importance within the system of flows would have index values close to 1 while the least important would be closer to zero.

<sup>17</sup> It takes into consideration information on flows between 2012 and 2013. Colombia is a natural case for a regional benchmark. On the one hand it is a country which has developed its financial system in the last decade and in addition it has strengthened its fiscal sector through prudential reforms.

<sup>18</sup> This refers to the absence of mechanisms/instruments of non-bank intermediation (mainly the stock market).

**GRAPH 3.5 Relative Importance by Country**

Source: IDB staff estimates extracted from the matrix of average flows for the region.

Note: The index is on a scale from 0 to 1.

**GRAPH 3.6 Propensity to Contagion Index**

Source: IDB staff estimates extracted from the matrix of average flows for the region.

Note: Zero represents the least possibility of contagion and 100 the highest.

to credit and investment opportunities in Panama.<sup>19</sup>

Finally, the flow chart provides us with an indicator of the ease at which a negative shock disseminates to the rest of the economy, and this reveals that the intensification of credit and debit operations has led to a higher propensity to contagion from negative shocks. As noted above, the flows initially received by one sector are subsequently used in operations with other economic agents, thus increasing the intra-sectoral and inter-sectoral ties. To measure the exposure to negative shocks, an indicator is used to quantify the number of

times flows have been transferred between sectors. This index shows that in CAPDR all the sectors of the economy, on average, almost doubled their contagion propensity (see Graph 3.6). Between 2008 and 2013, what stands out is the remarkable increase in the exposure of the banking sector, which almost tripled its vulnerability to contagion. In the same way, the indicator confirms that the more inter-related sectors are the most exposed, followed by sectors with a greater number of links with sectors of systemic importance.<sup>20</sup>

<sup>19</sup> The index consists of a weighted average of three known centrality measures. For further information on these measures, see the Annex II. The index goes from zero to one hundred, in which zero represents no probability of contagion and one hundred certain contagion.

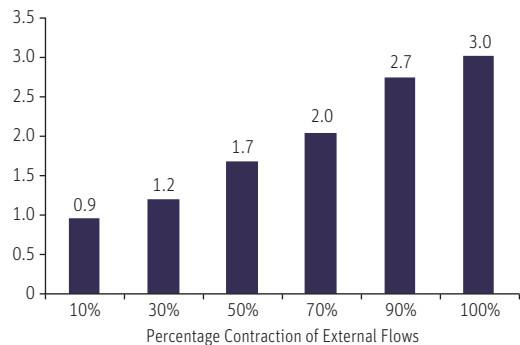
<sup>20</sup> In other words, a sector's speed of contagion rises when it is more linked to the banking and the public sector.

## VULNERABILITIES... THE EFFECTS OF SHOCKS IN EXTERNAL FLOWS

The impact on CAPDR of these levels of concentration of flows and propensity to contagion can be analyzed by using a stress test on the network of flows. In this test, the flows that the domestic economy receives from the external sector are reduced from their current level to their 2008 level (see Box 3.1 for more details).<sup>21</sup> This sudden reduction in flows affects all the sectors that normally find financing from abroad. Assuming that economic agents cannot easily adjust their financing needs, the demand for domestic credit would increase. Since the banking sector is the main provider of domestic financing but cannot obtain resources from abroad, it seeks funds from the monetary authority, while reducing, to some degree, its credit lines to the private sector. Ultimately, it is the public sector that covers the liquidity problem by supplying resources to the economy (for example, to firms through the public banks). Graph 3.7 shows the fiscal cost incurred as a result of a reduction in external flows by different percentages,<sup>22</sup> ranging from 10% to 100%. We find that the fiscal cost of keeping the network functioning would be between 0.9% and 3.0% of GDP, depending on the shock.

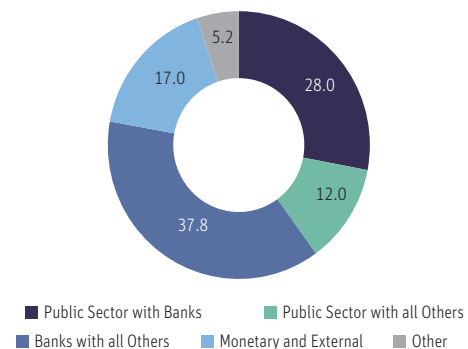
The results of the stress test also show that the main channels of transmission to the economy are those related to banking and public sectors. First, in terms of their contribution to the fiscal cost, these sectors seem to carry the largest share. In fact, the financial transactions between these two sectors account for almost 28% of the total cost (see Graph 3.8). Another 38% is caused by the banking sector's multiple links with the rest of the economy. About

**GRAPH 3.7 Fiscal Cost After the Shock (% of GDP)**



Source: IDB staff estimates extracted from the matrix of average flows for the region.

**GRAPH 3.8 Decomposing the Shock: By Sectoral Linkages (% of the Cost)**



Source: IDB staff estimates extracted from the matrix of average flows for the region.

<sup>21</sup> The exercise is replicated for the case in which the flows are reduced only by 90% from this first scenario. Later the replication is extended as far as 10%.

<sup>22</sup> The reduction by 100% represents a shock, which takes external flows to levels prior to the recession, while 10% represents a contraction in the flows of only 10%.



### BOX 3.1 STRESS TEST: SHOCK TO FLOWS FROM OUTSIDE THE COUNTRY

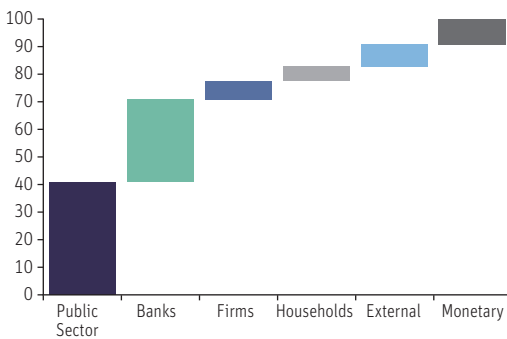
The structure of flows is exposed to a shock which reduces the availability of external financing to levels observed before the recession. Information on flows and balances from 2008 is used as a starting point as this was the point at which financial markets began to show signs of instability. Until the final quarter of 2008 financial conditions remained relatively normal and it was only with the fall of Lehman that conditions of stress applied.

The stress test assumes that after the shock each sector keeps its financing needs the same. Since each sector is tied to another through debits and credits, the shock propagates simultaneously to every member that has received external flows. The analysis suggests that the effects of the shock would be disseminated principally through the banking sector since it has links with each one of the other sectors. However, the shock would create an analogous dynamic beginning from the private or public sector when portfolio investment in the economy contracts.

The dynamic in which the contagion takes place could be the following: after the shock the banking sector is obliged to reduce credit to the economy as a result of the contraction in external financing. At the same time, the public sector sees its external sources of funds restricted and transfers its needs to the banking sector. Meanwhile the private sector turns to the banks, as it normally does, for lines of credit. This continues to occur until the latter is not able to meet the demand. To try to cover the demand, the banks first turn to interbank credit and then to the monetary authority to obtain funds, but only until its balance is adjusted. When this occurs, the private sector resorts to the public banks. To compensate for what is lacking, the public banks increase their lines of credit but not without first accessing financing from the monetary authority or transfers from the central government. These effects are greater when the flows have been transferred multiple times between sectors, whether in the form of loans or investments. In any case, owing to the high dependence on the public sector, what's lacking ultimately falls on it.

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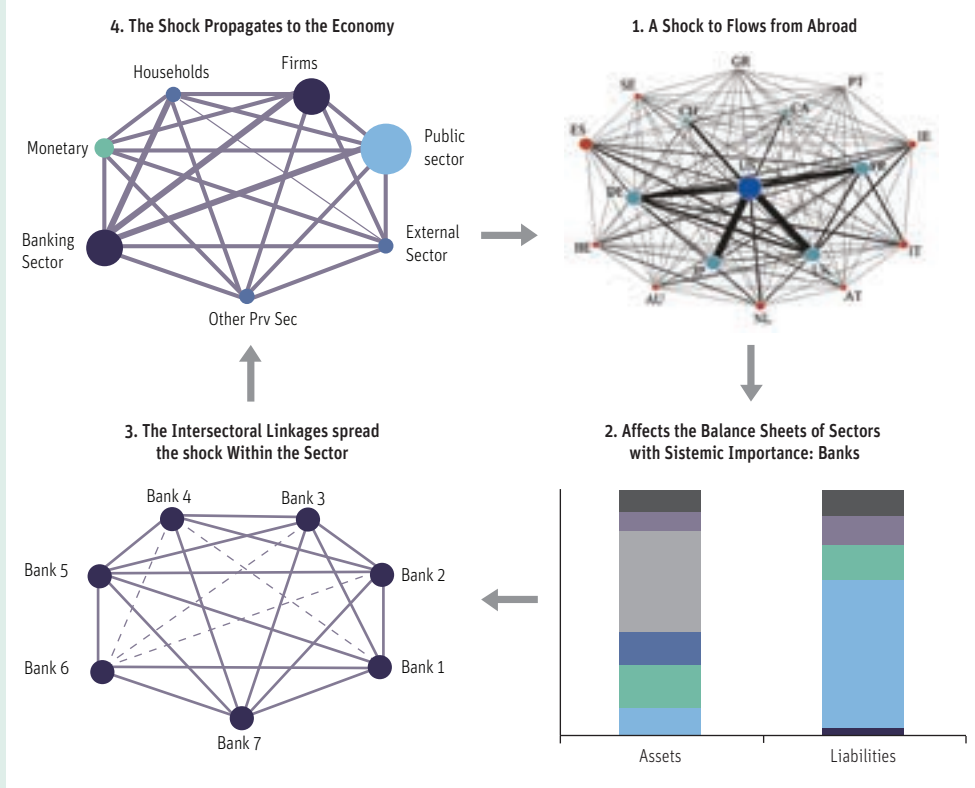
**GRAPH 3.9** Fiscal Cost After the Reduction in External Flows (% of the Total)



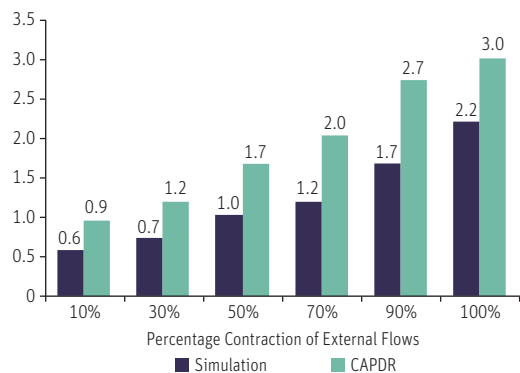
Source: IDB staff estimates extracted from the matrix of average flows for the region.

12% originates from the dependence of other sectors on the government. A further 17% reflects the monetary effect of external flows and 5.7% accounts for the linkages between the remaining sectors. It is worth noting that without double-counting, and aggregating the costs separately for each sector, the role of the private sector stands out (as well as the public and banking sectors), accounting for around 12% of the total cost of the reduction of external flows (see Graph 3.9).<sup>23</sup>

<sup>23</sup> Private sector here refers to firms (6.8%) and households (5.1%).

**GRAPH R 3.1 Propagation of a Shock to External Flows**

By contrast, it is evident that the costs of a reduction in external financing could be lower if the levels of concentration between sectors were reduced (Graph 3.10). This second test consists of a simulation aimed at lowering the fiscal costs in case of a reduction of external financing. The simulation rebalances the flow of credits and debits among sectors until a new network is obtained (for more details, see the Annex). This network is more resilient to cuts in external financing because the new pattern of linkages makes the respective sectors them more capable of satisfying a greater percentage of the financing needs. Improving

**GRAPH 3.10 Fiscal Cost After the Shock: CAPDR and Simulated (% of GDP)**

Source: IDB staff estimates extracted from the matrix of average flows for the region.

the internal capacity to cope with a shock reduces the costs for the public sector. Three lessons emerge from this last stress test. First, moving to a less concentrated pattern of flows distributes shocks more uniformly between sectors and reduces the direct costs for the public sector; therefore, a uniform increase in debits and credits between all the sectors lessens the concentration and mitigates the effects of a negative external shock. Second, the systemic importance of the banking sector is confirmed and, consequently, the importance of effectively monitoring and regulating the sector in order to reduce its vulnerabilities. Third, if external flows increase, the monetary authority becomes more important as the agent that safeguards the system's stability. This reflects the important role of the monetary authority as a manager of net external assets of the economy.<sup>24</sup>

Enhancing macroprudential regulation in the financial sector is an effective way of mitigating vulnerabilities associated with the concentration of flows. Regarding the multi-sectoral dimension, the tasks consist of identifying institutions of (relative) systemic importance within each sector and implementing measures that reflect the degree to which they could affect the stability of the system. Various criteria can be used to identify the institutions of highest importance, and the indicator of concentration of flows is one of them. The macroprudential approach suggests, on the one hand, that to reduce the concentration of flows it is necessary to allow other agents in the economy to have access to financing and investment mechanisms. On the other hand, to mitigate risks arising from the multiplication of financial transactions, policies to assure monitoring and capital adequacy are necessary.<sup>25</sup> Hence, there must be strict rules on capital reserves (including for the non-financial private sector) which, to a degree, fall within the most recent Basel guidelines. CAPDR could benefit from the experience of other countries, such as Colombia, Peru and Mexico, which offer possible paths for addressing these challenges (see Box 3.2 and the Annex II).

A further factor for consideration is the growth of interbank credit, which also represents a shock amplifier. The interbank market is an important mechanism for the distribution of excess liquidity among financial entities, since it can provide coverage for institutions (banks) experiencing difficulties meeting their short-term liabilities.<sup>26</sup> Its correct functioning is important to guarantee financial intermediaries' access to sources of liquidity so that they can make financing available for households and firms. However, as was seen during the 2008–09 financial crisis, a shock to any of the participants in the interbank market can affect the pattern of flows, reduce the availability of funds, and interrupt the provision of liquidity, especially to the banks affected directly by the shock. Furthermore, while larger entities tend to obtain finance from a larger number of creditors, the small ones do not, thus making them the most vulnerable to shocks that affect the banking system.<sup>27</sup>

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<sup>24</sup> This would be achieved if the external sector increases its systemic importance by approximately the same amount as the monetary authority.

<sup>25</sup> Equity financing, opposed to debt, is a natural stabilizer as its value adjusts automatically after a shock. This result suggests the convenience of limiting policies (either fiscal or regulatory) that give advantages to debt over equity, either fiscal or regulatory.

<sup>26</sup> Bhattacharya and Gale (1985), Freixas *et al.* (2010), Acharya *et al.* (2012).

<sup>27</sup> Allen and Gale (2000).

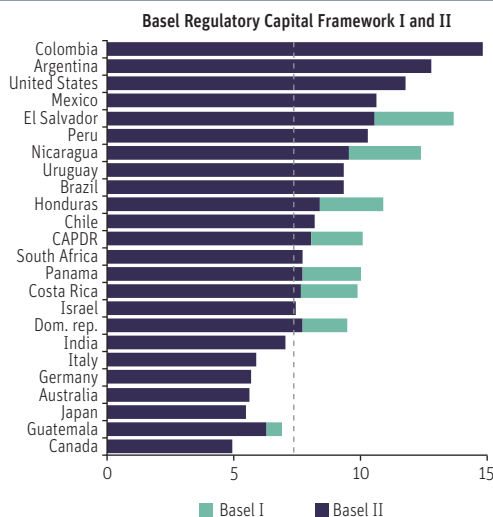
### BOX 3.2 PRUDENTIAL MEASURES IN COLOMBIA, MEXICO AND PERU

In Latin America, Colombia, Mexico and Peru have benefited from the implementation of prudential regulations. Just as in other countries which are recipients of flows, the recent crisis generated important changes in the patterns of flows in these three countries and therefore in sectoral balances. However, they have been able to respond satisfactorily to them so far.

CAPDR could reduce its vulnerabilities by implementing similar measures to those carried out in these countries. To lessen concentration, the creation of non-bank societies with intermediation services of limited purpose (Sofol), and from which banks themselves have been restricted, has been encouraged. Their aim is to provide the financial system with institutions that increase the alternatives and the financing flows for economic agents. Among these societies are found mortgage lenders, educational loan institutions, household credit and credit to micro and small firms.

Meanwhile, to reduce the risks of contagion and its fiscal effects, it is important to have prudential regulation for international banks and repatriation of capital. In this regard, Mexico has required international banks to establish themselves as a subsidiary rather than a branch, thereby minimizing the exit of resources to the matrix. In addition, in Colombia, Peru and Mexico the gradual adoption of the Basel principles I and II has been rewarded by high levels of regulatory capital. It should be stressed that at present CAPDR is not very far from the capital adequacy levels suggested by Basel. However, it is important that the region assimilates the Basel Accords in order to reduce the vulnerabilities of the financial system in general. The risk mitigation agenda is not static and therefore permanent monitoring of market conditions is preferable. For this reason Colombia, Peru and Mexico are proceeding to improve their financial regulation criteria with the aim of extending them across the multi-sectoral, macroprudential field and making them more suitable for the post-crisis financial reality. Graph R2.2 points out some of these elements.

GRAPH R 3.2 Capital Adequacy and Reform Schemes



Source: Central Banks and Financial Soundness Indicators of the IMF.

Note: The black dotted line indicates the minimum level suggested in Basel II.

(continued on next page)

**BOX 3.2 PRUDENTIAL MEASURES IN COLOMBIA, MEXICO, AND PERU** *(continued)***GRAPH R 3.2 Capital Adequacy and Reform Schemes** *(continued)*

Basel II and the Macroprudential Scheme	
Prudential Policy	Example of Reform
Microprudential Framework: Basel II Improved	<p>Increase in the quantity and improvement in the quality of capital</p> <p>Urgent need for capital adequacy requirements in the trading book</p> <p>Improvement in risk management and disclosure</p> <p>Introduction of a leverage coefficient complementary to risk-weighted measures</p> <p>Treatment of counterparty credit risk posed by over-the-counter (OTC) derivatives</p>
Macroprudential Approach	<p>Managing stability over time (pro-cyclicality)</p> <ul style="list-style-type: none"> <li>• Anti-cyclical capital requirements and dynamic provisioning</li> <li>• Capital conservation rules to maintain higher capital excesses</li> </ul> <p>Managing stability over time (systemic approach)</p> <ul style="list-style-type: none"> <li>• Additional systemic capital requirement in financial institutions of systemic importance</li> <li>• Identification of inter-connections and shared exposure in all financial institutions</li> <li>• Systemic vigilance of OTC derivatives (infrastructure of central counterparty entities)</li> </ul>

Given the relative importance of the public sector in CAPDR, an all-encompassing management of the government's liabilities is crucial to reduce vulnerabilities in the economy. Under the multi-sectoral approach, the authorities should recognize that fiscal policy is the cornerstone of a general financial stability framework. Similarly, in CAPDR the public sector is the largest player in local financial markets and its domestic liabilities are the benchmark for risk-free interest rates in each of the financial systems. For these reasons, governments must take into account the impact of fiscal policy on the stability of the financial system. Concretely, fiscal policy should not only aim to be counter-cyclical, but also take into account the importance of strengthening fiscal buffers, as they will provide CAPDR with better capacities to cope with shocks affecting the financial sector.

## CONCLUSIONS

During the years following the recent financial crisis, the convergence of diverse factors—both internal and external—in many ways predetermined the economic performance of CAPDR, a region that is more open than ever to international markets. In these years, the region experienced a boom in the attraction of financing flows from overseas. Like potential external shocks, these

flows are key determinants of the behavior of the main macroeconomic variables. In this light, their effects represent a constant policy challenge for the economic authorities.

There is no doubt that the inflow of external funds has been beneficial, and so far the economy has not shown any notable deterioration in its balances, but inadequate management of the inter-sectoral flows could lead to instability. In addition, higher liquidity resulting from the external flows has facilitated greater activity in credit and debit operations between market participants, and with this, the emergence of certain vulnerabilities, which are not immediately evident in the balances. In this regard, the analysis presented here shows that the influx of funds from abroad has effectively modified credit and debit patterns in the entire region, leading to vulnerability in some cases. These vulnerabilities, associated with the intensification in financial operations and with the presence of sectors of high systemic importance, could eventually lead to imbalances that could ultimately spread negative effects through the rest of the economy.

The lessons of this chapter are that the intensification of financial relationships between sectors must be accompanied by a multi-sectoral agenda for action. A multi-sectoral approach would make it possible to achieve coordinated results and confront vulnerabilities that might lead to scenarios of instability and risk aversion. In addition, with a policy framework of this kind, countries of the region could benefit by bolstering investor confidence and thereby enhancing creditworthiness. The policy agenda in CAPDR should broaden its scope, to take heed of the risk that imbalances in one particular sector might have damaging effects on the rest of the economy.



# IV

## IF THE WINDS WERE TO CHANGE? GROWTH SCENARIOS FOR THE REGION

The prospects for CAPDR have improved thanks to the recovery trends in the United States, as well as the fall in oil prices. It is expected that the former will benefit the exports and remittance inflows in the region. Moreover, since CAPDR countries are net oil importers, the fall in oil prices should also have positive effects, helping to improve the current account and lessen inflationary pressures.<sup>1</sup> Low oil prices also provide an opportunity to reduce energy subsidies, therefore, improving the fiscal position.

In spite of this positive outlook, there remain risks that need to be considered. In particular, the withdrawal of monetary stimulus in the United States could cause greater volatility in capital markets and push up the costs of external resources, which have become important sources of financing for the region. Recent history shows that at times of financial turbulence, investors can suddenly become more risk averse and seek refuge in assets of economies with stronger fundamentals (a phenomenon known as flight-to-quality), with serious repercussions for emerging markets.<sup>2</sup> As it can be seen in panel A of Graph 4.1, increases in financial volatility (measured by the VIX<sup>3</sup> volatility index) during crisis periods tend to be accompanied by a rise in the premium over the interest rate on United States Treasury bonds (the international risk-free rate) that emerging markets have to pay to obtain financing in international markets. The increasing integration of the region in capital markets exposes it to this type of risk, as demonstrated during the international financial crisis (see Graph 4.1, panel B).

There is also uncertainty about the duration of lower oil prices. The potential impact of lower oil revenues on political stability in some of the main oil producing countries could trigger changes

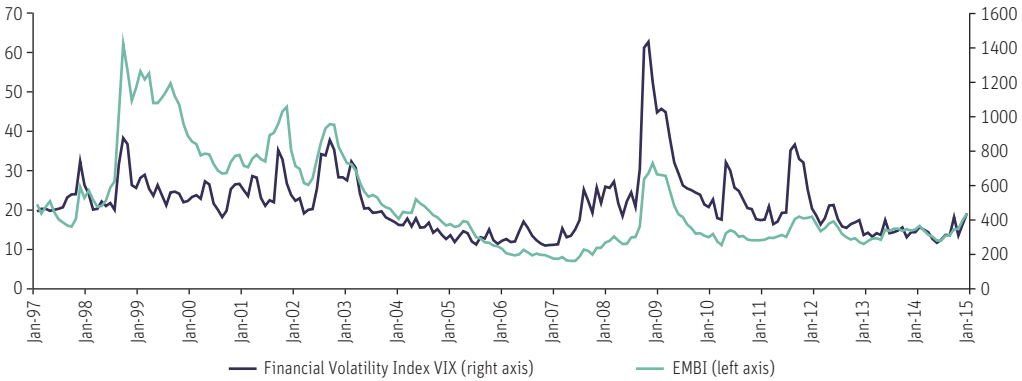
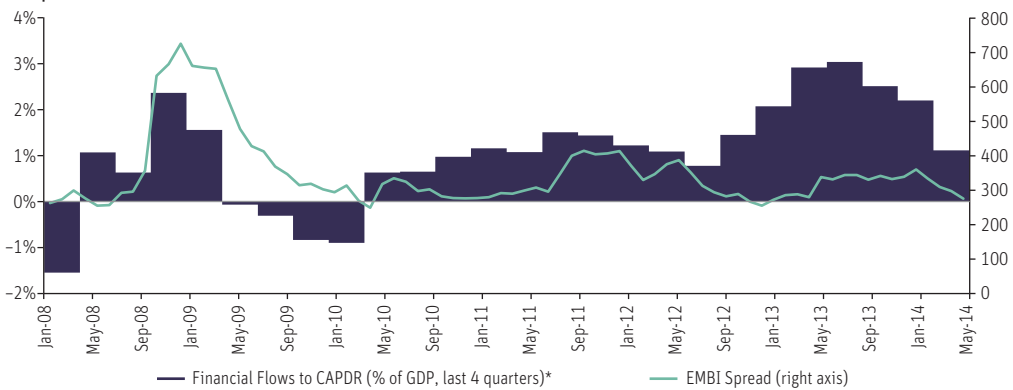
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<sup>1</sup> This would give central banks flexibility in policy-making.

<sup>2</sup> See, for instance, Calvo (1999) for a theoretical formulation of how information asymmetries on the part of investors can cause reversals in capital flows to emerging markets for reasons unrelated to their economic fundamentals.

<sup>3</sup> The VIX is an indicator, which measures the confidence of investors in capital markets.



**GRAPH 4.1 Financial Shocks and Capital Flows****A. Financial Volatility and the Cost of External Financing****B. Capital Flows to CAPDR**

Source: Bloomberg and national sources.

Note: \*corresponds to the financial account minus foreign direct investment flows.

in oil supply and therefore in prices. Moreover, it remains plausible that the weak performance of other economic zones in the world (especially Europe) may damage growth in the United States and the region.

In this context, it is useful to examine the impact on regional growth of an increase in the oil price, greater volatility in financial markets, and weaker growth performance in the United States. To quantify the impact of each of these risks, this chapter estimates an econometric model of the average regional growth<sup>4</sup> as a function of the behavior of the relevant exogenous variables: economic growth in the US, the oil price, and international financial conditions (captured by the VIX volatility index).<sup>5</sup> The results show the implications of specific scenarios in the external environment on growth in CAPDR for the next two years.

<sup>4</sup> The growth rates of Belize, Costa Rica, El Salvador, Guatemala, Panama, and the Dominican Republic were considered, representing 87% of regional GDP.

<sup>5</sup> See Annex III for details of the model employed.

As a starting point, the baseline scenario is as follows: oil prices gradually recover, to reach US\$69 per barrel (dpb) in 2017;<sup>6</sup> growth in the United States is 3.6%, 3.3% and 3.1% in 2015, 2016 y 2017, respectively; and financial volatility (measured by the VIX index) shows a similar evolution to 2012-2014 (see Graph 4.2). This baseline scenario is contrasted with four stress scenarios. In the first, the assumption is that the oil price rises at a faster pace between 2015 and 2017 (see Graph 4.2, panel A), to reach US\$85 at the end of 2017. In the second, it is assumed that financial volatility increases in a similar way to the period of adjustment and negotiation over the Greek debt in 2011 and 2012 (see Graph 4.2, panel B). The third stress scenario assumes that growth in the United States economy slows down as a result of the weak performance of the Euro Zone and China, reducing annual growth, on average, by 0.4 percentage points in 2015-2017 (see Graph 4.2, panel C).<sup>7</sup> Finally, in a fourth scenario, the three shocks described above are combined.

Graph 4.3 presents the results of the different scenarios. In the first one, a more rapid than expected recovery in the oil price compares unfavorably with the baseline scenario, with growth rates for the region reduced by 0.2 and 0.5 percentage points in 2015 and 2016, respectively. In this case, economic activity of the region would expand 3.6% by 2016, compared to 4.1% in the baseline.

In the second scenario, a sudden increase in volatility would negatively affect economic growth in CAPDR. The peaks in volatility would translate into GDP growth that is 0.6 percentage points below the baseline in 2015 (see Graph 4.3). Given that it is assumed that the greater volatility would continue until 2016, this negative effect would lower the region's average growth from 4.1% to 3.4.

In the third scenario, lower growth rates in the US would have an important impact on the region in both 2015 and 2016. As shown in Graph 4.3, the potential impact of an average reduction of 0.4 percentage points in the growth of the United States (main trading partner of the region) would be a growth slowdown of 0.5 percentage points in 2015, compared to the baseline. This effect would be accentuated in 2016, with the model projecting growth 3.3%, 0.8 percentage points below the baseline.

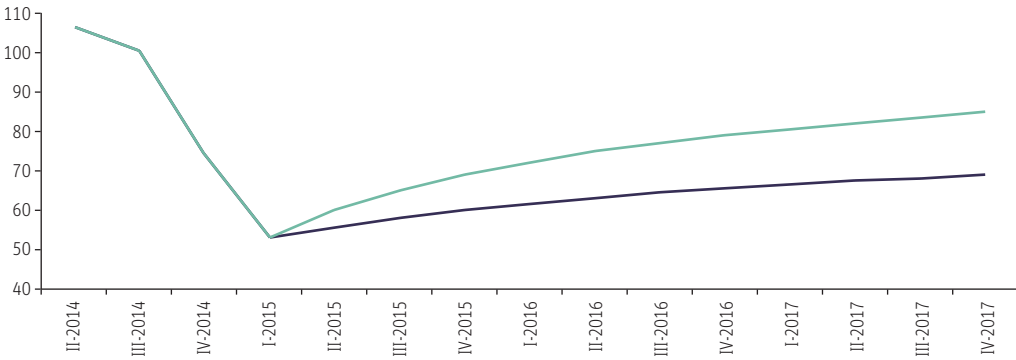
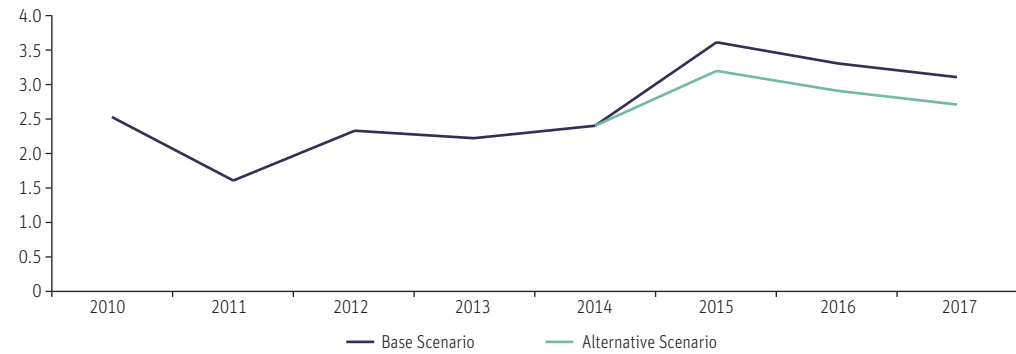
Finally, the least optimistic scenario in which the three shocks hit the region simultaneously, economic growth is reduced to 3.2% in 2015, and the slowdown would become more acute in 2016 with a rate close to 2.9% (less than the growth rates recorded in 2013-2014). The reduced dynamism of the U.S. economy would explain 60% of the potential impact in this scenario; higher oil prices 28%; and the increased volatility 12%.

What can be learned from these scenarios? Although the region is currently benefiting from favorable tail winds due to the US recovery and low oil prices, there are risks that could curtail growth. A new round of global economic instability would have serious consequences for growth

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<sup>6</sup> This path is consistent with the most recent projections by the World Bank.

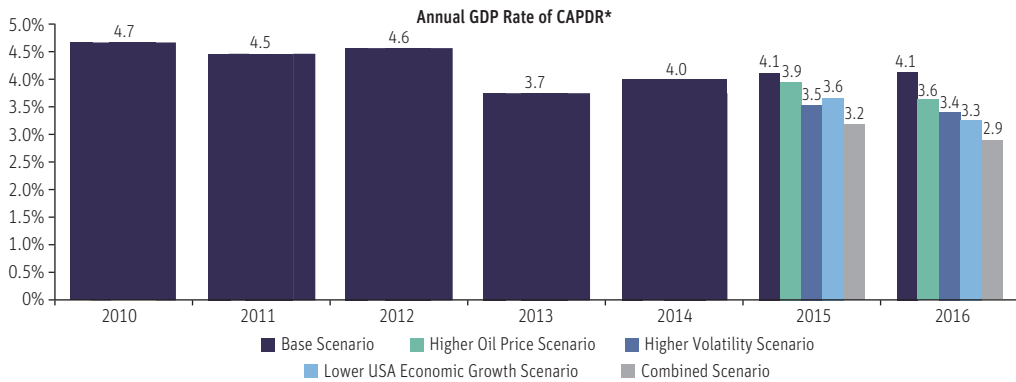
<sup>7</sup> This potential impact was calculated by simulating a deepening of the European recession and employing a Global Vector Auto-Regression (GVAR) model, which captures trade and financial linkages between advanced economies and Latin America, developed in Cesa-Bianchi *et al.* (2012).

**GRAPH 4.2 Scenarios: Evolution of the External Factors****A. Oil Prices (US\$ per barrel)****B. Financial Volatility (VIX index)****C. United States Growth (Real GDP, percentage change)**

Source: U.S. Federal Reserve, Chicago Board Options Exchange (CBOE) and own calculations.

of the economies of the region and, given the limited space for a counter-cyclical fiscal policy as a consequence of higher levels of debt, the recovery process could be even slower and more complex.

These results highlight the importance of taking advantage of the favorable environment to regain fiscal space, while implementing policies to strengthen the region's growth in the medium- and long-term. CAPDR might be tempted to delay the process of fiscal consolidation in the current

**GRAPH 4.3 Impact of External Scenarios on the Region**

Source: IDB staff estimates after 2014. IMF World Economic Outlook for historical data.

Note: \* average growth includes Belize, Costa Rica, El Salvador, Guatemala, Panama and Dominican Republic, which account for 87% of regional GDP.

favorable external environment, as happened in the case of some Latin American commodity-exporting economies during the price boom of recent years, but this would be a mistake.

This chapter highlights how important it is for CAPDR countries to further reduce their vulnerability to changes in the external outlook, reinforcing the arguments of earlier chapters. In line with the analysis in Chapter 2, it suggests that the key to building more resilient economies is to keep strengthening policy frameworks, to assure positive risk perceptions and access to low cost financing. Such policies will enable countries to implement counter-cyclical measures to mitigate the harmful effects of external shocks. Moreover, the results of this chapter support the findings of Chapter 3, in stressing the need to design macro-prudential regulation that takes into account the increased exposure of different sectors of the economy to external indebtedness, as well as the greater ties amongst them. As discussed in Chapter 3, this demands progress in the implementation of the recommendations of the Basel accords, such as the establishment of strict rules on capital reserves (including for the non-financial private sector). Similarly, the evidence here supports strategies aimed at monitoring fiscal and debt positions to strengthen buffers in the region and thus mitigate the impact of potential future crises.



## ANNEX I

The relationship between credit rating and the IIR is generated by means of a map, which assigns 1 to an Aaa rating and 0 to Caa3. The following table shows these equivalences:

**TABLE AI.1** Credit Rating Equivalence between Moody's and IIR

Rating	IIR
Aaa	90.04
Aa1	86.27
Aa2	82.5
Aa3	78.74
A1	74.97
A2	71.2
A3	67.43
Baa1	63.67
Baa2	59.9
Baa3	56.13
Ba1	52.36
Ba2	48.6
Ba3	44.83
B1	41.06
B2	37.29
B3	33.53
Caa1	29.76
Caa2	25.99
Caa3	22.23

Source: Elaborated by IDB staff with data from Moody's and the *Institutional Investor* Magazine.

### Estimations Methodology

**General specification of the model:** the model is constructed on the basis of the specification proposed by Bannister *et al.* (2011). The specifications used for this chapter expand the initial estimation by means of a set of variables which significantly contribute to approximating the economic fundamentals:

$$IIR_{it} = \rho IIR_{it-1} + z'_{it}\beta_1 + x'_{it}\beta_2 + \alpha_j + \varepsilon_{it} ,$$

where  $z$  corresponds to the set of controls in Bannister *et al.* (2011) and  $x$  includes factors of institutional strength, industrial complexity (Index of Export Complexity) and financial depth (liquid liabilities in the balance of payments as a percentage of GDP).

To gauge the degree of correlation between the variables of institutional strength, the *Kaufman World Wide*

*Governance Indicators* indices were taken into consideration and submitted to a decomposition of principal components. As can be seen in Table A2, around 75% of the information is accumulated in the first two components with the priority distribution as indicated there. The relative weight of each factor, an important variable for the selection of the factors to be included in the estimations, is also important. For the rest of the estimations, annual series from 1989 until 2013 are used in five-yearly averages for each one of the series.

**Generation of clusters.** With the five-year series a k-means method is used based on debt as a percentage of GDP and the Institutional Investor Rating (IIR), using the measure L2.

**Indicators of strength by clusters.** The table below reflects the relative position of CAPDR for each aspect of Institutional Strength.

**Measurement of the effects by clusters.** The general formulation is extended by means of dummy variables,  $D$ , indicating membership to each cluster.

$$IIR_{it} = \rho IIR_{it-1} + z'_{it}\beta_1 + x'_{it}\beta_2 + D'_{it}\beta_3 + \alpha_i + \varepsilon_{it} .$$

**Estimation method.** Since a specification of fixed effects in a dynamic panel is involved, various methods are explored, among them the Fixed Effects, Least Squares, Arellano-Bond regression (1991) and Arellano-Bover (1995). As a greater number of countries than periods are available, the instruments option in a Generalized Method of Moments results in more consistent estimations, and therefore the Arellano-Bover (1995) results are those used in the body of the document. Table A4 shows a summary of results from the estimations, using Arellano-Bover (1995):

**Analysis of non-linearities.** With the aim of studying whether there are different effects between clusters for our proxies of economic fundamentals, first a t-test of means between clusters and factors was elaborated. Table AE1 shows the results of these tests. The tests reflect the fact that there are statistically significant differences between clusters for some of the factors used, which might suggest the existence of non-linear effects between clusters. To corroborate this, a series of estimations were carried out, including interaction of debt and IIR dummies. To generate the debt dummy ( $d$ ), the average between the figure which separates cluster 1 and 2 and that which separates cluster 3 y 4 was used. The same method was used to generate the dummy ( $i$ ) of the IIR. The following set of estimations was carried out:

$$IIR_{it} = \rho IIR_{it-1} + z'_{it}\beta_1 + x'_{it}\beta_2 + D'_{it}\beta_3 + (d_{it} \times f_{it})' \beta_4 + \alpha_i + \varepsilon_{it} ,$$

$$IIR_{it} = \rho IIR_{it-1} + z'_{it}\beta_1 + x'_{it}\beta_2 + D'_{it}\beta_3 + (i_{it-1} \times f_{it})' \beta_4 + \alpha_i + \varepsilon_{it} .$$

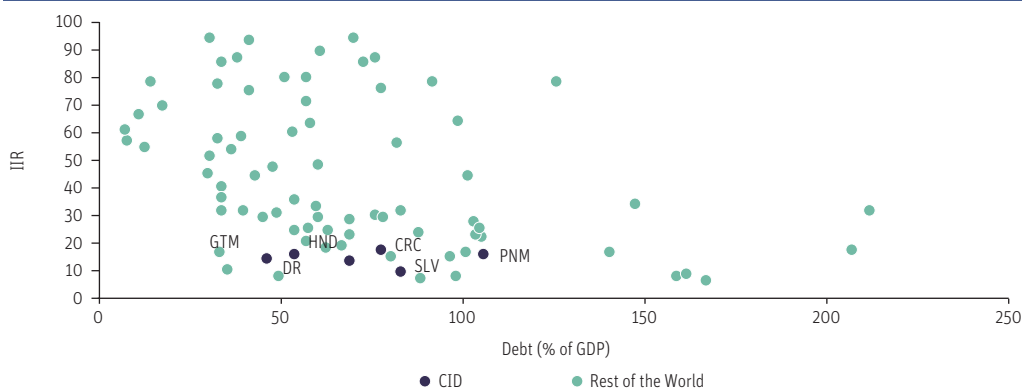
TABLE AI.2 Estimation of Principal Components

Correlation explained by principal component					Relative weight of factors within the principal components		
Principal components/ correlation	Number of obs.	342	Factor	Component 1	Component 2		
	Number of comp.	9	Corruption	0.4089	-0.0014		
	Trace	9	Rule of law	0.4123	-0.0053		
	Rho	1	Accountability	0.3611	-0.1699		
Component	Eigenvalue	Difference	Proportion	Cumulative	Security	0.3572	0.0205
Comp1	5.48	4.38	0.61	0.61	Transparency	0.4115	-0.0106
Comp2	1.10	0.29	0.12	0.73	Complexity	0.3493	-0.1414
Comp3	0.81	0.20	0.09	0.82	Financial depth	0.2043	0.4999
Comp4	0.61	0.22	0.07	0.89	Financial Integration	0.0927	0.7956
Comp5	0.39	0.09	0.04	0.93			
Comp6	0.30	0.07	0.03	0.97			
Comp7	0.23	0.19	0.03	0.99			
Comp8	0.04	0.01	0.00	1.00			
Comp9	0.03	—	0.00	1.00			

The group of estimations below explores whether belonging to each cluster is correlated with any non-linear effect. Since there are  $k=2$  debt groups and  $j=2$  IIR groups,  $2^2$  possibilities are generated reflecting each cluster:

$$IIR_{it} = \rho IIR_{it-1} + z'_{it}\beta_1 + x'_{it}\beta_2 + D'_{it}\beta_3 + \left( i_{it-1}^k \times d_{it}^j \times f_{it} \right)' \beta_4 + \alpha_j + \varepsilon_{it}.$$

GRAPH AI.1 CAPDR During 1989



Source: IDB Staff based on data from *Institutional Investor Magazine* and from the International Monetary Fund (2014).

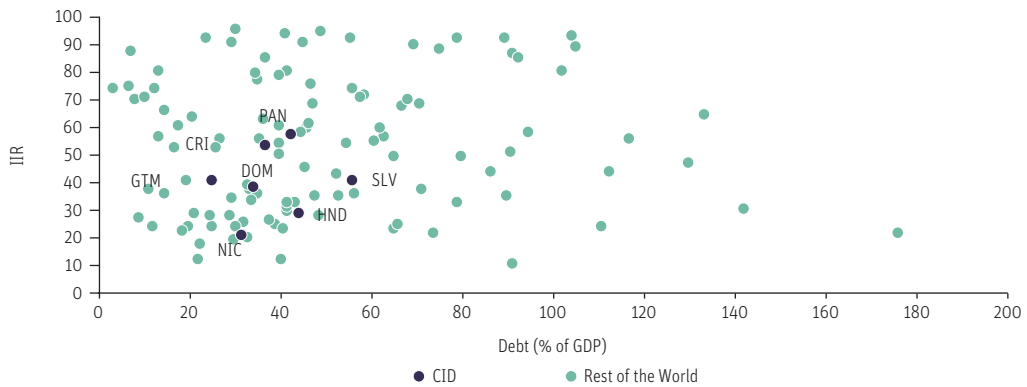


GRAPH A1.2 CAPDR During 2007



Source: IDB Staff based on data from *Institutional Investor Magazine* and from the International Monetary Fund (2014).

GRAPH A1.3 CAPDR During 2013

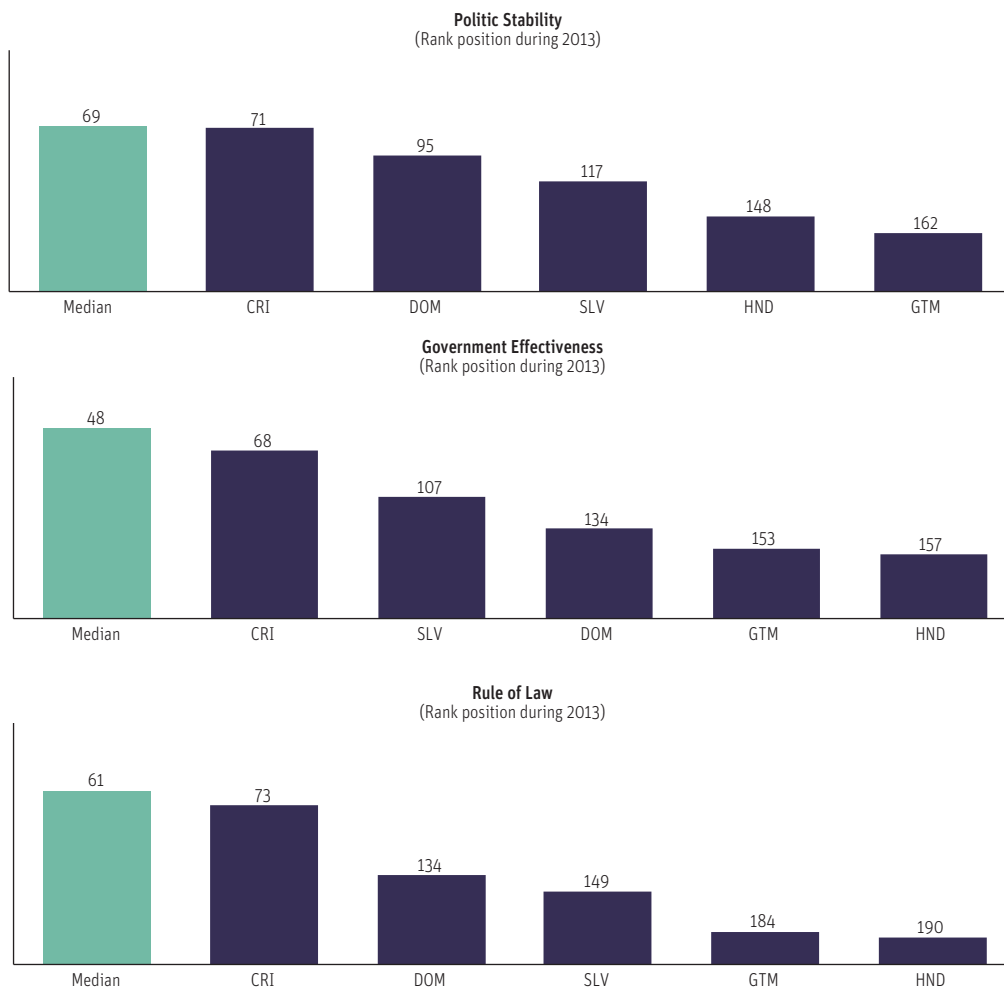


Source: IDB Staff based on data from *Institutional Investor Magazine* and from the International Monetary Fund (2014).

Finally, non-linear continuous effects between the debt and factors were tested as well as between the IIR and factors:

$$IIR_{it} = \rho IIR_{it-1} + z'_{it} \beta_1 + x'_{it} \beta_2 + D'_{it} \beta_3 + (debt_{it} \times f_{it})' \beta_4 + \alpha_i + \varepsilon_{it},$$

$$IIR_{it} = \rho IIR_{it-1} + z'_{it} \beta_1 + x'_{it} \beta_2 + D'_{it} \beta_3 + (IIR_{it-1} \times f_{it})' \beta_4 + \alpha_i + \varepsilon_{it}.$$

**GRAPH AI.4** Position of CAPDR on Each Indicator of Institutional Strength in Relation to the Median of Cluster 3

Source: IDB Staff based on data from Worldwide Governance Indicators (2014).

TABLE AI.3 Estimations by Clusters

Variable	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Lag of IIR	0.434** -5.77	0.489** -7.13	0.539** -7.77	0.390** -4.82
Debt	-0.329** (-6.08)	-0.309** (-5.98)	-0.375** (-6.61)	-0.386** (-7.15)
Square debt	0.00149* -4.52	0.00133* -4.21	0.00164* -4.81	0.00173* -5.23
GDP per capita	0.000104* -2.07	0.000109* -2.24	0.000132* -2.47	0.000125* -2.49
Inflation	-8.701** (-4.11)	-6.969** (-3.32)	-8.833** (-3.71)	-9.973** (-4.38)
Default	-8.740** (-5.26)	-8.936** (-5.46)	-9.557** (-5.52)	-8.757** (-5.24)
Trend	0.413 -0.7	0.163 -0.3	-0.454 (-0.82)	0.41 -0.7
Depth	-0.00391** (-2.67)	-0.00377** (-2.64)	-0.00390** (-2.61)	-0.00374* (-2.52)
Control of corruption	8.053** -4.41	7.650** -4.18	5.839** -3.4	7.951** -4.27
Dummy for cluster	-3.297+ (-1.73)	1.368 -0.64	-1.561 (-0.72)	6.065* -2.27
Constant	45.16** -13.77	41.62** -13.3	45.23** -11.33	47.20** -14.09
Observations	359	359	359	359

Source: IDB staff.

Note: t statistics in parentheses.

+ p < 0.10; \* p < 0.05; \*\* p < 0.01.

## Statistical appendix

**TABLE AE1 Statistical Summary** (% of GDP, Unless Otherwise Indicated)

Cluster 3 Selected economic indicators (% of GDP, unless otherwise indicated)						Cluster 4 Selected economic indicators (% of GDP, unless otherwise indicated)					
Indicator	Mean	Median	Standard Deviation	Minimum	Maximum	Indicator	Mean	Median	Standard Deviation	Minimum	Maximum
IIR <sup>a</sup>	74.35	74.76	10.97	57.60	94.26	IIR <sup>a</sup>	76.29	76.30	13.59	53.40	92.34
Debt	31.96	35.14	15.24	5.94	54.94	Debt	84.80	81.27	16.30	62.36	123.18
BCC*	4.34	1.89	9.43	-10.61	37.56	BCC*	0.56	-1.65	6.26	-6.15	20.28
Tax burden	34.99	33.20	12.37	16.47	69.53	Tax burden	39.56	41.19	9.10	19.20	50.84
Complexity <sup>a</sup>	0.66	0.69	0.60	-0.70	1.63	Complexity <sup>a</sup>	0.97	1.12	0.46	0.00	1.54
Depth	91.67	48.32	121.51	10.96	665.16	Depth	220.06	163.40	211.01	17.64	872.48
Integration	27.98	-9.14	102.95	-80.23	343.99	Integration	-18.28	-21.99	73.85	-114.28	207.00
Control of corruption <sup>a</sup>	0.72	0.47	1.00	-1.04	2.44	Control of corruption <sup>a</sup>	1.14	1.36	0.78	-0.54	2.16

Note: <sup>a</sup> Index

Cluster 2 Selected economic indicators (% of GDP, unless otherwise indicated)						Cluster 1 Selected economic indicators (% of GDP, unless otherwise indicated)					
Indicator	Mean	Median	Standard Deviation	Minimum	Maximum	Indicator	Mean	Median	Standard Deviation	Minimum	Maximum
IIR <sup>a</sup>	40.08	37.16	10.26	26.66	55.14	IIR <sup>a</sup>	36.61	36.74	11.91	10.65	55.38
Debt	23.80	25.70	9.01	9.44	36.30	Debt	50.08	46.14	14.42	32.34	84.28
BCC*	-1.51	-2.09	5.80	-10.71	11.16	BCC*	-4.90	-4.54	6.36	-22.51	5.80
Tax burden	24.98	23.20	8.75	11.43	38.05	Tax burden	30.29	28.25	11.67	6.60	60.98
Complexity <sup>a</sup>	-0.58	-0.56	0.72	-2.14	0.73	Complexity <sup>a</sup>	-0.28	-0.11	0.67	-1.78	0.92
Depth	40.95	31.13	29.55	9.05	138.62	Depth	51.34	42.97	32.14	18.08	174.07
Integration	-30.29	-30.98	42.15	-98.78	38.84	Integration	-49.80	-44.01	55.21	-257.34	34.56
Control of corruption <sup>a</sup>	-0.58	-0.71	0.53	-1.41	0.62	Control of corruption <sup>a</sup>	-0.50	-0.56	0.62	-1.44	1.27

Note: <sup>a</sup> Index

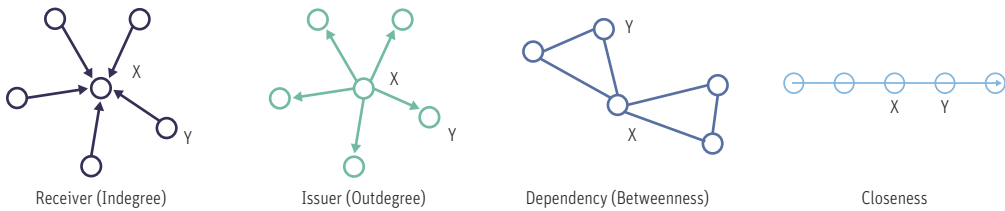
Source: IDB Staff based on data from *Institutional Investor Magazine* and from the International Monetary Fund (2014).

\*BCC = Balance of current account.

## ANNEX II

**The index of relative or systemic importance.** The index is generated from four broad components extracted from the network of flows: i) importance as a recipient of flows; ii) importance as a transmitter of flows; iii) dependence; and iv) proximity. The first two are based on the values of credits and debits received. Dependence is based on quantifying how indispensable each sector is for the flows of funds from one sector to another. Finally, proximity is based on the volume of flows between sectors. Each component is normalized between 0 and 1, where 1 is equivalent to a higher level in each case. The index weights each one uniformly and their sum shows the relative importance.

**GRAPH AII.1** Components of the Index of Relative Importance in a Network of Flows



**Systemic importance of CAPDR compared to Colombia.** With the aim of having a comparative benchmark in Latin America, Graph AII.2 also includes the index for CAPDR in 2013 and Colombia.<sup>1</sup> Colombia is a natural choice as a regional benchmark: it is a country, which has developed its financial system in the last decade and, in addition, has strengthened its fiscal sector through prudential reforms. Thus, comparing the value of the systemic importance index, it can be seen that it has tended to diminish in the region's banking sector to stand very close to the value registered for Colombia in 2013. However, the same graph reveals some differences between the region and Colombia. One example is the high systemic importance of the public sector in CAPDR compared to Colombia. Another marked difference is that households and the monetary authority are much more important in Colombia than in CAPDR. This is consistent with the lower level of development of the financial and capital market in CAPDR.

**The simulated network that minimizes fiscal costs.** This network of flows is obtained beginning with the current structure of credits and debits. As was explained in Box 3.1, the shock takes external financing back to levels similar to those of 2008. However, in this simulation, the procedure shown in Box 3.1 and the findings of Graph 3.7 are used to find the distribution of debits and credits that would reduce the fiscal cost as much as possible. This means that

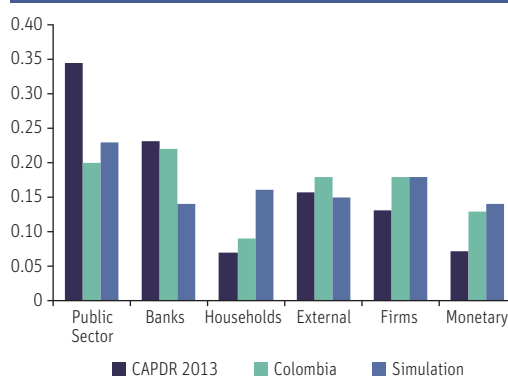
<sup>1</sup> Considers information on flows between 2012 and 2013.

the linkages between sectors change and therefore the patterns of debits and credits are modified. With the new patterns of flows, indicators of systemic importance are generated. Graph AII.2 compares the index of relative importance to what was observed in CAPDR in 2013, the comparable one for Colombia and the new simulated network. In their turn, the costs generated under this simulation are shown with blue bars in Graph 3.7.

### Dimensions of the macroprudential policy approach (see Graph AII.3).

The first aspect of the macroprudential approach is the multi-sectoral dimension. This seeks to avoid common features, such as similar capital structures and the inter-connection between entities. But in the time dimension the pro-cyclicality of bank activity stands out as well as its impact on systemic risk.<sup>2</sup> The latter has been extensively explored, while the multi-sectoral dimension has drawn attention only since the recent financial crisis. The multi-sectoral dimension focuses on the system of flows as a whole, not just those that occur within a particular sector. It considers that the aggregated risk depends on the behavior of institutions; that is, decisions, which can be rational individually, can be prejudicial when combined with those of all other institutions. This approach, unlike others applied previously, uses prudential instruments such as regulation and supervision, but with systemic goals rather than focusing on a specific sector. Furthermore, it demands a view of the effect of microprudential regulations beyond their immediate impact on the individual solvency of each sector or entity. In addition, it differs from the approaches to financial stability in general because it concentrates on macroeconomic aspects and the monetary stability of the country, and not only on forecasting the systemic stability of the financial sector. Graph AII.3 shows some of the measures included under the multi-sectoral dimension.

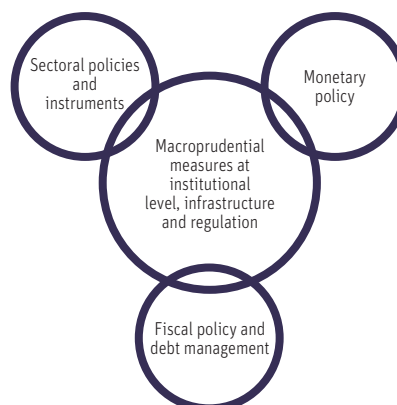
GRAPH AII.2 Relative Importance in CAPDR



Source: IDB staff estimates extracted from the matrix of average flows for the region.

Note: The scale of the index is from 0 to 1.

GRAPH AII.3 Multi-Sectoral Policy Approach



<sup>2</sup> See, for example, Fernández de Lis (2010), Caruana (2010a) or Borio (2008)

TABLE AII.1 The Multi-Sectoral Dimension

Prudential Policy		Monetary Policy		Fiscal Policy	
<b>Mitigating the problems of individual banks (microprudential)</b>	<b>Mitigating the problems of the system as a whole (macroprudential)</b>	<b>Maintain price stability</b>	<b>Cooling down expansions</b>	<b>Manage aggregate demand</b>	<b>Generate fiscal surpluses in boom times</b>
Quality/quantity of capital	Anti-cyclical capital requirement	Official interest rate	Raise the official interest rate	Taxes	Reduce debt levels
Leverage coefficient	Dynamic provisioning	Conventional repo operations	Raise bank reserve requirements	Automatic stabilizers	Introduce taxes/levies on the financial sector
Liquidity levels	Systemic capital requirement	Policy guarantees	Drain liquidity (Central Bank treasury certificates, exceptional repos)	Anti-cyclical approach (discretionary)	<b>Offer help to the financial sector in periods of tension</b>
Counterparty credit risk	Leverage coefficient	Payment of interest on reserves	<b>Offer stimuluses in contractions</b>		Capital injections
Limits on bank activities (for example, trading on own account)	Maximum limits on loan to value	Policy corridors	Reduce the interest rate		Deposits and debt guarantees
Strengthening risk management	Robust infrastructure (central counterparty entities)		Reduce obligatory reserve requirements		Bank rescue packages
			Inject liquidity		Discretionary stimuluses
			Quantitative credit relaxation		
			Provision of emergency liquidity		
			<b>Exit strategies</b>		
			<b>Excess cash reserves</b>		

## ANNEX III

**Brief general description of the model employed.** The impact of the recent fall in oil prices and the solid performance of the United States economy could contribute to an improvement in the prospects for CAPDR. To this end, a vector auto-regression (VAR) model is estimated on the basis of quarterly data from 1992 to 2014. The model consists of two blocks of variables, one external and the other internal. The first block, which includes growth in the United States, the oil price and financial volatility, makes it possible to capture the interactions of the external environment. The second block captures the effect of the external variables on growth. It considers the average growth of the CAPDR region and inflation as endogenous variables while the variables of the external block are incorporated exogenously.

The model can be represented in two parts. The first corresponds to the external block and its specification can be summed up in the following structural form:

$$AY_t = BY_{t-1} + C\epsilon_t$$

Where  $Y$  is the vector of explanatory variables and  $\epsilon$  is the error term, while  $A$ ,  $B$ , and  $C$  are the parameter matrices. To ensure the identification of each parameter, the following restrictions are applied:

$$A = \begin{pmatrix} 1 & 0 & 0 \\ a_{21} & 1 & 0 \\ a_{31} & a_{32} & 1 \end{pmatrix} \text{ and } B = \begin{pmatrix} b_{11} & 0 & 0 \\ 0 & b_{22} & 0 \\ 0 & 0 & b_{33} \end{pmatrix}$$

The second block is summarized in the following system:

$$X_t = DX_{t-1} + EY_t + F\theta_t$$

Where  $X$  is the vector which includes the growth in regional GDP and inflation, while  $Y$  is the vector of external variables.  $D$ ,  $E$  and  $F$  correspond to the respective parameter matrices.





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