

# INCLUSIVE GROWTH

Challenges and Opportunities for  
Central America and the  
Dominican Republic

Coordinators **Jordi Prat** and **Arnoldo López**



BELIZE COSTA RICA DOMINICAN REPUBLIC EL SALVADOR GUATEMALA HONDURAS NICARAGUA PANAMA



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## Inter-American Development Bank

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## FOREWORD

During 2017, economic growth continued its positive trend in Central America and Dominican Republic. Stable commodity prices and a vitalized U.S. economy drove up consumption and investment, opening the way for a regional economic expansion of 3.8%, slightly above that of 2016.

The foreseen gains in poverty reduction and income distribution have not materialized, however, with the indicators stalling or even backsliding in some countries. This poses serious challenges for the region, especially considering that the growth prospects for the next three years have been adjusted downward, due to the risks associated with key variables such as international interest rates, commodity prices – particularly oil – and U.S. trade policy.

The regional policy agenda should be examined in this context, to set clear priorities for taking advantage of the region's growing labor force, market access, high levels of integration, sound and highly integrated financial systems, and natural and historical heritage, so that countries of the region can boost growth and its benefits can be reaped by more people.

“Inclusive Growth: Challenges and Opportunities for Central America and the Dominican Republic” examines policy options to help the countries in the region boost medium-term, inclusive economic growth, while mitigating the risks of the current international juncture. The report first assesses the region's social and macroeconomic conditions and analyzes their opportunities and risks in the medium term. The document then studies the potential effect of several policy variables on human capital accumulation, which can then accelerate inclusive economic growth. The role played by financial integration in the region's credit behavior is also examined, followed by a study of the sensitivity of regional growth to external shocks such as changes in international commodity prices and U.S. economic growth.

This report aims to contribute with its analysis and conclusions to a regional debate on the courses of action the countries should follow to strengthen their economic performance and ensure that benefits reach all its citizens.

***Verónica Zavala***

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Haiti, Mexico, Panama and the Dominican Republic  
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## EXECUTIVE SUMMARY

In 2017, Central America and the Dominican Republic (CADR) experienced stable economic growth. Factors such as the U.S. economic performance and low commodity prices kept the region's key indicators – inflation and current account balance, for instance – from fluctuating abruptly. Even so, the fiscal sector faces serious challenges in the medium term. Given a lack of political agreement, no major fiscal policy changes are foreseen, and we would expect a continued upward trend in fiscal deficits and public debt, putting pressure on interest rates which would have adverse repercussions on economic growth. This has been reflected in downward adjustments to regional growth prospects. Growth has been moderate, but its low inclusivity is a matter of concern, given its weak power to reduce poverty and improve income distribution. This economic growth shortcoming is one of the prime motivators for this report, which seeks to underscore the need to strengthen the region's human capital accumulation, take advantage of integration with other trade partners, and generate spaces for policy reaction in a highly uncertain environment.

Chapter 1 looks at the regional economic performance in a global context, in the face of CADR's most serious challenges. We first review the economic results for 2017 and expectations for 2018. Three major regional challenges are highlighted: inclusive growth, the need for the region to take advantage of the apparently "spontaneously" occurring integration, and the continued need to create spaces for policy reaction in a highly uncertain environment for the region.

Chapter 2 describes the determinants influencing economic growth and CADR's ability to accumulate human capital. It examines how household and personal characteristics affect an individual's probability of accessing education and health services, and then looks into how some countries are more likely than others to be affected by labor informality, where variables such as sectoral composition and formal sector rigidities appear to factors

that influence the size of the underground economy. We also analyze the link between human capital and economic growth and give several policy recommendations for achieving sustainable economic growth with greater inclusivity.

In Chapter 3, we examine how credit convergence in CADR has evolved over time, reaching peaks around the 2008-2009 financial crisis. We find that the convergence describes asymmetric credit responses. A slowdown of a trade partner's real activity reduces credit in the region in a synchronized manner (more convergence), but a speedup increases credit unevenly across countries (less convergence). This means that despite its less developed financial markets the region is beginning to integrate.

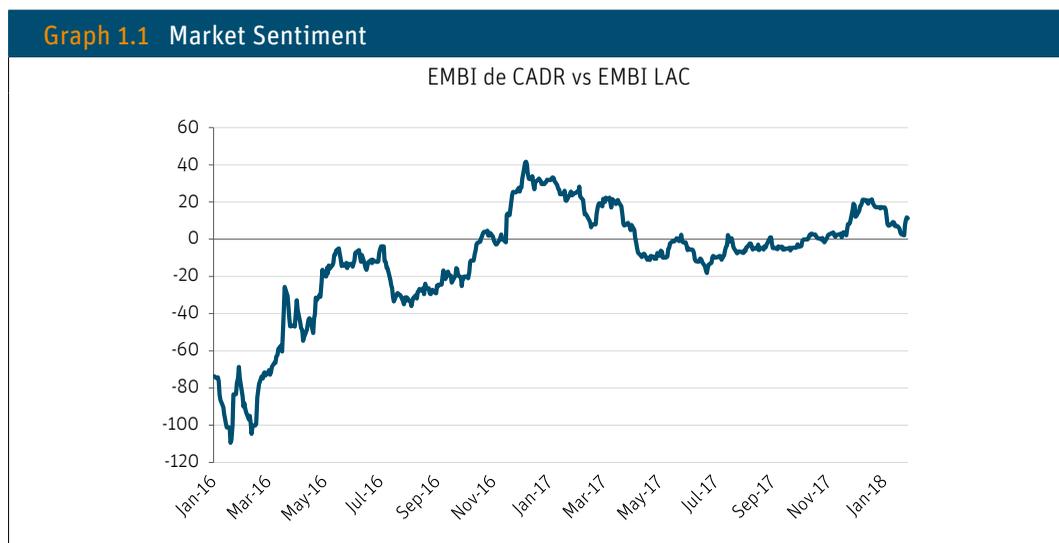
Finally, Chapter 4 offers various scenarios of regional economic performance in the face of external shocks. The region is exposed to shifts in the pace of U.S. monetary policy "normalization" and price fluctuations in its exported commodities such as coffee and sugar, or in its imported commodities, primarily hydrocarbons. All of these are subject to a certain amount of price volatility, whether because of smaller harvests in Brazil or climate phenomena – in the case of coffee and sugar – or because of conflicts in the Middle East, in the case of oil.

# 1

## THE FAVORABLE CONTEXT HAS NOT MOVED TO THE REGION

Even with a favorable external environment in 2017, the results for countries of Central America and the Dominican Republic (CADR) were mixed. The region is highly integrated into the world economy, whether through trade flows, foreign direct investment, or remittances, and though the world economy has eclipsed its economic performance forecasts the region's macroeconomic results are mixed.

This sentiment can be seen reflected in the market. As can be seen in Graph 1.1, between 2016 and 2017, the favorable sentiment towards the region has been disappearing. After the spreads of the region were below the spreads of the rest of Latin America, they began to be above in November 2016 and remained at those levels in 2017

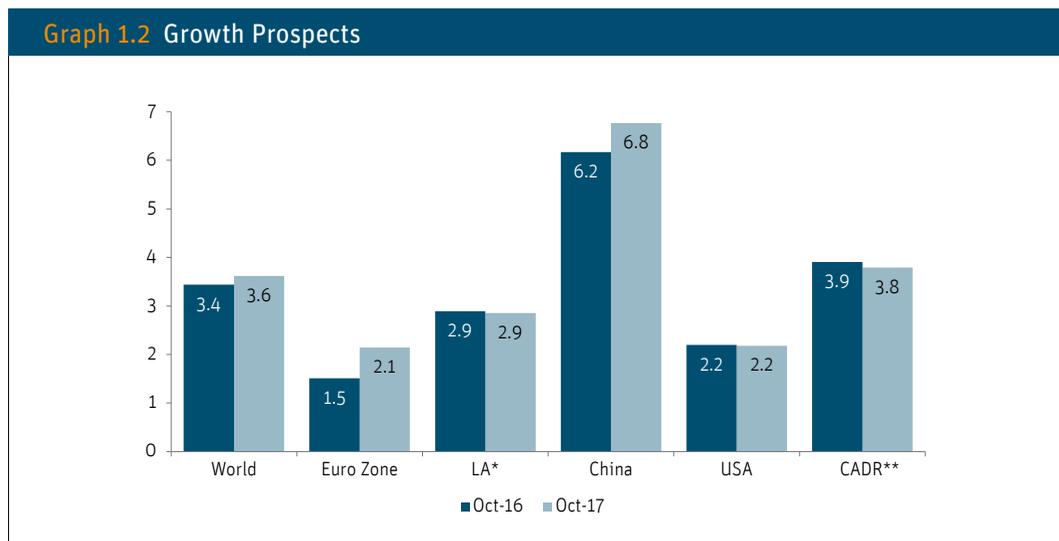


Source: IADB-CID compilation with data from Bloomberg

This chapter starts with a review of this environment and follows with a review of the region's results for 2017 and the expected results for 2018. Finally, we conclude by highlighting three major challenges for the region's future: inclusive growth, the need for the region to take advantage of the apparently "spontaneously" occurring integration, and the continued need to create spaces for policy reaction, given the region's highly uncertain environment.

## A FAVORABLE ENVIRONMENT, NUMBER-WISE

CADR countries are characterized as economies that have opted for integration into the world economy. World economic performance has outpaced the 2016 end-of-year forecasts. As seen in Graph 2, world growth in general will be ending up at 3.6%. China and Europe, in particular, will be growing faster than expected, while the U.S. growth rate will remain steady. Curiously, overall Latin American prospects have also not improved.



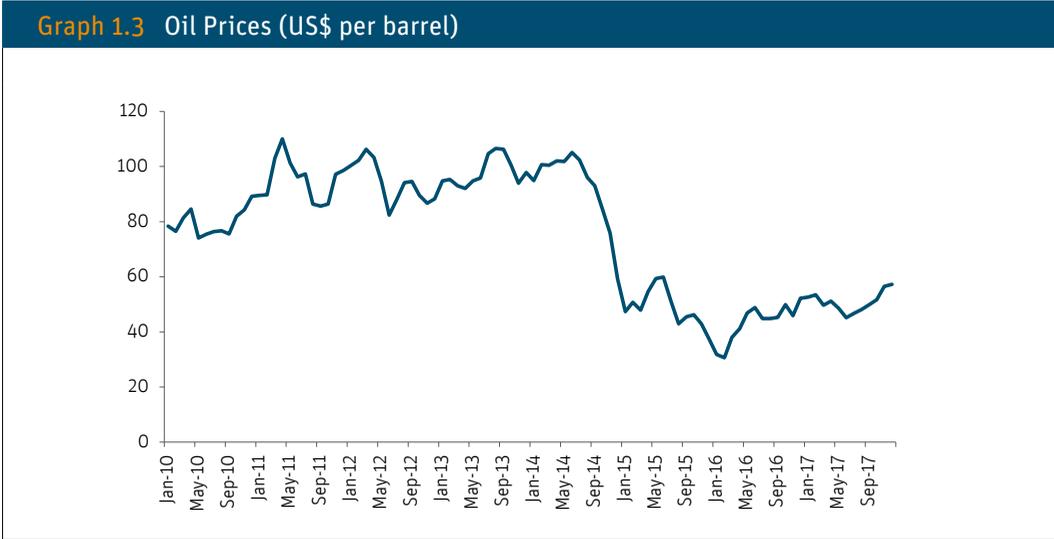
**Source:** IADB-CID compilation with International Monetary Fund data (WEO, October 2016 and October 2017)

**Notes:** \*Simple average for Latin America, not including Venezuela

\*\*Simple average growth for Belize, Costa Rica, El Salvador, Guatemala, Honduras, Panama and the Dominican Republic

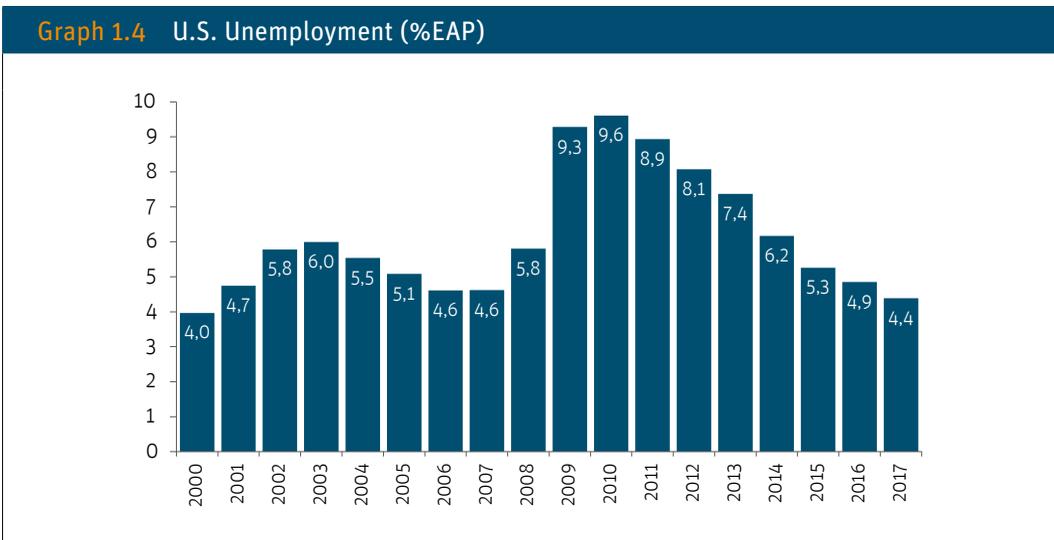
Moreover, although U.S. growth would not appear to be improving with world growth, it should be pointed out that a reversal is taking place of the balancing of its accounts. As of November 2017, non-oil imports registered a higher growth rate than the Gross Domestic Product (GDP), increasing its share from 10.0% to 10.3% of GDP.

In addition, as seen in Graph 3, international commodity prices have leveled off, maintaining the positive trade terms recorded in recent years. As shown in the following graph, despite their recent rebound oil prices are still 30% to 40% below prevailing prices prior to 2014.



Source: IADB-CID compilation with Energy Information Administration data

For the external accounts, the strong performance is not only in the trade in goods; tourism has also flourished. According to the World Tourism Organization, revenue from tourism will apparently close out 2017 with a growth of 7%, meaning that the sector is growing more quickly than the world economy.<sup>1</sup> Furthermore, the U.S has the third largest growth in tourism spending, after China and Korea, with a growth rate of 8%.

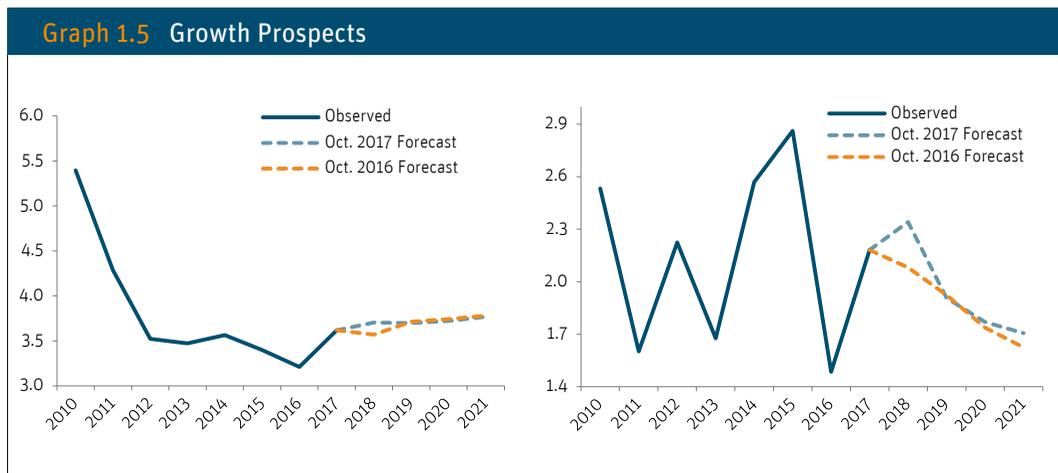


Source: IADB-CID compilation with International Monetary Fund data (WEO, October 2017)

<sup>1</sup> <http://media.unwto.org/press-release/2017-11-06/international-tourism-track-record-year>

Also, as seen in Graph 4, U.S. unemployment is at an historic low. This is also true for Hispanic unemployment in the U.S. According to the Pew Research Center, the Hispanic unemployment rate in the U.S. closed out 2017 at 4.7%, the lowest on record since this figure was first estimated (1973).<sup>2</sup> Moreover, regardless of the group (men, women, U.S.-born or foreign-born), 2017 unemployment is below the pre-Great Recession low. This labor market situation bodes well for remittances.

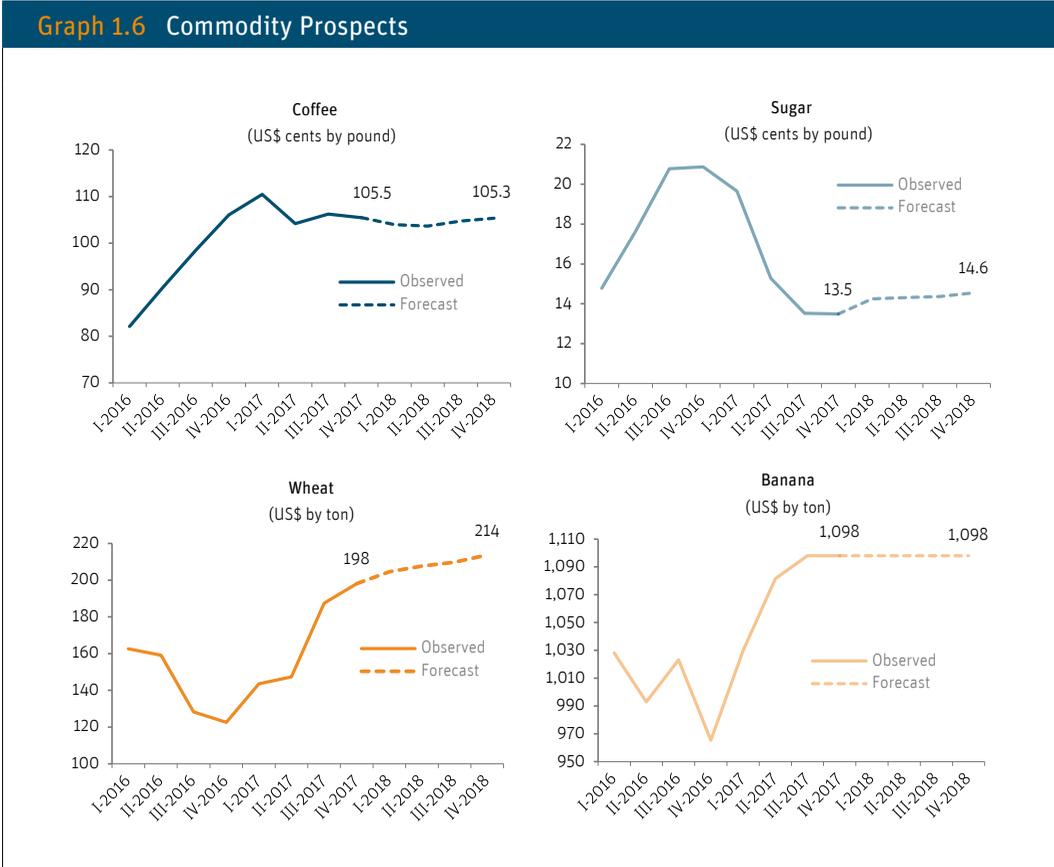
If we look at future prospects – at least for 2018 – this improved environment will continue. Graph 5 shows how growth prospects for 2018 have been revised upward between 2016 and 2017, and the 2016 outlook is still in place for the future (that is, the improvements in 2017 and 2018 would not appear to be a cycle followed by a sudden slowdown).



Source: IADB-CID compilation with International Monetary Fund data (WEO, October 2017)

Additionally, commodity prices for both exports and imports, seemed to remain stable. As seen in Graph 6, sugar and coffee prices are expected to remain stable. Oil prices, after their recent rebound, are apparently dropping again as a result of the response of U.S. oil producers to the higher prices.

<sup>2</sup> <http://www.pewresearch.org/fact-tank/2017/09/28/latino-unemployment-rate-is-back-at-historic-low/>



Source: IADB-CID compilation with International Monetary Fund data

Finally, U.S. monetary policy poses a factor of uncertainty. Since both the public and the private sectors in CADR have net liabilities with the rest of the world, interest rate adjustments affect the region. However, what has been called U.S. monetary policy normalization (that is, interest rate increases and a reduction of the monetary expansion used for dealing with the 2007 financial crisis) has been relatively slow. The U.S. Federal Reserve has acted cautiously, raising rates only three times in 2017, with a similar adjustment expected in 2018.<sup>3</sup>

<sup>3</sup> The adjustments were made on March 15 (from 0.75% to 1.00%), June 14 (from 1.00% to 1.25%), and December 13 (from 1.25% to 1.50%).

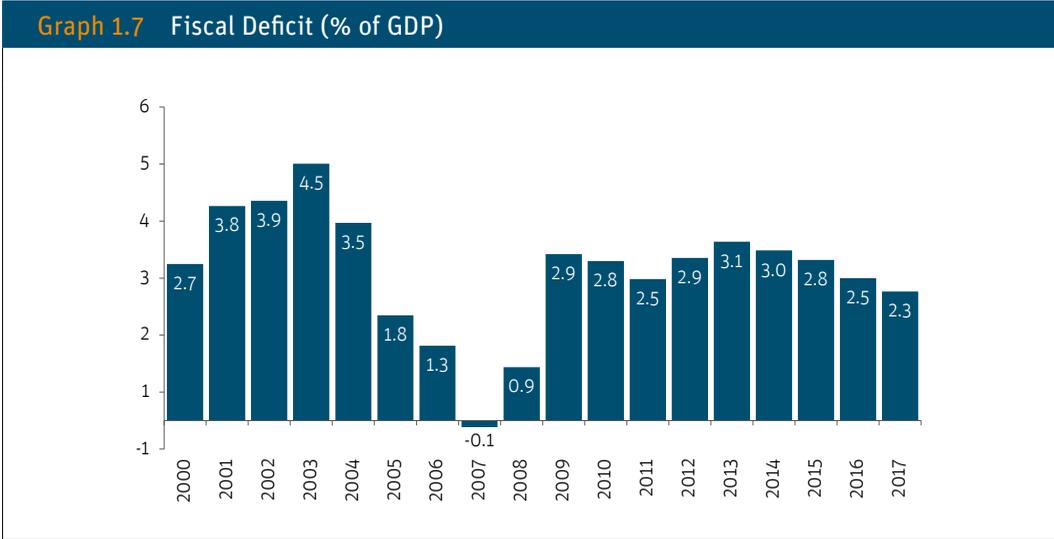
## MIXED RESULTS IN A FAVORABLE CONTEXT

All the phenomena described above constitute positive growth factors for the region. Despite this, although growth will surpass the 2016 level, it is not expected to be better than what was expected at the end of 2016. It is predicted to close out 2017 at 3.8% (compared to 3.6% in 2016), practically the same as the 2016 year-end forecast of 3.9%.

As discussed in Prat and Solera (2017), the region appears to be converging its long-term growth, which according to several methods is between 3.2% and 4.0%, which is a relatively low growth rate. As a reference, they argue that if these potential rates are maintained it could take the region 148 to 159 years to catch up with the per capita income of the U.S. and 46 to 76 years to converge to that of emerging countries such as Peru.

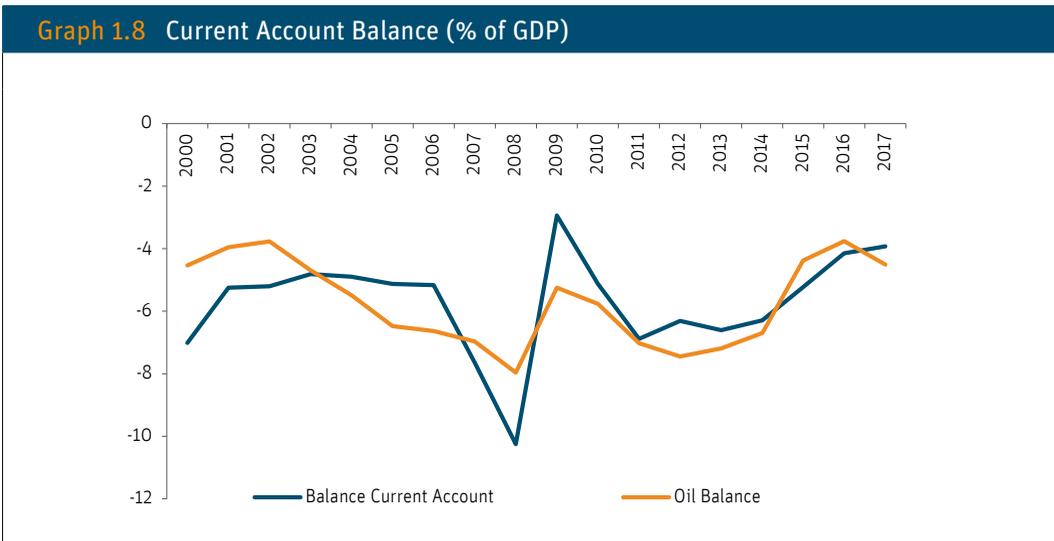
They explore the causes of this slow growth, which cannot be attributed completely to a low build-up of factors or low productivity but rather stems from a combination of both. Using traditional growth methods, they find factors that explain the growth and where the region has gaps, such as in the technology, the quality of institutions and public services, and the region's productive structure (or lack of productive transformation), etc. They also find that, on average, the "country effect" (the effect that cannot be explained by international comparisons) is negative for the region. That is, each country has idiosyncratic factors that make for slow growth in the region. The paper cites country studies and finds certain common issues for the region, particularly infrastructure gaps and failings in public and private coordination for promoting productive innovation.

One issue that stands out, however, is why the region's growth does not appear to react to the improved external environment. Part of this can be explained by an uncertainty over the staying power of the positive environment (as we discuss below), and part by the fact that several countries have finally undertaken fiscal adjustments. As shown in Graph 7, after almost reaching a fiscal balance in 2007, the countries embarked on anticyclical policies to handle the international financial crisis, leaving fiscal deficits that still persist. The average fiscal deficit between 2010 and 2014 was 2.9%. In 2016 it was 2.5%, and in 2017 it is expected to fall to 2.3%, continuing the fiscal consolidation. This has not occurred uniformly, however. The 2017 fiscal results for three countries in the region show an improvement that is at least 1% of the GDP better than the 2010-2014 average, while the results for the other countries are the same or even worse.



Source: IADB-CID compilation with International Monetary Fund data (WEO, October 2017)

Parallel to this fiscal behavior, the current account, including the non-oil current account, has also improved. As has already been mentioned, since it is not an oil producer the region is extremely sensitive to oil prices. Its foreign accounts are therefore closely tied to oil prices, so for our evaluation we need to separate out the effect of oil to get an understanding of how much is due to exogenous factors (at least in the short term) and how much can be attributed to internal dynamics.

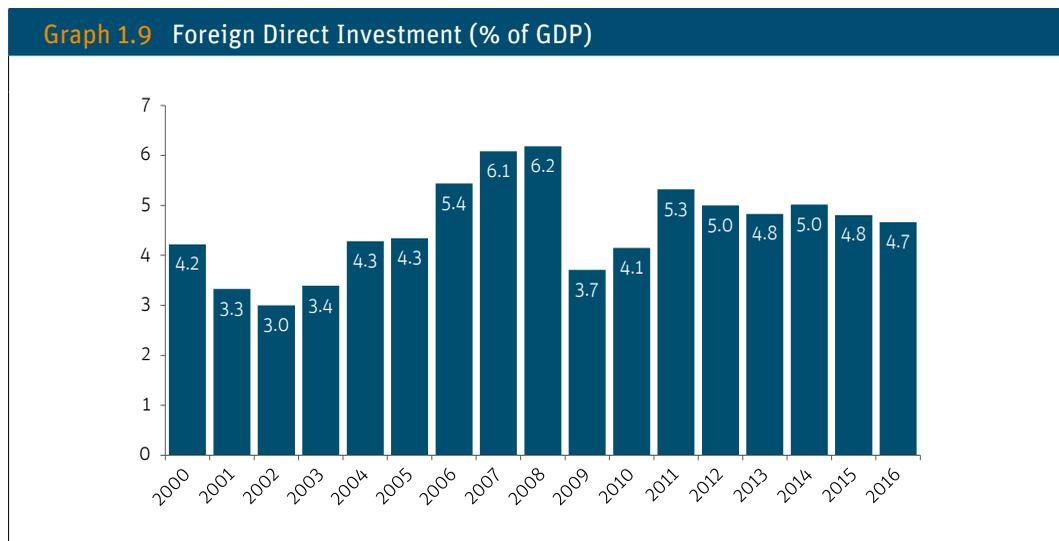


Source: IADB-CID compilation with International Monetary Fund data (WEO, October 2017)

From 2010 to 2014 the region showed a current account deficit of 6.2% of the GDP, reflecting a deficit in the oil trade balance of 6.8% of the GDP. In 2016 this deficit was 3.8% of the GDP, but the current account deficit was 4.2%, reflecting the fact that part of the “oil savings” had been consumed by a deterioration in the non-oil current account.

With the fiscal adjustments, however, a current account deficit of 3.9% of the GDP is expected for 2017, although with the slightly improved oil prices the non-oil balance would accrue a deficit of 4.5% of the GDP. This reflects the fact that, with the fiscal adjustments, domestic savings are being adjusted. Dollar exports grew by 6.8%, on average, while non-oil imports grew by 4.1% (reducing their GDP share). As with the previous case, however, this was not homogenous across the region and the adjustments should be continued.

The deficit has been financed primarily by foreign direct investment (FDI) flows. Graph 9 shows how the level of FDI has remained practically the same since 2014 while the current account has varied, so today FDI finances more than 100% of the current account balance.<sup>4</sup> For this reason the deficit still does not pose a risk for the region. As long as it is financed through FDI, the need for adjustment is low, so with the fiscal adjustment the region is not expected to have to adjust its foreign sector.



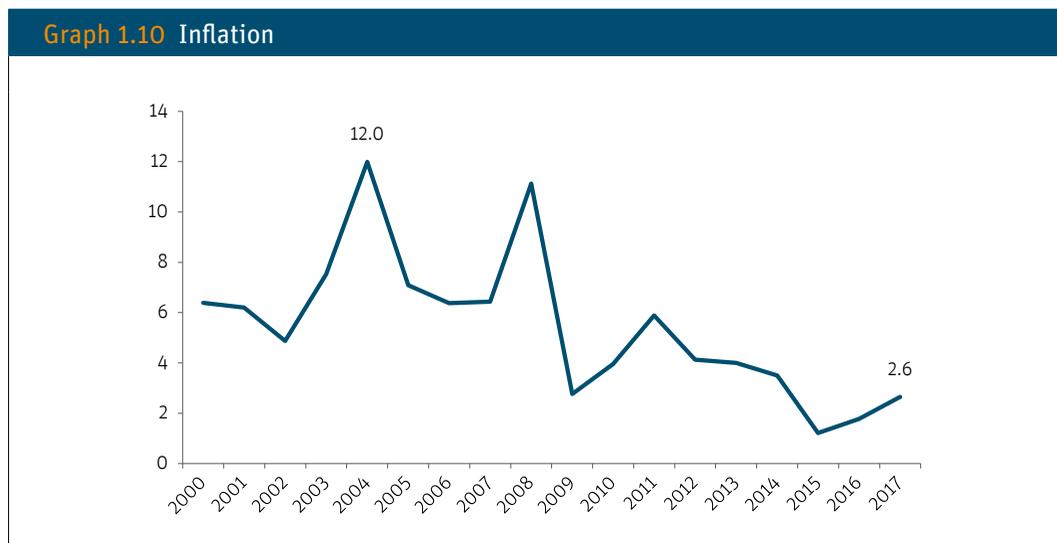
**Source:** IADB-CID compilation with data from the Executive Secretariat of the Central American Monetary Council, the Economic Commission for Latin America and the Caribbean, and the International Monetary Fund (WEO, October 2017)

**Note:** \*Data as of the first semester

<sup>4</sup> At mid-2017, already 2.7% of the GDP had been accumulated in FDI, suggesting that the year would close at a very similar figure to that of previous years.

This FDI attraction is particular to the region and can be seen as an advantage. As explained earlier, the region's growth is relatively slow, partially explained by the fact that the region characteristically has low capital formation, given its income level. Within a context of low investment, then, the region has been notably successful in attracting foreign flows. In fact, according to IADB estimates the region receives an additional 2.6% of the GDP, on average, over countries with similar capital formation levels.

Finally, remarkable in this context, the region continues to report low inflation. After several years of extremely low inflation (to the point where various countries recorded negative rates) due to falling commodity prices, with the leveling off of these prices inflation is now reaching the target levels set by the central banks. Average inflation for the region is expected to reach 3.2% for 2017, 1.8% higher than for 2016 but still in line with the central banks' expectations.



Source: IADB-CID compilation with International Monetary Fund data (WEO, October 2017)

The region's favorable external environment will apparently continue in 2018, but despite this its macroeconomic indicators are not expected to improve. Growth for 2018 is expected to be similar to that of 2017, 3.9%. The current account and oil balance deficits are likewise expected to continue, and finally, the 2018 inflation rate is expected to vary little from that of 2017 (3.6%).

The expected fiscal deficit for 2018 would be 2.4% of the GDP (that is, higher than that of 2017), reflecting the nature of the adjustment being made in the region. In general, the countries have made headway on tax administration and control of spending, particularly investment spending. This type of adjustment is not easy to predict, however. The forecasts take into account the inertia in spending and income. We might call it a passive scenario: if

continued policies are not followed for tax administration and spending control, the deficit will increase.

This also highlights the limitations of the adjustment policies that have been implemented. On the one hand, there is a limit to the reduction of investment spending, the consequences of which are seen in a shortage of infrastructure. Moreover, although the region has been correcting its tax administration shortcomings, its revenues are under pressure from social demands and the need for an improved fiscal balance in order to set up fiscal buffers to help the region weather adverse crises. It will therefore need to propose fiscal reforms with structural measures (long-term) for both expenditure (particularly current expenditure) and revenue.

To sum up, in the context of a relatively favorable external environment the region would appear to be making the necessary adjustments. There is still a long way to go, however, and the region still has to face the challenge of speeding up its growth.

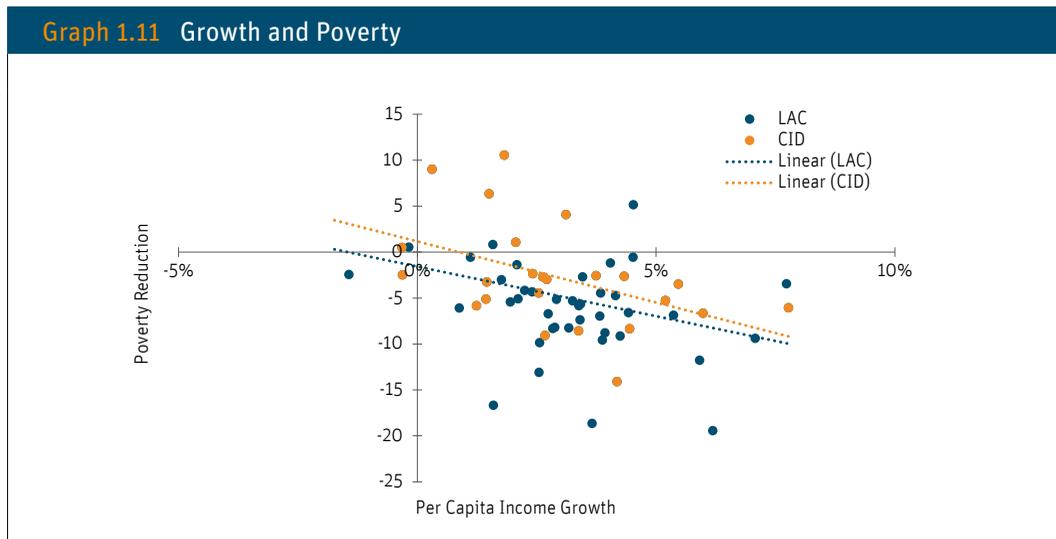
## THE CHALLENGE OF INCLUSIVE GROWTH

The consequence of this growth is that the challenge of reducing poverty becomes more difficult. As has been amply documented, growth helps to reduce poverty. It also would appear that this reduction of poverty is harder for Latin America (see, for example, Dollar and Kraay, 2002). The perception of the region's policymakers is that it is even harder for Central America and the Dominican Republic.

Although this has not been formally documented, a look at the stylized numbers seems to verify this perception. From 2000 to 2017, income per capita in Latin America grew by 1.8% and poverty fell 13 percentage points (from 43.8% in 2000 to 30.7% in 2017). For Central America these figures were 2.3% and 12.1% (going from 51.8% in 2000 to 39.7% in 2017), implying that the region's growth elasticity of poverty is a third less than that of Latin America.

Looking more closely at the data, the following graph shows the change in poverty and average per capita growth by three-year periods from 2000 to 2015.<sup>5</sup> Each point represents a three-year period for a country in the sample. Both the region and the rest of Latin America are shown. As can be seen, although the CADR line has a steeper slope, it is completely above the Latin America line in the relevant range of growth rates. This suggests that for each level of per capita income growth it is harder for CADR to reduce poverty.

<sup>5</sup> Using the World Bank's line of US \$5.50 per day.



Source: IADB-CID compilation with World Bank data

The inability of Central American economies to generate opportunities is notable. In general, Latin America is characterized by a shortage of formal employment. From 2000 to 2017, its unemployment rate dropped from 9.3% to 7.1%, with informality falling from 49.9% to 45.4% (in 2014, the date of the latest comparable intra-country data). This means that in 17 years Latin America was barely able to increase by 6% the percentage of workforce with formal jobs. We should remember that this period saw a recession in the region, which could be an argument to explain the shortage of jobs, if we take into account that the effects of recessions tend to persist over time.

If we look at the numbers for CADR, unemployment fell from 8.2% to 7.0%, with informality sliding from 48.2% to 46.3%. In other words, even though CADR grew more and did not suffer a recession it was only able to increase by 3% the percentage of workforce with formal jobs. It appears that the region has trouble generating opportunities.

This is discussed in Szekely (2015a, 2015b, 2015c, 2015d and 2016) and Szekely and Schettino (2017), in which comprehensive social sector diagnostics were performed for Costa Rica, Guatemala, Nicaragua, Panama, the Dominican Republic and Honduras, respectively. The approach consisted of a comparative study at the regional level of different dimensions – including health, nutrition, social protection, education, and productive opportunities throughout the life cycle – based on what the authors call the “social thermometer”.

To organize their analysis of this reality, they proposed a comprehensive scheme using the “asset” approach, whereby they could examine the income generation of an individual or family and identify the aspects limiting their potential. To simplify the discussion, assets can be divided into two types: human capital and physical capital. Human capital

includes the set of competences, abilities, skills or knowledge needed to produce a good or service, measured generally in terms of each individual's level of nutrition, health and education. Physical capital refers to the monetary value of any form of financial asset, money and property holdings and capital reserves used for production. This type of capital can play different roles in that it can be used for buffering temporary shocks or generating income (investment), and it can also be accumulated for long-term goals such as retirement savings.

Following this reasoning, in order to modify the structural conditions of specific families or groups public policies should focus on improving their assets and their possibilities of using those assets, including the pay they receive for those assets. A core aspect of this approach is to recognize the existence of different windows of opportunity for building capacities and taking advantage of productive opportunities throughout a person's life cycle, starting at the prenatal stage and going through infancy, childhood, adolescence, maturity and old age. The different interventions of protection, skills and opportunities can be identified as a cumulative process occurring throughout the life cycle. As one matures into an adult the options start to become more relevant for using the skills that have been developed through joining the workforce, undertaking one's own activities, or obtaining financing for business ventures. A key element in all the dimensions and moments of the life cycle is equality.

To implement the idea, the authors developed the aforementioned concept of "social thermometer", which consists of a consolidation of social sector data throughout the life cycle, assessing three specific dimensions in each case: the level of each social indicator, its tendency over time, and the inequalities observed within the country. The benchmark for assessment, in each case, is each indicator's comparison with its respective Latin American average.

There are also three categories. Green is for dimensions with a higher level, a more favorable tendency, or fewer inequalities than the Latin American average in each dimension. Yellow is for dimensions where the level, tendency, or inequalities are less favorable compared to the rest of the region. Red is for areas where the country has a less favorable outlook, constituting a public policy priority for intervention.

A review of the six studies shows that the issue of "productive opportunities" precisely reflects the ability to use acquired skills; this appears in yellow for Honduras, Nicaragua, Panama and the Dominican Republic and in red for Costa Rica and Guatemala. When analyzed by internal inequalities, the six countries appear in red for productive opportunities; that is, access to these opportunities is unequal in the six countries.

These results appear to confirm the hypothesis that the region has problems generating productive opportunities. We should once again remember that this is in comparison to

Latin America; that is, the region's gaps are wider than those of Latin America, implying a particular problem for CADR. This could argue in favor of the perception that poverty in the region is shrinking less with growth.

Chapter 2 of this report looks at several variables that affect the ability of the region's countries to accumulate human capital and at the influence of this human capital on economic growth. It examines the way various household and personal characteristics may affect the chances for an individual to access educational and health services. It also looks at how some countries are more likely than others to be affected by labor informality, where factors such as sectoral composition and formal sector rigidities appear to be significant determinants of the underground economy.

## TAKING ADVANTAGE OF INTEGRATION

Chapter 3 of this report finds that credit convergence in CADR has fluctuated over time, reaching its peaks around the 2008-2009 financial crisis. In particular, the study finds that the convergence describes asymmetric credit responses. For example, it was seen that a slowdown of a trade partner's real activity reduces credit in the region in a synchronized manner (more convergence), but a speedup increases credit unevenly across countries (less convergence). This means that despite its poorly developed financial markets, the region is beginning to have integration.

This complements a recent study for the IDB<sup>6</sup> where Central American labor markets were found to be increasingly integrated, especially when the evidence of the degree of wage convergence is reviewed. Migration is a potential driver of this integration, and the results show that migration and wage differences are positively related. That is, the countries with larger wage differences tend to have more migration, and wage differences in Central America are shrinking over time.

These two outcomes suggest that the region's factor markets are integrating, though this does not necessarily reflect the result of a specific policy. Indeed, it shows a need to coordinate financial and labor regulations. In addition, we have a series of markets where policies have been implemented and results have been obtained, but improvements clearly could have been made.

For example, the region is its own second largest trade partner. In other words, after the U.S., the second largest market for the countries in the region is their own region. Major trade barriers are still in place, however. Some of these barriers are physical. For example, as has been extensively documented, the average speed between the Mexican border and Panama City is 17 kilometers per hour. This is not necessarily due to the highway

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<sup>6</sup> Robertson (2018).

infrastructure but rather to border crossings. But there are still institutional barriers as well. Another IDB<sup>7</sup> study found that completion of the architecture of intraregional trade agreements could boost economic growth in CADR. Generally speaking, regional trade would be expected to expand by 56%, leading to an additional 1.2% increase in real GDP by 2030.

Similarly, the regional electricity market exchanges the equivalent of 5% of all regional energy consumption, similar to other energy exchanges in Latin America, but in a multilateral context. This has made it possible to address specific energy needs that cannot be met locally in various countries in the region. It does not permit the possibility of long-term purchase and sale agreements, however, putting the brakes on new large-scale projects that would help reduce the costs of generation in the region.

For this reason, the region's institutional framework needs to keep pace with the headway being made in regional economic exchanges, thereby ensuring the long-term sustainability of these exchanges and enhancing their benefits for the population.

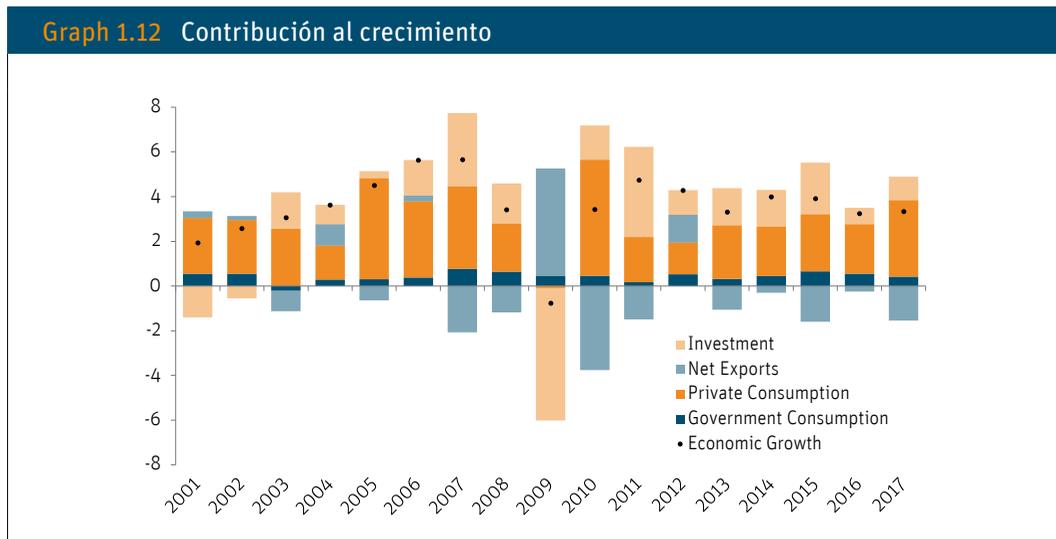
## **AN UNCERTAIN SCENARIO AND THE IMPORTANCE OF BUFFERS**

Aside from the long-term challenges described here, the region is also clearly facing short-term challenges. As mentioned earlier, the external scenario looks good, number-wise. The scenarios depend on several external factors, though, and the region is exposed to various shocks, the effects of some of which will be discussed in the last chapter in this report.

Uncertainty partially explains why CADR growth is not higher. Uncertainty over the external environment could affect investment in the region. As shown in Graph 12, the contribution of gross capital formation to growth has been shrinking in 2016 and 2017. Although public investment has been slowing, this is nothing new and the diminished contribution in 2016 and 2017 also reflects a cutback in private investment.

Foremost among the uncertainty factors are the threats of a less open world economy. The region has pinned its hopes on the trade opening and, in particular, integration with the United States, but the U.S.'s trade agenda appears to be moving towards a less open trade regime. An extreme scenario would have the U.S. unilaterally revoking the CAFTA-DR, with a negative impact on CADR. Real GDP would shrink by an estimated 6%, translating into an annual average of almost 0.5 percentage points. Growth losses would be the product of a 13% reduction in trade. The labor market would also be hurt, with a potential loss of 1.8 million jobs.

<sup>7</sup> Rojas-Romagosa y Guevara (to be published).



Source: IADB-CID compilation with data from the Economic Commission for Latin America and the Caribbean, 2018

Despite good performance of the U.S. labor market, another source of uncertainty is the U.S.'s migration policy, which could adversely impact remittances. This is especially pertinent to Northern Triangle countries, where remittances account for more than 10% of the GDP and more than 85% of these remittances come from the United States. An extreme scenario where all migrants are deported would imply a drop in the growth rate of up to 0.64% of the GDP (and as we've mentioned, the region's growth is already slow). If only half were affected, the reduction could be 0.28%. It should be noted that these scenarios are part of a general equilibrium model; they assume that external demand does not change, and that part of the negative shock is absorbed by increased exports. If this were not possible, the drop in GDP would be greater.

The region is also exposed to changes in the pace of U.S. monetary policy normalization. Typically, it has deficits in both the fiscal accounts as well as the national savings accounts (because of the current account deficit). Public and private debt continues to climb. Although the majority of the debt of the countries is at a fixed rate, this would affect the new debt to be contracted. IDB estimates show that with the fiscal deficit alone each additional interest rate point in the public debt (which would be a medium-term scenario) implies an adjustment of 0.3% to 0.93% of the GDP, depending on the country.

Up to now, the region has also been benefitting from a favorable scenario where the price of its main imported commodity (oil) is at a low compared to the average for the last 10 years, and the prices of its main exported commodities (such as coffee and sugar) have been on the rebound. These prices are volatile, though, and events such as Middle East conflicts or strong Brazilian harvests could quickly change them. The last chapter of this report studies some of the impacts of these price variations.

Finally, added to these economic uncertainties is the challenge of natural disasters. CADR is one of the regions most exposed to natural disasters, and in 2017 it was affected by a variety of natural disasters. A recent Fitch Ratings report states that the costs of natural disasters for CADR countries represent between 5% and 20% of government expenditure, highlighting not only the costliness of these disasters but also the fact that they are already being included in the risk assessments made of the region. In addition, even though several of these disasters may be of low intensity their persistence over time causes major economic damage. For example, Tropical Storm Nate caused more than US \$350 million in damages in Costa Rica.

There is a need, then, to make headway on various fronts. First, spaces need to be created for dealing with negative shocks. As mentioned earlier, one important step is fiscal reform. The region has to recover the fiscal space that enabled it to react in 2008-2009 to the global financial crisis. The adjustments should also contribute to improving the region's foreign position, given what we said of the relationship between the foreign sector and the fiscal sector. This fiscal adjustment, though, should also be accompanied by monetary policies that permit the accumulation of reserves.

Furthermore, the region needs to create instruments for handling the costs of natural disasters. This entails measures ranging from investing in the countries' resiliency to creating fiscal spaces so that when the events do occur the countries are able to act. The private sector also needs to be encouraged to create its own spaces for handling the losses from these disasters.

With long-term issues, the region has to explore more aggressive productive development and trade policies. It should seek a way to diversify the destination markets for its exports. Recent assessments by the IADB found that the negative effects of increased U.S. protectionism could be reversed if the region expanded its presence in other markets, including stronger intraregional integration (Rojas-Romagosa y Guevara, to be published). The strategy has to be comprehensive, however. More regional integration alone, or more trade with the rest of Latin America or other markets alone is not enough; the region needs the combined effect of opting for all markets.

Likewise, CADR has to seek to diversify its export goods and services. As discussed in earlier years, the region's export package has not changed in thirty years, with few exceptions. Notably, opportunities have arisen in the service sector, particularly tourism. There needs to be closer coordination between the public and private sectors for developing new productive activities so that the region can venture into new products and services with greater added value. This would also help generate more opportunities for its citizens.

# 2

## ECONOMIC GROWTH AND HUMAN CAPITAL

The population of Central America and Dominican Republic is relatively young. In upcoming years the labor force's share of the total population will increase in almost all the countries in the region as more and more young people reach working age (Praty Solera, 2017). Although the behavior varies from country to country, on average this share will continue to climb until 2035, and in some countries, such as Belize, Guatemala and Honduras, it will do so even longer, until 2045. The steadily expanding work force represents a window of opportunity for strengthening regional economic inclusive growth.

An expanding working age population is an important input for economic growth, though it is not sufficient. To maximize the impact on economic growth of this demographic recomposition (demographic dividend), measures should be taken to strengthen both human capital and labor market efficiency, so that workers' skillsets match companies' needs.

An agenda aimed at improving the human capital of new generations is needed to maximize the benefits of the demographic dividend. King (1998) argues that enhanced public well-being and economic performance are complementary processes. A minimum level of nutrition, shelter, and education is needed by economic agents for their full emotional and physical development. Quite commonly, however, these conditions are not achieved in lower-income areas. If anything, populations with low human capital levels characteristically have a lower life expectancy due to high infant mortality, and work is limited to a subsistence economy or extremely low-paying activities, limiting this population's labor productivity and ability to save.

Education and health are key inputs for human capital development. Individuals with high levels of education and health have a larger skillset and greater productive capacity and therefore contribute more to economic growth. At the same time, people with higher levels of human capital have a longer life expectancy and a stronger ability to achieve better wages.

Education enables people to be more productive, enhancing their income-generating capacity. Various studies have shown the positive impact of schooling – especially tertiary

education – on growth.<sup>8</sup> For Hanushek and Woessmann (2007), cognitive skills are powerfully related to income level and distribution and to economic growth. Depending on the estimation method, personal earnings could increase from 6% to 9% for each additional year of schooling (Harmon et al., 2000), although the relationship is not linear.

At the same time, healthy people are also more productive. Bloom et al. (2001) state that healthy workers are physically and mentally more robust, reducing the likelihood of missing work due to illness. Health problems have been seen to significantly reduce the number of hours worked, impacting family earnings. This is observed particularly in developing countries, where a large percentage of the labor force works at manual labor, compared to developed countries. In addition, healthier lifestyles lead to a longer life expectancy, which, in turn, can have implications on earnings and the level of savings (Lee et al., 2000), as well as on capital accumulation (Bils and Klenow, 2000).

Although the region has made headway in both areas, there is ample room for improvement. According to PEN (2016), Central American countries had great difficulty improving public well-being and social progress from 2000 to 2014. Despite improvements in life expectancy, infant mortality, access to public services, and educational coverage, challenges remain to continue improving living conditions.

Improving public education and health would lead to a virtuous circle of well-being and regional economic growth. A healthy, educated labor force is highly attractive to foreign investment, which generates better jobs and higher earnings, thereby making economic growth more inclusive. At present CADR has a window of opportunity for improving the profile of its labor force and thus maximizing its demographic bonus. Nevertheless, there are challenges to the accumulation of human capital that must be tackled. A characterization of these challenges will help regional authorities focus their policy agendas and thus improve the efficiency of their short- and medium-term actions.

This chapter looks at several variables that affect the ability of the region's countries to accumulate human capital, which impacts economic growth.<sup>9</sup> It examines the way various household and personal characteristics may affect the chances for an individual to have access to educational and health services. It also looks at how some countries are more likely than others to be affected by labor informality, where factors such as sectoral composition and formal sector rigidities appear to be significant determinants of the underground economy.

The chapter is structured as follows. Section 2 contextualizes the regional educational sector, analyzing the trends of various indicators and assessing the impact of both household and personal characteristics on school attendance. Section 3 makes a similar analysis, but

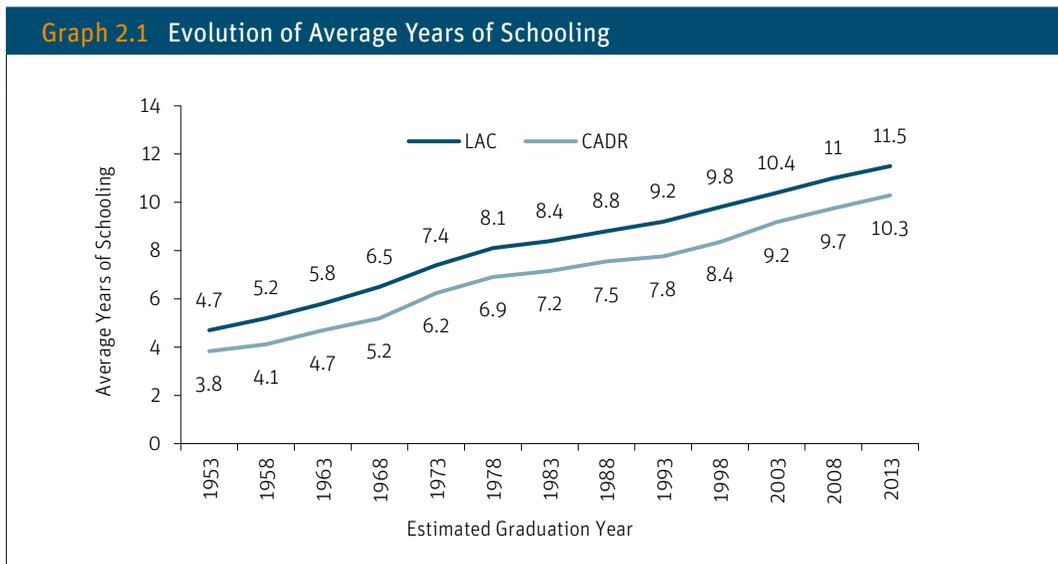
<sup>8</sup> Wang and Liu (2016), Ramcharan (2004), Hanushek and Woßmann (2007), etc.

<sup>9</sup> An evaluation was made in the previous macroeconomic report (Prat and Solera, 2017) of the impact of the demographic bonus on growth, where only one of the dimensions of human capital was considered: education.

with a focus on health, evaluating the influence of several determinants on access to health services. Section 4 estimates the impact on economic growth of improving several human capital indicators, and the potential cost this may pose to CADR authorities. Finally, section 5 gives conclusions and policy recommendations.

## REGIONAL CHARACTERIZATION OF EDUCATION

Regional educational coverage can be characterized by three major milestones. The first was at the end of the 1960s when the average CADR population reached the level of completed primary education (see Graph 1; six years of schooling). The second was at the mid-nineties, when the region’s average population reached the lower secondary education level (nine years of schooling). To reach the third milestone (upper secondary education – twelve years), however, the region’s average education needs to be increased by at least 2.5 years.



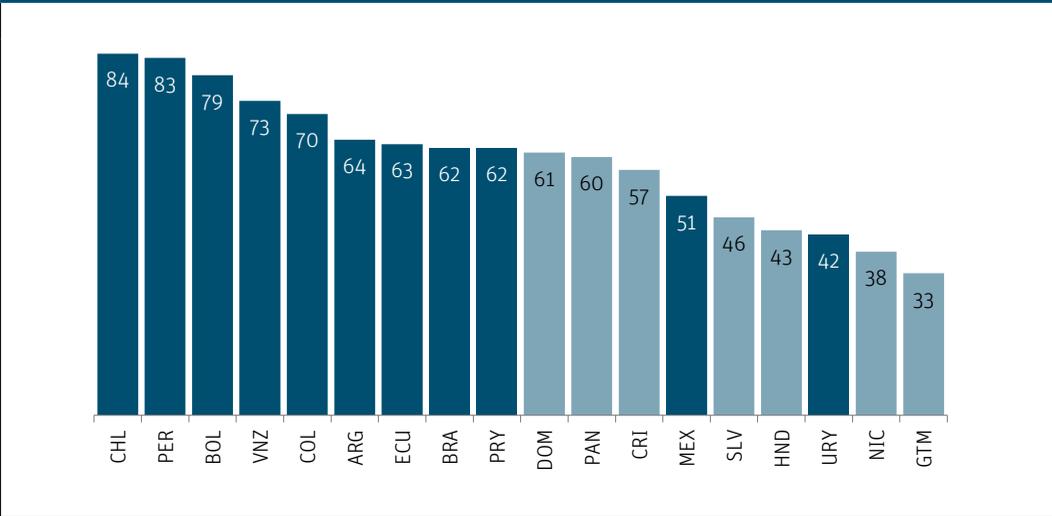
Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

Central American educational systems have some general common characteristics. Prat and Solera (2017) observed the following common pattern of characteristics: (i) since education is mostly public, it has more funding; (ii) educational policy documentation is neither clear nor explicit with regard to terms of performance and monitoring and evaluation mechanisms; (iii) TERCE test results alert to the low quality of primary education; and (iv) more than half the youths between 15 and 24 years of age are outside the educational system and most of them work at low-quality, poorly paid jobs.

The region's educational systems show different levels of maturity. According to PEN (2016), an educational system can be characterized into at least three evolutionary stages. The first is a mature educational system, with ample funding and high levels of access, although challenges persist in quality, universality of secondary schooling, and improved educational profile of teachers. The country that most closely meets this scenario is Costa Rica. The second level is that of "mixed" educational systems, with some characteristics of the first system but with fewer achievements and low levels of institutional capacity, spending, coverage and quality. This is partly a result of the fact that most teachers are not as well qualified as those of a mature system. The countries most closely meeting this situation are Panama, El Salvador, and Belize. Finally, at the third level we have incipient educational systems, lagging in many aspects when compared internationally. These systems have weak institutionality, little public spending, poor levels of coverage – primarily in secondary education – and insufficient educational quality. Nicaragua, Guatemala and Honduras can be classified at this level.

Another challenge faced by the region is the low level of high school completion. While in the rest of Latin America 61% of youths aged 27 to 29 have a high school degree, in Central America the figure is only 38%. Another worrisome fact is that the four countries with the lowest percentages of high school graduates pertain to this region (Graph 2).

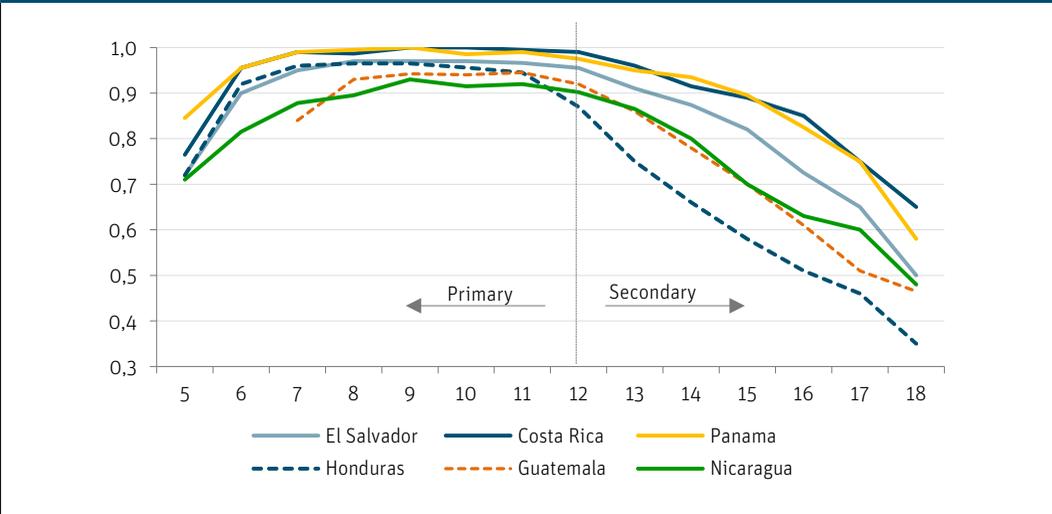
**Graph 2.2** Percentage of individuals between 20 and 24 years old who graduated from Secondary Education (circa 2013)



Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

Middle school attendance still has ample room for improvement. School attendance of children between the ages of 5 and 12 (primary cycle) is almost 100% in countries such as Costa Rica and Panama, but only around 95% in El Salvador and Honduras. The countries lagging the most with primary education are Nicaragua and Guatemala, with coverage of barely 90%. However, coverage tends to drop (in some countries more markedly than in others) once students reach middle school.

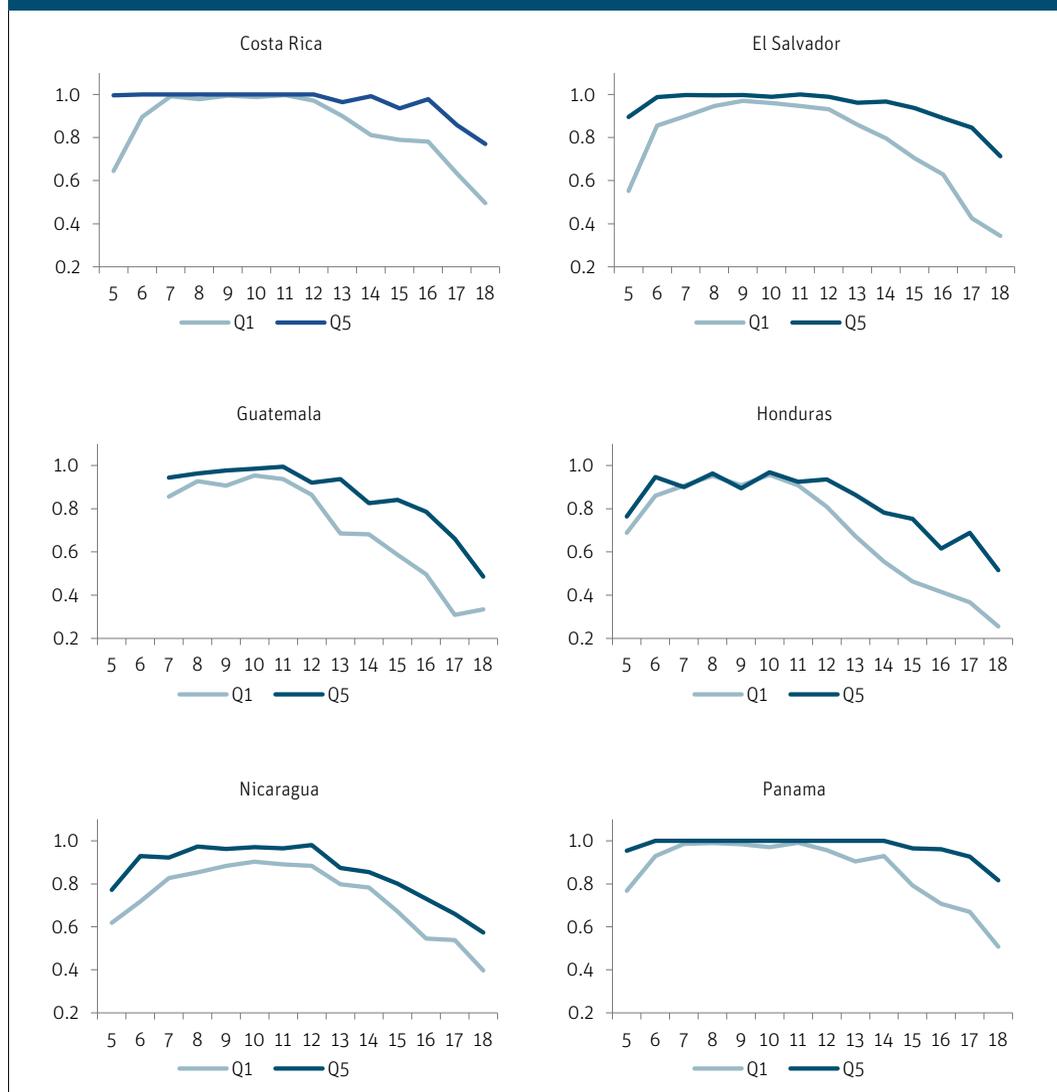
**Graph 2.3** School Attendance in Central America



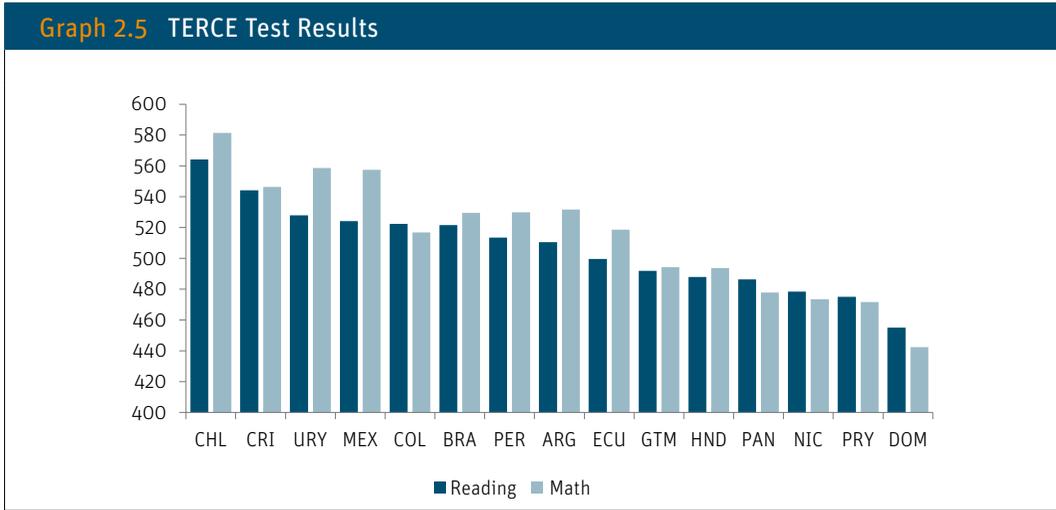
Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

When we break it down by income level we see a similarity, although this is more notable in lower-income countries. The CADR average shows a high rate of coverage at the primary school level, although coverage is quite varied at the individual level. At the secondary school level, all the countries show a decline in the first few years at this level; this decline becomes more accentuated with each passing year in the educational system. In countries such as Guatemala, Honduras and Nicaragua the dropout rate is more notable than in the other countries for the entry levels under study. For the lowest income quintile, the secondary school enrollment rate at age 18 is 33%, while in the other countries this rate is 45%.

**Graph 2.4** Enrollment Rate in the Poorest and Richest Household Quintiles in Central America, 2013

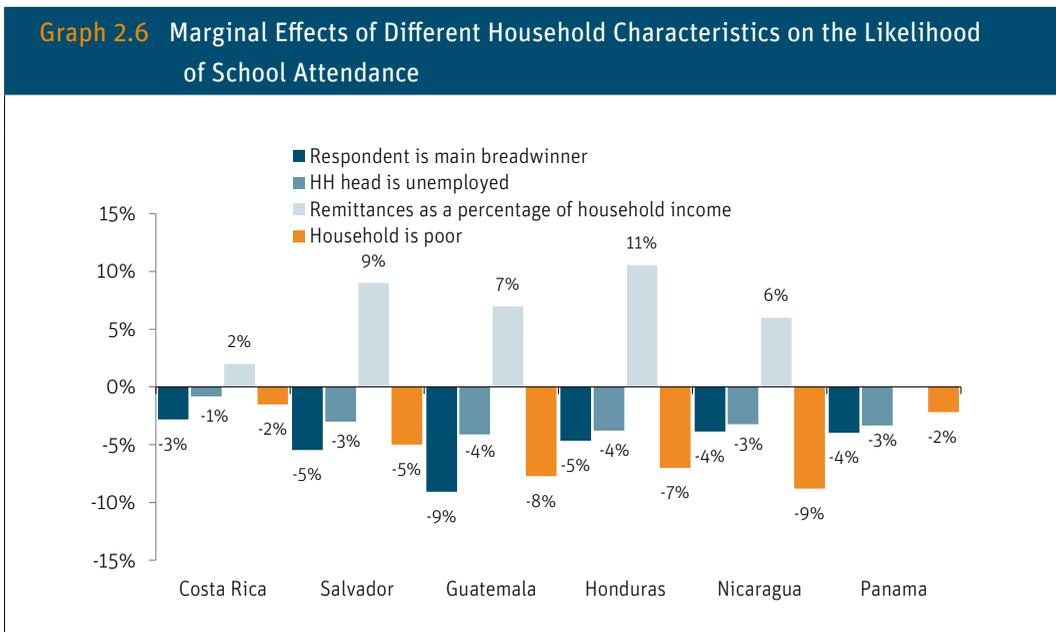


Source: IADB-CID compilation with data from CEPALSTAT and national surveys.



Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

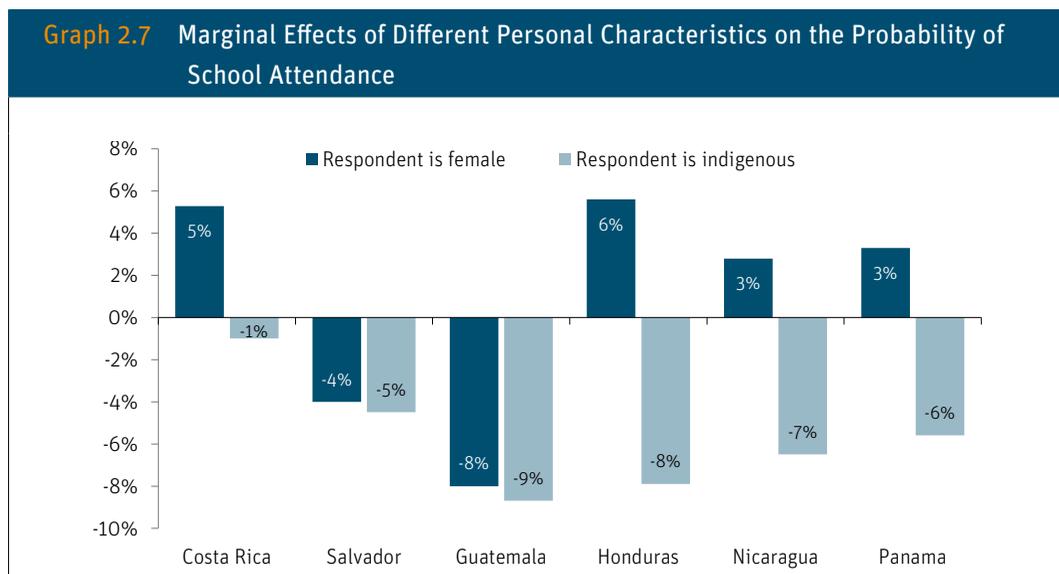
The high levels of primary education coverage are not reflected in educational quality. The results of the Third Comparative and Explanatory Regional Study (TERCE) show that five of the CADR countries are among the six worst-performing countries in reading and mathematics. The average grades on reading and mathematics were 491 and 488, respectively (out of a maximum 600 points), while the rest of the Latin American countries obtained averages of 518 and 533.



Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

A worrisome aspect of the regional educational system is the school dropout rate, which can be explained by various reasons. In most countries, economic reasons and little interest in studying explain more than 50% of school dropouts. In second place are personal reasons, which explain 17% of the dropouts. Education availability does not appear to be a determinant of school dropout, since less than 6% is related to a lack of access to schooling.

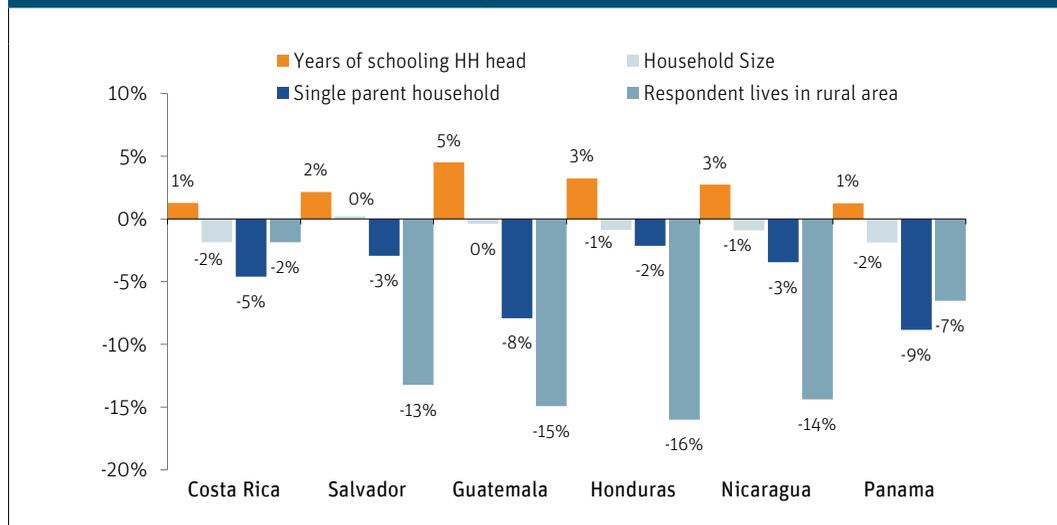
Household characteristics affect the probability of attending school. A positive aspect affecting school attendance is when the household receives remittances as part of its income; the more remittances, the greater the likelihood of attendance. This is especially relevant in Northern Triangle countries where a major part of the household income is from remittances. Aspects that negatively affect the probability of attending school include: (i) the individual supports the family, implying that they have few or no possibilities of studying since they must use their time to work; (ii) the head of household is unemployed, implying that the main income source is not generating sufficient income, so the little there is must go to subsistence rather than education, or the other members of the household have to drop out of school to help meet household obligations; and (iii) the household is poor, with unmet basic needs, meaning the scant resources are reallocated to food and housing, and education is not at the top of the list of priorities.



Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

The possibility of attending school depends on several personal characteristics.<sup>10</sup> Generally speaking, in all of the study countries being indigenous reduces the likelihood of attending school. This might be due to the large indigenous community in these countries (40% of the Guatemalan population is considered indigenous, for instance) and to the fact that most of the indigenous people live in depressed areas. Being a woman, on the other hand, increases the likelihood, but only in four of the six countries. We should point out that this behavior is particularly notable in Guatemala, so these are factors to be taken into account and focused on especially in policy recommendations or actions

**Graph 2.8** Marginal Effects of Household Characteristics on the Probability of School Attendance between the Ages of 15 and 17



Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

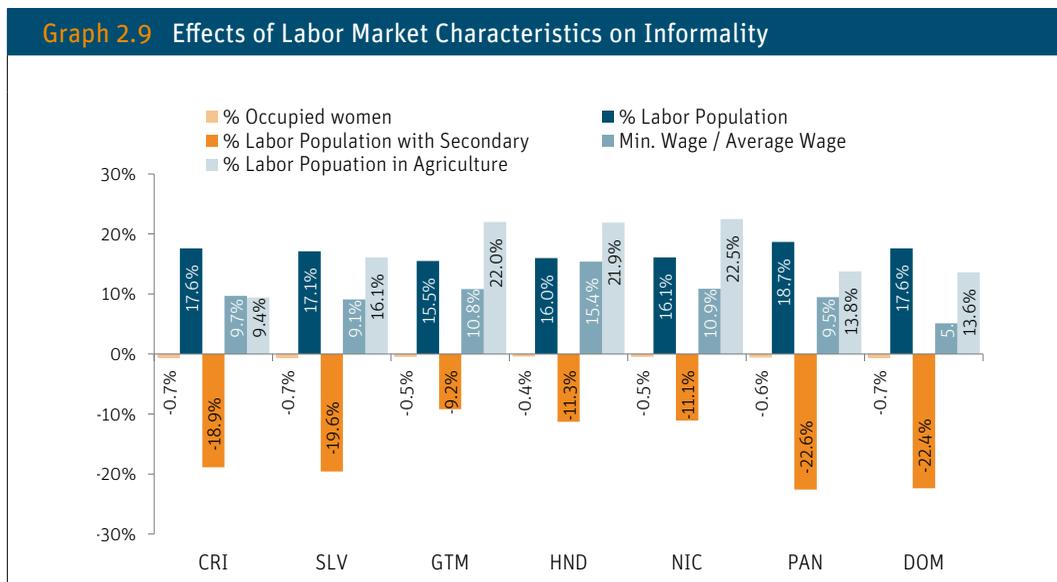
Secondary school attendance is also determined by the students' households. Regionally, a characteristic that positively impacts the likelihood of attending secondary school is the head of household's number of years of schooling; the higher the educational level, the greater the likelihood that an adolescent will attend secondary school. By contrast, having only one parent and/or living in a rural area negatively affects secondary school attendance. It should be noted that living in a rural area is the characteristic with the greatest impact on secondary school attendance in four of the six study countries. This is especially worrisome in three of the countries (Honduras, Guatemala, and Nicaragua), which are highly rural.

One of the consequences of early school dropout is the increase of informality and youths who neither study nor work. In 2013 an estimated 20% of Central American youngsters

<sup>10</sup> A probit model that examined the influence of several individual characteristics on the likelihood of school attendance was used to estimate these effects. These estimates were made individually by country using household surveys as the main input.

between the ages of 15 and 18 neither studied nor worked (NEET – not in education, employment or training). This is warning sign for authorities, if we take into account that the rate of NEETs in the rest of Latin America is 15% and six of the eight countries in the region are among the countries with the highest rate of NEETs. Low educational levels have forced a major portion of the population to work in the informal sector. Approximately 62% of Central American workers are estimated to participate in the informal market – a figure well above the 46% seen in the rest of Latin America. We need to understand, therefore, what is causing youths to drop out of school.

Informality reduces tax revenues and limits personal earnings. In general, the informal sector is defined as that part of the economy that pays no taxes or social security and has very limited information. According to Schneider and Enste (2000), informality erodes the tax base for both taxes and social security, resulting in a vicious circle that can lead to higher taxes in the formal sector, which in turn motivates other players to leave formal jobs, weakening economic and social collective agreements. At the same time, informal sector activities tend to be less sophisticated and to have low added value, limiting their income-generating potential.



Source: IADB-CID compilation with data from CEPALSTAT and national surveys.

Informality has some common characteristics in the region. As can be seen in Graph 9 a country with a young population, a high percentage of rural workers, and a higher real minimum wage, tends to have higher levels of informality, generally speaking. The larger the proportion of economically active population with secondary education, the lower the level of informality. This is partially due to the fact that, when they have greater human

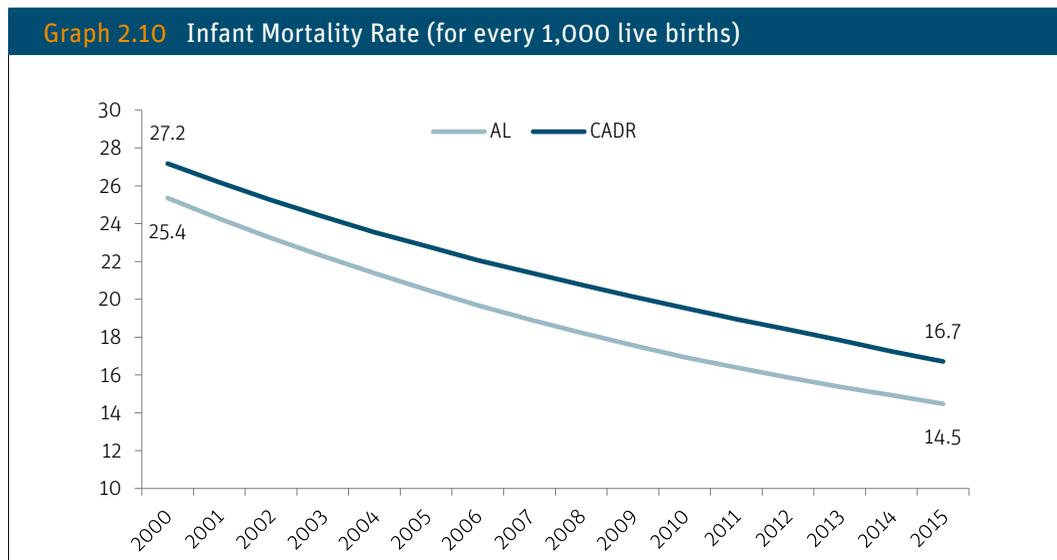
capital, this group of workers tends to pursue activities with wages commensurate with their skills – activities usually found in the formal sector of the economy.

## REGIONAL CHARACTERIZATION OF HEALTH

Health is an essential input of human capital. Although the relationship between productivity and health is positive for any kind of worker, it is more important for people living in poverty, since health could be considered their most highly valued work asset. An unhealthy individual cannot work and therefore cannot generate earnings. Moreover, a healthy child with good nutrition has a better ability to learn and accumulate human capital.

Improved health indicators in CADR have stemmed from different circumstances. According to PEN (2016), the key factors for health in Central America have been improved living conditions, disease control and prevention, and access to food, prenatal control, and improved water sources.

In recent years, there has been an improvement in maternal mortality rates and prenatal care during birth. On average, the countries have been able to reduce the maternal mortality rate by 22% from 2000 to 2015, going from 106 to 83 maternal deaths for every 100,000 live births, compared to 74 in the rest of Latin America. In the case of births attended by skilled health personnel, although CADR's 9.8 percentage point jump (from 80.1% to 89.9% of births) is greater than the Latin American average increase (7.3 percentage points), Central American countries still lagged behind the rest of Latin America in 2015 (96% of all births).

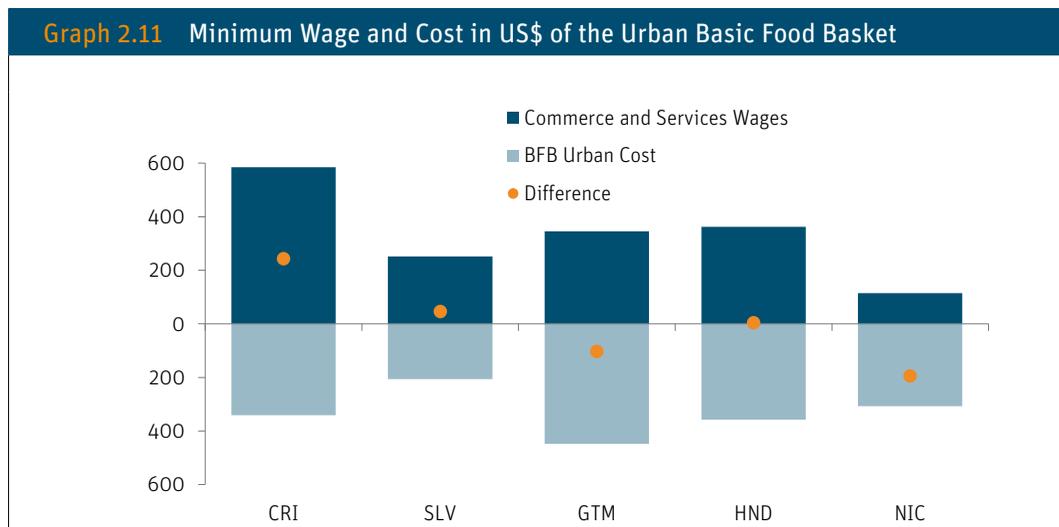


Source: IADB-CID compilation with CEPALSTAT data.

The region has been able to significantly reduce infant mortality rates. From 2000 to 2015, CADR reduced its infant mortality rate from 27.2 to 16.7 deaths for every 1,000 live births, placing the region's countries at a par with the rest of Latin America (see Graph 10). Guatemala and Nicaragua recorded the biggest changes, though they still lagged significantly. According to PEN (2016), the downturn in this indicator is due to the prevention of such ailments as diarrhea and respiratory and infectious diseases through improved nutrition, care, and vaccination.

Lower malnutrition has tended to reduce infant mortality. According to the United Nations Children's Fund (UNICEF), CADR reduced its rate of child malnutrition from 25.5% to 15.9% from 2000 to 2015.<sup>11</sup> For PEN (2016), this improvement is associated with an increased participation of women in the labor force, primarily in urban and higher-income areas. It is worth noting that iron-deficiency anemia is the most common nutritional deficiency in Central America.

Low incomes are one factor making it difficult to access the basic food basket. In 2013, the minimum wage in El Salvador, Guatemala, Honduras and Nicaragua is not enough to buy the basic food basket (BFB), according to Tinoco and Tinoco (2015). This is a particularly critical situation in Nicaragua, where the cost of the BFB is 2.7 times the minimum wage in commerce and services – that is, the income level only goes far enough to buy 37% of the BFB (see Graph 11). Added to this are high degrees of informality, which are typically associated with personal earnings below the minimum wage.



Source: IADB-CID compilation with PEN (2016) data

<sup>11</sup> The problems of malnutrition refer to children who are stunted for their age, measured as the percentage of children between 0 and 59 months who are at less than two standard deviations from the median height for children of the same age group.

Health spending per capita in CARD is low and inefficient. According to World Bank data, in 2014 average per capita spending on health in CARD was US \$752 (constant PPP dollars at 2011), compared to US \$1,091 for the rest of Latin America. This amount is lower, but it is apparently not being used efficiently. For example, Beverinotti and Prat (2016) estimate that results could improve by up to 25% for the same level of spending.

Hospital services in CADR have ample room for improvement. World Health Organization data for 2013 shows that while Latin America has 2.1 hospitals for every 100,000 inhabitants, CADR has only 0.9. This gap is also seen in the number of hospital beds per 10,000 inhabitants, where CADR has 12.4 beds compared to 19.5 in the rest of Latin America and the Caribbean.

Several variables help predict the state of public health. Rayo (2008) analyzed the determinants for the probability of children having diarrhea (a proxy variable for good health) and found that the older the child, the less likely he or she would get diarrhea. He also found that the higher the mother's level of education, measured by years of schooling, the less likely the child would get diarrhea. At the same time, children in rural areas were more likely to get diarrhea than children in urban areas. With respect to the use of health services, Aparicio and Morera (2010) found that the demand for these services rises with increased aging, the patient's self-perception of his or her health, and the presence of chronic diseases.

## MACROECONOMIC IMPACT OF IMPROVED HUMAN CAPITAL

Improved human capital indicators enhance individual productive capacity, which should lead to stronger economic growth. In order to estimate the effect of education and health on economic growth, we need growth models and/or time series or panel data estimates. Moreover, establishing the most appropriate variables poses a major challenge. Given limited data, Bleakley (2010) and Weli (2007) propose an extrapolation. Hence, we combine the estimates of microeconomic studies on education and health indicators, in order to estimate income changes by country. We recognize, however, that this type of approximation fails to give a good estimate of the levels by country, but it does give the magnitude of the average effect.

One of the best proxies for measuring human capital is the average years of schooling. Barro (2013) concluded that each additional year of schooling in adults (25 years of age or older) implies a 0.44% increase in the annual GDP growth rate. Likewise, Baldacci et al. (2008) found that 1% increments in the school attendance rate could lead to 0.08% increases in the GDP per capita growth rate in Latin America.

The CADR countries with fewer years of schooling would benefit the most by closing the gap with Latin America. On average, the education of the 25-59 year-old population in

Guatemala, Honduras, Nicaragua and El Salvador lag almost three years behind the rest of Latin America, where the average is 9.2 years of schooling.<sup>12</sup> If these countries were to close that gap, they could increase their growth by an average of 1.3% annually.

Achieving universal secondary education coverage would also have a positive impact on regional growth. On average, CADR countries would be able to increase their economic growth by three percentage points. Benefitting the most would be the countries with the lowest coverage rates, such as Guatemala, Honduras and Nicaragua, where secondary school coverage is less than 50%. These countries could increase their economic growth by more than four percentage points.

Although the level of education is a major determinant for growth, it needs to be accompanied by policies for both the supply side (quality and efficiency) and the demand side (labor market). Fasih (2008) indicates that policies aimed at improving labor force skills could have a limited impact if other structural measures are not considered for enhancing the demand for such skills. We therefore carried out an additional simulation that considers increased returns to education as a result of structural economic changes in the countries. Montenegro and Patrinos (2014) estimated that an addition year of schooling represents an average return of 12.4% for Honduras. Assumed as a result of structural change, the average returns to education increased by 5% (from 12.4% to 13.0%). The addition of another year of schooling is associated with a 0.46% increase in Honduras's annual economic growth rate. Table 1 summarizes the returns from an additional year of schooling according to Montenegro and Patrinos (2014).

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<sup>12</sup> The rest of the countries (Costa Rica, Panama and the Dominican Republic) have the same or more average years of schooling as the average for Latin America.

**Table 2.1** Changes in Educational Returns

Country	Additional Year of Education Return	Increase of 5% as structural change
Costa Rica	10.70%	11.20%
El Salvador	9.30%	9.90%
Guatemala	10.00%	9.90%
Honduras	12.40%	13.00%
Nicaragua	6.00%	6.30%
Panama	10.00%	10.50%
Dominican Rep.	9.40%	9.90%
<b>CADR</b>	<b>9.69%</b>	<b>10.10%</b>

Source: IADB-CID compilation with CEPALSTAT and Montenegro and Patrinos (2014) data

On the health side, we proxy human capital through reduced infant mortality among children under five, which has a positive impact on growth. O'Hare et al. (2013) studied the relationship between income and the foregoing indicators, estimating income elasticity with regard to the infant mortality rate by groups of countries (see Table 2).

**Table 2.2** Income Elasticities with regard to Infant Mortality

Country Group	Elasticities	
	IMR	IMR5
Total	-0.95	-0.45
Medium and Low Income Countries	-0.85	-0.30
Low Income Countries	-	-0.21
Latin America	-1.17	-

Source: IADB-CID compilation with O'Hare et al. data (2013)

CADR countries would increase their GDP per capita growth rates if there were a drop in infant mortality. Given the spread of infant mortality rates in the region, different changes or adjustments are assumed, depending on the country. It is assumed for Guatemala, Honduras, Nicaragua, and the Dominican Republic, that the rates are reduced until the gaps with Latin America are closed. The assumption with El Salvador, Costa Rica and Panama is that the gaps with Chile are eliminated. To sum up, if the infant mortality gaps are eliminated, the region would have an additional 0.21% growth, while this figure would be 0.09% if the infant mortality gaps are closed for children under five (see Table 3).

**Table 2.3** GDP Per Capita Adjusted for Infant Mortality Rate Changes

Countries	Infant Mortality Rate	Δ Mortality Rate (Gap)	Δ Per Capita GDP	Infant Mortality Rate < 5 years	Δ Mortality Rate (gap)	Δ Per Capita GDP
Costa Rica <sup>1/</sup>	7.70	-0.06	0.08	8.80	-0.06	0.02
El Salvador <sup>1/</sup>	12.90	-0.44	0.38	15.00	-0.45	0.13
Guatemala	23.90	-0.38	0.32	28.50	-0.39	0.12
Honduras	16.00	-0.07	0.06	18.70	-0.06	0.02
Nicaragua	16.80	-0.11	0.10	19.70	-0.11	0.03
Panama <sup>1/</sup>	14.10	-0.49	0.42	16.40	-0.49	0.15
Dominican Rep.	17.00	-0.12	0.11	30.70	-0.43	0.13
CADR	<b>15.50</b>	<b>-0.24</b>	<b>0.21</b>	<b>19.69</b>	<b>-0.28</b>	<b>0.09</b>

Source: IADB-CID estimates with O'Hare et al. data (2013)

## COSTS OF IMPROVING INDICATORS

With education, we used a range of percentage increases in public education spending as a reference. For example, for Guatemala if an increase in years of schooling by 4.3 is assumed to represent 1% of education spending per inhabitant, then the additional spending is estimated at US \$4.15 at constant 2010 prices. On the other hand, if we assume that the spending associated with increasing years of schooling by 4.3 is equal to 100% of education spending per inhabitant, then the additional spending on education per inhabitant would rise to US \$415.2 at constant 2010 prices. The estimated amount would depend directly on each country's actual spending. On average, CADR countries would have to increase spending per inhabitant to US \$325 (which in the aggregate could account for up to 8% of the GDP) in order to raise average years of schooling by one year. Table 3 summarizes the results by country and the estimated interval for additional spending per inhabitant.

In order to approximate the cost of reducing infant mortality rates (IMRs), we used 2015 CEPALSTAT data on public health spending per inhabitant at constant 2010 prices. The assumption is that spending to reduce IMRs falls in the range of 1% to 100% of health spending per inhabitant. If we assume for Honduras, for example, that 1% of health spending is earmarked for the IMR (representing US \$0.6), then the additional spending for reducing the IMR is estimated at US \$0.04 per inhabitant at constant 2010 prices. On the other hand, if we assume that the spending on IMR is 100% of health spending per inhabitant (US \$60), then the additional spending would be US \$4 per inhabitant. On average, then, the region could reduce its IMR by 24% by increasing health spending per capita by US \$25, which would be the equivalent of 0.4% of the GDP.

**Table 2.4** Additional Education Spending Per Inhabitant in Constant US\$ and as a % of GDP

Countries	Public Expenditure Per Capita in Education (US\$ constant prices)	Years of Schooling Increase	Per Capita Cost of an Increase in Years of Schooling	Cost as % of GDP
Costa Rica <sup>1/</sup>	594	1.0	[\$5.94, \$593.7]	[0.06%, 6.2%]
El Salvador <sup>1/</sup>	126	1.4	[\$1.77, \$176.9]	[0.05%, 4.6%]
Guatemala <sup>2/</sup>	97	4.3	[\$4.15, \$415.2]	[0.13%, 13.2%]
Honduras <sup>2/</sup>	122	2.7	[\$3.29, \$329.1]	[0.15%, 15.1%]
Nicaragua <sup>2/</sup>	79	2.7	[\$2.13, \$212.8]	[0.11%, 10.9%]
Panama <sup>1/</sup>	336	1.0	[\$3.36, \$336.5]	[0.03%, 3.0%]
Dominican Rep. <sup>1/</sup>	219	1.0	[\$2.19, \$219.2]	[0.03%, 3.2%]
<b>CADR</b>	<b>225</b>	<b>2.0</b>	<b>[\$3.26, \$326.2]</b>	<b>[0.08%, 8.0%]</b>

Source: IADB-CID estimates with CEPALSTAT data

**Notes:**

<sup>1/</sup> Record years of schooling equal to or greater than the LA average, so the exercise assumes an increase of 1 year of schooling.

<sup>2/</sup> An increase is assumed for reaching LA levels.

**Table 2.5** Additional Health Spending Per Inhabitant in Constant US\$ and as a % of GDP

Countries	Health Public Expenditure Per Capita (US\$ constant prices)	IMR Reduction	Per Capita Cost of IMR Reduction	Cost as % of GDP
Costa Rica <sup>1/</sup>	79	-0.06	[US\$0.05, US\$5.13]	[0.001%, 0.1%]
El Salvador <sup>1/</sup>	80	-0.44	[US\$0.35, US\$35.3]	[0.009%, 0.9%]
Guatemala <sup>2/</sup>	36	-0.38	[US\$0.13, US\$13.4]	[0.004%, 0.4%]
Honduras <sup>2/</sup>	60	-0.07	[US\$0.04, US\$4.12]	[0.002%, 0.2%]
Nicaragua <sup>2/</sup>	65	-0.11	[US\$0.07, US\$7.34]	[0.004%, 0.4%]
Panama <sup>1/</sup>	200	-0.49	[US\$0.98, US\$97.9]	[0.009%, 0.9%]
Dominican Rep. <sup>2/</sup>	100	-0.12	[US\$0.12, US\$12.4]	[0.002%, 0.2%]
<b>CADR</b>	<b>89</b>	<b>-0.24</b>	<b>[US\$0.25, US\$25.1]</b>	<b>[0.004%, 0.4%]</b>

Source: IADB-CID estimates with CEPALSTAT data

**Notes:**

<sup>1/</sup> Record rates under those of LA, so the exercise assumes a decrease for reaching the level of Chile.

<sup>2/</sup> An increase is assumed for reaching LA levels.

## CONCLUSIONS AND POLICY RECOMMENDATIONS

The demographic dividend expected for CADR in upcoming years is an opportunity for boosting economic growth. An increase of the population's pool of human capital needs to be increased if the impact of this demographic recomposition is to be maximized. With timely decision-making, an improvement of both coverage and quality of education and health in Central America would equip the population with more and better skills and lead to an expanding, increasingly more productive labor force.

A population with higher levels of human capital makes a country more attractive to investors and results in more inclusive economic growth. A labor force with a strong human capital profile is linked to greater productivity, enabling a country to join more sophisticated value chains and attract foreign investment in high value-added activities. A more skilled labor force would obtain higher wages, enabling it to improve its standard of living.

The biggest educational challenge in CADR for expanding its human capital is secondary education. Only a small portion of Central American youths are able to complete this level. Factors such as rurality, household size and single head of household appear to exert a negative influence on secondary school attendance of youths between the ages of 15 and 17.

Education that is closely linked to the labor market is the key to reducing school dropout. CADR youths apparently do not perceive the advantages of staying in the educational system and in many cases they complete their studies and fail to find work. Initiatives such as vocational education, dual education, internship programs, etc., should therefore be promoted to strengthen the links between the education received by youths and the labor demands of the business world.

With regard to health, infant mortality is a limiting factor for labor force growth. Although the region has had some success in reducing infant mortality rates, it still lags significantly behind the rest of Latin America. In the long term, children now suffering from ailments such as diarrhea or malnutrition may grow to be adults without having fully developed their physical and cognitive skills, crippling their abilities and productive skills.

The region can aim for an inclusive economy, improving its human capital. The results of our exercises show that infant mortality rate changes are associated with significant GDP per capita jumps; if infant mortality gaps are eliminated the region would have an additional 0.21% growth. Moreover, increased years of schooling (0.44% per additional year of schooling over the annual GDP growth rate) are also associated with significantly higher growth rates in CADR countries.

More resources might necessarily be entailed for making headway on human capital. Since the education sector is where the region is most lagging, it comes as no surprise that this is where more funding is needed. On average, educational spending would need to be

increased to an estimated 8% of the GDP in order to close education gaps with respect to the rest of Latin America. As for health, bringing infant mortality rates down to the average Latin American level would entail an estimated additional cost of 0.4% of the average GDP. That said, it should be noted that any measure implying increased spending should also be accompanied by efforts to increase the efficiency of what is already being spent.<sup>13</sup>

A more detailed strategy should be defined in each country for making headway on health and education. There is no common recipe for all the countries, seeing that they are all at different stages of development in their levels of health and education. The Bank could work together with each country's authorities to develop specific case-by-case intervention agendas based on their individual needs and requirements.

Going forward, the agenda is rich and the demographic bonus in many of the CADR countries offers an opportunity they should not pass up. The youngest countries in the region are the ones that could get the most out of this situation. Nevertheless, since the region has a high number of youths who neither study nor work, spending is needed on programs geared to helping this population join the workforce. Failure to act could lead to a larger number of unemployed, poorly skilled youths, turning the demographic bonus into a liability with serious social challenges. The time is now for moving forward on this ambitious agenda, which would help the region increase its growth and allow the benefits to reach more people in CADR.

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<sup>13</sup> For a more in-depth description of measures to improve spending efficiency in education and health, see Prat and Beverinotti (2016)



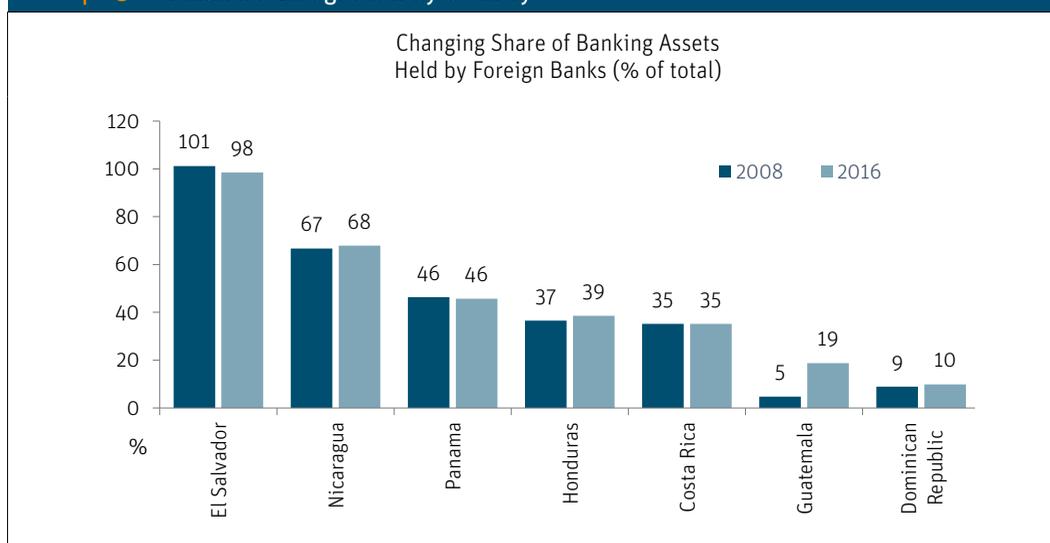
# 3

## PARTICIPATION OF FOREIGN BANKS IN CENTRAL AMERICA AND THEIR EFFECTS ON THE REGION'S FINANCIAL CONVERGENCE

### INTRODUCTION

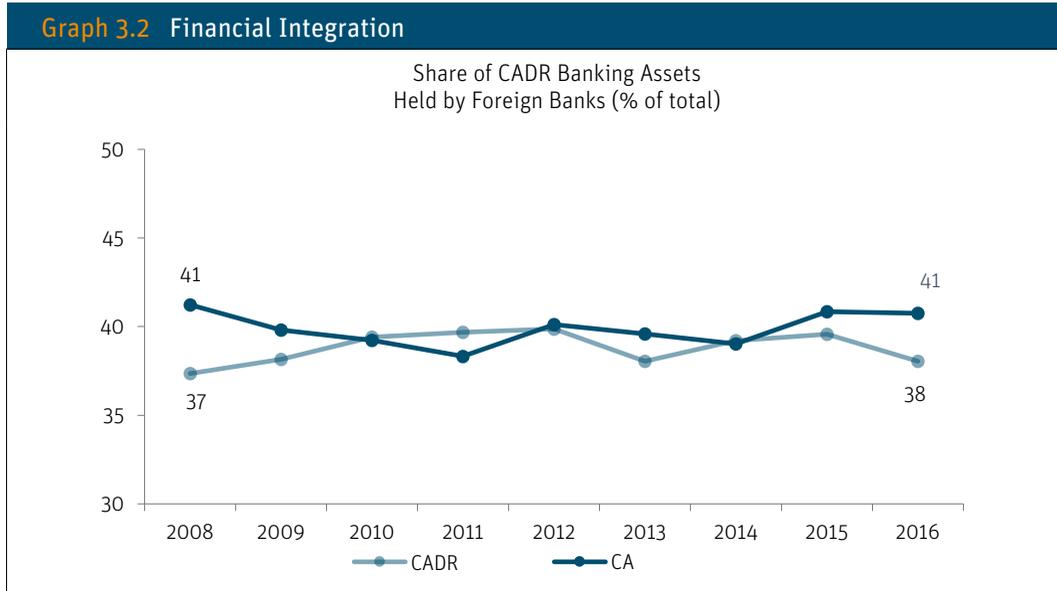
Foreign banks have played a strong role over the past ten years in the financial systems of Central America and the Dominican Republic (CADR), representing on average close to 39% of the banking system's total assets.<sup>14</sup> Their participation, however, is quite uneven among countries. For instance, from 2008 to 2016, foreign-bank capital accounted for approximately 100% of bank assets in El Salvador but only around 10% of bank assets in the Dominican Republic. The share of foreign banking has also remained notably stable in most of the region's countries, except for Guatemala, where it grew from 4% in 2008 to almost 19% in 2016.

**Graph 3.1** Financial Integration by Country



**Source:** Author's compilation with data from Orbisbank and bank superintendent offices.

<sup>14</sup> This does not include the percentage of Central American banks with holdings in the region's countries.



Source: Author's compilation with data from Orbisbank and bank superintendent offices.

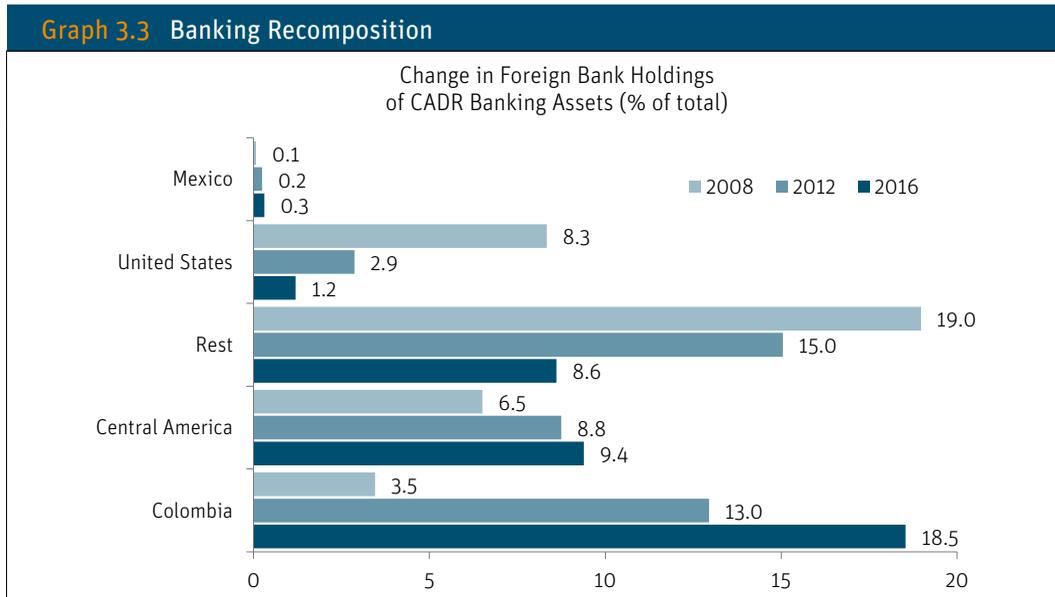
Note: CA =Central America

Since 2008, the percentage of foreign assets in total CADR banking assets has remained relatively stable, although its composition has changed notably. This was most evident during the 2008-2009 global financial crisis, when various American and European international banks reduced their exposure in CADR markets and focused on their primary regions.<sup>15</sup> In the case of Central America, the position vacated by these banks was basically filled in by Central American financial groups, though Colombian capital was prominent.<sup>16</sup> This reallocation process concluded in 2013.

Specifically, the share of Central American banking capital rose from 6.5% of total assets in 2008 to 8.8% in 2012 and 9.4% in 2016, while for those same years, Colombian banks increased their share from 3.5% to 13.0% and, finally, 18.5% of the region's total banking assets. Among the main financial groups that withdrew or reduced operations in CADR were the British HSBC and U.S. Citibank and GE, while the new participants included the Colombian Davivienda, Bancolombia, and Aval groups and the Canadian bank, Scotiabank.

<sup>15</sup> This change was a response to both the need of advanced-economy banks for a deleveraging and stronger regulatory requirements, which forced many banks into selling off non-strategic markets and segments in the CADR region.

<sup>16</sup> The main determinants of the Colombian banking expansion included: the search for new business, diversification of risk, the provision of financial services to Colombian companies, and the existence of higher intermediation margins in Central America. "Integración Bancaria entre economías emergentes," Boletín Económico, Banco de España (2014).

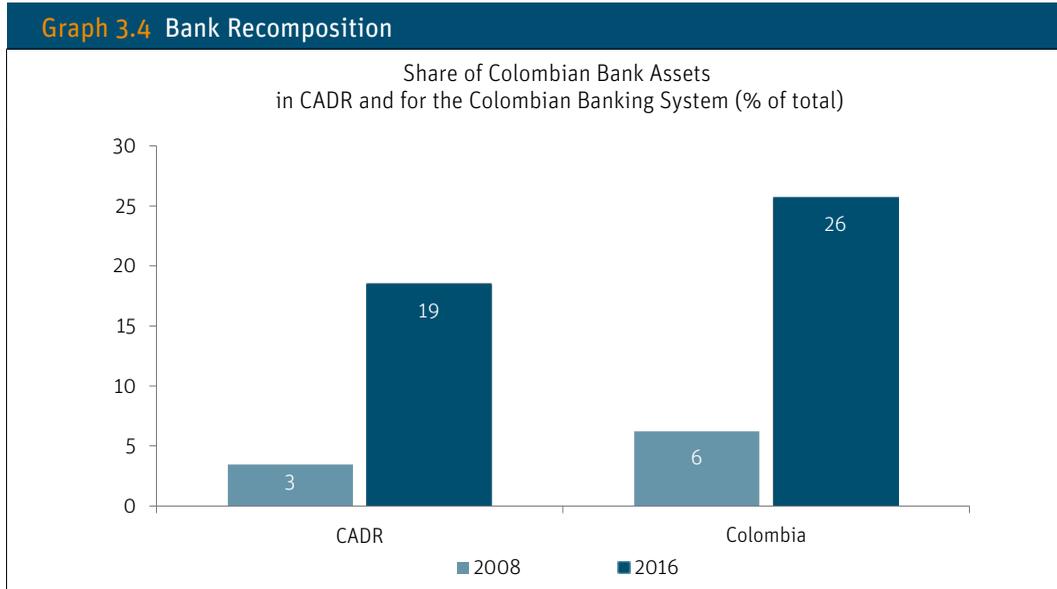


Source: Author's compilation with data from Orbisbank and bank superintendent offices.

The literature on the effects of integration is inconclusive. On the one hand, greater financial integration could generate benefits from the strengthened financial ties and business flows between countries. On the other hand, it entails potential risks for the countries due to the increased vulnerability to their partners' spillovers. Nevertheless, greater integration could be expected to lead to a certain degree of synchronization among different financial variables.

This chapter analyzes the effect of the structural change in banks' holdings on the dynamics of CADR financial variables. Although no increase has been recorded in the total share of foreign banking, the stronger concentration of capital in the hands of Central American and Colombian banks could work as an integrating factor by mainstreaming common financial practices in the region's countries. This increased concentration is expected to translate into greater synchronization of financial variables.

The rest of the chapter explores the degree of synchronization of CADR financial variables, their links to the changing integration patterns, and to the region's and main partners real cycle. From the results, it concludes with a few reflections on economic policy implications.



Source: Author's compilation with data from Orbisbank and bank superintendent offices.

## FINANCIAL INTEGRATION VERSUS FINANCIAL CONVERGENCE

The similarities in productive structure, business patterns, and financial flows in Central American countries suggest the possibility of strong regional integration in various areas, including the financial one. Financial integration can be measured as the degree of limitations on capital mobility and/or the share of foreign banks in national banking systems, as in Galindo, Izquierdo and Rojas-Suarez (IDB 2010 a). Their results show that, in 2010, Central American integration had increased due to both reduced restrictions on financial transactions and a significant share of total banking assets held by foreign banks. The latter would suggest the existence of a common business model leading to similar financial practices among countries, such as increased credit and reduced terms and interest rates. Galindo, Izquierdo and Rojas-Suarez (2010 b) have also suggested that foreign banks showing similar behavior – other than the Spanish ones – tend to amplify the impact of external shocks on domestic financial variables.

Given the larger share of Colombian and regional banks in CADR, these changing financial integration patterns might have increased synchronization of the region's financial cycles by introducing similar financial practices. This synchronization is evaluated using a notion of convergence. Convergence of a financial variable is defined as the degree of association of that variable with its common regional cycle. A strong regional convergence suggests that fluctuations in countries tend to be similar in direction and magnitude and

therefore, are usually conditioned by common factors.<sup>17</sup> The question is whether changing ownership-patterns can foster greater convergence of financial variables with respect to their common cycle. Alternatively, we might ask if the larger share of CADR assets held by Colombian and regional banks affects convergence by intensifying the ties with these countries. Due to the importance of CADR ties with partners such as the U.S. and Colombia, we look at the impact of these countries' real activity on financial convergence.

In addition to a high degree of financial variable synchronization, strong regional convergence could potentially intensify external shocks or spread financial stress events occurring in any of the region's countries. An empirical check of the financial convergence behavior in CADR could therefore indicate a few potential vulnerabilities in the region and whether they are related to the integration process.

To evaluate the impact of financial integration on convergence, we analyze changes in financial convergence – that is, changes in the association between financial variables and their common cycles. This implies that, by construction, convergence itself will be variable and will differ from other, more static notions.<sup>18</sup> Financial integration will only be analyzed as the share of the region's assets held by foreign banks, with emphasis on the changing composition of foreign bank holdings after 2008.

## MEASUREMENT OF FINANCIAL CONVERGENCE

The first step in studying convergence is to estimate common cycles for the different financial variables. The common cycle captures the co-movement or synchronized dynamics of a set of variables in the region. It should therefore meet two conditions: a) it should positively relate to each country variable ; and b) it can be estimated for any financial variable (i.e. there are as many common cycles as there are financial variables). It should be noted that the relevance of a common cycle lies in its ability to explain the fluctuations of the variables it describes. Common cycles that contribute most to explaining a set of variables also indicate convergence.

The second step is to allow convergence to vary over time. Common cycles capture the average positive co-movement among financial series, so they describe latent dynamics for a specific time. However, each variable's association with its common cycle can vary over time, depending on several factors. External shocks or events with simultaneous impacts on countries' credit and activity, for example, can modify regional credit convergence.

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<sup>17</sup> Most of the literature has focused on the convergence of business cycles. Kose, Otrok and Prasad, 2012, define convergence as the synchronization of real cycles with respect to a common dynamics (global or group). After studying the convergence of business cycles in advanced and emerging economies from 1960 to 2005, they conclude that, since 1985, greater convergence has been found among countries within each group but greater divergence has been seen between groups.

<sup>18</sup> Other notions, such as beta or sigma-convergence, are considered static because they are limited to identifying whether convergence exists during a period of time. These notions tend to be applied to cross-section data or panels with few time observations. Our notion of convergence, as that in Kose, Otrok and Prasad (2012) and Hristov and Rozenov (2009), allows convergence to change over time.

Integration changes leading to more or fewer similarities in the region's business models can also affect convergence.

Most of the literature on convergence focuses on analyzing whether it occurs. This chapter evaluates changes in convergence. To explain these changes, we propose hypotheses based on the heuristics of the available data. We examine, for instance, if financial integration influences convergence and how credit and activity dynamics affect the region's credit convergence.

## METHODOLOGY

Aggregated financial information was organized for each of the CADR countries with monthly periodicity from December 2004 to June 2017. The database includes the growth rates of the banks' main balance sheet items and management indicators, such as indicators of balance sheet soundness, portfolio quality, efficiency, profitability, stability, liquidity, and asset-liability composition.<sup>19</sup> A database by country for the CADR banking system, from 2008 to 2016, was also built to measure the changes in financial integration.<sup>20</sup>

We then estimated common cycles for each financial variable. Common cycles were constructed using a two-stage procedure to ensure a positive relationship between each country variable and its cycle. We first calculated the principal components of all regional financial variables –138 variables – and selected the first ten components, which account for 85% of their variability. We then identified those component-rotations that fulfilled the expected relationship between the variable and its cycle.

Once the common cycles were calculated for each of the variables, we identified those variables most in sync with the common cycle or best explained by their cycle.

We then estimated the changes in convergence as the changes in the covariance between the variable and its common cycle. The covariances were calculated with a 3-year moving window.<sup>21</sup> This was done only for real credit growth, as this was the variable most in sync with its common cycle.

Finally, we performed a panel estimation (SUR- structure) to explain the degree of convergence of real credit growth.<sup>22</sup> The main determinants of credit convergence are the real activity convergence, regional credit acceleration, and real activity of CADR, the U.S., and Colombia with regard to these countries' financial-integration indicators.

<sup>19</sup> The data comes from banking indicators compiled by the Center for Latin American Monetary Studies (CEMLA). All growth rates are real annual rates and the indicators are calculated based on annual flows. The complete base consists of 138 variables. The balance sheet soundness indicators are: risk-weighted capitalization and leverage; portfolio quality measured by the ratio of past-due portfolio to total portfolio and allowances for loan losses; efficiency, which considers the financial margin and administrative expenses as a portion of assets; profitability, which is ROA; stability, approximated by the z-score coefficient; and liquidity, which is the cash asset ratio.

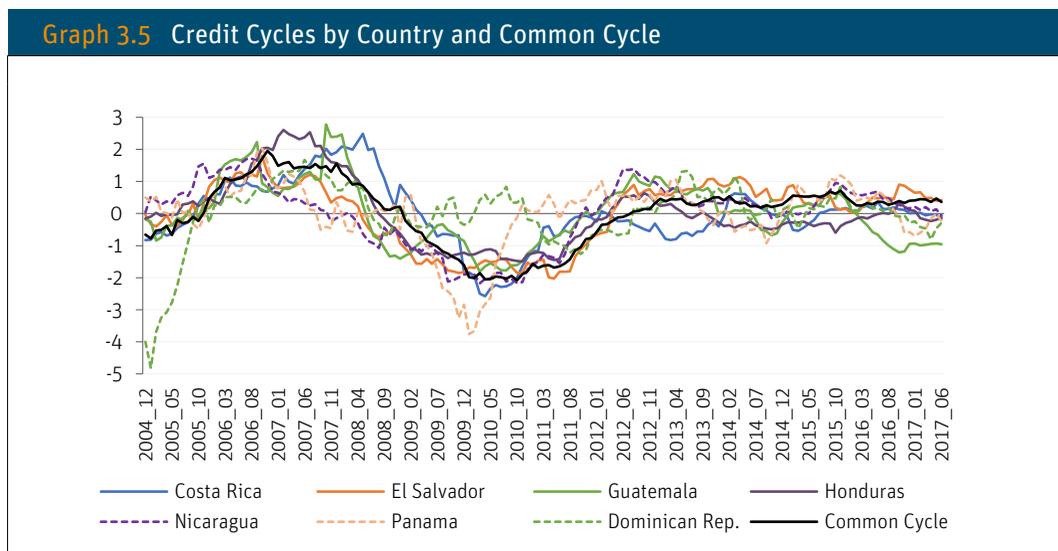
<sup>20</sup> The data were constructed from the ORBISBANK database and bank balance sheets published at the each country's banking oversight office.

<sup>21</sup> All covariances were calculated with standardized variables. The selected width of the moving window (36 months) allowed to incorporate the full effect of potential shocks on the series dynamics.

<sup>22</sup> SUR stands for "seemingly unrelated regressions". The estimation incorporates the correlation of residuals among countries.

## RESULTS

Our estimates show that the variable with greater convergence is the real credit growth, which has the highest degree of synchronization with its common cycle. Credit dynamics by country and their common cycle can be seen in Graph 3.5. The common cycle explains, on average, about 53% of the region's credit variability. That is, more than half of its fluctuations are explained by regional factors. Other variables, such as the asset-credit ratio, the overdue loan portion, and the financial margin show common cycles that explain, on average, more than 40% of these variables' fluctuations in CADR (see Table 3.1).



Source: Author's compilation.

**Table 3.1** Decomposition of Variable Variance by Country

Variable	Country	% Common Variance (VC)*	% Varianza no común (V-NC)	Promedio %VC	Promedio %V-NC
Real credit growth (CRER)	Costa Rica	63%	37%	53%	47%
	El Salvador	77%	23%		
	Guatemala	52%	48%		
	Honduras	72%	28%		
	Nicaragua	56%	44%		
	Panama	33%	67%		
	Dominican Rep.	18%	82%		
Credit/asset (SHCRE)	Costa Rica	80%	20%	46%	54%
	El Salvador	43%	57%		
	Guatemala	60%	40%		
	Honduras	9%	91%		
	Nicaragua	42%	58%		
	Panama	6%	94%		
	Dominican Rep.	79%	21%		
Past due / credit portfolio (CV)	Costa Rica	15%	85%	41%	59%
	El Salvador	47%	53%		
	Guatemala	47%	53%		
	Honduras	58%	42%		
	Nicaragua	69%	31%		
	Panamá	21%	79%		
	Dominican Rep.	30%	70%		
Financial margin (MF)	Costa Rica	26%	74%	37%	63%
	El Salvador	8%	92%		
	Guatemala	37%	63%		
	Honduras	69%	31%		
	Nicaragua	59%	41%		
	Panama	49%	51%		
	Dominican Rep.	13%	87%		

Source: Author's compilation.

The countries with the closest relationship to the regional credit cycle are Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua. Credit variations in Panama and the Dominican Republic are largely explained by idiosyncratic factors rather than common regional factors. In general, Panama and the Dominican Republics showed, on average, a weaker association with common cycles (see Table 3.2). This suggests that these economies have characteristics that differentiate them to a greater extent from the rest of the region.

These countries' credit cycles may be less in sync with the region due to the differences in their productive structures. The fact that these economies are relatively less integrated may also be a contributing factor. A look at the composition of assets in these countries shows that Colombian held-assets account for 18% of total assets in Panama, but are absent in the Dominican Republic. Central American held-assets accounted for 11% of assets in Panama and 1% of assets in the Dominican Republic in 2016.

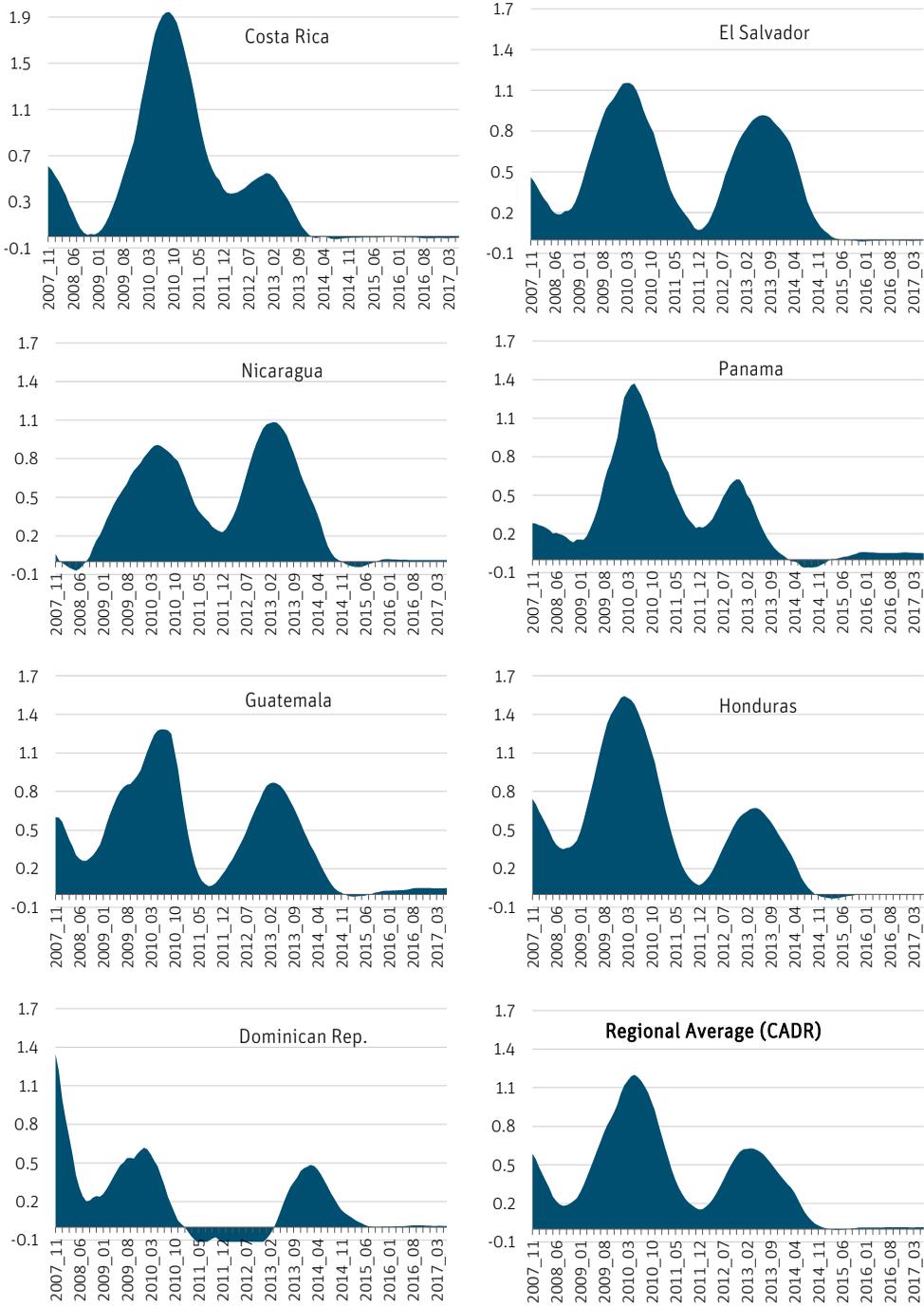
**Table 3.2** Average Common Variance by Country

Country	Average % Common Variance All Variables	Average % Common Variance Credit-related Variables: CRER, SHCRE, CV, and MF
Costa Rica	25%	46%
El Salvador	30%	44%
Guatemala	36%	49%
Honduras	30%	52%
Panama	15%	27%
Dominican Rep.	17%	35%

**Source:** Author's compilation.

Considering that the variable with greater convergence was credit, and given the importance of credit in financial consumption and investment decisions, we looked deeper into this variable. The estimated changes in credit convergence (the covariance between credit and its cycle) for each of the countries, along with the regional average, are shown in Graph 3.6.

**Graph 3.6 Real Credit Convergence by Country and the Regional Average**



Source: Author's compilation.

In general, the highest degrees of convergence for real credit growth were found around 2010 and 2013, while convergence has weakened in recent years. A direct interpretation of these results is that, currently, financial convergence does not appear to be a risk factor for the region. Its strong increase in the past, however, opens the possibility that similar conditions might increase it again. We need to understand, then, what has affected credit convergence in the past.

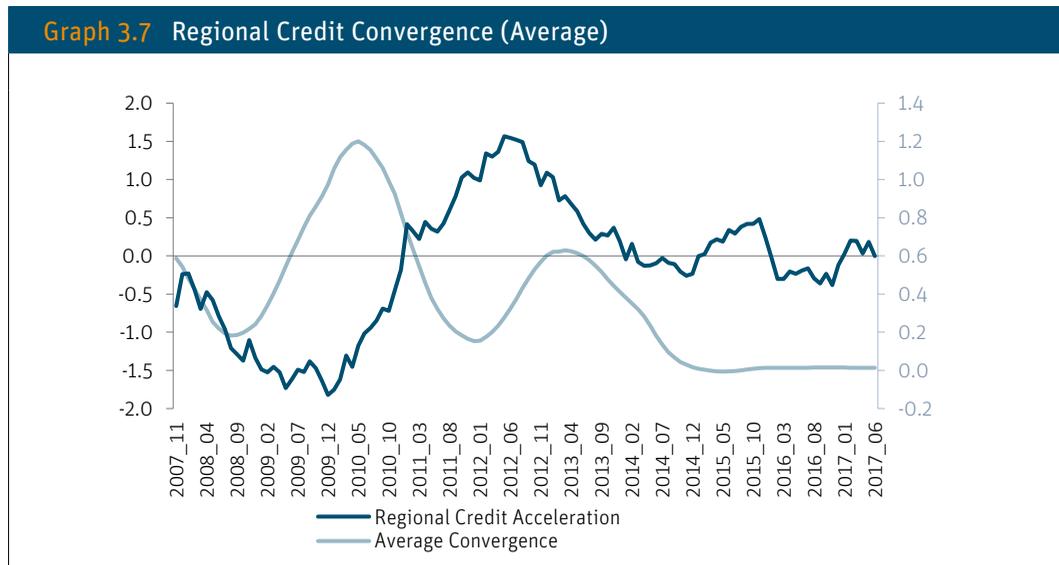
The following hypotheses were proposed for this analysis:

- Increased credit convergence after 2009 might be associated with the general economic slowdown experienced by the countries in the region. There are two alternative explanations for the observed behavior. One is that the simultaneous adjustment in real economic activity (real convergence) leads to greater credit convergence. This positive relationship between real convergence and credit convergence could occur regardless of the direction of the adjustments in credit.<sup>23</sup> Another possibility is that lower regional real growth rates could increase credit convergence by reducing credit simultaneously in all countries. In this case, the association between convergence and the regional cycle is negative.
- During 2013, most of the region's countries experienced lower real credit growth rates. This credit slowdown, per se, could therefore have contributed to increasing convergence that year. This increase might not necessarily have been attributed to economic activity. If this is the case, a regional credit acceleration would reduce convergence.
- As for the relationship between financial integration and credit convergence, we assume that integration has served as an amplifier of the region's and main-trading-partners' economic activity. We examined this hypothesis, by letting the partners' real activity interact with the financial-integration indicators constructed for Central America, Colombia and the U.S., respectively. These indicators give the percentage of assets held by these countries' in each of the region's members, as summarized in Graph 3.3.

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<sup>23</sup> Real convergence for the region is also very high around the 2009-2010 economic downturn. The common economic activity cycle explains, on average, 64% of the countries' variance.

Using statistical estimates, we empirically contrast the above hypotheses.<sup>24</sup> A preliminary result was that if the common credit cycle shows decreasing growth rates, credit convergence tends to be greater (see the coefficient of credit acceleration in the table of Annex 3.1). This negative association between average credit convergence and regional credit acceleration is also seen qualitatively in Graph 3.7.<sup>25</sup>



Source: Author's compilation.

With regard to the effects of U.S. and Colombian economic activity on convergence, below-average growth rates tend to increase credit convergence in the region.<sup>26</sup> This effect is magnified by greater financial integration – among countries in the region and with Colombia.<sup>27</sup> With the U.S., the impact of real activity on convergence would appear to have heightened, despite the weakening of financial integration (see Graph 3.3).<sup>28</sup> This might indicate the existence of other channels of integration with the U.S. that were not captured by the indicator.

The foregoing results suggest that the increased credit convergence in 2009-2010 might be explained by greater convergence around the recession (in the region and the U.S.), the economic slowdown in Colombia, and the drop in regional credit (in 2009.) This is in line with the idea that crises lead to a generalized credit squeeze (Demirgüç-Kunt, Detragiache, and Gupta, 2006; Dell'Ariccia, Detragiache, and Rajan, 2008), as occurred in Latin America

<sup>24</sup> We used a panel estimate of the region's countries to explain the credit convergence variable; the full results are shown in Annex 1.

<sup>25</sup> We also found a positive relationship between real convergence and credit convergence. A more synchronized business cycle in the region's countries partially explains greater credit synchronization.

<sup>26</sup> The real activity coefficients of Colombia and the U.S. are both negative.

<sup>27</sup> The coefficients of the interaction between real growth and the integration index are negative for Colombia and the region. The sum of Colombian activity coefficients becomes more negative with greater integration.

<sup>28</sup> The coefficient of the interaction between real growth and the integration index is positive for the U.S., indicating that the sum of U.S. activity coefficients has become more negative with time.

during the financial crisis (Rai and Kamil, 2010; Barcenas, Barreiro, and Pagliacci, 2016). The amplified effect of the partners' economic activity on convergence through financial integration is worth noting. Today's weak credit convergence would appear to lie in the relative regional stability of both credit and economic activity.

## CONCLUSIONS AND POLICY IMPLICATIONS

The results of this chapter suggest that credit convergence in CADR is a mixed phenomenon. On the one hand, its intensity has varied over time, reaching peaks around the financial crisis in 2009. On the other hand, some of the synchronization can be associated with a deepening of financial integration. The two results indicate that, to the extent countries' financial and economic conditions change, the need for both the assessment of changes in convergence and the actions mitigating risks arise.

A risk associated with strong credit convergence is the possibility that external or idiosyncratic shocks could be transmitted more rapidly and deeply to the region. However, the real risk seems to lie in the factors that lead countries' financial systems to impact credit provision simultaneously

When convergence is fostered by financial crises, multiple triggers may be at play. In this case, the whole arsenal of macroprudential policies is precisely designed to avoid crises. The results in this chapter also suggest that the implementation of countercyclical regulatory measures for credit buffering is desirable. To the extent they effectively soften credit falls, these policies will tend to minimize the associated convergence. But since convergence is a regional phenomenon, implementation of these policies should be studied from a regional standpoint to make them potentially more effective and to minimize the risks of regulatory arbitration as well.

When convergence stems from financial integration, the risk lies in the increased connectivity or interrelationships with financial partners that tends to exacerbate the (direct or indirect) impact of their performance. This does not mean, however, that policies should be implemented to limit integration; on the contrary, policymakers should be alert to the partners' changing performance. Moreover, given the importance of financial stress tests for bank oversight, the complexity added by greater integration and credit convergence needs to be recognized. Convergence has a clear impact on the banking systems involved and should be taken into account in these tests – particularly in highly integrated regions.

Convergence measures an additional credit dimension. Stronger credit convergence indicates whether credit fluctuations have a common trigger that is setting off synchronized responses in countries. Although the findings in this chapter indicate that stronger convergence may have its roots in crises and financial integration, we still need to

understand what its specific external triggers would be and through which channels they may be transmitted. The 2009 financial crisis, for example, combined the U.S. economic recession with falling commodity prices, but the two events could have led to increased convergence by different means. Part of the pending agenda, then, would be to analyze in greater depth how different external shocks would explain changes in regional convergence.

Another idea suggested in this chapter is that convergence describes asymmetric credit responses. For instance, a slowdown in a trading partner's real activity squeezes credit in the region in a synchronized manner (greater convergence), but an acceleration expands credit heterogeneously among countries (less convergence). So, understanding how convergence is affected by upward or downward external triggers would provide information on the regional dynamics of credit. Furthermore, monitoring convergence might help anticipate the spread of common shocks while occurring. This analysis is relevant for planning public policies aimed at mitigating risks for the banking sector and the CADR economy in general.

**Annex 3.1: Panel Estimates for Credit Convergence**

Dependent Variable: Real Credit Convergence Method: MCG (SUR cross-section)

Credit Convergence	(1)	(2)	(3)	(4)
Real cycle convergence by country (-6)	0.113	0.133	0.117	0.091
Regional credit acceleration /1	-0.051	-0.073	-0.044	-0.037
Regional real cycle (-4)		0.007*		
Integration with CA * Regional real cycle (-4) /2		-0.023		
Colombian real cycle (-4)			-0.013	
Integration with CO * Colombian real cycle (-4) /2			-0.072	
U.S. real cycle (-3)				-0.172
Integration with the U.S. * U.S. real cycle (-3) /2				0.423
CR--C	-3.606	-3.741	-3.52	-3.055
ES--C	1.452	1.334	1.547	1.975
GT--C	-1.106	-1.273	-1.01	-0.543*
HN--C	-0.984	-1.157	-0.94	-0.469*
NI--C	0.684*	0.630*	0.744*	1.227
PN--C	-1.371	-1.609	-1.309	-0.718
DR--C	1.702	1.589	1.815	2.203
Controls:/3				
Real credit of all countries in the region (-1 to -3)	Yes	Yes	Yes	Yes
Real activity of all countries in the region (-1 to -3)				
Loan interest rates of all countries (-1 to -3)				
R-squared	0.993	0.993	0.993	0.993
Sum of the square of residuals	1.022	1.029	0.997	0.919
Time observations	110	110	110	110
Cross-sections:	7	7	7	7
Total observations (balanced pool)	770	770	770	770

\*Coefficients not significant at 10%

1/ : Refers to the annual absolute difference of the common real credit growth (regional). This variable is considered weakly exogenous with respect to credit convergence.

2/ : The integration index with respect to a country (or set of countries) is defined as the percentage of that country's assets out of the total assets of each of the region's members. Integration indexes were calculated for Central America (CA), Colombia (CO) and the U.S. These integration indexes were interacted with countries' real activity variables. The activity variables are standardized annual real growth rates.

3/ : These control variables correct for self-correlation of residuals. The control variable coefficients were allowed to be different for each country. These lagged explanatory variables were included to minimize potential problems of endogeneity

### Annex 3.2: Calculation of Common Cycles

The common cycle captures the co-movement or synchronized dynamics of a set of variables in the region. To ensure that each country variable relates positively to its common cycle, the cycle is constructed following a two-stage procedure. We first calculated the principal components of all regional financial variables –138 variables – and selected the first ten components, which account for 85% of their variability. We then identified those component-rotations that fulfilled the expected relationship between the country variable and its cycle.

Define  $X$  as the set of 138 standardized financial variables of 151 time-observations, and  $F^F$  as the set of the first  $f$  principal components of  $X$ , being  $f < 138$ . Also define  $Q^F$  as an  $f \times f$  dimensional rotation matrix that satisfies:  $Q^F Q^{F'} = Q^{F'} Q^F = I$ <sup>29</sup> Being  $q$  as a column vector of  $Q^F$ , each  $q$  represents a possible linear combination of the selected principal components. Consider  $X^i$  as the subset of  $X$  that contains one type of variable, for example, real credit growth for all members of the region. For all  $t = 1, 2, \dots, 151$ ,  $CC_t \equiv F_t^F q$  is a possible common-cycle candidate for  $X^i$  if  $CC$  relates positively with  $X^i$ . In the linear regression model:

$$X_t^i = \gamma CC_t + \zeta_t \quad (1)$$

$CC$  represents the common cycle of the variables in  $i$  if  $\gamma_i > 0$ .<sup>30</sup>  $\zeta_t$  is the idiosyncratic error vector, i.e. the portion of  $X^i$  unexplained by the common cycle. There are numerous  $q$  linear combinations that satisfy the imposed restrictions, so there is some degree of uncertainty about  $CC$  estimates. Operationally, the estimation of a common cycle consists of finding a sufficient number ( $d$ ) of draws  $q^d, (q^1, q^2, \dots, q^d)$ , such that they satisfy imposed restrictions. The estimated common cycle is obtained as the median of all possible common cycles, i.e.  $(CC^1, CC^2, \dots, CC^d) \equiv (F^F q^1, F^F q^2, \dots, F^F q^d)$ .<sup>31</sup>

<sup>29</sup> This  $Q$  matrix is obtained by applying the QR decomposition to an  $f$ -dimensional matrix of draws from a standardized normal variable. Rubio-Ramirez, Waggoner and Zha (2010) use an analogous  $Q$  matrix to implement sign-restriction identification of structural shocks in SVAR models.

<sup>30</sup> Since the region has seven countries, each common-cycle candidate satisfies seven restrictions, one per country.

<sup>31</sup> It is sufficient to set  $d=200$  for estimating a common cycle, since the addition of new draws does not significantly alter estimates.

# 4

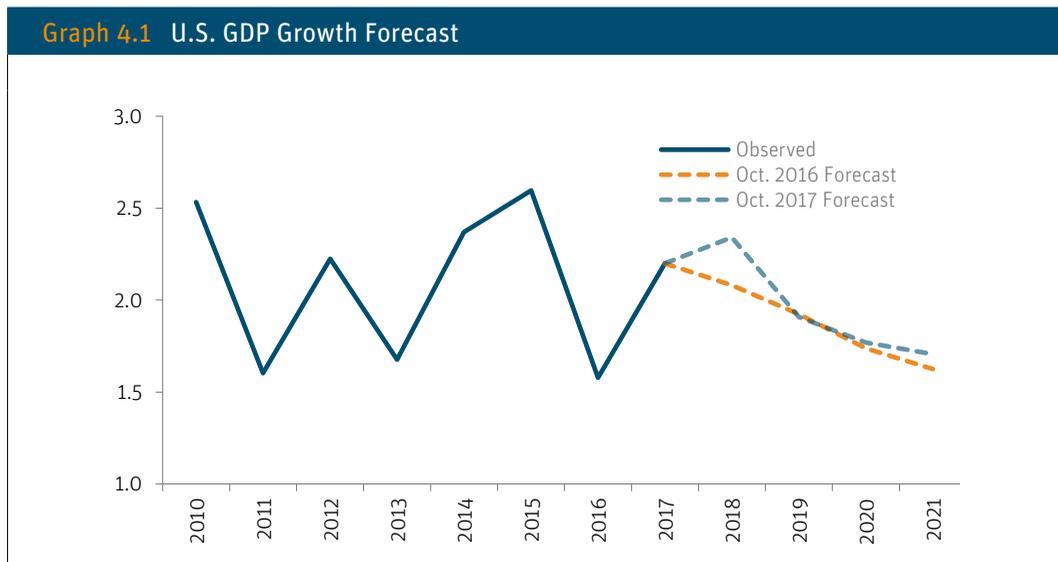
## THE EXTERNAL ENVIRONMENT GIVES AN UPSIDE POTENTIAL TO THE REGION'S OUTLOOK

*A global economic upswing, together with the external conditions of the world's primary commodity markets, is putting a favorable spin on the region's growth in 2018.*

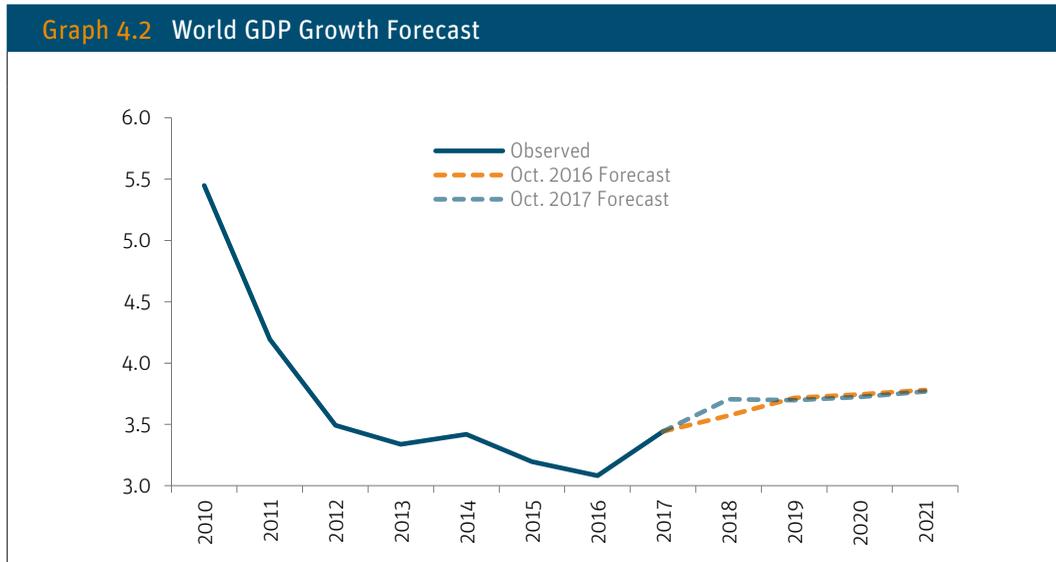
### GLOBAL ECONOMY

Global growth outlook has improved for 2018 to 3.7% compared to the earlier prediction of 3.6%. This change was also seen in the region's main trading partner, the United States, whose growth scenario for 2018 was revised upward from 2.1% to 2.3% (see graphs 4.1 and 4.2).

**Graph 4.1** U.S. GDP Growth Forecast



Source: IADB-CID with International Monetary Fund data (WEO, October 2017)



Source: IADB-CID with International Monetary Fund data (WEO, October 2017)

It is worth noting that U.S. growth estimates do not take into account the fiscal reform passed in December 2017, leading to a turn for the better in the forecast.<sup>32</sup> To this regard the 2018 growth estimates of private sector analysts have been improving in recent months. By December their consensus was already at 2.6%, and in January 2018 this rose to 2.7%.<sup>33</sup> This would be a higher growth rate than the 2.2% estimated for 2017 and the 2.1% eight-year average for the post-2009 crisis recovery period.

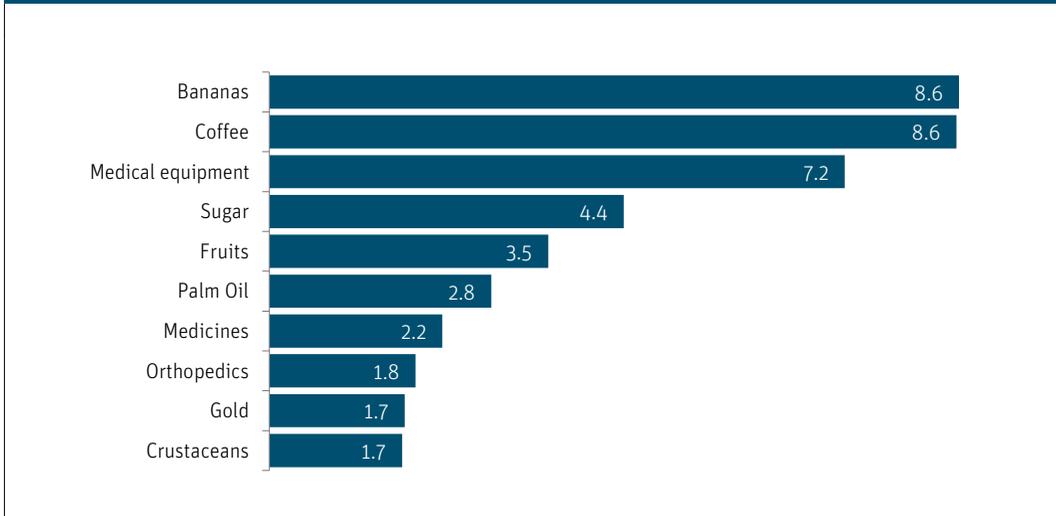
## KEY GLOBAL COMMODITY MARKET CONDITIONS FOR THE REGION

In general, primary commodities carry the most weight in the region's exports. The top ten CADR primary products in 2016 were agricultural goods such as coffee, bananas, and sugar (averaging 22% of the exports), and fruit, palm oil and shellfish (8%), followed by medium-technology goods (9%) and gold (2%). This structure has not varied significantly in the last three years. These goods contribute considerably to the GDP. For example, coffee, banana and sugar exports account for 22% of the region's GDP, on average.

<sup>32</sup> The scenarios considered were from the IMF World Economic Outlook of October 2017.

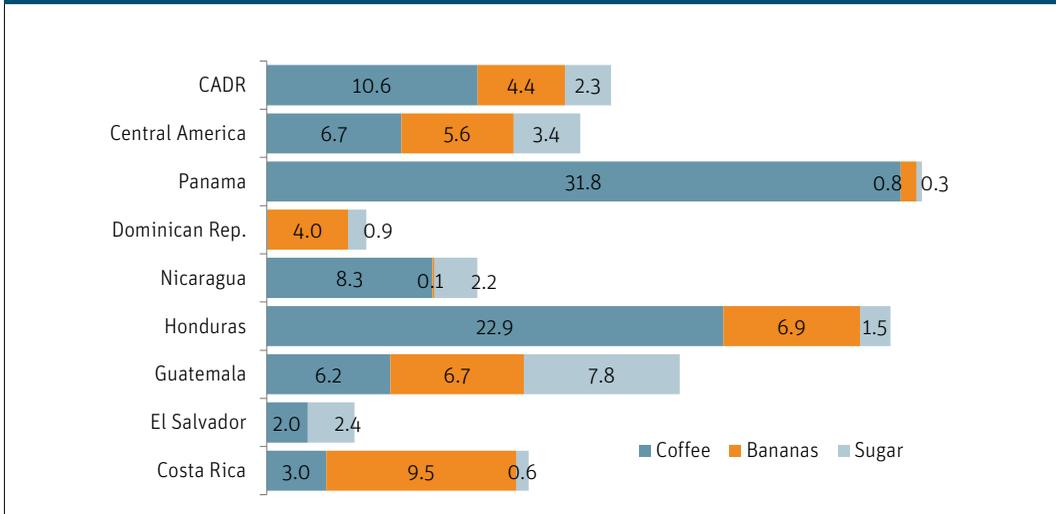
<sup>33</sup> Blue Chip Economic Indicators consensus forecast.

**Graph 4.3** Share of Main Exports in Total Central American Exports



**Source:** IADB-CID with data from the Secretariat for the Central American Economic Integration System (SIECA) Data for 2016. Does not include the Dominican Republic.

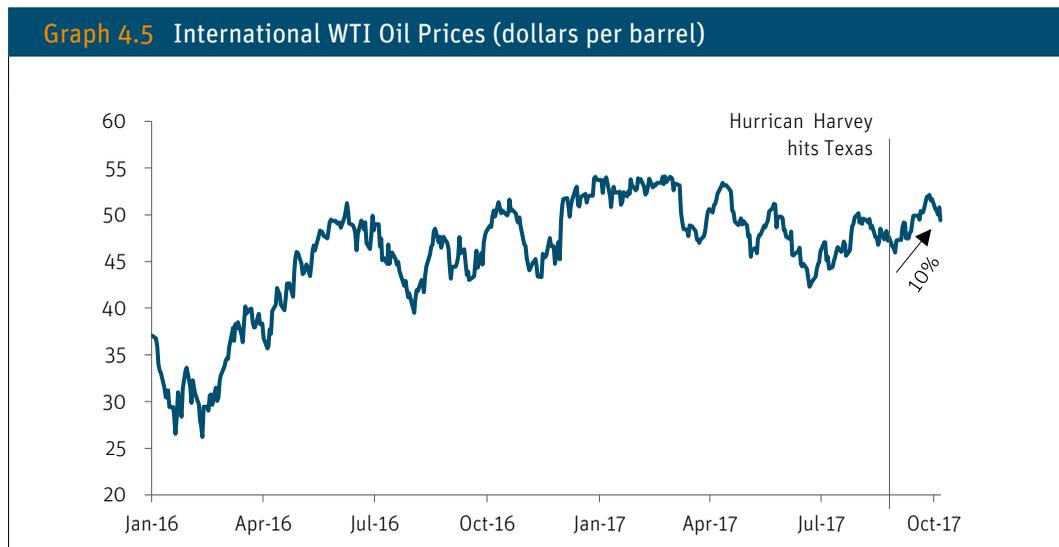
**Graph 4.4** Share of Coffee, Bananas and Sugar in Total Exports by country(percentage)



**Source:** IADB-CID with data from the Executive Secretariat for the Central American Monetary Council (SECMCA). Data for 2016.

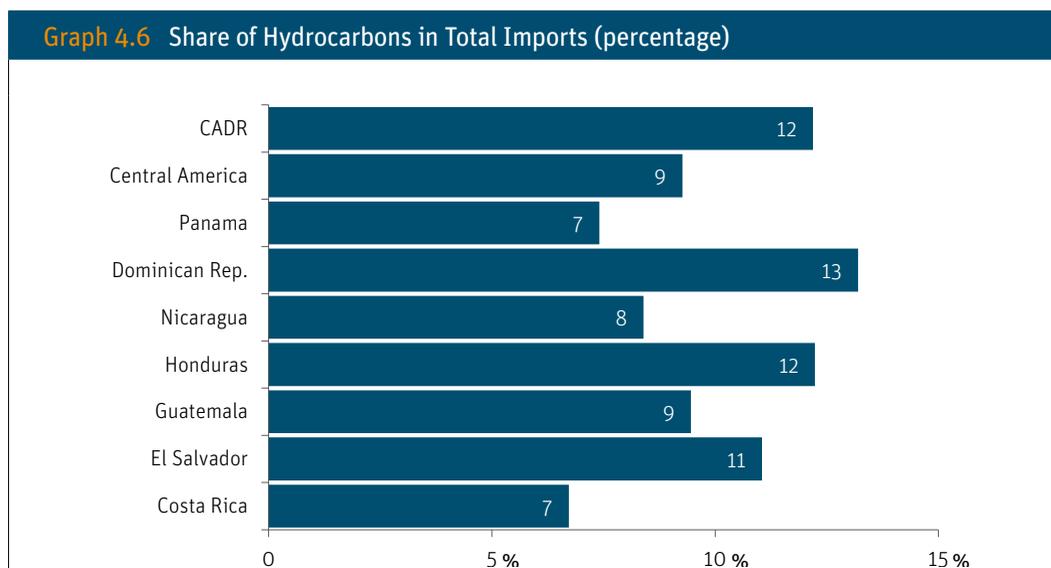
Although countries in the region are major suppliers of these goods globally, they lack the ability to individually influence the international price (a condition known in the literature as being price-takers) and their economies are affected by the international price behavior.<sup>34</sup> International commodity prices can vary drastically from year to year in response to global demand or supply conditions in the major producers (see Borensztein and Reinhart, 1994). Several key international commodity markets for the region's exports have recently been facing climate shocks, with a consequent impact on prices and their outlooks.

On the import side, hydrocarbons have the most weight in the region, accounting for 12% of the region's imports in 2016 and range from 7% to 13% of each country's total imports. In 2017, international oil prices were affected by climate events in the Texas production area. Specifically, after Hurricane Harvey hit the state at the end of August 2017, limiting oil production and distribution, the international price of West Texas Intermediate (WTI) oil spiked up by more than 13% in the following three weeks, leveling off in the fourth week at 10% over the price at the beginning of August. In addition, intensified political conflicts in the Middle East and a severe winter in the northern hemisphere appear to be once again pushing up oil prices.



Source: IADB-CID with data from Bloomberg

<sup>34</sup> In 2016, Central America contributed 11% of the world's export country coffee production (Source: International Coffee Organization). It contributed 6% of the world's total sugar exports (Source: USDA, Foreign Agricultural Service). In the banana market, the region contributed more than 6% of world production (Source: Banana Market-SSI Review 2014).



Source: IADB-CID with data from the Executive Secretariat for the Central American Monetary Council (SECMCA). Data for 2016.

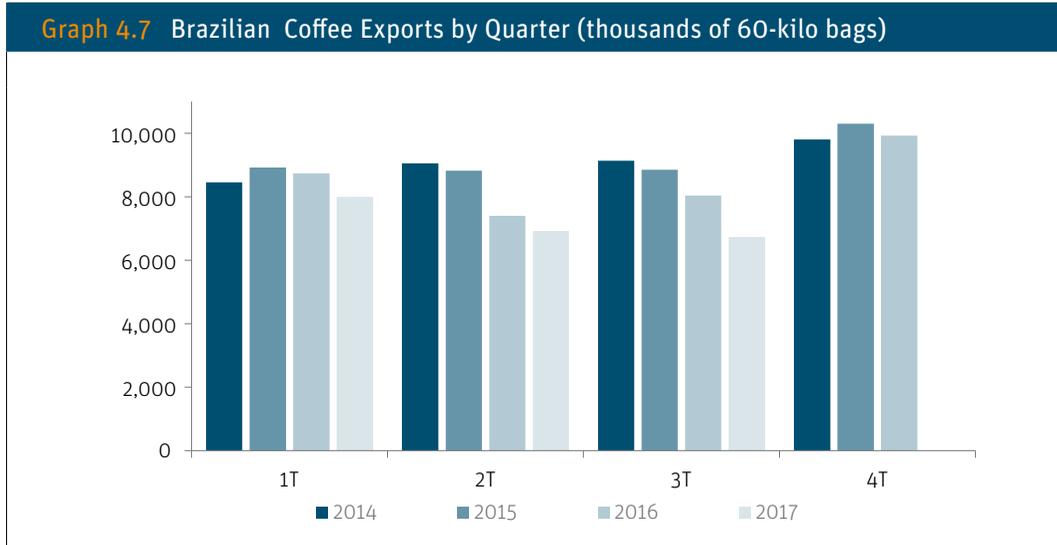
In addition, commodity markets for the region's exports have also sustained global supply shocks recently, especially for the region's three key export commodities: coffee, bananas and sugar. The Food and Agriculture Organization of the United Nations (FAO) notes that the sugar market has also been affected by demand factors related to health concerns.<sup>35</sup> A description of the global market conditions for these products follows.

In 2017 the international coffee market was impacted by climate events and plagues such as rust fungus, which affected the production of the world's two top producers, Brazil and Vietnam. Their exports in each of the first three quarters of the year have fallen below their previous year's exports, and for Brazil, below exports for 2014 and 2015.

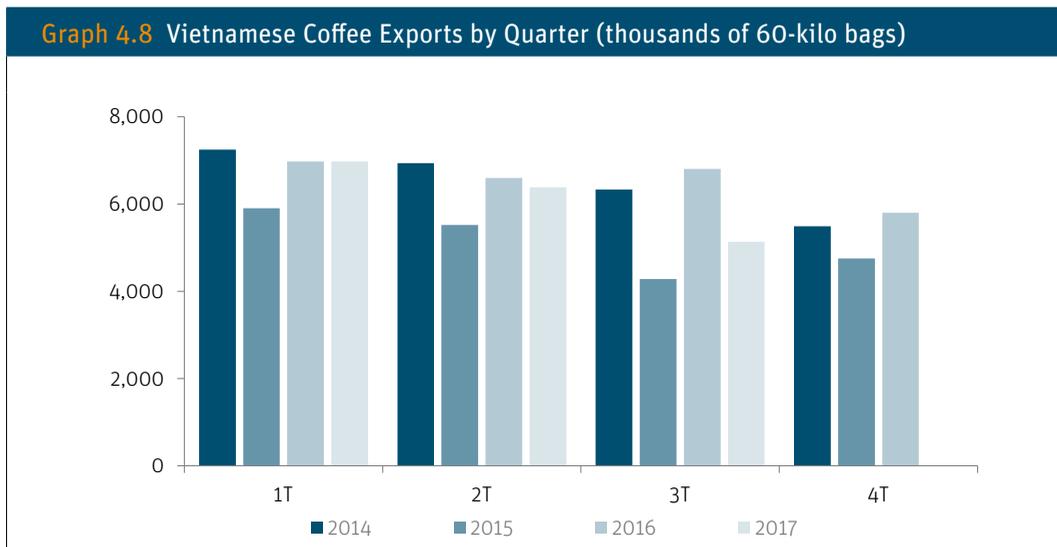
Given this setting, the CADR region has been able to increase its production from 8.4% of world production in 2013 to 11.0% in 2016,<sup>36</sup> thanks to the fact that its production has grown at an average annual rate of 8.0% from 2014 to 2017 while global production has only grown by an average annual rate of 1.1% during this same period.

<sup>35</sup> See Chapter 3 of the OECD-FAO Agricultural Outlook 2017-2026 for a description of recent determinants and international sugar price scenarios.

<sup>36</sup> Source: International Coffee Organization.



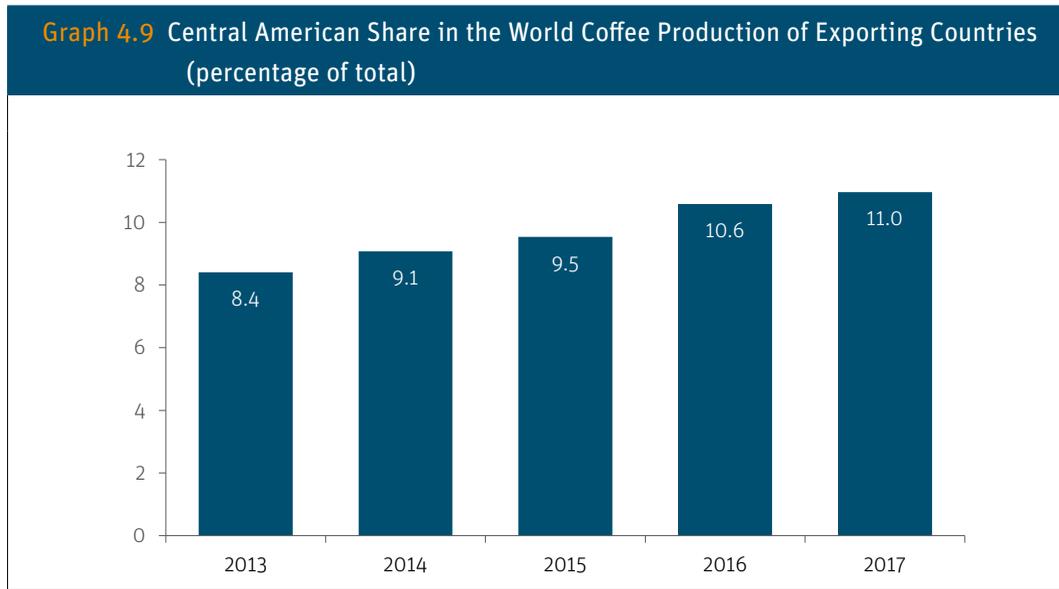
Source: IADB-CID with data from the International Coffee Organization



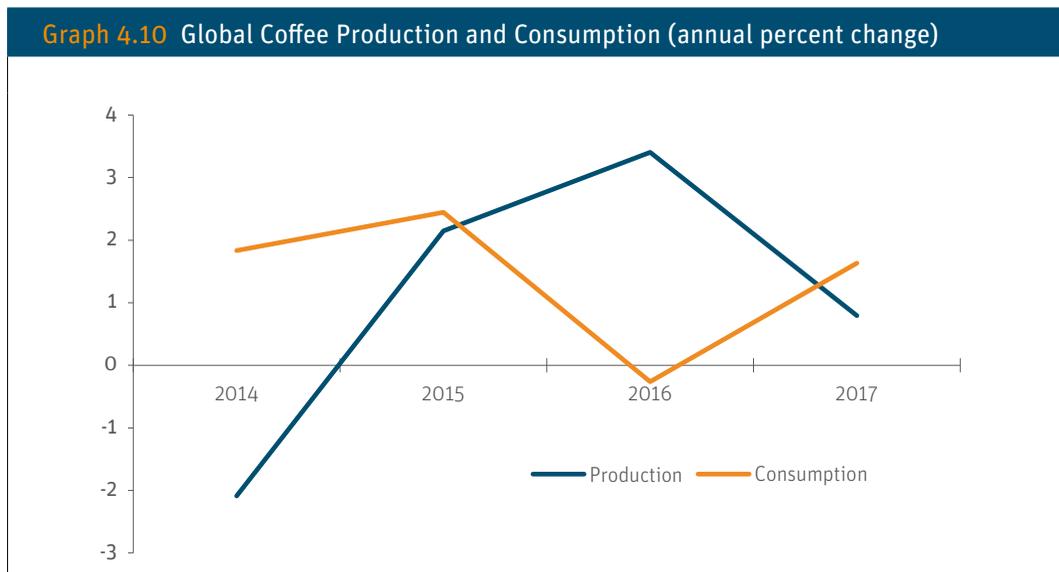
Source: IADB-CID with data from the International Coffee Organization

The international price, however, appears to lag behind production and consumption, which could be related to coffee stocks and distribution, especially for exports. After a major jump in production in 2016, for example – which was also accompanied by falling consumption – the price dropped steeply in 2017 and only started to recover at the beginning of 2018. The International Coffee Organization (ICO) estimates that coffee consumption grew faster than global production in 2017, so the potential lag effect may imply a higher price in 2018.

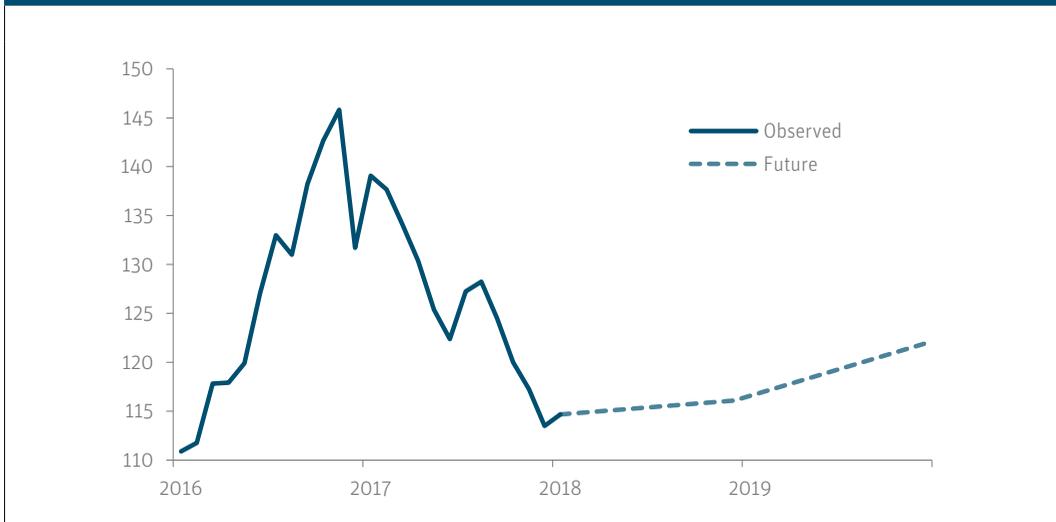
As of January 2018, the futures markets predict the international coffee price to rise by 2.3% in 2018 and 5.0% in 2019. The increased consumption and potential price rise, together with the expanding market share trend, constitute a favorable factor for the region’s economic outlook.



Source: IADB-CID compilation with data from the International Coffee Organization

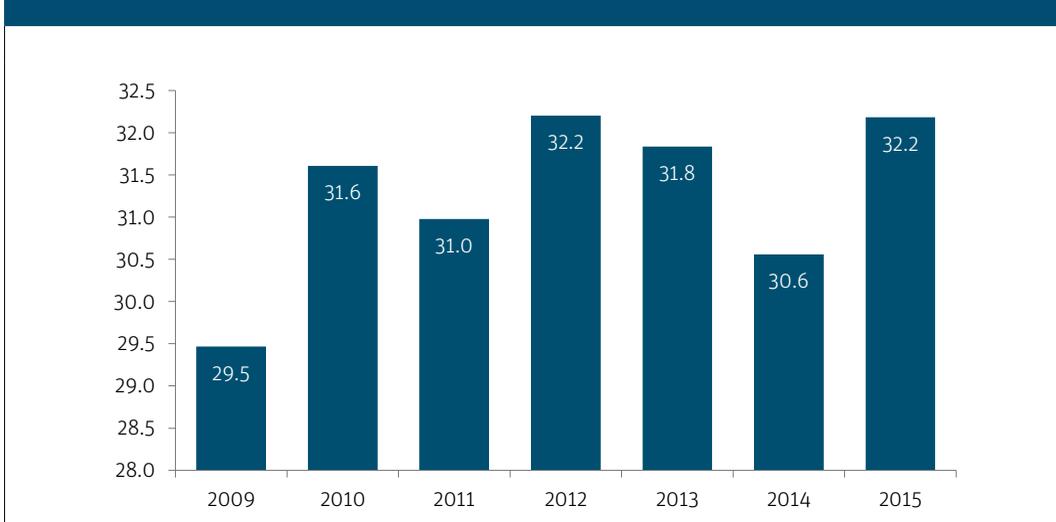


Source: IADB-CID compilation with data from the International Coffee Organization

**Graph 4.11** Coffee Price (cents/pound)

Source: IADB-CID with data from the International Coffee Organization (ICO) and Bloomberg Futures. The price refers to the ICO composite indicator.

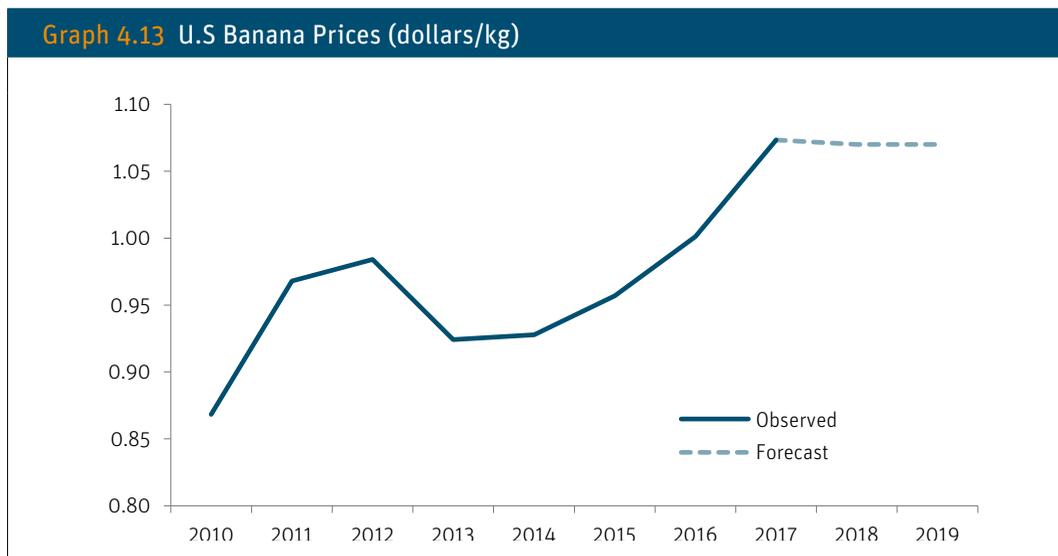
CADR is a major player in the global banana market, contributing on average 31.6% of the world's exports from 2003 to 2015. In recent years it has increased its market share from 29.5% in 2009 to 32.2% in 2015.<sup>37</sup>

**Graph 4.12** CADR Share of World Banana Exports (percentage of total)

Source: IADB-CID with data from the International Coffee Organization (ICO) and Bloomberg Futures. The price refers to the ICO composite indicator.

<sup>37</sup> Latest available data.

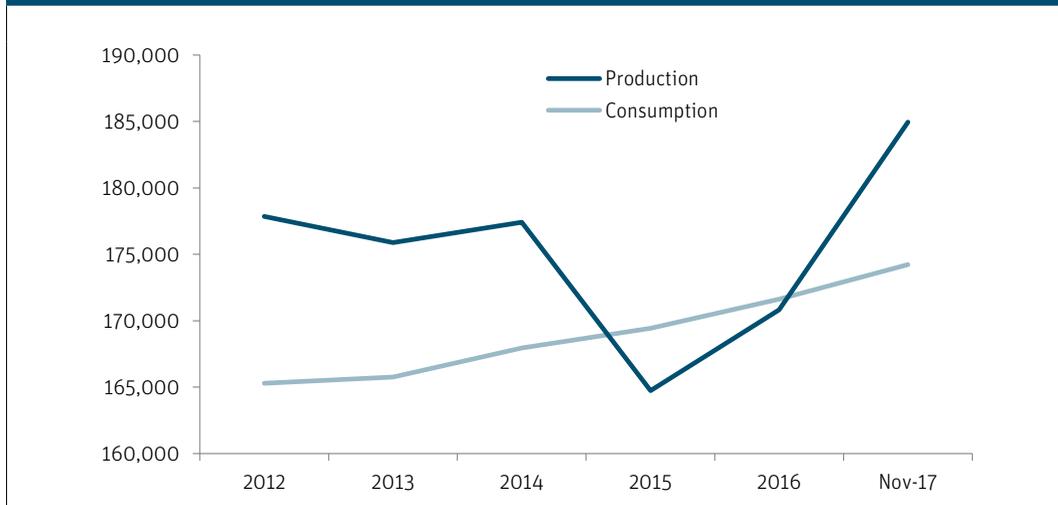
Moreover, in 2017 a recovery was recorded for the international market price of bananas, thanks in part to the demand in the U.S. and Europe and limited production in Asia and Africa due to climate change and a failure to eradicate infestations such as the fusarium wilt.<sup>38</sup> No substantial changes are expected in 2018 in U.S. and European demand, given their economic and consumption forecasts, so the predicted price changes will most likely be influenced by supply factors.



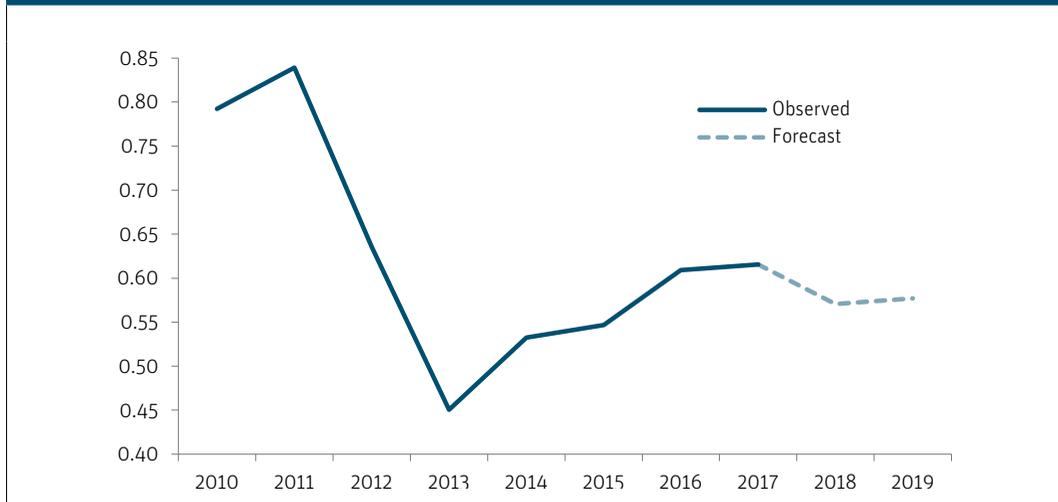
Source: IADB-CID with World Bank data

Finally, in the sugar market the growth of global consumption has been sluggish with an average annual growth of 1.1% over the last five years, a result of health concerns and sugar substitution by other products (e.g. stevia, dextrose, honey, etc.). Consumption in the European Union, for example, has stagnated in the last three years. In the medium term these factors could mean a lower international price, depending primarily on supply factors. Rising consumption would come from population growth and emerging countries, primarily. In the last five years, Central American exports have accounted for about 6% of total world sugar exports. The result of global production rising faster than consumption appears to be an 8.5% fall in the price of sugar from the first to the second half of 2017. In the futures markets the price is expected to continue to fall by 7.0% from 2017 to 2018.

<sup>38</sup> For more detail, see Banana Market Review 2015-2016, Food and Agriculture Organization of the United Nations, 2017.

**Graph 4.14** World Sugar Consumption and Production (1,000 metric tons)

Source: IADB-CID with data from the Foreign Agricultural Service of the U.S. Department of Agriculture

**Graph 4.15** U.S. Sugar Prices (dollars/kg)

Source: IADB-CID with data from the International Sugar Organization and Bloomberg Futures.

This analysis focuses on the shifting conditions of international prices of key commodities for the region. Worthy of note, however, is that according to the FAO the long-term trend in the U.S. is an upswing in raw and prepared food prices driven by the increased demand resulting from economic growth.<sup>39</sup> In these estimates, the projected price increase results from a higher growth of demand over supply.

<sup>39</sup> Commodities and Development Report 2017. Food and Agriculture Organization of the United Nations.

In order to quantify the potential impacts on the 2018 GDP from both potentially stronger U.S. growth and the abovementioned international market price fluctuations, we applied the different econometric models described in the annexes to this chapter.

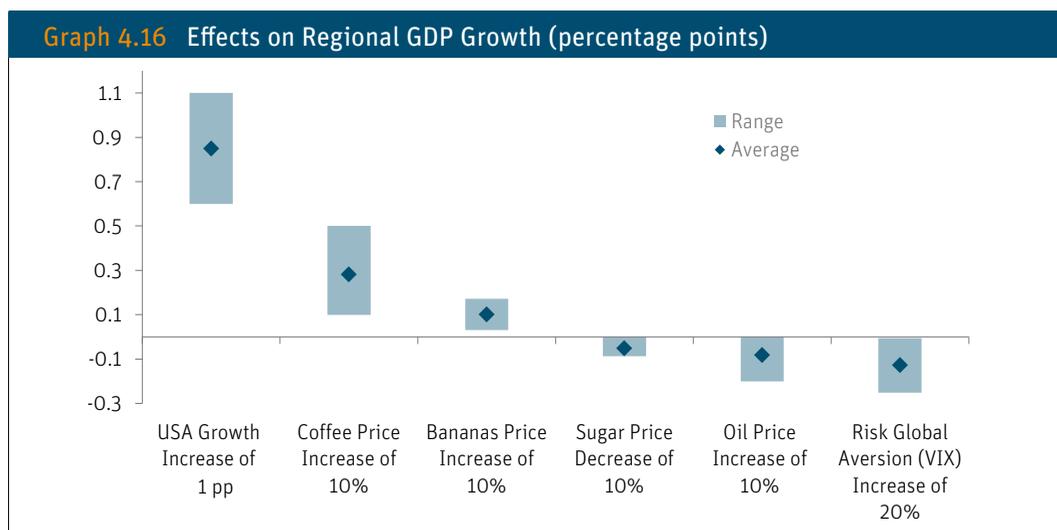
We also need to consider that other sources of uncertainty contributing to higher global risk aversion. This aversion spills over to emerging countries, which are associated with higher risk. We therefore quantified the effect of higher global risk aversion on the region's growth.

Specifically, we estimated that one additional percentage point of U.S. growth could contribute around 0.9 percentage points to CADR growth.

With regard to the price of commodities, a 10% increase in the international coffee price could lead to a 0.3 percentage point increase in the region's GDP growth rate. An equally high increase in the international banana price would generate an increase of around 0.1 percentage points. In contrast, a 10% increase in the international oil price would drive GDP growth down by 0.1 to 0.2 percentage points. As of January 2018, the price per barrel of WTI oil used in the futures market is 6.7% higher in 2018 as compared to 2017.

The excess supply of sugar on the market is expected to drive the international price down in 2018; a 10% cut in the sugar price would imply a regional GDP loss of close to 0.1 percentage points. The following graph summarizes these estimates and their intervals.

Finally, global risk aversion as measured by the VIX global volatility index is at its lowest point since 1990, the first year for which price data is available.<sup>40</sup> A 20% increase from this level would have a limited effect, estimated at around -0.13 percentage points, on the region's growth rate.



Source: Author's compilation

<sup>40</sup> The VIX is a volatility index of S&P500 options prices.

To sum up, the expectations of external demand and the different key international commodity markets for the region, along with the estimates in this chapter, suggest a turn for the better in the region's GDP growth in 2018. More specifically, this upside potential in the outlook can be attributed to U.S. economic growth and improving markets for coffee and bananas – the two goods with the most weight in the region's exports.

This growth outlook, however, also presents important risks even if the U.S. economy may grow more in 2018 than expected at mid-2017, we cannot ignore the possibility of any of its other policies affecting the region. Rojas-Romagosa and Guevara (to be published), for example, estimate a more restrictive U.S. trade policy could cut the region's GDP by 5.8% in 10 years. Additionally, according to Hinojosa (2017) a hardening of the U.S. migration policy could shave 0.6% off the GDP of Northern Triangle countries.

### Annex 4.1: Estimation using BSVAR (Bayesian structural vector autoregression) with Exogenous Blocks

Estimation with a structured VAR model, used to explain the impact different variables – such as U.S. GDF, international commodity prices, global risk, etc. – could have on Central America, is a special case developed by Zha (1999) in which additional restrictions are imposed on the estimate.<sup>41</sup> By means of these restrictions the exogenous block variables are not affected by the endogenous block variables contemporaneously (in time  $t$ ) or in the lags ( $t-1$ , for example). That is, a zero value is imposed on the coefficients of the exogenous block variables (both contemporaneously and in the lags) in equations where the dependent variable is included in the exogenous block when making the estimate.

In this case, the endogenous block is comprised by the CADR GDP, the nominal exchange rate, accumulated government spending, and the international coffee price, while the exogenous block is comprised by the U.S. GDP, the VIX, and the international oil Brent price. Estimates were also made including the price of bananas and sugar. Restrictions were also imposed on the contemporaneous (time  $t$ ) coefficients in a staged manner (upper triangle) as is typical in a structured VAR (SVAR) estimation, in the following order: nominal exchange rate, coffee price, accumulated government spending, and CADR GDP. The following order was used for the exogenous cluster: Brent price, U.S. GDP, and VIX. Estimates were also made changing the order of the variables, with emphasis on endogenous variables, and no substantial changes were seen in the results. The data that was used was expressed in annual percent change with the exception of the VIX, given its extreme heterogeneity with respect to the other series, and the sample period runs from the first quarter of 2004 to the third quarter of 2015.<sup>42</sup>

This being a Bayesian estimate, percentiles are usually reported at 90% of the estimated values (equivalent to the intervals of confidence in classical econometrics). However, in order to make the estimators more homogenous with respect to those obtained by other estimation methods (linear regression or panel), we used the values of the estimators found in the joint distribution mode calculated from the maximum likelihood method.

Using a model fit criterion that compares second moments (variances and correlations) of the observations (simulations) generated by the estimated model and the sample moments obtained from the data, we found that the two-lag selection in the SVAR estimation best describes the data dynamics.

<sup>41</sup> The countries considered include: Costa Rica, Guatemala, Honduras, Nicaragua, Panama, the Dominican Republic and El Salvador.

<sup>42</sup> To obtain data for the Central American region we took the average percent change of the nominal exchange rate. We translated accumulated government spending and GDP into the same currency (dollars) using the exchange rate for each period and added them up for the seven countries, after which we took the percent change.

Intervals of the effects were calculated with the mode of the parameters estimated with bands at 70% of the subsequent distribution.<sup>43</sup>

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<sup>43</sup> The percentiles were obtained with 120,000 simulations of the Bayesian SVAR estimation, discarding the first 20,000.

## Annex 4.2: Panel Estimation

Complementarily, we made panel estimations for the CADR economies' GDP growth determinants. The GDP explanatory variables of each country are the same as previously indicated: nominal exchange rate, international coffee, banana, and sugar price, accumulated government spending, U.S. GDP, international oil Brent price, and VIX. The data that was used was expressed in annual percent changes. The panel is not balanced, since the sample periods vary among the countries depending on data availability, and most of them start from 1991 (2004, in one case). The estimations included estimations by ordinary least squares (OLS), feasible generalized least squares (FGLS) to correct for slight autocorrelation, and 2SLS with instrumental variables using the same variables' lag as instruments for a dynamic panel estimation that included the lagged country GDP growth variable as an explanatory variable. The model fit was good, generally speaking, as the R2 statistics of the estimations were between 0.7 and 0.8.



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