

# FISCAL ADJUSTMENT IN LATIN AMERICA AND THE CARIBBEAN: SHORT-RUN PAIN, LONG-RUN GAIN?

Semiannual Report  
Office of the Regional Chief Economist  
April 2018



**THE WORLD BANK**  
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Latin America & the Caribbean

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Short-Run Pain, Long-Run Gain?**

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ISBN (electronic): 978-1-4648-1290-3

DOI: 10.1596/ 978-1-4648-1290-3

Cover design: Javier Daza.

## *Acknowledgements*

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This report was prepared by a core team composed of Carlos A. Végh (Regional Chief Economist), Guillermo Vuletin (Senior Economist), Daniel Riera-Crichton (Economist), Diego Friedheim and Luis Morano (Research Analysts), and José Andrée Camarena (Consultant). The authors gratefully acknowledge the comments and support provided by numerous colleagues that greatly improved this report. A team of country economists working under the supervision of Pablo Saavedra (Practice Manager for Macroeconomics, Trade and Investment), particularly Cristina Savescu, offered invaluable support. Elena Ianchovichina, Samuel Pienknagura, Joana Silva, María Ignacia Cuevas, Luciana Galeano, Diego Rojas, and Lucila Venturi kindly provided very insightful comments and suggestions. Alejandra Viveros (Manager, External Communications) and Candyce Rocha (Senior Communications Officer) provided constant feedback that made this report more accessible to non-economists. Finally, this report would not have come to fruition without the unfailing administrative support of Ruth Eunice Flores and Jacqueline Larrabure.

**April 2018**



## *Executive Summary*

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*After a growth slowdown that lasted six years, including a contraction of 1 percent of real GDP in 2016, the Latin America and the Caribbean (LAC) region has finally turned the corner and resumed an increasing growth path. Specifically, LAC is estimated to have grown by 1.1 percent in 2017 and expected to grow by 1.8 percent in 2018 and 2.3 percent in 2019. Excluding Venezuela, these figures become 1.9 percent in 2017, 2.6 percent in 2018, and 2.8 percent in 2019. Since South America accounts for 71 percent of the region's real GDP, the growth recovery has been mainly linked to the resumption of growth in the two largest South American economies, Brazil and Argentina. After a two-year contraction (with real GDP falling by 3.8 percent in 2015 and 3.5 percent in 2016), Brazil is estimated to have grown by 1.0 percent in 2017, a modest rate but hopefully the beginning of a long-lasting recovery (Brazil is expected to grow by 2.4 percent in 2018 and 2.5 percent in 2019). In turn, after contracting by 1.8 percent in 2016, Argentina's economy is estimated to have grown by 2.9 percent in 2017 and is expected to keep growing at roughly the same pace in 2018 and 2019.*

*Unfortunately, Venezuela's economy continues to implode, with real GDP estimated to have fallen by 14.5 percent in 2017 and expected to fall by another 14.3 percent in 2018. The cumulative loss of output of more than 40 percent in the last 3 years has led to an economic, social, and humanitarian crisis. Mexico is estimated to have grown by 2.0 percent (down from 2.9 percent in 2016) but is expected to increase its growth rate to 2.3 and 2.5 percent in 2018 and 2019, respectively. Central America is estimated to have continued to grow at a healthy pace of 3.9 percent in 2017. In contrast, growth in the Caribbean is estimated to have fallen to 2.7 percent in 2017, down from 3.0 percent in 2016, reflecting in great part the devastating effects of hurricanes Irma and Maria.*

*The external environment continues to provide a gentle push to the region's growth. South America, in particular, has benefited from a recovery in commodity prices, led by a doubling in the price of oil from a low of 30.8 dollars per barrel in January 2016 to 65.4 dollars in February 2018. More generally, growth in the United States and China is expected to remain relatively strong (with forecasts of 2.3 and 6.5 percent, respectively, for 2018), which should help the whole region. Net capital inflows into the region ended up at an estimated 47.5 billion dollars by the end of 2017, up from net capital outflows of 31.6 billion dollars in November 2015, reflecting a growing appetite for the region's public and private debt. Finally, while the long-awaited monetary policy normalization in the United States is firming up, emerging markets can take solace in its very gradual nature. In fact, several LAC countries (most notably Brazil) have found room to lower policy interest rates in an effort to stimulate economic activity.*

*Given the benign external environment, the fragile fiscal situation of most LAC countries continues to be the main macroeconomic concern. Indeed, 31 out of the 32 LAC countries ran an overall fiscal deficit in 2017 and public debt for the whole region stands at 57.6 percent of GDP, with five countries (Jamaica, Barbados, Venezuela, Belize, and Antigua and Barbuda) having debt-to-GDP ratios above 80 percent. Not surprisingly, since January 2017 four countries were downgraded by Fitch (Chile, Costa Rica, Suriname, and Brazil) and Venezuela was declared in default. While gradual fiscal adjustment has started in several countries, as reflected in positive primary surpluses, there is little*

doubt that it will be necessary to (i) increase the pace of fiscal adjustment, (ii) carry out further structural reforms (particularly regarding pensions), and (iii) strengthen/ implement fiscal rules as needed. Fiscal adjustments would also help in building some fiscal space during relatively good times, which would enable countercyclical fiscal policies when bad times come along, and freeing resources to deal with potential risks stemming from natural disasters, ranging from hurricanes to earthquakes.

In the long run, lower fiscal deficits – and hence lower public debt burdens – would help consolidate the impressive gains achieved by the region in terms of lowering inflation, reducing poverty and inequality, and increasing long-run growth. But how much fiscal adjustment is needed? As argued in Chapter 1, this is a rather difficult question to address since the standard answer, which relies on computing the primary surplus that would stabilize public debt as a proportion of GDP, ignores the crucial issue of the reduction in the level of public debt that may be needed, along with other fiscal reforms, to achieve an investment grade. To get a sense of the orders of magnitude that may be involved, and based on a simple estimate of the relationship between the debt-to-GDP ratio and Fitch credit ratings, we estimate the path of the primary fiscal balance that would be needed by LAC countries without an investment grade to achieve investment grade over a 10-year period. On average (and excluding Venezuela), such countries would need to increase their primary fiscal balance (as a percentage of GDP) by 4.5 percentage points in the first year, then run a primary surplus of 3.2 percent of GDP in the following nine years, and of 1.3 percent of GDP from then onwards. While simply suggestive, this exercise conveys the message that the needed fiscal adjustments are far from trivial.

Conventional wisdom has it that fiscal adjustments should lead to long-run gains at the expense of short-run costs. Whether long-run gains will be there, however, is really an empirical matter since, theoretically, a fiscal adjustment effected through, say, an increase in income taxes or a cut in public investment should reduce long-run growth. The possibility of short-run costs has been ingrained in the mind of any undergraduate economics student in the form of the famous Phillips curve (the inverse relationship between the unemployment level and the inflation rate). But, again, this idea may not hold for LAC countries, as evidenced by the numerous exchange-rate-based stabilizations in the 1980s and 1990s which, by unleashing supply-side effects, led to a substantial short-run increase in output. So how much truth is there in the conventional wisdom when it comes to the LAC region? Chapter 2, the core of our report, takes a detailed look at the short- and long-run effects of fiscal adjustments in the region and how they have evolved over time. The picture that emerges is a much more nuanced view of the effects of fiscal adjustments, particularly in the short run.

We start by quantifying the long-run effects of lowering fiscal deficits (based on a sample going back to as early as 1900) and find that, for the LAC region, a reduction of one percentage point in the primary fiscal deficit as a percentage of GDP has translated, on average, into a reduction of 2.2 percentage points in the inflation rate and an increase of 0.2 percentage points in the long-run growth rate of the economy. Hence, even though, as mentioned above, a fiscal adjustment could lead to long-run costs, the fact that most fiscal adjustments in LAC have involved a reduction in primary government spending (particularly in the 1980s) has turned out to be beneficial for the economy in the long run. An important caveat, however, is that cuts in public investment have become much more important components of fiscal adjustment packages in the recent past, which does not bode well for future growth in the region.

In terms of short-run costs, we draw several important conclusions from our empirical analysis. First, 85 percent of the 136 fiscal adjustment episodes that we identify in the region for the period 1960-2017 have involved only cuts in government spending, as opposed to 4 percent involving only tax hikes (the remaining 11 percent involved both). While this is, in principle, good public policy (especially if it is feasible to cut unproductive government spending), we show that the short-run costs of raising taxes (specifically, value-added taxes) are highly non-linear: costs are essentially zero for

*low initial levels of the tax rate (around 10-12 percent) and quite substantial for high initial levels (above 20 percent). Hence, low-taxation countries may actually find it in their best interest to raise taxes as part of a fiscal adjustment rather than cutting public investment or reducing social transfers (particularly to the most vulnerable). Second, the short-run output costs of reducing primary spending are also non-linear (i.e., marginal costs increase with the size of spending cuts), which makes a strong case for gradual versus shock fiscal adjustments. Finally, even when policymakers should be careful not to rely too heavily on cutting public investment, it should not be done at the cost of reducing social transfers which are found to have important costs on both output and poverty.*





## Chapter 1:

# Growth and Fiscal Challenges in the Region

### Introduction

After six years of growth deceleration (including essentially no growth in 2015 and a contraction of 1 percent of real GDP in 2016), the Latin America and the Caribbean (LAC) region is estimated to have grown by 1.1 percent in 2017 and expected to grow by 1.8 percent in 2018 and 2.3 percent in 2019 (Table 1.1 and Figure 1.1, Panel A).<sup>1</sup> While rather modest, the resumption of growth in 2017 is welcome news in a region that had essentially lost its main engine of growth (high commodity prices) since the end of the Golden Decade (2003-2012). Not surprisingly, growth during 2017 was considerably helped by a modest recovery in commodity prices, together with a strong demand in international financial markets for emerging markets' assets, and a rather slow process of monetary policy normalization in developed countries.

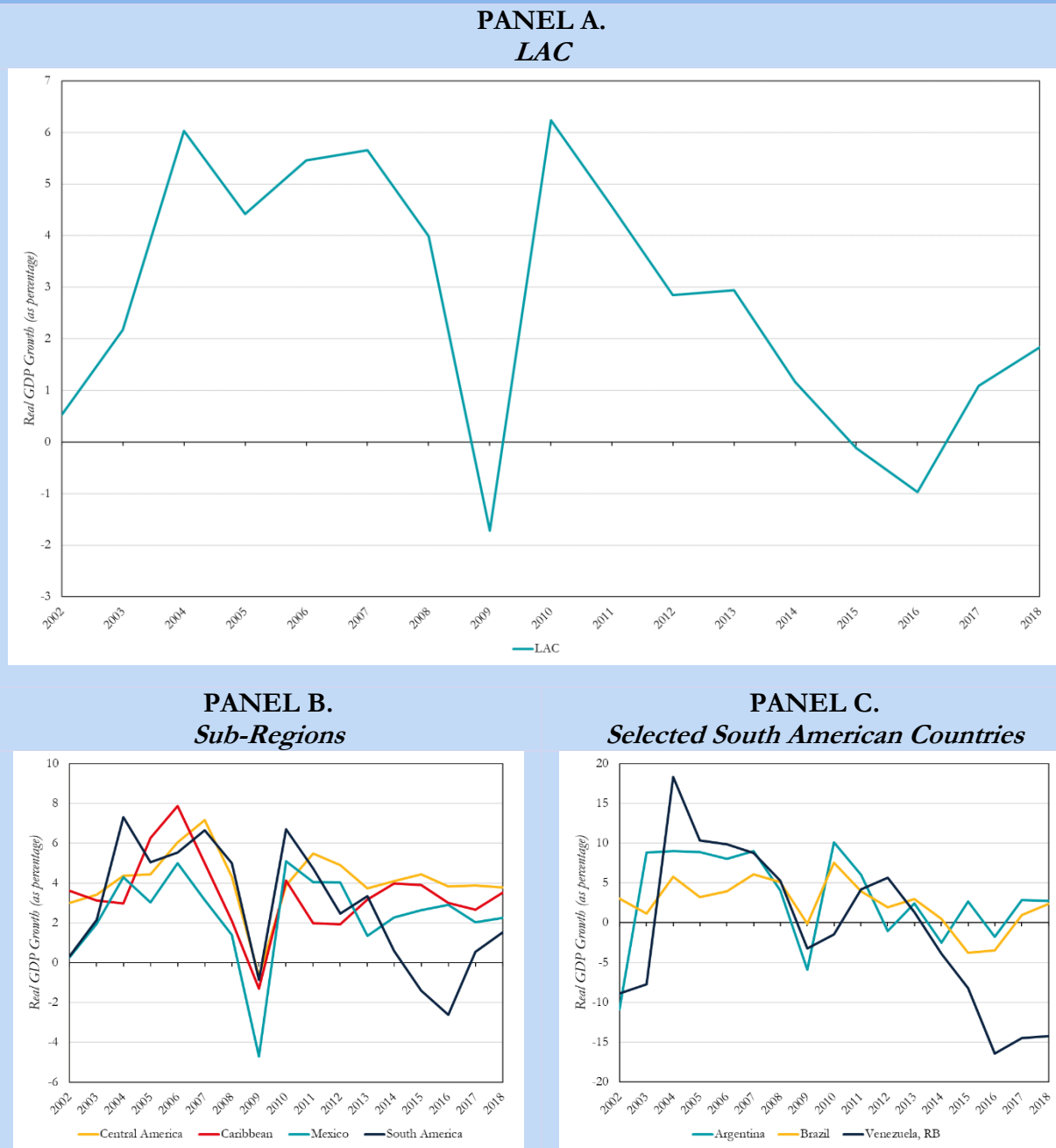
**TABLE 1.1. Recent and Forecasted Real GDP Growth in LAC**

Region	Annual Real GDP Growth Rates				
	2015	2016	2017e	2018f	2019f
<b>LAC</b>	<b>-0.1</b>	<b>-1.0</b>	1.1	1.8	2.3
Central America	4.4	3.8	3.9	3.8	3.8
Caribbean	3.9	3.0	2.7	3.5	3.4
Mexico	2.6	2.9	2.0	2.3	2.5
South America	<b>-1.4</b>	<b>-2.6</b>	0.6	1.5	2.1
Argentina	2.6	<b>-1.8</b>	2.9	2.7	2.8
Brazil	<b>-3.8</b>	<b>-3.5</b>	1.0	2.4	2.5
Colombia	3.1	2.0	1.8	2.7	3.3
Venezuela, RB	<b>-8.2</b>	<b>-16.5</b>	<b>-14.5</b>	<b>-14.3</b>	<b>-7.0</b>

Notes: Sub-regional values are weighted averages; "e" stands for estimated and "f" for forecasted. South America includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela, RB. Central America includes Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. Caribbean includes Antigua and Barbuda, The Bahamas, Barbados, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago. Sources: World Bank staff estimates (March 2018) when available, otherwise WEO (October 2017).

<sup>1</sup> Excluding Venezuela, LAC's real GDP fell by 0.2 percent in 2016, is estimated to have grown by 1.9 percent in 2017 and expected to grow by 2.6 and 2.8 percent, respectively, in 2018 and 2019.

**FIGURE 1.1. LAC: Real GDP Growth**



Notes: Sub-regional values are weighted averages. For countries included in each sub-region, see note to Table 1.1. Sources: World Bank staff estimates (March 2018) when available, otherwise WEO (October 2017).

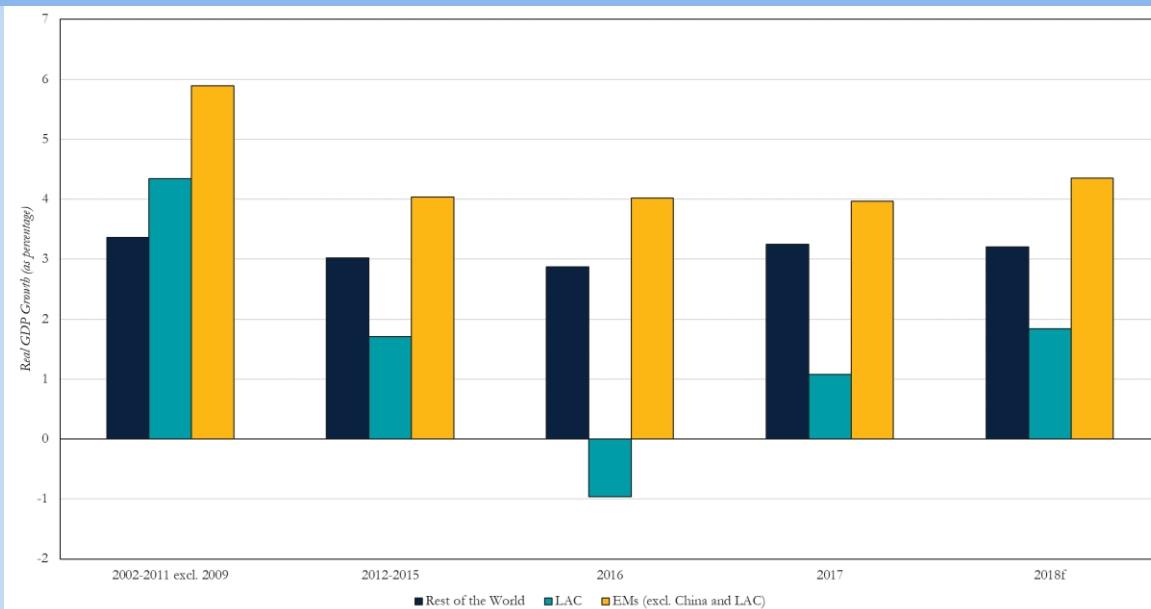
As has been the norm in the recent past, the average growth in the region masks a great degree of heterogeneity across both sub-regions and countries (Figure 1.1). Central America continues to grow at a strong pace of close to 4 percent (Table 1.1). Growth in the Caribbean suffered mainly due to a

series of devastating hurricanes (particularly Irma and María) in September 2017.<sup>2</sup> Mexico’s growth fell from 2.9 percent in 2016 to 2.0 percent in 2017, partly reflecting a tight monetary policy to ensure financial stability and the increasing uncertainty over NAFTA negotiations.

Overall, though, the regional performance follows mainly that of South America (SA), due to its weight within the region.<sup>3</sup> As indicated in Table 1.1, SA grew by 0.6 percent in 2017 after a two-year contraction (real GDP fell by 1.4 percent in 2015 and 2.6 percent in 2016). The recovery in SA was led by Argentina, which grew by 2.9 percent, and Brazil, which grew by 1.0 percent after contracting for two consecutive years. Venezuela is, quite unfortunately, in the midst of an economic, political, and humanitarian crisis, with real GDP falling by a staggering 16.5 and 14.5 percent in 2016 and 2017, respectively, with the forecast for 2018 equally gloomy.<sup>4</sup>

In relation to the rest of the world, the region continues to underperform. As illustrated in Figure 1.2, after the commodity boom ended, the region has grown less than both the rest of the world and non-LAC emerging markets (excluding China). In other words, the only time span during which the region performed better than the rest of the world was the commodity boom episode, as captured by the period 2002-2011 in Figure 1.2. The region’s underperformance simply reinforces the critical need to find new sources of growth, as will be emphasized below.

**FIGURE 1.2. Real GDP Growth: LAC, EMs (non-LAC excl. China) and Rest of the World**



Notes: Sub-regional values are weighted averages. Sources: World Bank staff estimates (March 2018) when available, otherwise WEO (October 2017).

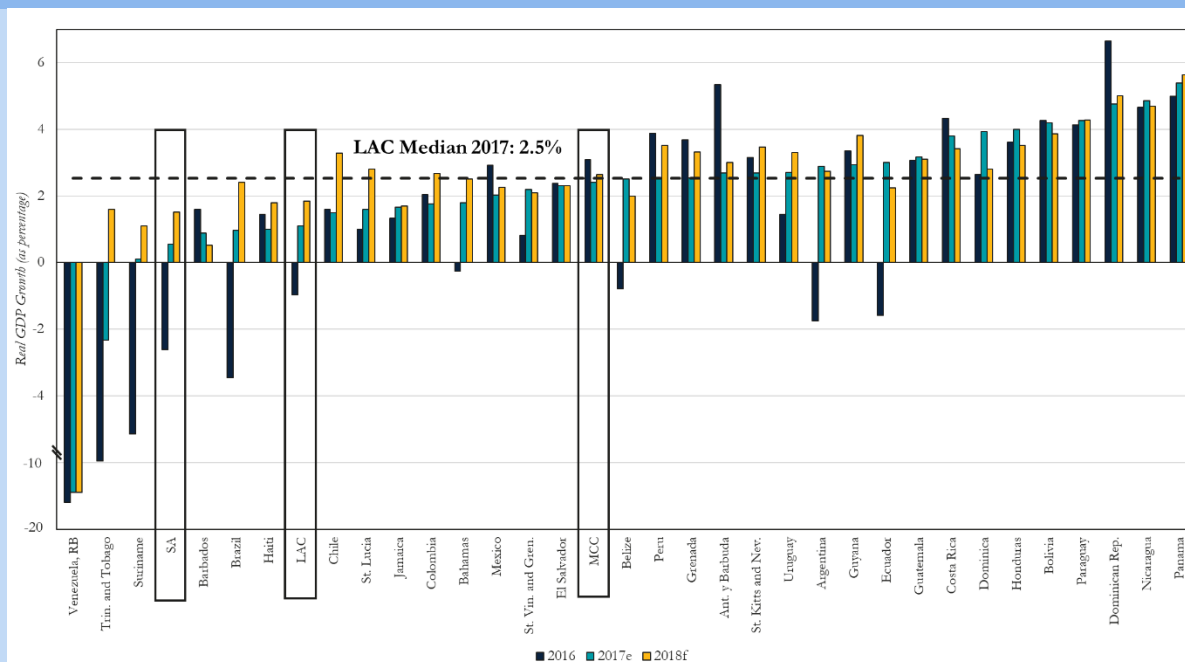
<sup>2</sup> The World Bank has estimated the loss for Dominica from Hurricane Maria at 1.37 billion dollars (2.5 times the 2016 dollar GDP) and for Antigua and Barbuda from Hurricane Irma at 221 million dollars (16 percent of 2016 dollar GDP). See Box 1 in our previous semiannual report (Végh *et al.*, 2017b) for details of these devastating natural disasters (including the earthquakes in Mexico, also in September 2017).

<sup>3</sup> South America accounts for 71 percent of the region’s real GDP.

<sup>4</sup> Excluding Venezuela, SA’s real GDP fell by 1.6 percent in 2016, is estimated to have grown by 1.6 percent in 2017 and expected to grow by 2.7 percent in both 2018 and 2019.

In terms of individual countries, Figure 1.3 shows the growth rate in 2016, 2017 (estimate), and 2018 (forecast) for each country in LAC. The three fastest growing economies in 2017 were from Central America and the Caribbean (Panama, Nicaragua, and the Dominican Republic, which grew by 5.4, 4.9, and 4.8 percent, respectively), followed by the two fastest growing economies in SA, Paraguay (4.3 percent) and Bolivia (4.2 percent). The median real GDP growth rate in 2017 for all countries in LAC was 2.5 percent.

**FIGURE 1.3. Real GDP Growth in LAC per Country, 2016-2018**

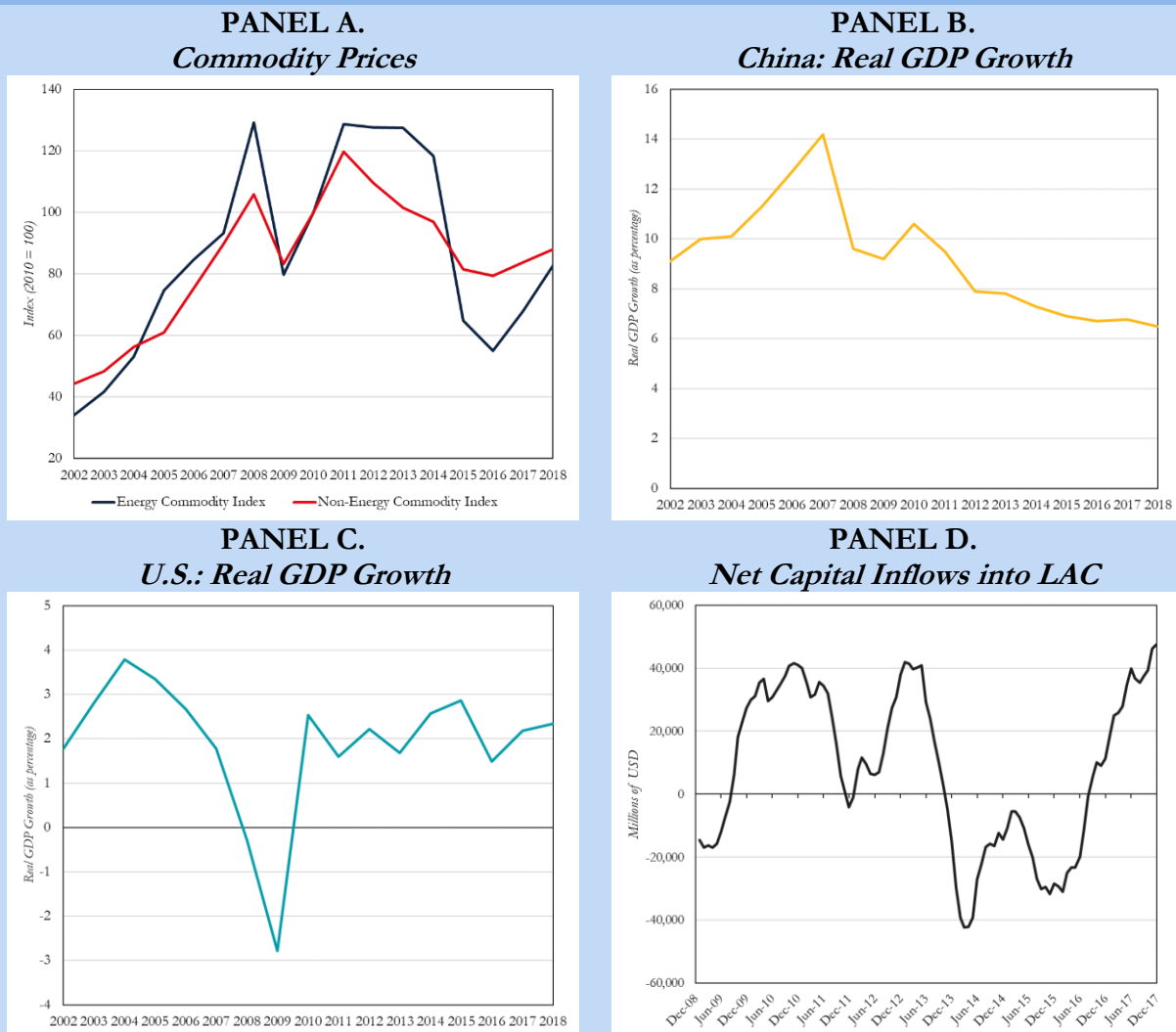


Notes: Sub-regional values are weighted averages. MCC stands for Mexico, Central America, and the Caribbean. Sources: World Bank staff estimates (March 2018) when available, otherwise WEO (October 2017).

## The Growth Pick-Up and the Role of External Factors

From the perspective of a small open economy, as those in LAC, external factors play a fundamental role in determining growth. In fact – and as already pointed out – this has been a critical determinant of the marked deceleration in growth experimented by SA since 2011.

Generally speaking, the price of commodities, growth in China and the U.S., and international liquidity – as captured by net capital inflows into LAC – are among the most important external factors. Figure 1.4 illustrates the time path of these four variables. Notice first the recent improvement in commodity prices, particularly related to energy. As showed in Figure 1.5, Panel A, this is especially true for oil prices, which roughly doubled from \$30.8 per barrel in January 2016 to \$65.4 in February 2018. The importance of oil as a source of exports cannot be overemphasized. Table 1.2 illustrates the fact that oil is the main commodity export of three major SA countries – Venezuela, Colombia, and Ecuador – accounting for 82.0, 35.5, and 31.8 percent of total exports, respectively.

**FIGURE 1.4. External Factors Affecting LAC Growth**


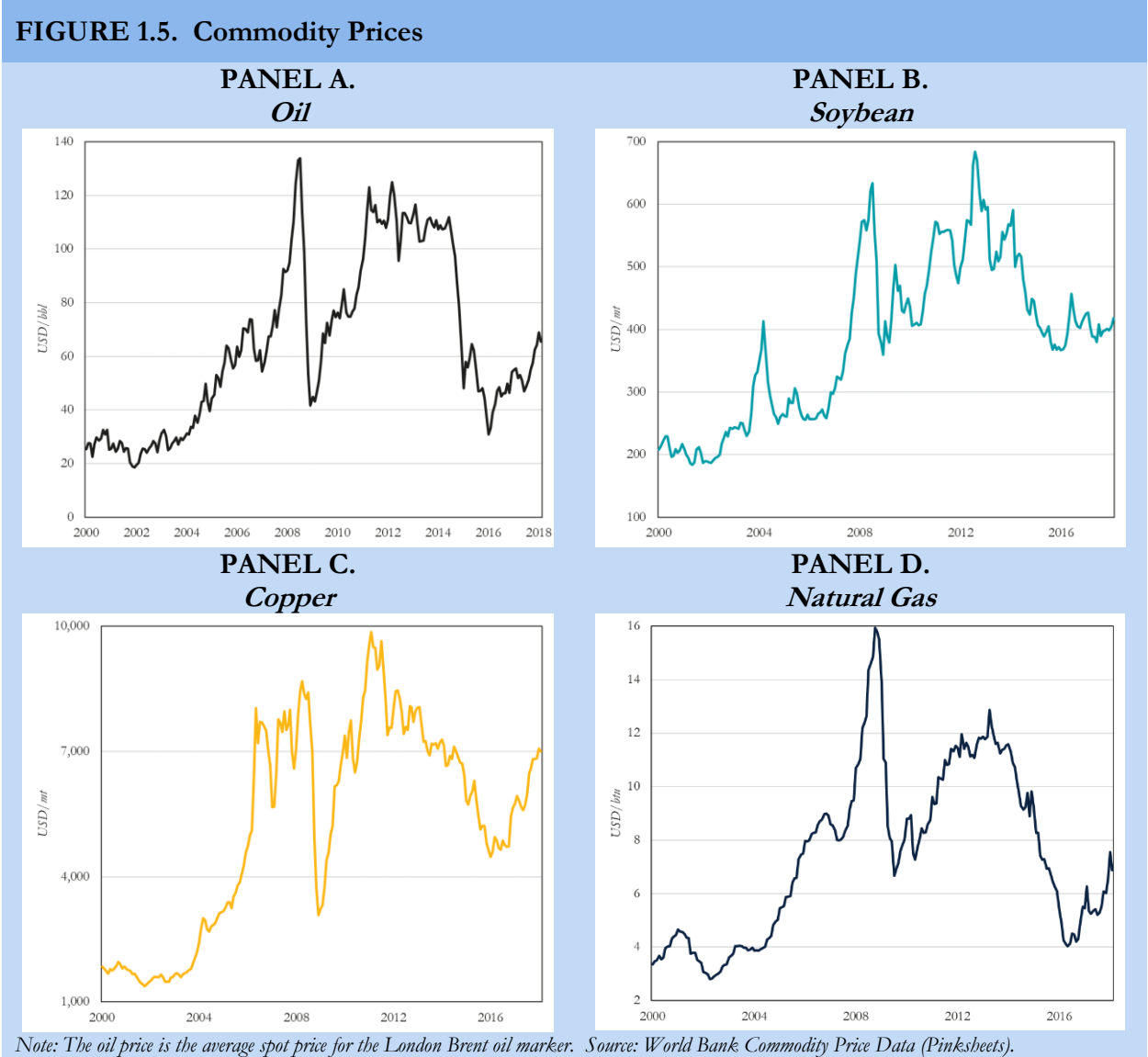
Note: When available, forecasts for 2018 were included. Sources: EPFR Global, Haver Analytics, and World Bank Commodity Price Data (Pinksheets).

In turn, the price of soybeans has stabilized around \$400 per metric ton (Figure 1.5, Panel B) which has greatly helped countries such as Argentina, Brazil, Paraguay, and Uruguay whose main commodity export is soybeans (Table 1.2). Copper prices (Figure 1.5, Panel C) have increased markedly since their low of \$4,471 per metric ton in January 2016 and reached \$7,006 in February 2018. In this case, the main beneficiaries have been Chile and Peru (Table 1.2). Finally, the recovery in natural gas prices (Figure 1.5, Panel D) has been particularly helpful for Bolivia. Growth in China and the United States is expected to remain strong, benefiting the whole region, but particularly SA in the case of China and Mexico, Central America, and the Caribbean (MCC) in the case of the United States.<sup>5</sup>

<sup>5</sup> According to Arreola-Rosales *et al.* (2017), China has become the main commercial partner of Argentina, Brazil, Chile, Peru, and Uruguay.

Finally, from a net *outflow* of 31.6 billion dollars in November 2015, net capital inflows into LAC reached an estimated 47.5 billion dollars in December 2017, reflecting a strong appetite for the region’s debt.

As we have done before in these semiannual reports – and to shed light on the quantitative importance of external factors in the growth performance in SA – we use an econometric model that estimates the effects of four external variables on the growth rate of SA.<sup>6</sup> The explanatory variables are the growth rate of the G-7 and China, an index of commodity prices, and the real yield on the United States 10-year Treasury note as a proxy for the global cost of capital.



<sup>6</sup> See De La Torre *et al.* (2013) for details of the model.

**TABLE 1.2. Main Commodity Exports for Selected LAC Countries**

Country	Main Commodity Export	Percentage of Total Exports
Argentina	Soybean (and derivatives)	29.3
Bolivia	Natural gas	28.2
Brazil	Soybean (and derivatives)	12.8
Chile	Copper ore (and refinements)	43.2
Colombia	Oil (and refinements)	35.5
Ecuador	Oil (and refinements)	31.8
Mexico	Oil (and refinements)	4.5
Paraguay	Soybean (and derivatives)	37.2
Peru	Copper ore (and refinements)	27.5
Uruguay	Soybean (and derivatives)	16.3
Venezuela, RB	Oil (and refinements)	82.0

Source: *Atlas of Economic Complexity 2016* (Harvard University).

Figure 1.6 illustrates the results of the model. The blue line is the actual growth rate of SA while the red line is the growth rate predicted by the model based on the four external factors just mentioned. Therefore, the difference between both lines (i.e., actual minus predicted) can be interpreted as the influence of domestic factors. Hence, when this difference is positive (negative), domestic factors have contributed to (detracted from) growth.

Three important points follow from Figure 1.6. First, the sharp growth deceleration suffered by SA during 2011-2016 was mainly due to external factors. This can be clearly inferred from the fact that the red line falls steadily from 2010 to 2016. Second, during the period 2015-2016, various domestic factors negatively affected growth in the region (i.e., actual growth was less than predicted by external factors). Given its size, the major recession suffered by Brazil in 2015 and 2016, partly as a result of political upheaval, major corruption scandals, and a paucity of reforms, explains a great part of this gap. In turn, the recovery in Brazil, as well as in Argentina, explains the closing of the gap between actual and predicted values during 2017. Third, as of 2017.Q4, the gap stands at 1.1 percentage points, with actual growth of 2.6 percent compared to predicted growth of 1.5 percent. This small gap suggests that external factors are basically explaining all of the current growth in SA. This, in turn, clearly indicates that for the region to grow faster – which it desperately needs to do – it must find its own domestic sources of growth: structural reforms (including pensions, education, and labor



markets), a big push in public infrastructure investment, further trade and financial integration within and outside the region, increased competition within the region (airlines, land transportation), improvements in governance, and a tough anti-corruption stance. Unless such reforms are carried out – or deepened as needed – it will be difficult for SA to generate more of its own growth.

**FIGURE 1.6. Role of External Factors in South America’s Growth**



## *Fiscal Situation in LAC*

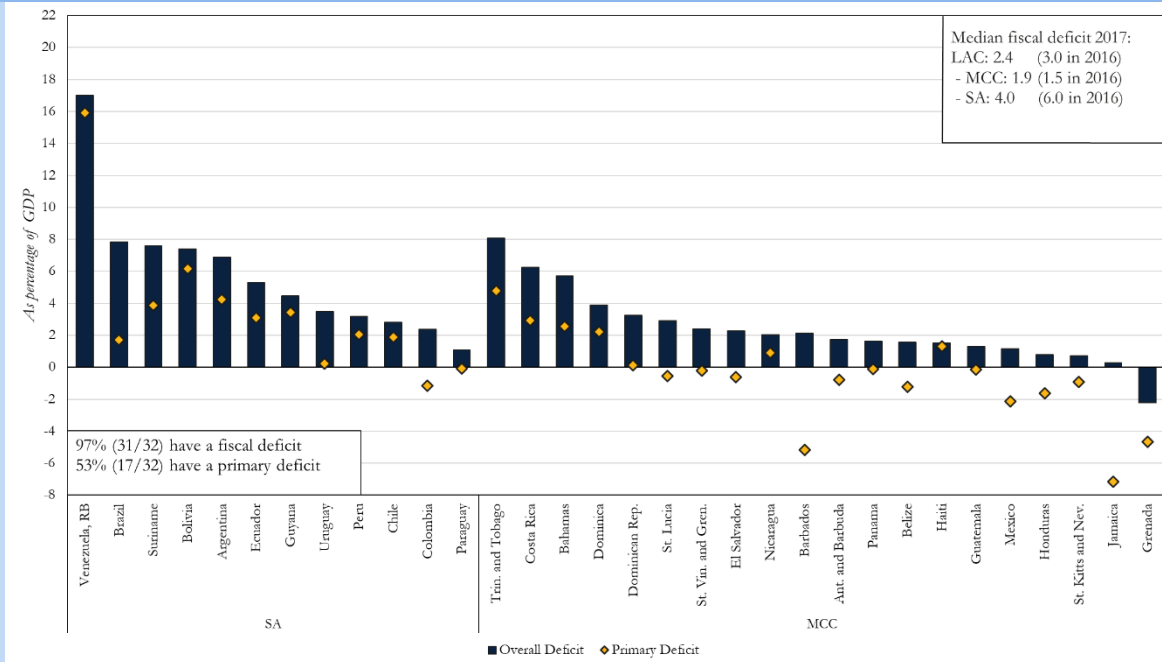
As emphasized in the two previous semiannual reports (Végh *et al.*, 2017a,b) the region’s fiscal situation continues to be quite fragile, with 31 out of 32 countries having had an overall fiscal deficit in 2017 (Figure 1.7). The median fiscal deficit for the region is 2.4 percent of GDP, with that of SA (4.0 percent) more than twice as much as that of MCC (1.9 percent).<sup>7</sup> As in previous occasions, if there is a silver lining, it is the fact that many MCC countries actually show a primary surplus, a rare fact among SA countries. Several factors have contributed to the fiscal deterioration in SA. First, most SA governments failed to save enough during the Golden Decade of 2003-2012, when commodity prices were extremely high, and instead spent most of the windfall.<sup>8</sup> While some of the spending was undoubtedly important to improve social conditions and meet other public needs, a cardinal principle of public finance is that permanent expenditures should only be financed out of permanent increases in revenues. Increasing permanent spending out of mostly temporary increases in revenues will surely sow the seeds of future fiscal problems. Second, slowdowns typically reduce revenues endogenously

<sup>7</sup> Unfortunately, the recent string of natural disasters in Mexico and the Caribbean will impose an additional fiscal burden.

<sup>8</sup> For a detailed analysis of the procyclicality of fiscal policy in LAC, see Végh *et al.* (2017a).

due to the fall in the tax base, which normally has a high elasticity with respect to GDP in the region (in general higher than one, as shown in Sancak *et al.*, 2010).

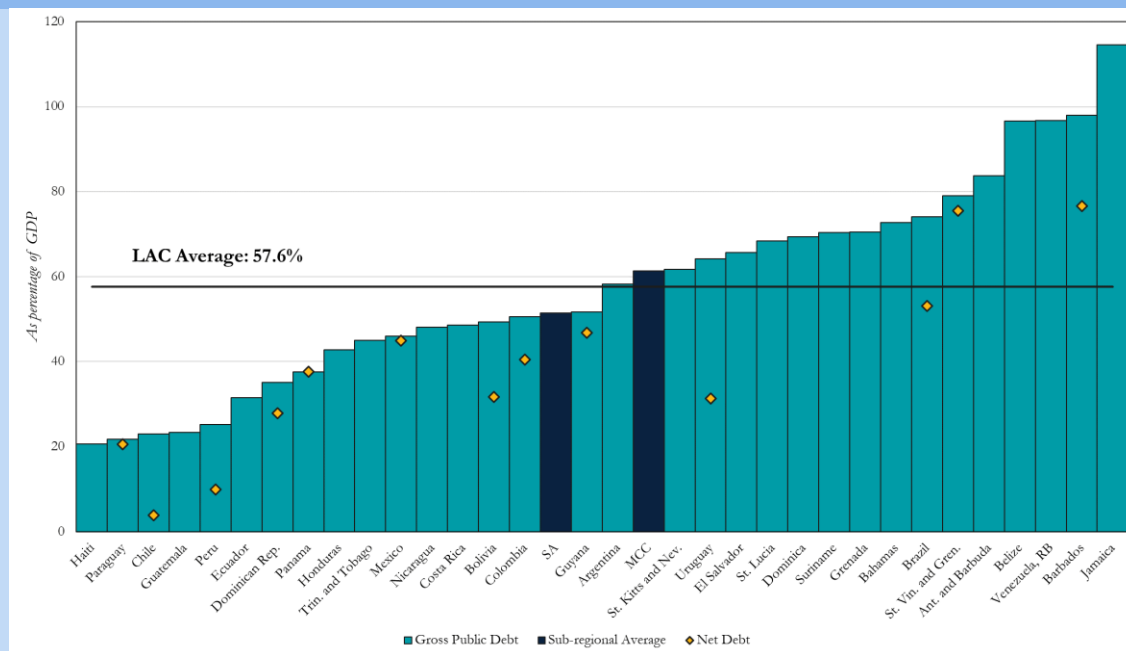
**FIGURE 1.7. Fiscal Deficits in LAC, 2017**



Sources: World Bank staff estimates (March 2018) when available, otherwise WEO (October 2017).

The pervasive fiscal deficits continue to feed into the countries' debt (Figure 1.8), which now stands at 57.6 percent of GDP, with five countries having debt-to-GDP ratios above 80 percent.

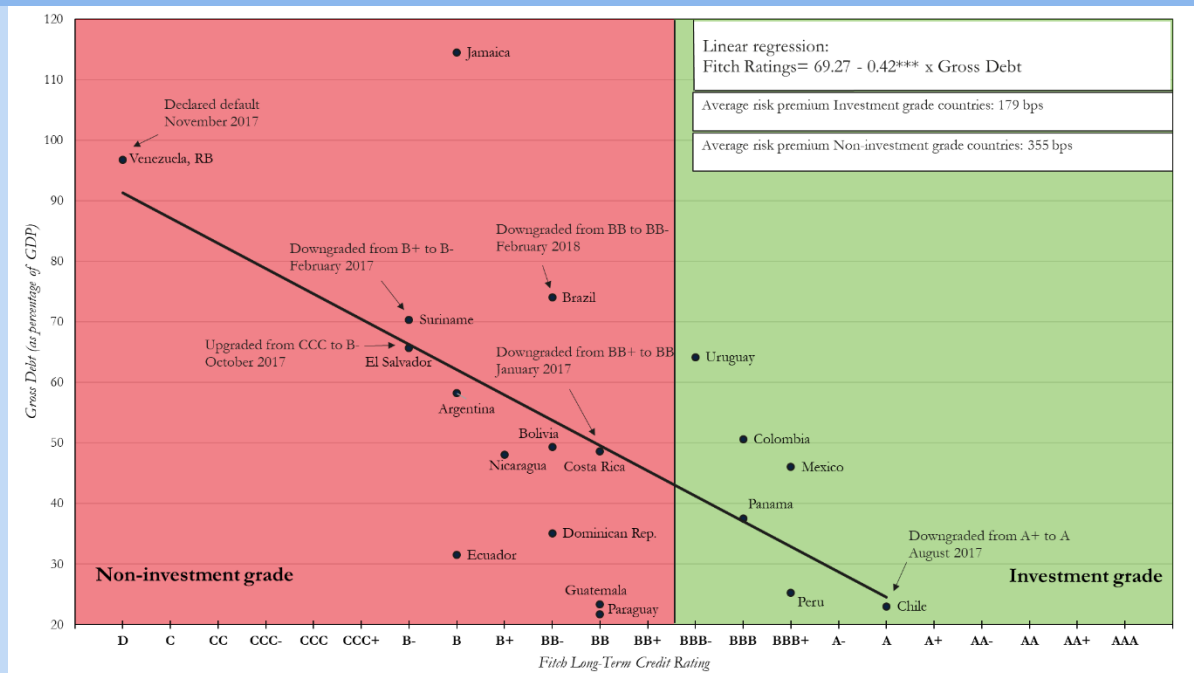
**FIGURE 1.8. Gross and Net Debt in LAC, 2017**



Sources: World Bank staff estimates (March 2018) when available, otherwise WEO (October 2017).

Higher debt negatively affects credit ratings. Indeed, Figure 1.9 shows a highly significant (at the one percent level) and negative relationship between the level of the debt-to-GDP ratio and credit ratings: the higher the debt ratio, the lower the credit rating.

**FIGURE 1.9. Debt and Credit Ratings in LAC, 2017**



Sources: World Bank staff estimates (March 2018) and Fitch Ratings.

Lower credit ratings make it costlier to access international credit markets.<sup>9</sup> Indeed – and as illustrated in Figure 1.9 – in great part because of the deteriorating fiscal situation, four countries in the region have seen their Fitch credit rating downgraded since January 2017: Costa Rica (January 2017), Suriname (February 2017), Chile (August 2017), and Brazil (February 2018).<sup>10</sup> In fact, during this period, El Salvador was the only country in the region that saw its credit rating increased from CCC to B-. Not surprisingly, fiscal authorities in investment grade countries such as Colombia and Uruguay repeatedly issue public warnings about the risk of losing the precious investment grade status if the fiscal deficits are not reduced.

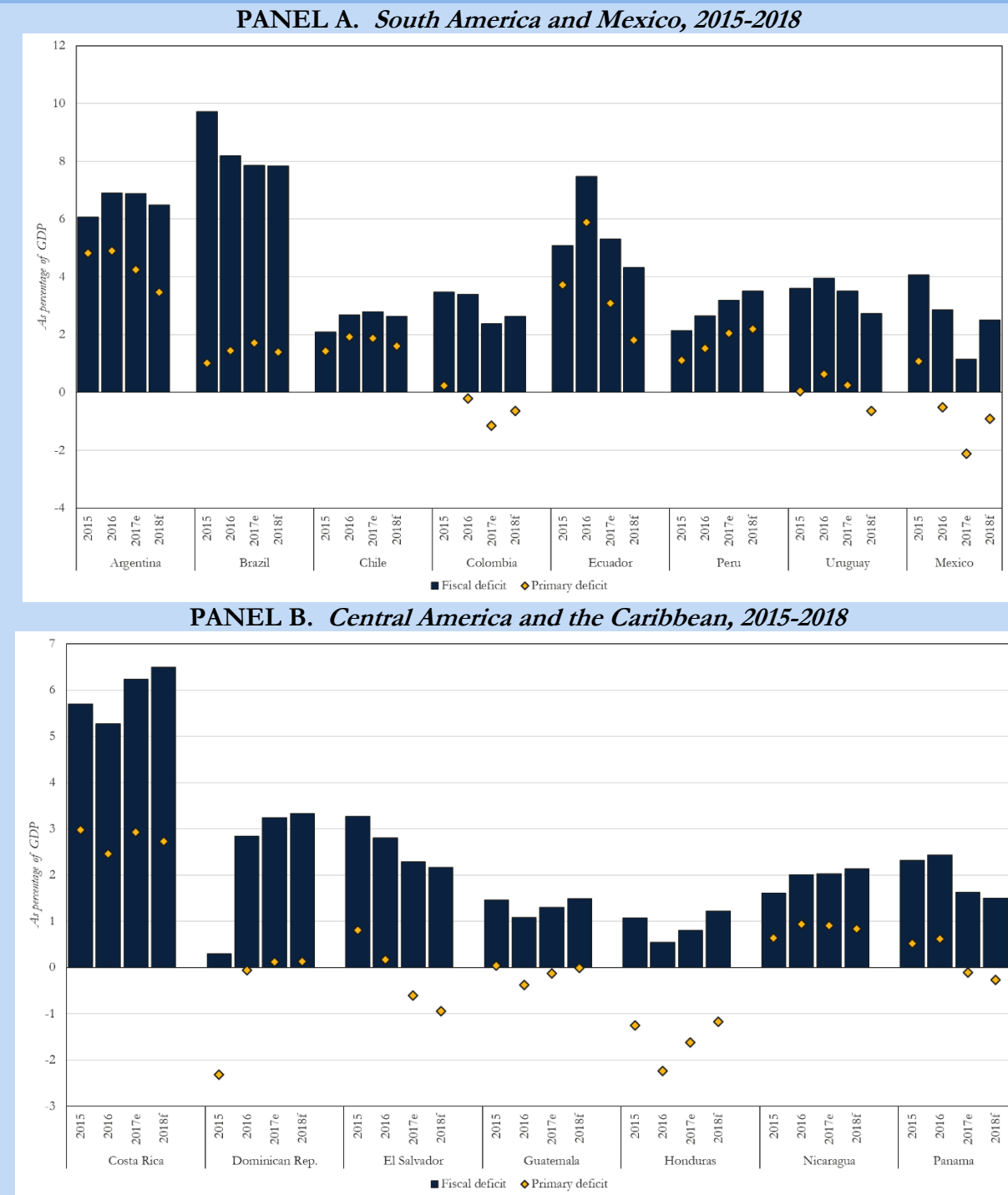
Given the weak fiscal situation throughout LAC, there is little doubt that countries should be engaged in fiscal adjustments already. Figure 1.10, Panel A, however, shows that fiscal adjustment is generally proceeding rather slowly in several SA countries and Mexico. Even though a gradual adjustment path is not necessarily a bad strategy given the still weak recovery and lower costs associated with gradual as opposed to shock adjustments (as analyzed in Chapter 2), it seems inevitable that many countries will have to increase the pace of fiscal adjustment in the near future. In Central America and the

<sup>9</sup> Excluding Venezuela (currently in default), the average risk-premium paid in 2017 by non-investment grade LAC countries was twice as much as that paid by investment grade LAC countries (355 compared to 179 basis points).

<sup>10</sup> Venezuela was declared in default in November 2017.

Caribbean (Figure 1.10, Panel B), countries like El Salvador and Panama also appear to be gradually reducing their overall fiscal deficits, with several countries showing primary surpluses.

**FIGURE 1.10. Fiscal Deficits in Selected LAC Countries**



Source: World Bank staff estimates (March 2018).

## *How Much Should Countries Adjust?*

Undoubtedly, high debt levels and persistent fiscal deficits are signaling serious fiscal problems, but surely the most important question for policymakers is: by how much do countries need to adjust? While the question is clear, the answer is not easy to pin down.

The most common fiscal adjustment figure reported in a myriad of reports and academic studies is the constant level of the primary surplus needed to keep the current debt-to-GDP level constant, which we will refer to as the debt-stabilizing primary balance (DSPB). The value of the DSPB (denoted by  $\bar{x}$ ) is given by<sup>11</sup>

$$\bar{x} = \bar{b} \left( \frac{r-g}{1+g} \right), \quad (1)$$

where  $r$  is a measure of the effective real interest rate,  $g$  is an estimate of long-run growth, and  $\bar{b}$  is the constant level of the debt-to-GDP ratio.<sup>12</sup>

To fix ideas, consider the example of Brazil, which has a debt level,  $\bar{b}$ , of 74.0 percent of GDP at the end of 2017, an effective real interest rate,  $r$ , of 8.3 percent (calculated as the interest rate bill over the debt stock), and an average growth rate,  $g$ , for the period 2008-2017 of 1.6 percent. Equation (1) then yields a DSPB ( $\bar{x}$ ) of 4.9 percent of GDP. Put differently, if Brazil ran a primary surplus of 4.9 percent from 2018 onwards, its debt-to-GDP ratio would remain constant forever at 74.0 percent.

A critical issue to note, however, is that the value of the DSPB does not take into account the current primary balance being run by the country in question (that is, the primary balance run in 2017 in our case). In our example, Brazil's primary fiscal balance was -1.7 percent of GDP in 2017 (denoted by  $\bar{x}_{t-1}$ ). As shown in Appendix A, the increase in the primary balance in 2018 relative to 2017 needed to keep a constant debt level of 74.0 percent of GDP from the end of 2017 onwards is then equal to

$$\Delta \bar{x}_t = \bar{x} - \bar{x}_{t-1},$$

which equals 6.6 percent of GDP [= 4.9 - (-1.7)] for Brazil. This is the value reported in Figure 1.11.

Figure 1.11 thus reports the increase in primary surplus for selected LAC countries (that is, the difference between the primary balance in 2018 and 2017) required to keep the end-of-2017 debt-to-GDP ratio constant.<sup>13</sup> We can see that of the five countries with the largest required adjustment, four belong to SA (Venezuela, Brazil, Suriname, and Argentina). Notice also that, as illustrated for Brazil in Figure 1.12, Panel A, the main adjustment (i.e., an increase of 6.6 percentage points in the primary balance as a percentage of GDP) is required at time  $t$  (2018 in our example) to reach a primary balance of 4.9 percent of GDP starting from a primary deficit of 1.7 percent. From then onwards ( $t + 1$ ,  $t + 2$ , ...), the country would be required to run the DSPB (4.9 percent of GDP).

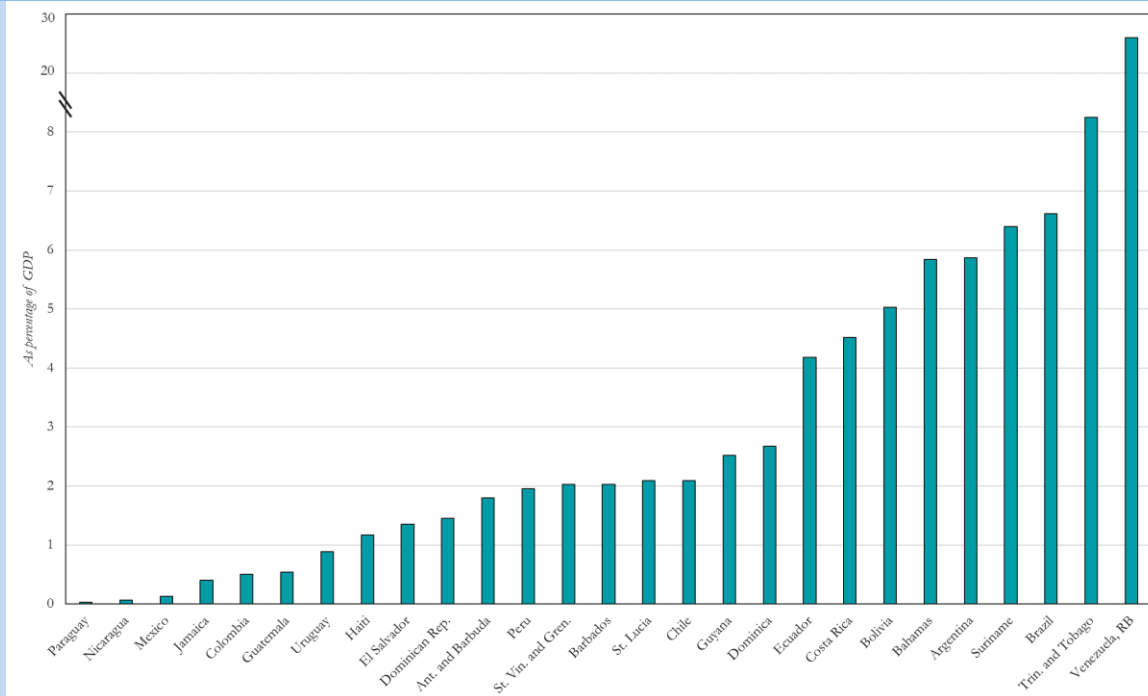
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<sup>11</sup> See Appendix A for the derivation of equation (1) and details on the estimates of  $r$  and  $g$ .

<sup>12</sup> Overbars are used to denote variables as a proportion of GDP.

<sup>13</sup> We omit countries for which  $r < g$  and hence, as shown in Appendix A, the DSPB is not well defined.

**FIGURE 1.11. Increase in Primary Surplus Needed to Keep Debt-to-GDP Ratio Constant**



Note: See Appendix A for details. Sources: Authors' calculations based on data from World Bank staff estimates (March 2018) and WEO (October 2017).

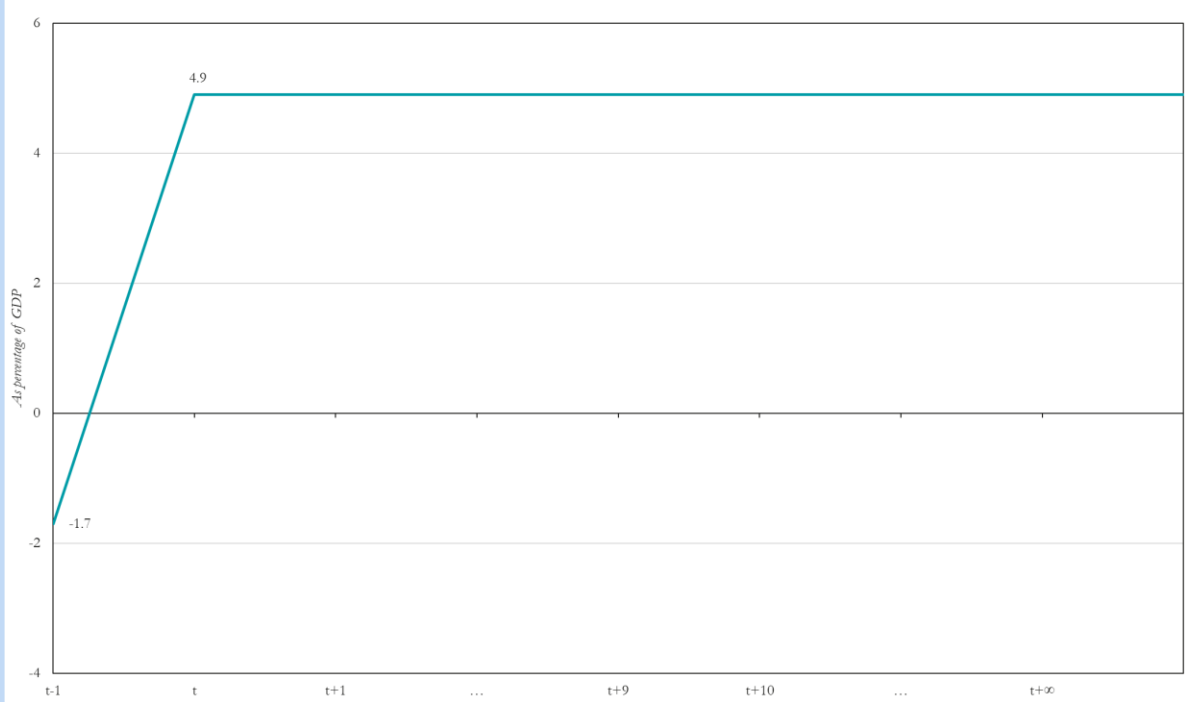
Another shortcoming of the DSPB is that it assumes that the country does not need to reduce its current debt level. This may lead to a situation in which two countries have the same DSPB but very different debt levels. As an example, consider country A with  $r = 0.08$ ,  $g = 0.03$  and a debt-to-GDP ratio of 30 percent and country B with  $r = 0.055$ ,  $g = 0.03$  and a debt-to-GDP ratio of 60 percent. While both countries would have a DSPB of 1.5 percent of GDP, country B's debt-to-GDP ratio is twice as high as that of country A and, in practice, its debt may easily become unsustainable.

To overcome this shortcoming, Figure 1.13 shows the change in the primary balance that LAC countries would need to carry out in the first year (2018 in our case) to achieve a target debt level consistent with investment grade (corresponding to BBB- in Figure 1.9) over 10 years.<sup>14</sup> To continue with the above example, Brazil would need to reach a debt-to-GDP ratio of 61.5 percent to achieve investment grade in 10 years (based on our estimates), down from 74.0 percent in 2017. Using equation A.10 in Appendix A, we infer that Brazil would first require an increase in the primary balance (as a percentage of GDP) of 7.5 percentage points in 2018 (i.e., from a primary deficit of 1.7 percent of GDP to a surplus of 5.8 percent of GDP) and then a primary balance of 5.8 percent of GDP from 2019 to 2028 to reduce the debt to the desired level (61.5 percent of GDP). From then on, it would just need to run a DSPB consistent with keeping the debt as a percentage of GDP constant, which requires a primary surplus of 4.1 percent of GDP. Figure 1.12, Panel B, illustrates this estimated time path of primary balances for the case of Brazil.

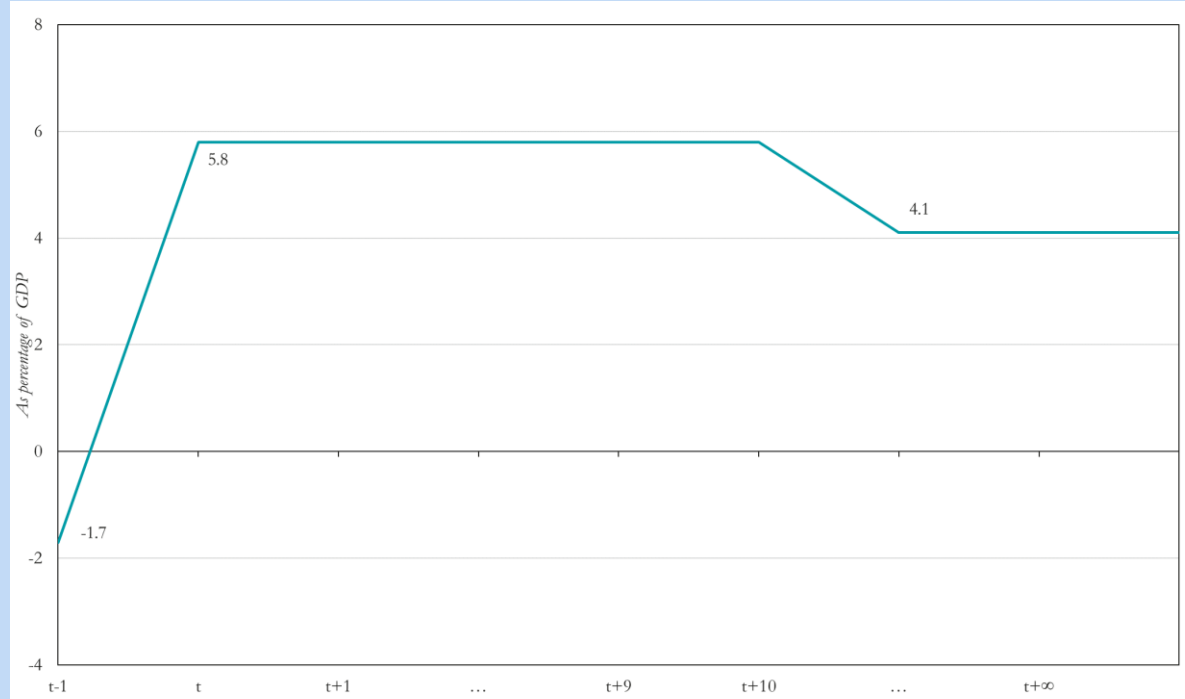
<sup>14</sup> See Appendix A for the determination of the target debt level that would achieve investment grade.

**FIGURE 1.12. Brazil's Primary Balance Path for Different Scenarios**

**PANEL A. DSPB Scenario**

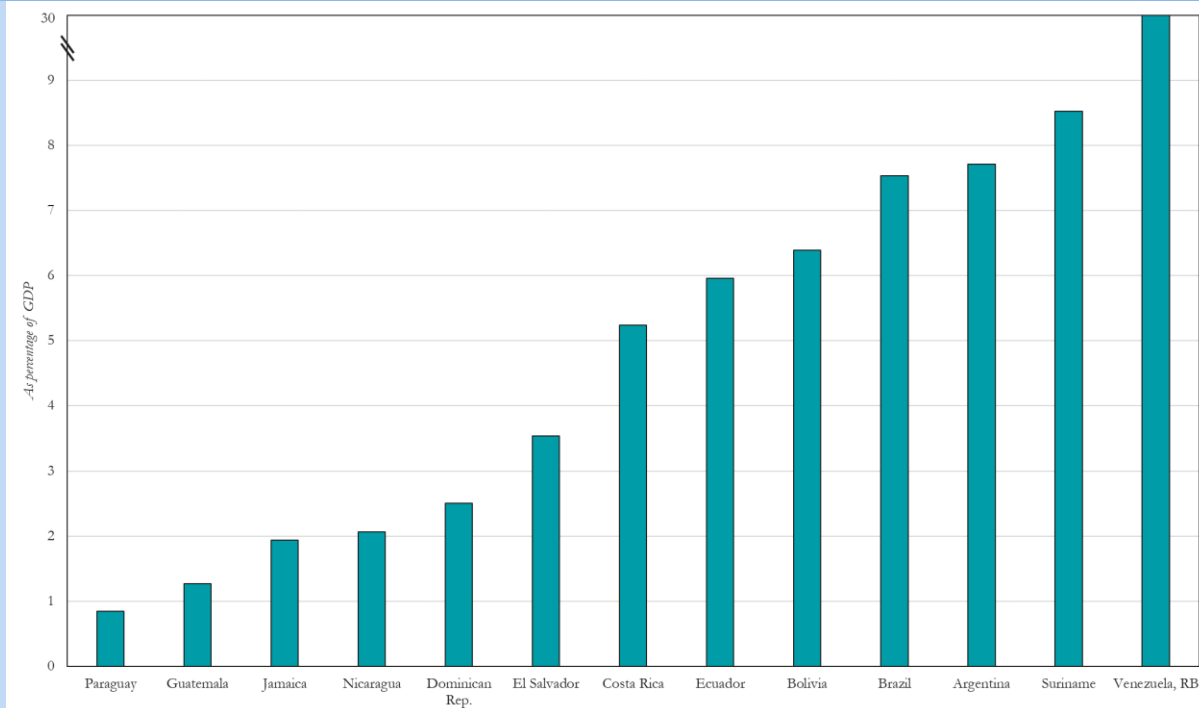


**PANEL B. Investment Grade Scenario**



Notes: The target debt levels implied in this exercise are the predicted values consistent with Figure 1.9. See Appendix A for details. Sources: Authors' calculations based on data from Fitch Ratings, World Bank staff estimates (March 2018), and WEO (October 2017).

**FIGURE 1.13. Increase in Primary Surplus Needed to Achieve a Constant Debt Level Consistent with Investment Grade in 10 Years**



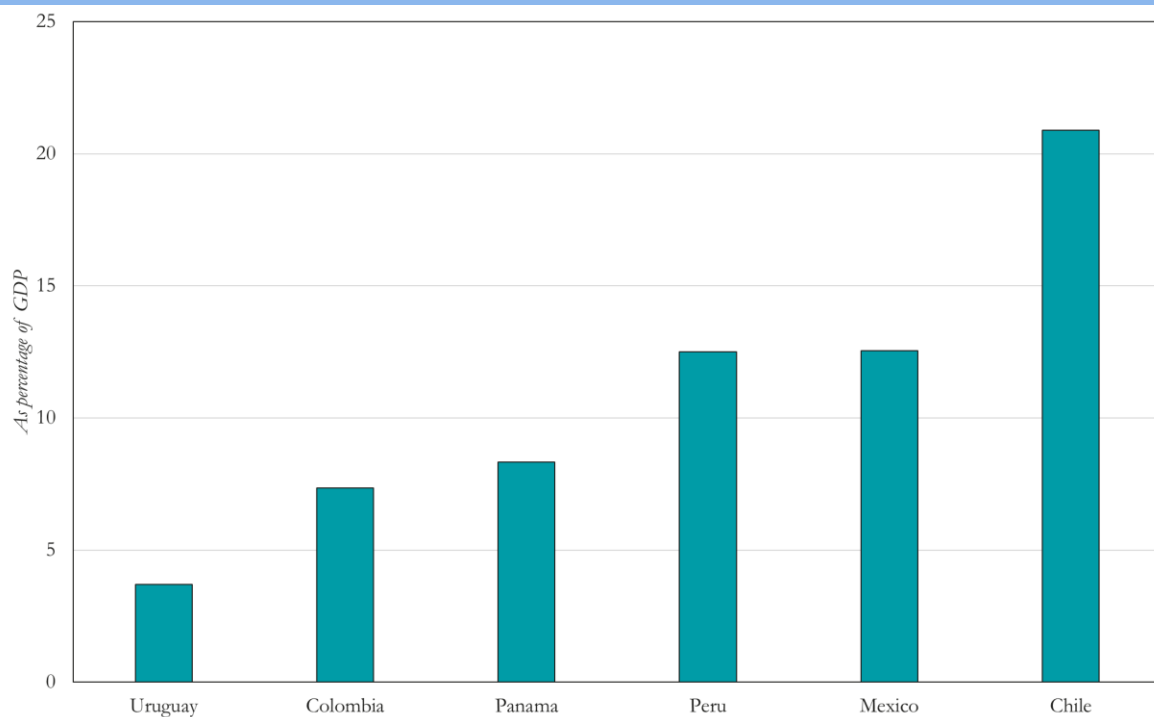
*Notes: The target debt levels implied in this exercise are the predicted values consistent with Figure 1.9. See Appendix A for details. Sources: Authors' calculations based on data from Fitch Ratings, World Bank staff estimates (March 2018), and WEO (October 2017).*

Finally, we turn to those countries in LAC that have achieved an investment grade and ask the question: how much fiscal space do they have? In other words, how much would their debt-to-GDP ratio need to increase for them to lose their investment grade?<sup>15</sup> Using such a metric, we see in Figure 1.14 that Chile is the country with the most fiscal space and Uruguay the one with the least.

<sup>15</sup> We assume that the debt level that would lead to a loss of investment grade is that corresponding to BB+ on the regression line in Figure 1.9.



**FIGURE 1.14. Increase in the Debt Stock that Would Lead to a Loss of Investment Grade**



*Notes: The target debt levels implied in this exercise are the predicted values consistent with Figure 1.9. See Appendix A for details. Sources: Authors' calculations based on data from Fitch Ratings, World Bank staff estimates (March 2018), and WEO (October 2017).*

## ***Costs and Benefits of Fiscal Adjustments***

The above discussion takes essentially as given the idea that countries with high debt and/or fiscal deficits need to adjust. While some rationale was given in terms of (i) the level of the debt-to-GDP ratio (i.e., the higher the ratio, the lower the credit rating, and hence the costlier the access to international credit), and (ii) debt sustainability (ever increasing debt levels are ruled out), the discussion has certainly not delved deep into the costs and benefits of fiscal adjustments. This will be precisely the focus of Chapter 2, which constitutes the core of our report.

Broadly speaking, the long-run gains of fiscal adjustment that are typically emphasized are lower inflation and higher growth. Lower fiscal deficits will, in the long run, reduce inflation by reducing the need for inflationary financing.<sup>16</sup> Figure 1.15 offers a first illustration of the benefits of reducing the fiscal deficit in terms of lower inflation by plotting average inflation and average overall fiscal balance (taking in both cases 5-year averages to smooth out the business cycle and focusing on the long run).<sup>17</sup> We can see a highly significant and negative relationship: the higher the overall fiscal

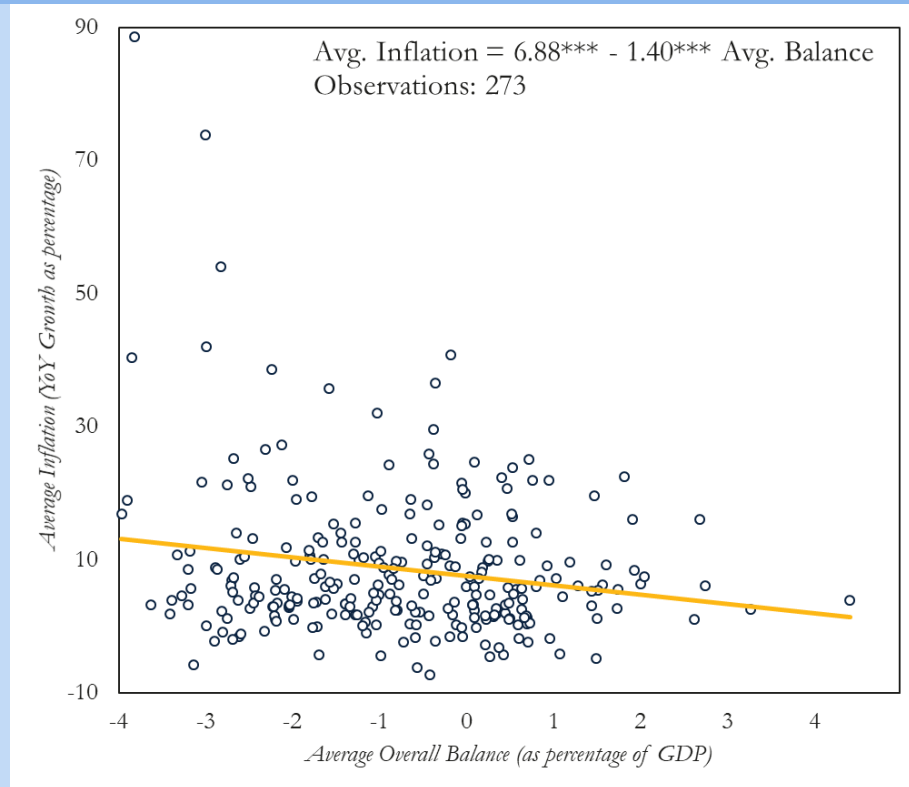
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<sup>16</sup> Naturally, in the short and medium run, fiscal deficits can be financed by issuing debt but, in the long run, only the inflation tax can finance a permanent fiscal deficit.

<sup>17</sup> For details on Figures 1.15 and 1.16, see Appendix B.

balance, the lower the average inflation rate. Specifically, a reduction in the average overall fiscal deficit of 1 percent of GDP is associated with a fall in average inflation of 1.4 percentage points.

**FIGURE 1.15. Average Inflation versus Average Overall Fiscal Balance**



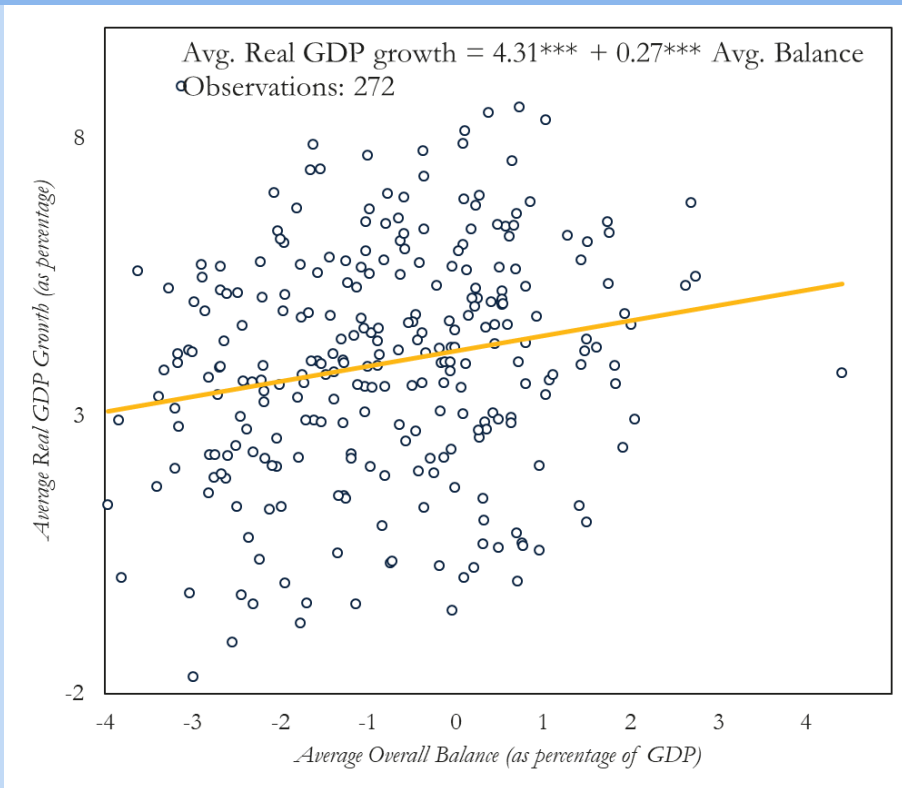
*Notes: Overall balance expressed as a percentage of GDP. Averages computed in 5-year non-overlapping intervals. Sample begins as early as in 1820 and, on average, in 1930, and excludes outliers. \*, \*\*, and \*\*\* indicate confidence at the 90, 95, and 99 percent level of a standard two-tailed means test, respectively. See Appendix B for details. Sources: Authors' calculations, based on data from Mauro et al. (2015), Global Financial Data, MOxLAD, WDI, and WEO (October 2017).*

It is hard to overemphasize the importance of lower inflation in the long run. First, inflation is one of the most regressive taxes (since the poor hold a much larger proportion of their assets in cash, especially in countries with large informal sectors as is often the case in LAC). Second, since higher inflation is typically more variable than low inflation, higher inflation leads to costly microeconomic distortions by affecting relative prices and reducing the information content of prices. Third, more variable inflation introduces more uncertainty into future planning by both enterprises and individuals, thus affecting investment and growth.<sup>18</sup> In fact, after decades of chronic inflation with occasional hyperinflationary outbursts, LAC countries have made tremendous progress over the last 30 years in bringing inflation down, thus contributing to more equitable and inclusive growth.<sup>19</sup>

<sup>18</sup> For an early survey of the costs of inflation, see Driffill *et al.* (1990). Tommasi (1994) stresses the costs resulting from a reduction in the information content in current prices about future prices due to real price variability. Lucas (2000) and Lagos and Wright (2005) provide quantitative estimates of the welfare costs of inflation.

<sup>19</sup> Inflation in LAC-7 (with Uruguay in lieu of Venezuela), for example, was 4.6 percent in 2017 compared to 247.5 percent in 1990.

**FIGURE 1.16. Average Real GDP Growth versus Average Overall Fiscal Balance**



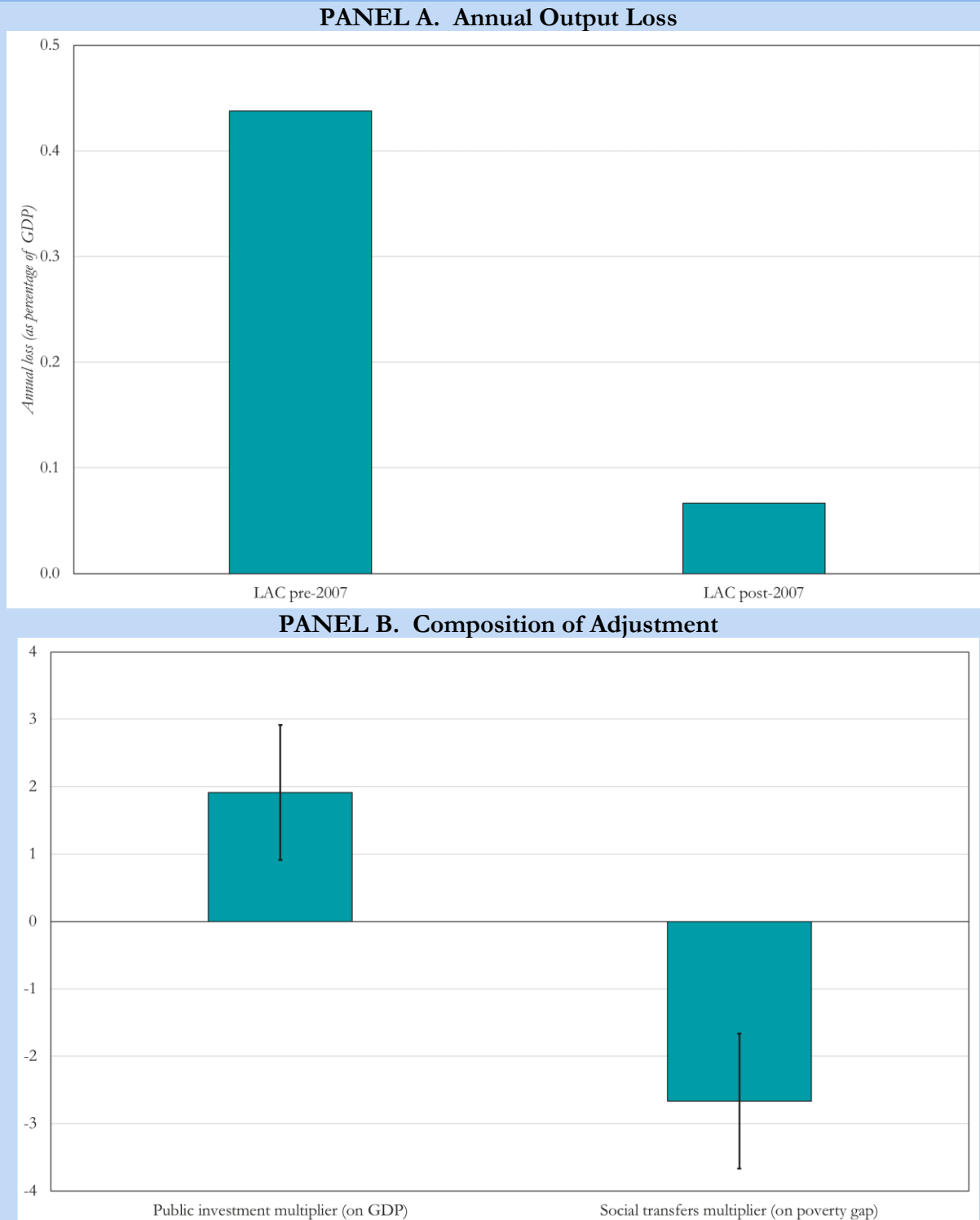
*Notes: Overall balance expressed as a percentage of GDP. Averages computed in 5-year non-overlapping intervals. Sample begins as early as in 1820 and, on average, in 1930, and excludes outliers. \*, \*\*, and \*\*\* indicate confidence at the 90, 95, and 99 percent level of a standard two-tailed means test, respectively. See Appendix B for details. Sources: Authors' calculations, based on data from Mauro et al. (2015), Global Financial Data, MOxLAD, WDI, and WEO (October 2017).*

Fiscal deficits have also a highly significant effect on growth, as illustrated in Figure 1.16. The regression line suggests that lowering the overall fiscal deficit by one percent of GDP increases growth by 0.27 percentage points. As analyzed in detail in Chapter 2, fiscal deficits may negatively affect long-run growth through a variety of channels, including supply-side effects and excessive debt (the so-called “debt overhang”).

The long-run benefits of lower inflation and higher growth, however, do not always come without costs. Figure 1.17 illustrates this phenomenon by showing (i) the annual output costs of the typical fiscal adjustment in LAC before and after 2007 (Panel A), (ii) the average output cost per unit of adjustment in public investment (first bar in Panel B), and (iii) the average impact on the poverty gap in response to a change in social transfers (second bar in Panel B). We can see from Panel A that it is now less costly than before to adjust. As shown in Chapter 2, this is because the typical fiscal adjustment in LAC in the distant past (i.e., in the 1980s and earlier) was larger than fiscal adjustments in the recent past. Panel B tells us that, in terms of the composition of the fiscal adjustment, cuts in public investment are particularly harmful to economic activity (for a given cut in public investment, GDP falls by twice as much) and reductions in social transfers tend to significantly increase the poverty gap (a cut in social transfers of one percent of GDP raises the poverty gap by 3 percentage points).

Hence, as will be argued in Chapter 2, the fiscal authorities should attempt to protect these spending categories and focus instead on reducing unproductive and/or inefficient government spending.

**FIGURE 1.17. Annual Output Loss and Composition of Adjustment**



*Note: See text and Appendix D for details. Sources: Authors' calculations based on data from CEPAL, SEDLAC, and WEO (October 2017).*



## *Chapter 2:*

# *Fiscal Adjustments in LAC: Costs and Benefits*

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### *Introduction*

As argued in the previous chapter, it has become painfully clear that most countries in the region will have to undertake fiscal adjustments, especially those that would like to reach investment grade status or maintain it. This core chapter of our report focuses on three key aspects of the required fiscal adjustments in LAC:

- First, a formal analysis of the main long-run benefits of reducing fiscal deficits is presented. This should be, after all, the main rationale for fiscal adjustments. If quantitatively important, the long-run benefits in terms of lower inflation and higher growth should greatly contribute to more equitable and inclusive growth.
- Second, a historical “anatomy” of fiscal adjustments in LAC is presented focusing on: (i) the composition of spending versus tax adjustments, (ii) the speed of adjustment (i.e., shock versus gradual approach), and (iii) how adjustments have been carried out in terms of the composition of spending. As will become clear below, the region has managed to overcome a historical pattern of traumatic fiscal adjustments/crises with large economic and social costs. While the new “breed” of fiscal adjustments has brought its own set of challenges, much progress has been done in terms of how to conduct necessary fiscal adjustments.
- Third, the analysis focuses on the economic and social implications of fiscal adjustments. We find that reductions in government spending have non-linear effects in terms of output costs. In other words, the same fiscal adjustment effected over a, say, 4-year period carries smaller costs than if undertaken all at once. This clearly favors gradual versus shock fiscal adjustment programs. We also find that, by undermining growth prospects, cuts in public investment are especially costly. Finally, we show that cuts in social transfers hurt low-income households particularly hard and should be avoided. To the extent possible, fiscal adjustments should focus on cutting non-productive government spending and, in countries with very low levels of taxation, increasing taxes to finance needed levels of spending (including social transfers).

### *Might There Be Short-Term Gains of Fiscal Adjustment?*

This seems to be the obvious first question to ask when the fiscal authority is considering a fiscal adjustment. After all, the expectation is that some short-term pain will be inevitable (though with some important nuances that our analysis below will make clear). So, unless long-run gains are important and clearly identifiable, it will be difficult to gather the political and social support needed to tackle a fiscal adjustment.

But before turning to the long-run gains, is it obvious that there will never be any *short-term* gains of reducing fiscal deficits? The answer, perhaps surprising to some readers, is clearly no, particularly in the “old” LAC where high and chronic inflation was rampant and stabilization attempts came and went in a never-ending succession. In this environment, inflation stabilization programs that enjoyed some degree of success due to being accompanied by a reduction in fiscal deficits and were based on using the nominal exchange rate as the nominal anchor would actually raise output and consumption in the short run.<sup>20</sup> Well-known examples include the Southern-Cone *tablitas* (named after a published table that would pre-announce the value of the dollar several months in advance) of the late 1970s and the Convertibility Plan implemented in Argentina that lasted for a decade (March 1991-December 2001), which was viewed at the time as a resounding success, both nationally and internationally, until intractable fiscal problems doomed it to failure in December 2001. This initial boom – which greatly benefited the poor due to higher real wages, more employment opportunities, and cheaper consumption goods – was instrumental in popularizing this type of programs in the region during the late 1970s, 1980s, and 1990s. Unfortunately, once abundant experience showed that most of these programs eventually ended in costly balance-of-payment crises, they essentially became an extinct species.

In fact, even outside the region, there have been experiences where fiscal contractions have led to economic expansions, as argued by Giavazzi and Pagano (1990) for the cases of Denmark and Ireland during the 1980s. In their interpretation, a fiscal adjustment may lead to two effects: (i) the traditional contraction in aggregate demand, and (ii) an expansionary expectations effect, if the public believes that the fiscal adjustment will be based on permanent reductions in government spending, which will lead to an expected increase in the private sector’s permanent income. Based on their analysis, they argue that the latter effect dominated in both Denmark and Ireland. More generally, based on 17 OECD countries over a 30-year period, Alesina *et al.* (2015) conclude that spending-based fiscal adjustments have been associated in many cases with no fall in output at all, as opposed to tax-based fiscal adjustments that have typically led to prolonged and deep recessions.

Hence, it is fair to conclude that there *may* well be short-term gains of fiscal adjustments.<sup>21</sup> We would argue, however, that in relatively low inflation environments, the standard contractionary effect would prevail, as indicated by our econometric evidence later in this chapter. We would thus take the view that in today’s LAC region, the gains of fiscal adjustments are to be found primarily in the medium to long run.

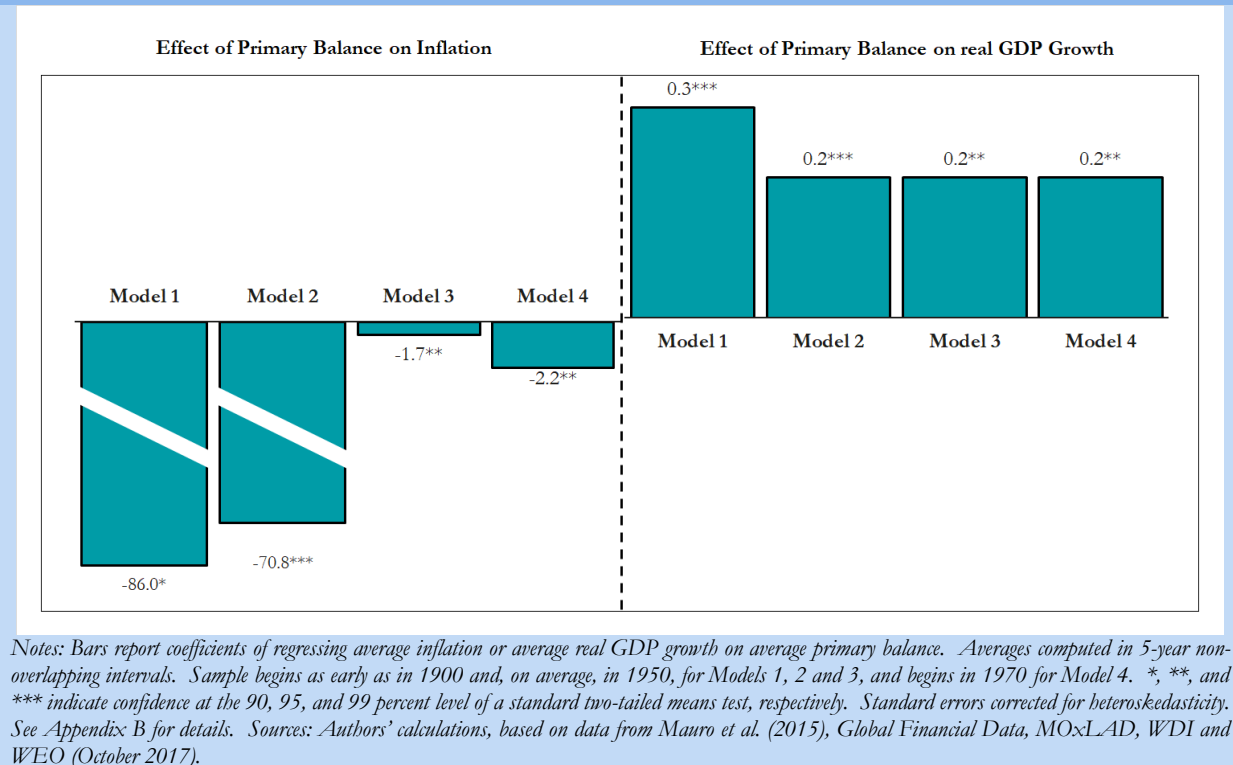
## ***Long-Run Gains of Fiscal Adjustments***

The long-run relationship between fiscal deficits and inflation is perhaps the easiest to understand.

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<sup>20</sup> See Calvo and Végh (1999) and Végh (2013, Chapter 13) for empirical evidence and theoretical explanations of the initial boom associated with exchange-rate-based inflation stabilization programs, most of them in South America.

<sup>21</sup> Another short-term gain of fiscal adjustment would be an increase in the country’s credit rating and, hence, lower cost of international credit, as documented in Chapter 1.

**FIGURE 2.1. Effect of Primary Balance on Inflation and Real GDP Growth**


Clearly, if a country runs recurrent fiscal deficits over the long run, it must be because tax revenues are not consistent with the country's government spending level. While, in the short run, revenue shortfalls can be covered by borrowing; in the long run, government revenues must cover permanent government expenditures. If this is not the case – and if we rule out explosive debt paths which will end up in crises – inflationary finance must fill the gap.<sup>22</sup>

We now briefly revisit this issue with much longer samples than in previous analyses. The left panel of Figure 2.1 illustrates the effects of changes in the primary fiscal balance as a percentage of GDP on the inflation rate (both computed as non-overlapping five-year averages). We run four different models. For each specification, the plotted bar indicates the point estimate and significance of the coefficient associated with the primary fiscal balance. Model 1, which includes outliers, is in the spirit of Figure 1.15 in Chapter 1 in that primary fiscal balance and inflation enter contemporaneously in an OLS regression. Clearly, such specification may suffer from endogeneity problems since inflation can also cause fiscal deficits through lagged tax collection and backward-looking indexation, among other channels.

To correct for this possible endogeneity bias, Model 2 uses lagged primary fiscal balances instead of the contemporaneous values of this variable. In turn, Model 3 builds upon Model 2 by excluding outliers. Model 4 extends Model 3 by including several standard controls in this literature: the lagged

<sup>22</sup> See Fischer *et al.* (2002) and Catao and Terrones (2005), among others, for detailed analyses of the relationship between fiscal deficits and inflation.



dependent variable, average investment as a percentage of GDP, average primary gross enrollment ratio, average terms of trade growth, and country fixed effects. Model 4, which we would take as the most refined one, indicates that an increase in the average primary balance of 1 percent of GDP reduces inflation by 2.2 percentage points.

The long-run relationship between fiscal deficits and growth is also highly statistically significant, as illustrated in the right panel of Figure 2.1.<sup>23</sup> Using the same models described above (just having the dependent variable be the growth rate of real GDP instead of inflation), we conclude, with the more refined specification (Model 4), that an increase in the average primary balance of 1 percent of GDP leads to an increase of 0.2 percentage points in real GDP growth.

The channels involved in the relationship between fiscal deficits and growth are certainly more elaborate than those governing the relationship between fiscal deficits and inflation discussed above.<sup>24</sup> Specifically:

- One of the best-known channels would be the indirect effect of lower fiscal deficits on growth through a reduction in inflation. Put differently, lower fiscal deficits reduce inflation, which increases long-run growth through supply-side effects. The relationship between inflation and growth has been studied extensively. Figure 2.2 illustrates this relationship by showing a scatter plot where lower inflation is associated with higher growth. In monetary models where cash is needed for investment purposes (as in Stockman, 1981; De Gregorio, 1993; and Rebelo and Végh, 1995), a fall in inflation reduces the effective cost of investment and increases growth. In fact, both Rebelo and Végh (1995) and Uribe (1997) show that this investment effect is critical in quantitatively explaining many episodes in which lower inflation led to higher investment and growth. A related supply-side effect, but likely less important quantitatively, consists in instances where lower inflation leads to increases in labor supply (for instance, by making consumption goods cheaper relative to leisure), thus leading to higher output.<sup>25</sup>
- A second channel would be the “debt overhang” effect, put on the table primarily by Sachs (1989), and heavily studied ever since. The idea is that high debt levels reduce growth. Hence, by reducing fiscal deficits and ultimately debt, long-run growth should increase. In particular, based on a panel of 61 developing countries for the period 1969-1998, Patillo *et al.* (2004) find that the effect of debt on growth operates through a strong negative impact on both physical capital accumulation and total factor productivity growth. The effect on investment would typically occur through a standard crowding out effect (i.e., more public debt soaks up available investment funds). More recently, Reinhart *et al.* (2012) have argued that public debt

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<sup>23</sup> See Easterly and Rebelo (1993) for an earlier study that also finds a systematic and positive relationship between fiscal surpluses and long-run growth.

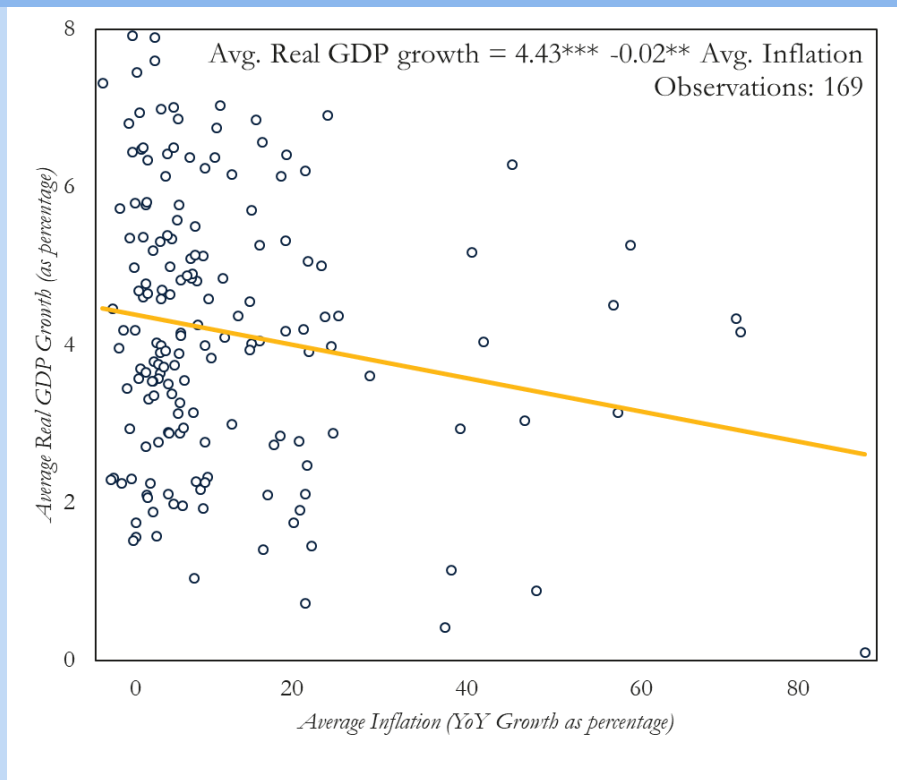
<sup>24</sup> See IMF (2015) for a recent review of the relationship between fiscal policy and long-run growth.

<sup>25</sup> See De Gregorio (1993), Rebelo and Végh (1995), Roldos (1995, 1997), Lahiri (2000), and Végh (2013, Chapters 7 and 13). In the context of endogenous growth models, see Jones *et al.* (1993) and Stokey and Rebelo (1993).

overhangs (defined as public debt exceeding 90 percent of GDP for at least five years) are associated with a reduction in the growth rate of one percentage point per year.

- More generally, in infinite-horizon models, the effects of fiscal deficits on growth will depend on what variables are adjusted in the long run to compensate for the fiscal deficits.<sup>26</sup> For instance, if fiscal deficits are reduced through an increase in income or investment taxes, long-run growth may suffer due to lower returns to capital accumulation.<sup>27</sup> In contrast, if the adjustment involves a reduction in primary government spending (in particular, unproductive government spending), such that some resources make their way back to the private sector through lower income taxes, growth may increase. In fact, any fiscal correction that reduces the long-run probability of a public-sector default may lead to higher growth by improving confidence and thus investment in both physical and human capital.

**FIGURE 2.2. Average Real GDP Growth versus Average Inflation**



Notes: Averages computed in 5-year non-overlapping intervals. Sample begins as early as in 1900 and, on average, in 1960. \*, \*\*, and \*\*\* indicate confidence at the 90, 95, and 99 percent level of a standard two-tailed means test, respectively. See Appendix B for details. Sources: Authors' calculations, based on data from Mauro et al. (2015), Global Financial Data, MOxLAD, WDI, and WEO (October 2017).

In sum, the empirical evidence for LAC countries clearly suggests that a reduction in fiscal deficits will, in the long run, lower inflation and increase growth. The higher growth will come about through

<sup>26</sup> In overlapping-generations models, government deficits tend to reduce savings and hence growth (see Alogoskoufis and Ploeg, 1990).

<sup>27</sup> See Barro (1990) and Easterly and Rebelo (1993) for a detailed analysis.

indirect channels (i.e., lower inflation) and direct channels (effects of debt and other fiscal instruments on growth).

## *The Anatomy of Fiscal Adjustments in LAC: Then and Now*

We will now seek to characterize how fiscal adjustments in LAC have evolved over time in terms of their (i) main instrument (higher taxes versus lower spending), (ii) speed of adjustment (gradual versus shock adjustments), and (iii) the composition of government spending (in particular, current primary spending versus public investment).

### *Spending-Based Versus Tax-Based Fiscal Adjustments*

For the purposes of this report, and with the idea of focusing on fiscal instruments (such as primary spending and tax rates) as opposed to fiscal outcomes (such as tax revenues), a fiscal adjustment episode is identified as an event where at least one of the following conditions holds:

- Primary spending decreases by at least 3 percent in total during the adjustment period. Such a period is defined by the number of consecutive years for which the primary spending growth is maintained below or equal to the output trend growth.<sup>28</sup>
- A tax rate hike of at least 10 percent for the value-added, corporate, and/or personal income taxes, which is not accompanied by a spending increase of more than 5 percent (to avoid tax increases aimed at financing spending increases) or tax rate cuts in the preceding, contemporaneous, or subsequent year (to avoid tax substitution among taxes or very short-lived episodes of tax rate hikes).

Using these criteria to define a fiscal adjustment, a total of 136 fiscal adjustment episodes are identified for the period 1960-2017 for 17 countries in LAC. A typical LAC country carries out, on average, a fiscal adjustment every 4 years. Using a different identification strategy, Alesina *et al.* (2015) find, for a sample of developed countries, that fiscal adjustments occur, on average, every 3 years.

The vast majority of adjustment episodes in LAC involves only spending-driven adjustments (85 percent of total episodes). In sharp contrast, only 4 percent involve purely tax rate hikes.<sup>29</sup> The remainder (11 percent of episodes) involve mixed fiscal adjustments that include both tax hikes and spending cuts. While relying on a different identification and measurement strategy, Alesina *et al.* (2015) find that at least 40 percent of fiscal adjustments in developed countries rely heavily on tax hikes.

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<sup>28</sup> As an illustration, suppose a country has a constant GDP trend growth of 2 percent per year and that the government (i) reduces the primary spending during the first and the second years by 2 percent each year, (ii) increases the primary spending by 1 percent in the third year, and (iii) reduces the primary spending during the fourth and fifth years by 2 percent each year. Our identification strategy would capture only one episode of fiscal adjustment for the 5 years, in spite of the small and short-lived increase of primary spending in the third year.

<sup>29</sup> About half of these episodes have involved substitution of the inflation tax by conventional revenues.

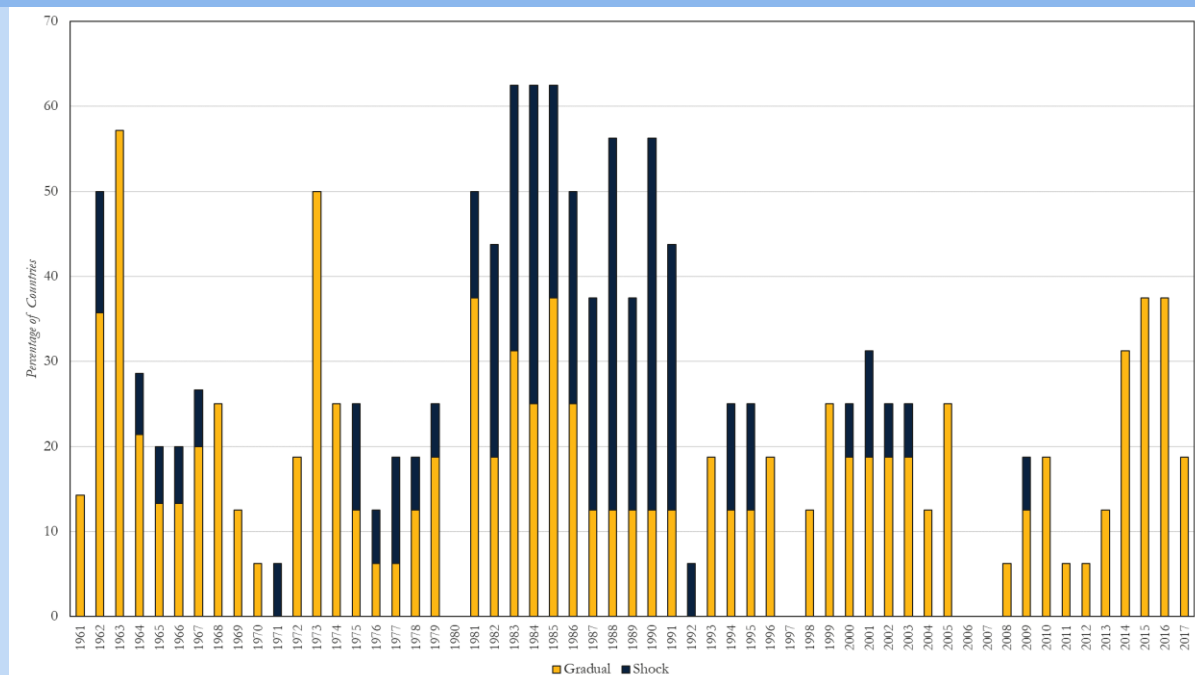
In sum, the frequency of fiscal adjustments in LAC does not seem to differ much from that observed in the developed world. However, unlike the evidence for developed economies, most of the fiscal adjustments in LAC have been primarily driven by spending cuts rather than tax hikes. Further, the share of spending-based versus tax-based fiscal adjustments does not show any clear pattern over time.

### *Shock Versus Gradual Fiscal Adjustments*

Having looked at the composition of fiscal adjustments (spending-based versus tax-based), we now look at the speed of adjustment (shock versus gradual). For the purposes of this report, “shock” and “gradual” categories of spending adjustment are defined as follows:

- A shock spending adjustment is a spending-driven fiscal adjustment episode in which primary spending is cut, on average, by more than 8 percent per year.
- A gradual spending adjustment is a spending-driven fiscal adjustment episode that is not classified as a shock adjustment. For this gradual group, the primary spending is cut, on average, by about 4 percent per year.

**FIGURE 2.3. Shock versus Gradual Spending Adjustments in LAC**



Notes: Vertical axis indicates share of LAC countries carrying out spending adjustments, while colors indicate their speed of adjustment. See text for details. Sources: Authors’ calculations based on data from Global Financial Data, MOxLAD, WDI, and WEO (October 2017).

Figure 2.3 shows that the shock type of spending adjustment was quite frequent in LAC in the distant past, especially during the 1980s.<sup>30</sup> Mainly as a result of the debt crisis in LAC, during the 1980s about

<sup>30</sup> For details on the episodes considered in Figure 2.3, see Appendix C.

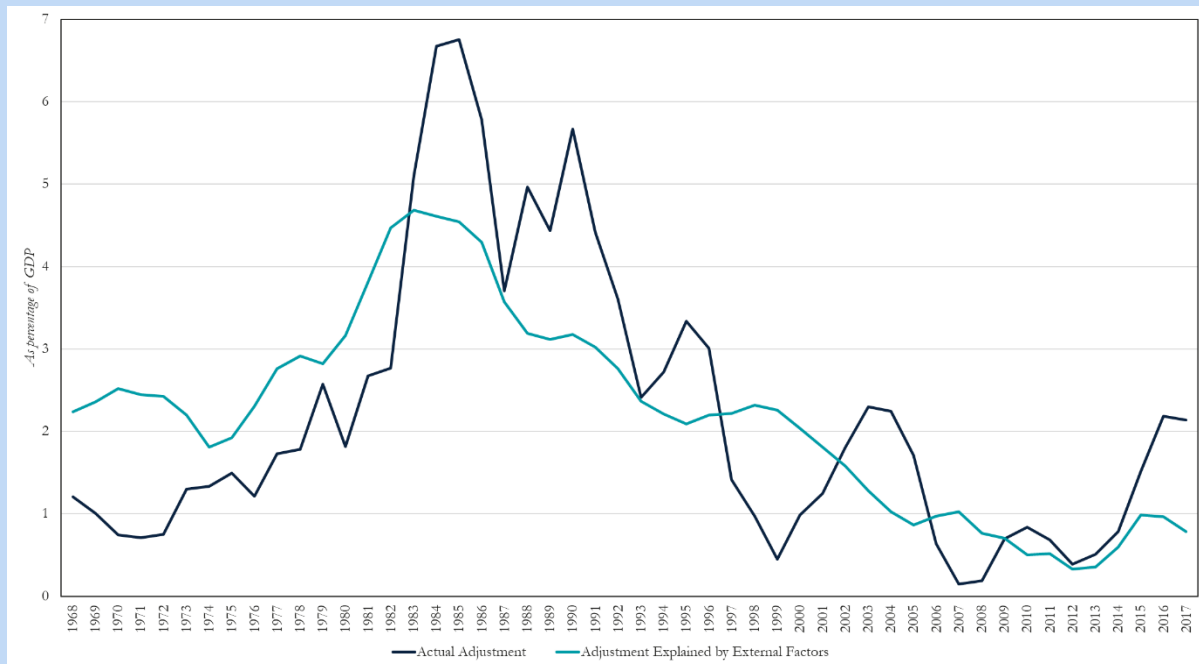
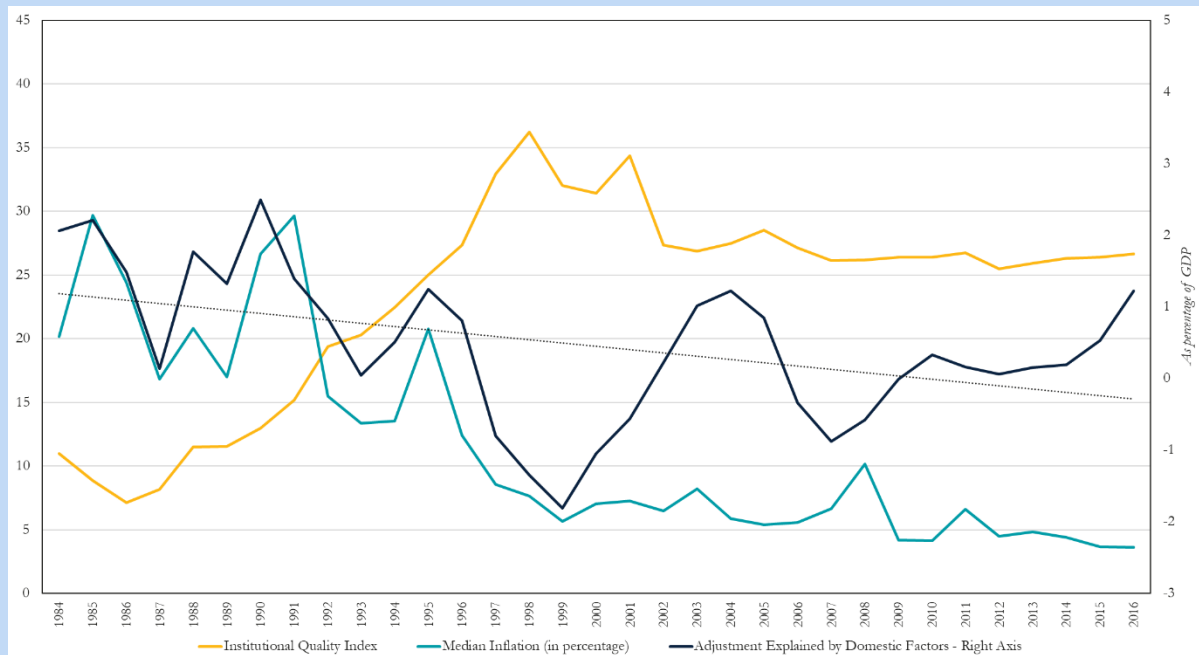
half of LAC countries were conducting fiscal adjustments through drastic spending cuts. In contrast, ever since the mid-1990s, those large spending cuts have tended to fade and have virtually disappeared since the early-2000s. As will become clear below, gradual fiscal adjustments – as opposed to shock adjustments – have lower costs in terms of output losses (even after controlling for the size of the spending cut).

A natural question arises when it comes to understanding the shift from mainly shock adjustments to gradual adjustments, as reflected in Figure 2.3. Has this shift taken place because external shocks have been milder in the recent past or because countries have substantially improved their macro-stability framework? The latter may have led to less procyclical fiscal policies, larger cushions of international reserves, and fiscal institutions of higher quality.<sup>31</sup> Panels A and B in Figure 2.4 show that, in reality, both factors have induced more gradual adjustments in the recent past. Panel A plots the average government spending cut observed in LAC countries against fitted values obtained from regressing the actual cuts on three global factors: economic growth in G-7 countries, index of commodity prices, and global liquidity (captured by the real yield on the 10-year United States T-bill). Just visually, Panel A makes clear that the average spending cut is, to a large extent, explained by such global factors. For example, in the early-1980s the LAC region was cutting government spending by about 7 percent, out of which two-thirds (i.e., about 4.7 percent) can be explained by external factors (mainly Volcker’s interest rate increase).

Panel B in Figure 2.4 shows the evolution of the spending cuts unexplained by external factors (i.e., the difference between the two lines in Panel A), which one could, by construction, associate with the incidence of domestic factors. Panel B also shows the evolution of average institutional quality and the inflation rate for the LAC region. As indicated in the figure with the dotted line (i.e., the trend of the adjustments explained by domestic factors), the importance of domestic factors has, with substantial ups and downs, fallen over time, which suggests that the region has learned how to lean against the wind and increase its resilience. These positive developments are in line with Frankel *et al.* (2013) and Végh *et al.* (2017a), who link this shift in the region’s resilience and ability to conduct macro-stabilizing policies with better institutional quality. In fact, as illustrated in Figure 2.4, Panel B, institutional quality increased significantly from 1984 until the late 1990s. While further progress has been slow to come, the region has managed to maintain these important improvements. The inflation rate also shows a clear negative trend in LAC, consistent with better institutional quality (including, for example, more central bank independence).

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<sup>31</sup> Végh *et al.* (2017a) show that procyclical fiscal policies in LAC have substantially declined over time and link it to higher institutional quality.

**FIGURE 2.4. Average Spending Adjustment in LAC: Evidence and Determinants**
**PANEL A. Observed Spending Adjustment and Adjustment Explained by External Factors**

**PANEL B. Spending Adjustment Explained by Domestic Factors and Potential Determinants**


Notes: Institutional Quality Index is a normalization of the same index presented in Végő et al. (2017b). The spending adjustments explained by external factors are constructed by regressing the observed primary spending cuts on three global factors: economic growth in G-7 countries, commodity prices, and global liquidity (captured by the real yield on the 10-year U.S. T-bill). The part of spending adjustments not attributed to these external factors are imputed to domestic factors. Sources: Authors' calculations based on data from Bloomberg, ICRG, IFS, Global Financial Data, MOxLAD, WDI, WEO (October 2017), and World Bank Commodity Price Data (Pinksheets).

To sum up, the LAC region has, on average, learned how to lean against the wind and be better prepared for bad times when external factors weaken in a low inflation scenario. Yet, it is clear that institutional gains cannot be taken for granted and need to be continuously reinforced and further reforms need to take place. From the point of view of fiscal adjustment, the virtual elimination of inflation as a source of revenues for the treasury has brought new challenges in terms of how to credibly and steadily conduct necessary fiscal adjustments.

### *Composition of Spending Adjustment*

We now look at the composition of fiscal adjustments when there is a cut in primary government spending. Based on a sample of 18 countries for the period 1988-2017, we divide total primary government spending into two components (primary current spending and public investment) and, in turn, primary current spending into two components (public consumption, which includes wages and goods and services, and social transfers).<sup>32</sup> Each figure in Table 2.1 represents the average percentage change in each variable during spending adjustments. In Panel A, we show such figures for the whole sample and before and after 2007.<sup>33</sup> In Panel B, we divide the sample into high and low inflation episodes.<sup>34</sup>

**TABLE 2.1. Typical Adjustment Spending Composition (as percentage)**

**PANEL A. *Before and After 2007***

	Total Primary Spending	Primary Current Spending	Wages	Goods and Services	Social Transfers	Public Investment
Whole sample	14.4	5.3	3.2	5.2	-1.1	12.1
Before 2007	16.3	6.2	4.2	4.3	-0.3	12.0
After 2007	5.5	3.4	1.5	6.7	-1.9	13.1

**PANEL B. *High versus Low Inflation***

	Total Primary Spending	Primary Current Spending	Wages	Goods and Services	Social Transfers	Public Investment
High Inflation	19.3	8.6	8.0	3.4	4.4	11.2
Low Inflation	7.8	2.6	0.4	5.2	-3.7	12.4

*Notes: All variables are expressed in real terms. Figures indicate the average percentage change of each category when the total primary expenditure decreases. Sources: Authors' calculations based on data from Global Financial Data, MOxLAD, and WDI.*

Total primary spending has always been used as a critical source of adjustment, though the size of the cuts has changed over time. Specifically, the cut in total primary spending before 2007 was 16.3

<sup>32</sup> All variables are defined in real terms.

<sup>33</sup> Following previous semiannual reports, we use 2007 as the breaking point year. Same results would hold for neighboring years.

<sup>34</sup> High inflation is defined as an inflation rate of at least 10 percent per year. Otherwise, we define it as low inflation.

percent compared to 5.5 percent after 2007. This naturally reflects our previous discussion regarding the predominance of shock adjustments in the distant past compared to more recent times. While public investment has always been a source of adjustment in LAC, this adjustment has been (i) somewhat higher in absolute terms in recent times (13.1 percent) compared to the distant past (12.0 percent) and (ii) more notably, in relative terms (i.e., in terms of how much it accounts for in the adjustment of total primary spending) even more relevant in the recent past than in the distant past. Specifically, before 2007, the typical fiscal adjustment (in terms of total primary spending) consisted of a cut of 45 percent in primary spending and 55 percent in public investment. After 2007, these figures became 21 percent and 79 percent, respectively.

While primary current spending adjustment in the past was about 6.2 percent, in the recent past it has almost halved. Such a drastic reduction in the adjustment of primary current spending has been mainly driven by the significantly lower adjustment in real wages. Interestingly, social transfers (mainly pensions and in-kind and cash benefits to the most vulnerable households) have not typically been a source of adjustment and, in the recent past, they have even received some extra funds during periods of adjustment.

While many factors could be behind the shift in the way spending adjustments have been conducted, Panel B in Table 2.1 shows that high inflation – which was particularly common in the distant past, as shown in Figure 2.4, Panel B – has clearly led to bigger cuts in real wages and real social transfers. The behavior in real wages is particularly striking: real wages have fallen by 8.0 percent during fiscal adjustments taking place in high inflation environments compared to just 0.4 percent in low inflation environments. A similar story holds for real social transfers. This is hardly surprising since it is much easier for a government to reduce real wages and real social transfers by generating higher inflation than through cuts in nominal wages/transfers.

In sharp contrast – and given the well-documented rigidities in nominal wages and social transfers – most of the recent fiscal adjustments have relied more heavily on cuts in public investment (particularly as a share of total adjustment) since there is no clear constituency (like unions in the case of nominal wages) lobbying for public investment. This difference in the pattern of adjustments has, in turn, naturally implied that it is now more difficult to cut primary current government spending. In the distant past (particularly the 1980s), moderate to high inflation rates made it much easier to carry out fiscal adjustments, especially by reducing real wages. In the recent past, however, low inflation rates have made such an adjustment process particularly challenging. Partly for this reason, the LAC region has tended to adjust less and rely more on cuts in public investment (as opposed to real wages).

Two questions naturally come to mind regarding the increased importance of public investment as a source of fiscal adjustments in the recent past. The first is its effect on the economy (particularly growth, of course) and social indicators. We will take up this critical question later in the chapter.

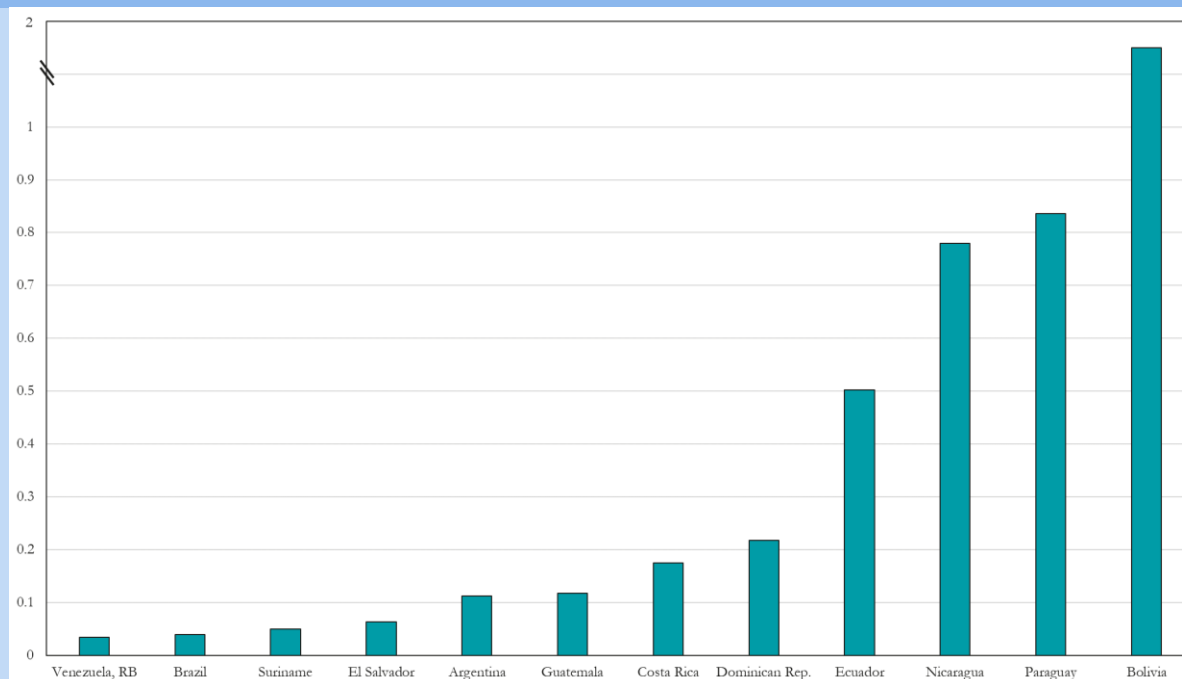
Second – and independently of its impact on the economy – the question arises about the extent to which adjusting via public investment may provide a credible fiscal strategy in the medium- and long-term (given its small size in the overall government budget) to implement the required fiscal adjustment. To address this point, Figure 2.5 shows the ratio of public investment to the increase in



the primary surplus needed to achieve a constant debt level consistent with investment grade in one year (for those countries without an investment grade). With the exception of Bolivia (which has doubled its public investment as a percentage of GDP during the commodity boom period), this ratio is always lower than one for all other LAC countries, indicating that such a fiscal adjustment cannot be credibly achieved by relying solely on cutting public investment. Moreover, this ratio is particularly low, especially for those countries with the greatest need for an increase in primary surplus to achieve a sustainable debt level consistent with investment grade (see Figure 2.5) such as Argentina, Brazil, Suriname, and Venezuela. For example, in the case of Brazil, the ratio is 0.04, indicating that even if Brazil cut public investment to zero, it would only cover 4 percent of the necessary adjustment. While this is just a thought experiment to make the point, it clearly suggests that cutting public investment can hardly become the main instrument to carry out fiscal adjustments.

In sum, better macroeconomic policies (and, hence, low inflation scenarios) have, in turn, triggered a new set of challenges regarding the way in which the LAC region conducts spending adjustment across spending categories. In particular, adjusting through lower public investment cannot provide a credible fiscal strategy (given its size in the budget) in the medium and long run.

**FIGURE 2.5. Ratio of Public Investment to Required Adjustment**



*Notes: Public investment is defined as Public Gross Fixed Capital Formation. The required adjustment is measured as the present discounted value of the path of primary balances in each country. Sources: Authors' calculations based on data from Fitch Ratings, World Bank staff estimates (March 2018) and WEO (October 2017).*

## *Economic and Social Implications of Different Types of Fiscal Adjustment*

We now evaluate the economic and social implications of the anatomy of fiscal adjustments in LAC across the three dimensions analyzed above: spending-based versus tax-based, gradual versus shock, and spending composition.

### *Spending-Based Versus Tax-Based Fiscal Adjustments*

As shown above, most of the fiscal adjustments in LAC have been primarily driven by spending cuts rather than tax hikes. Why could that be the case? One way of approaching this question is to assess the economic impact of tax rate changes (i.e., the so-called tax multipliers).

The available empirical evidence points to a large effect of tax changes on output in the developed world (based mainly on evidence from European countries).<sup>35</sup> In a recent study focused on the value-added tax, Gunter *et al.* (2018) find that the size of tax multipliers varies across countries (and over time) due to distortionary and disincentive-based arguments.<sup>36</sup> Specifically, the authors find that the effect of tax changes on output is highly non-linear. The tax multiplier is essentially zero under relatively low/moderate initial tax rate levels and much larger (in absolute terms) as the initial tax rate and the size of the change in the tax rate increase. Higher levels of initial tax rates are associated with larger distortions and disincentives to consume, work, and invest.

Panel A in Figure 2.6 shows, as of November 2017, the size of the tax multipliers for a global sample. In line with Alesina *et al.* (2015), Gunter *et al.* (2018) also find large (in absolute terms) multipliers for European countries. In contrast, Panel A (for a global sample) as well as Panel B (for LAC countries) in Figure 2.6 show that, in many developing countries (including, in the LAC region, many Central American countries, Paraguay, Ecuador, and Bolivia), tax multipliers are virtually zero, indicating that tax rate increases would not hurt much economic activity. For example, while Guatemala, Paraguay, and Costa Rica currently have value-added tax rates of 12, 10, and 13 percent, respectively, European countries have an average value-added tax rate of 22 percent.<sup>37</sup>

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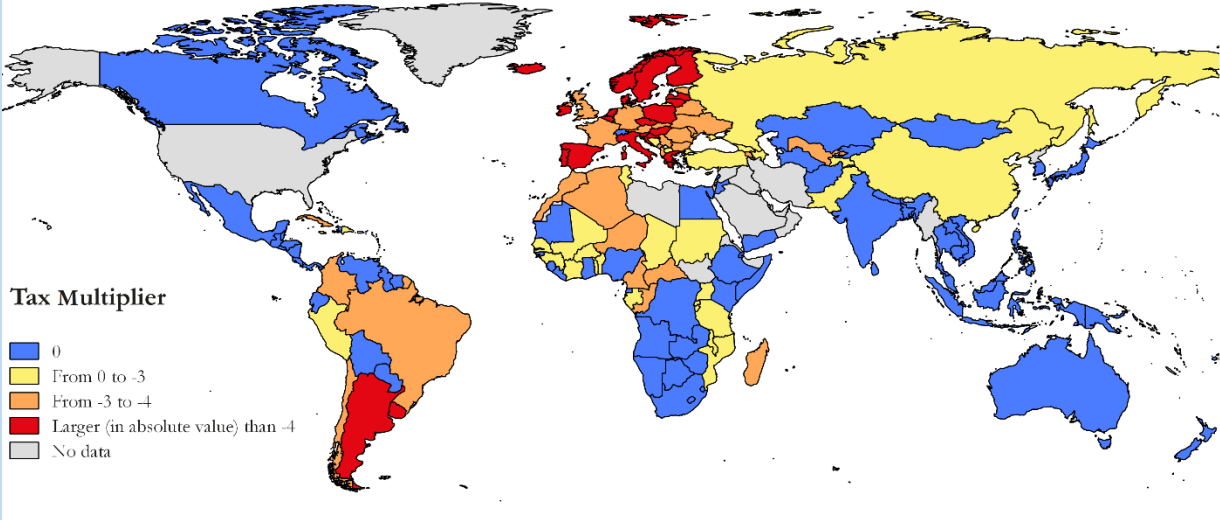
<sup>35</sup> For example, Alesina *et al.* (2015) find for a sample of 17 developed countries an average multiplier of about -2 (after two years of the tax shock). Other individual country studies, mainly for European countries, also find large multipliers, especially for indirect taxation (ranging between -2 and -6).

<sup>36</sup> The authors use a novel dataset on value-added taxes for 51 countries (21 industrial and 30 developing) for the period 1970-2014 and the so-called narrative approach to identify exogenous tax shocks to estimate the tax multipliers.

<sup>37</sup> In line with the low levels of taxation in Central America, several oil-producing countries in the Middle-East and North Africa rely mainly on oil-driven revenues and very little on regular taxation.

**FIGURE 2.6. Size of Tax Multiplier**

**PANEL A. Global Sample**



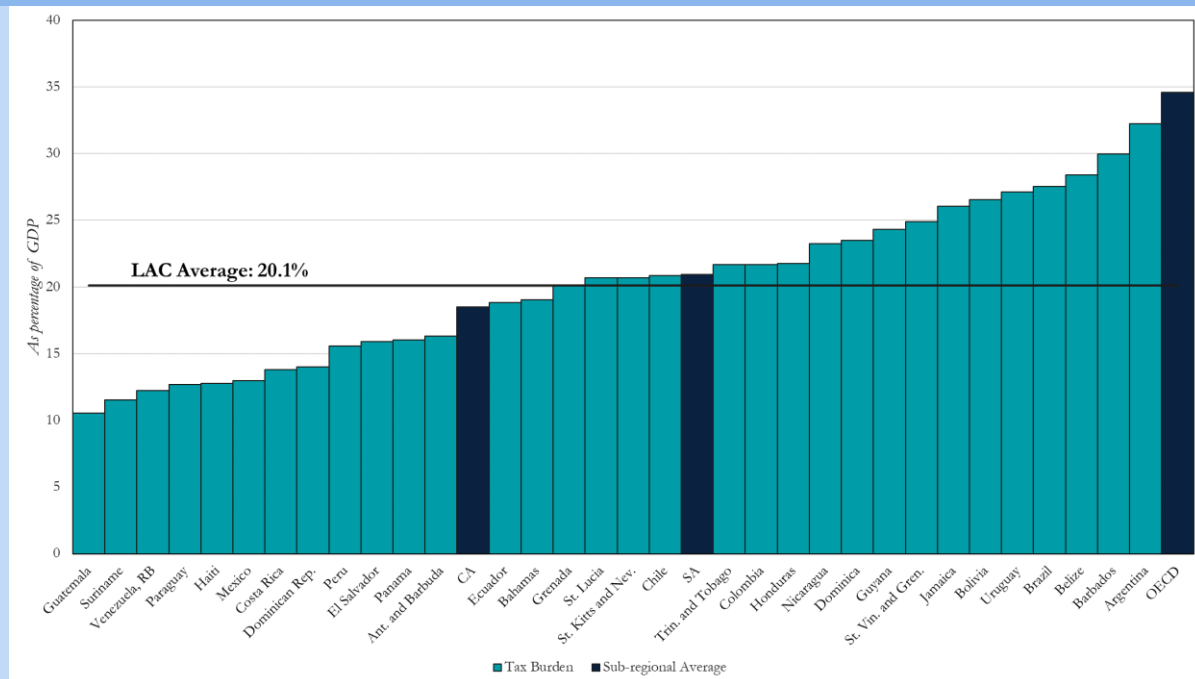
**PANEL B. LAC Sample**



*Note: See text for details. Source: Gunter et al. (2018).*

Figure 2.7 shows that the same general characterization is true when focusing on tax burdens: the average for OECD countries in 2017 is 34.6 percent, compared with 18.5 for Central American countries (CA).

**FIGURE 2.7. Tax Burdens**



Note: Tax burden is defined as the sum of tax revenues and social contributions as a percentage of GDP. Source: WEO (October 2017).

This evidence then suggests that while effecting a fiscal adjustment mainly through tax hikes might hurt economic activity significantly in LAC countries with high levels of taxation such as Argentina and Uruguay (much like in most European countries), it would be fairly innocuous in countries with low initial levels of taxation (this is especially true in many Central American countries).

Turning now to government spending multipliers, we should note that, contrary to the case of tax multipliers, there is a voluminous literature on the subject. We are mostly interested in what factors may determine the size of spending multipliers. In particular, Ilzetzki *et al.* (2013) show that, all else equal, the size of government spending multipliers depends on (i) the exchange rate regime (multipliers are essentially zero under flexible exchange rates and sizable under predetermined exchange rates, as the textbook Mundell-Fleming model would predict) and (ii) the size of the initial debt stock (countries with high debt have much smaller multipliers than countries with low debt). Auerbach and Gorodnichenko (2013) and Riera-Crichton *et al.* (2015) have shown that government spending multipliers are higher in recessions than in good times, again as a simple Keynesian model would suggest.

In this report, we will derive below some novel results regarding the size of government spending multipliers. First, we will show that the negative effects of cuts in government spending are non-linear, implying that large cuts in government spending have more than proportional negative effects on output than small cuts. Second, we will show that public investment multipliers hurt the economy

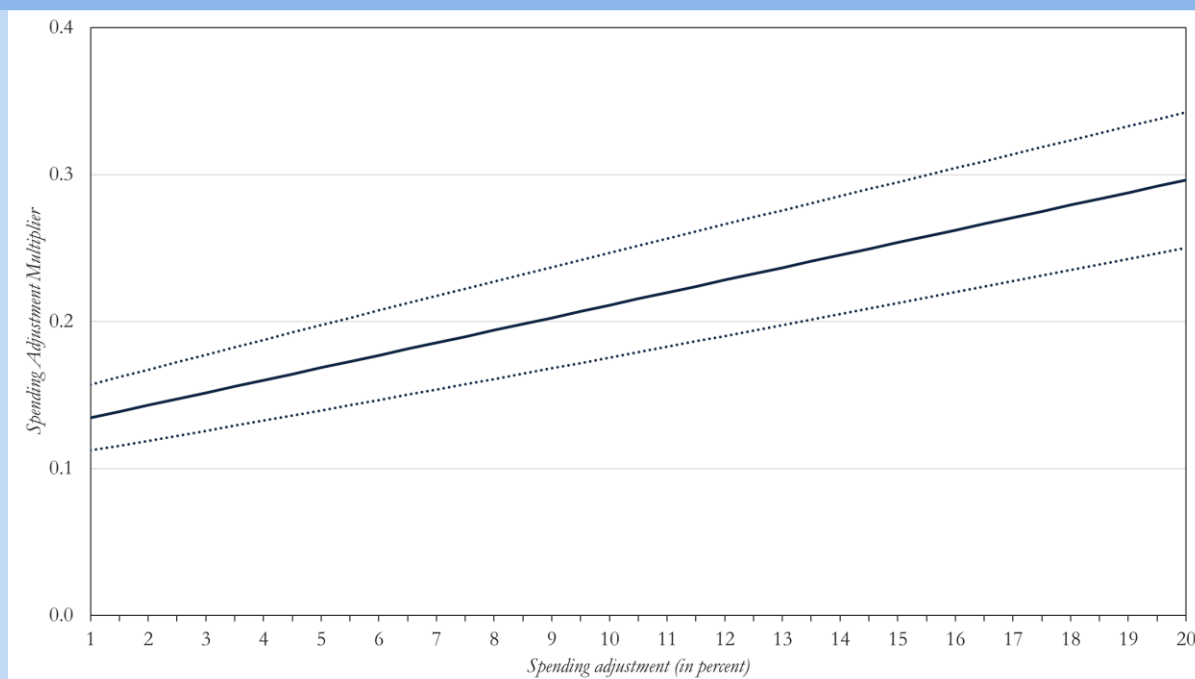
much more than public consumption multipliers. Finally, we will show that cuts in real social transfers greatly affect measures of social inclusion.

### ***Shock Versus Gradual Spending Adjustment***

As already mentioned, the LAC region used to resort to shock spending adjustments in the distant past (i.e., 1980s and before), but has recently turned to gradual spending adjustments. What are the economic effects of this significant policy shift?

To answer this question, we evaluate whether there is a non-linear effect of spending adjustments on output growth. In other words, we would like to compare the output costs of, say, (i) a gradual spending reduction of 4 percentage points per year during 4 years (for a total of 16 percent), to the costs of (ii) a 16 percent reduction in government spending carried out all at once. To this effect, we estimate the output costs of fiscal spending adjustments after two years taking into account possible non-linearities and controlling for other factors.<sup>38</sup> Figure 2.8 shows the corresponding spending multiplier. Notice that spending adjustments are always costly in the medium-run. Yet, interestingly, such output cost per unit of spending adjustment increases with the size of the spending adjustment. This non-linearity naturally implies that shock adjustments are (even after controlling for the overall size of the spending cut) much more costly than gradual adjustments.

**FIGURE 2.8. Spending Adjustment Multiplier for Different Sizes of Spending Adjustments**

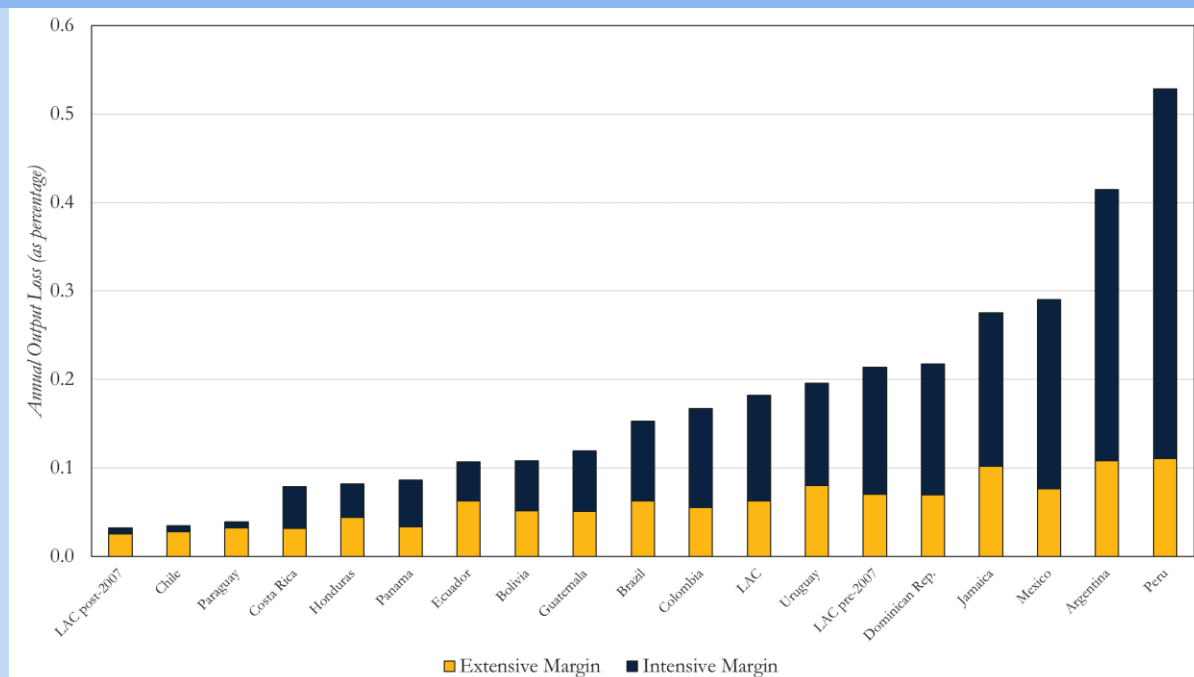


Notes: Solid line indicates the spending adjustment multiplier (i.e., the change in output in response to a change in primary spending) associated with spending cuts for different sizes of spending adjustments. See Appendix D for details. Source: Authors' calculations based on data from Global Financial Data, MOxLAD, and WDI.

<sup>38</sup> We evaluate the impact of a contemporaneous spending cut on growth after two years to mitigate possible reverse causality considerations. See Appendix D for details about methodology and control variables.

Using both the non-linear model illustrated in Figure 2.8 together with data on the spending adjustments in LAC from 1960 to 2017, Figure 2.9 displays the average annual loss of output growth experienced by each country as a result of their spending adjustments. An average for the LAC region is also computed for the full period, as well as for pre- and post-2007 samples. Moreover, taking as a reference point the typical gradual fiscal adjustment in the region (of 4.0 percent per year), it is possible to break down the average annual loss of output growth for any given country into two components: (i) the loss that would have resulted if each country had distributed all of its adjustments following the average gradual adjustment in the region (i.e., 4.0 percent per year), which we refer to as the “extensive” margin; and (ii) the additional loss associated with having pursued more aggressive, shock-based adjustments, which we refer to as the “intensive” margin.<sup>39</sup> Intuitively, the extensive margin reflects each country’s historical need of spending adjustment, with higher values indicating that more percentage points of spending cut were required from 1960 to 2017. On the other hand, the intensive margin represents the costs associated with the choice between gradual and shock adjustments.

**FIGURE 2.9. Loss of Output Growth in Response to Spending Adjustments**



Note: See Appendix D for details. Source: Authors’ calculations based on Global Financial Data, MOxLAD, WDI, and WEO (October 2017).

Figure 2.9 shows that the annual loss of economic growth associated with spending adjustments ranged between 0.04 and 0.53 percentage points (with Chile and Peru in the lower and upper bounds, respectively). At the regional level, LAC suffered a reduction in annual output growth of 0.18 percentage points. While this figure might look small, notice that the cumulative effect over the entire sample of 58 years would imply a loss of output of 10 percent. This picture changes dramatically if we split the sample into pre- and post-2007, with the distant past showing a bigger annual loss of

<sup>39</sup> The intensive margin is estimated as the difference between the average annual loss in output growth and the extensive margin.

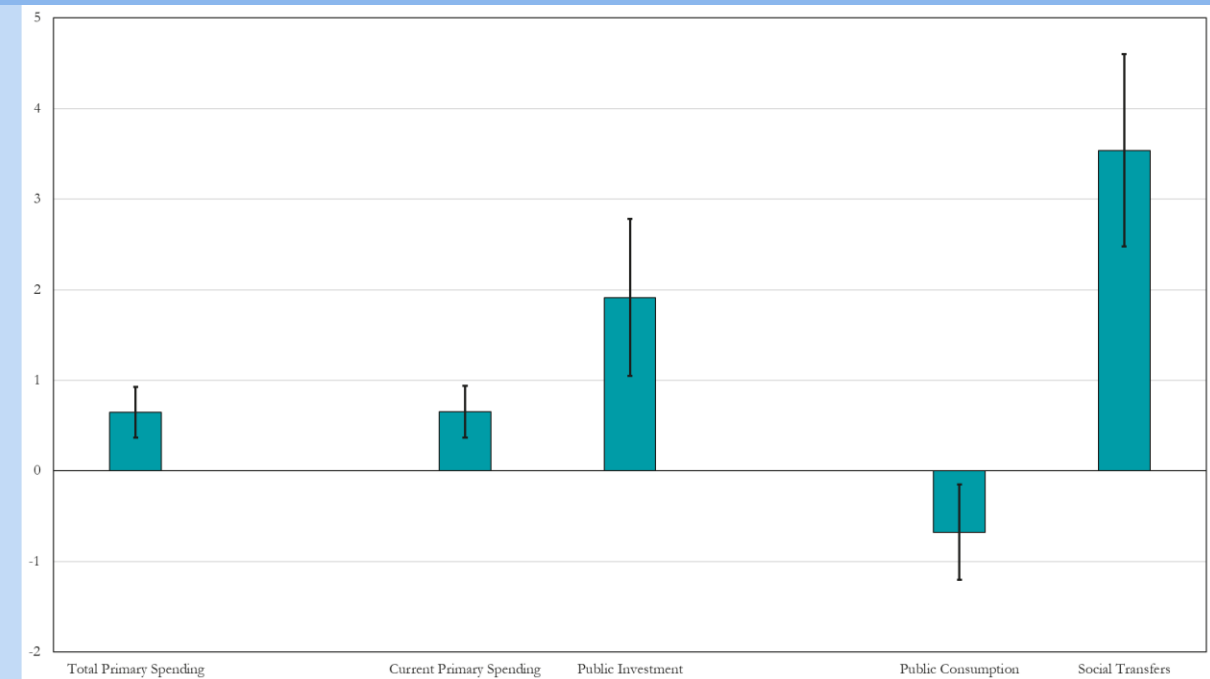
output growth than that of the more recent past: 0.21 versus 0.03 percentage points (a ratio of 7 to 1). In fact, the annual loss of economic growth for LAC in the post-2007 period is associated with the smallest output cost, marginally lower than that of Chile on the left of Figure 2.9.

We now turn to the extensive and intensive margin compositions. On average, the intensive margin explains about 66 percent of the annual loss of output growth in the LAC region, indicating that out of the 10 percent output loss, 6.6 percent was driven by the choice of shock adjustments. The intensive margin is essentially the same (67 percent) in the pre-2007 sample but falls dramatically to 21 percent in the post-2007 sample. This reflects the milder impact of the more gradual adjustments that have characterized the recent past, as opposed to the larger impact of shock-based adjustments in the distant past in LAC. Taking the entire history into consideration, Peru is the country that has suffered the most by conducting shock-based adjustments. Out of its annual loss of output growth, about 67 percent (i.e., 0.14 out of 0.21 percentage points) is explained by the intensive use of shock adjustments. In sum, this evidence stresses the importance of strengthening fiscal buffers and readiness as a means of avoiding aggressive spending cuts and large output costs, as has been the case of several countries in the LAC region in the recent past.

### *Composition of Spending Adjustment*

We now focus on the economic and social implications of spending adjustment within total primary spending categories: (i) current primary spending, which in turn involves public consumption (i.e., wages plus goods and services) and social transfers, and (ii) public investment. For this purpose, we evaluate the impact of each of these spending categories on output and the poverty rate, after two years of the spending shock. We use a sample of 16 LAC countries for the period 1990-2014 and a local projections approach (Jordà, 2005). Figure 2.10 shows the results of this analysis.

In line with previous studies, Figure 2.10. shows that the size of the fiscal multiplier associated with total primary spending is below one. In contrast, the public investment multiplier is larger than one (and actually reaches around 2 in our sample) and the multiplier associated with current primary spending is virtually identical to the one resulting from total primary spending (i.e., smaller than one). An emerging consensus regarding large investment multipliers has naturally emphasized the importance of not cutting (i.e., protecting) public investment spending as a source of medium-run growth. While many times not explicitly articulated, and particularly when facing the need of spending adjustment, this emerging consensus translates in policy recommendations pushing to adjust via current primary spending (especially if it is feasible to cut unproductive government spending). This sounds, in principle, like a good policy advice.

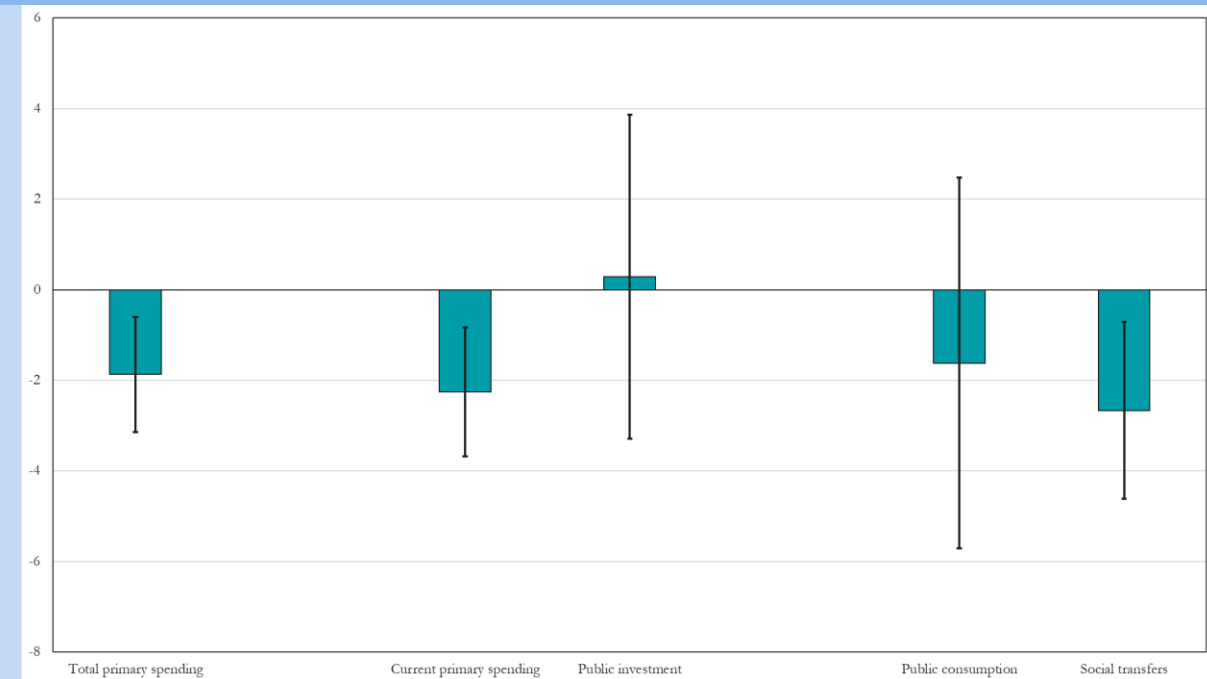
**FIGURE 2.10. Output Multipliers by Category of Spending**


Notes: Bars measure standard multipliers (i.e., change in output in response to a change in respective type of spending category). Black lines denote one-standard-error intervals. Source: Authors' calculations based on data from CEPAL.

However, and as shown in Riera-Crichton *et al.* (2018), when looking further within current primary spending categories (i.e., when differentiating between public consumption and social transfers), our findings point to large costs (both in terms of economic activity and especially in key social indicators such as the poverty rate) of adjusting via social transfers. Figure 2.11 shows that while adjusting via public consumption has no significant effect on poverty, adjusting via social transfers is extremely costly. Why? Recall that social transfers mainly involve social security and transfers to the most vulnerable households (through diverse programs). The beneficiaries of these transfers, mainly elderly people and low-income households, are in the lower percentiles of the income distribution and typically face (due to capital market imperfections, among other reasons) tight borrowing constraints. As a result, they have a larger propensity to consume compared to higher-income earners, such as public employees (a key category within public consumption). This difference is important to consider as the region engages in spending adjustment processes. Even when policymakers should be careful not to rely too heavily on cutting public investment, it should not be done at the cost of reducing social transfers which are to be found to have important costs on both output and various measures of social inclusion.



**FIGURE 2.11. Poverty Multiplier by Category of Spending**



Notes: Bars measure percentage point changes in poverty (measured by the poverty gap) in response to a change in the respective category of spending of one percent of GDP. Black lines denote one-standard-error intervals. Source: Authors' calculations based on data from CEPAL and SEDLAC.

### ***Policy conclusions***

This chapter has focused on the costs and benefits of fiscal adjustments in LAC. We have shown that there are clear long-run benefits of lowering fiscal deficits: lower inflation and higher growth. Lower inflation itself is an indirect channel that may greatly benefit long-run growth and reinforces the direct effects of lower fiscal deficits through lower debt burdens, more resources available to the private sector, and lower probability of public debt crises. In addition, lower fiscal deficits – and hence lower debt-to-GDP ratios – lead to more and cheaper access to international credit. Finally, if we take into account the potential unsustainability of high debt-to-GDP ratios, which may lead to extremely costly debt crises, the case for bringing the fiscal house in order is crystal clear.

As a very famous economist once said, though, there is no such a thing as a free lunch. The long-run gains of lower deficits come at a cost in the short run. This chapter has examined in detail such costs. First, we have pointed out that, even in the short run, lower inflation may lead to higher growth, as has been amply documented for the case of exchange-rate-based stabilizations. In situations of low inflation, however, one would expect – and our analysis clearly shows – that there will be costs. But these costs will greatly depend on how the fiscal adjustment is brought about. In particular, relying too heavily on cutting public investment, a very tempting strategy given that there are no political constituencies lobbying for public investment, will seriously jeopardize future growth. On the other hand, relying on cutting real social transfers will hurt the most vulnerable members of society. And since the “simple” solution of generating higher inflation to dilute real wages and real transfers is, by and large, no longer available, governments should strive to cut unproductive government spending.

## *Chapter 3:*

# *Challenges Ahead*

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This report has reviewed the recent growth performance in the LAC region and conducted a detailed analysis of the current fragile fiscal situation, including getting a quantitative sense of the order of magnitude of the fiscal adjustments that may be needed and the short- and long-run effects of such fiscal adjustments. Based on (i) the recent growth performance, (ii) the current fiscal situation, and (iii) the current external environment, we can conclude that the region faces the following major challenges.

First, as already emphasized in recent issues of this semiannual report, a major challenge is for the region to find and reinforce its own sources of growth to increase the long-run growth rate, which is critical to consolidate and eventually improve on the dramatic progress in social inclusion achieved during the Golden Decade of high commodity prices (2003-2012). While the recent partial recovery in commodity prices has provided a gentle push to the region's growth, it will clearly be insufficient to reach growth rates commensurate with the region's need. Indeed, the region is expected to grow at 1.8 percent in 2018, compared to 4.0 percent during the Golden Decade. While the reform needs naturally vary across countries in the region, structural reforms (particularly in the areas of labor markets, education, and pensions), increasing trade and financial integration within and outside the region, a big push in public infrastructure investment, and a tough anti-corruption framework should be at the top of the agenda.

The second major challenge will be to engage in fiscal adjustments to ensure debt sustainability in the long run and, for non-investment grade countries, the reductions in public debt needed to achieve investment grade, which will in turn provide for easier and cheaper access to international credit. While gradual fiscal adjustments are already underway in several countries in the region (most notably, Argentina, Colombia, Ecuador, El Salvador, Mexico, Panama, and Uruguay), the process has yet to gain traction in many others. Even though political uncertainty related to various upcoming elections in the region may weaken the political will to carry out these adjustments, one would still hope that, since further delays can only make things worse, broad agreements on the need to tackle these issues will prevail.

The third, and related, challenge will be to enact fiscal adjustments in such a way that they (i) are gradual, as opposed to shock adjustments, since the former carry less overall costs; (ii) do not rely excessively on cutting public investment (particularly at a time when addressing infrastructure needs in the region is critical) so as not to hurt future growth prospects; and (iii) protect the most vulnerable members of society by not cutting social transfers. Gradual fiscal adjustments will not only lead to lower inflation and higher growth in the long run, but will also help countries build some fiscal space during relatively good times and thus be ready to use fiscal policy countercyclically in the event of future downturns.

Finally, with monetary policy normalization in the United States becoming a reality and starting in Europe, LAC countries will be facing, in a not too distant future, higher international interest rates which should be expected to negatively affect capital flows into the region, weaken domestic currencies, and even perhaps economic activity. At that point, LAC countries will face once again the perennial monetary policy dilemma, analyzed in Végh *et al.* (2017b), of raising the policy interest rate to defend the currency at the cost of aggravating the underlying slowdown or lowering it to stimulate the economy at the risk of further depreciation and inflation. The good news is that several central banks in the region (like Brazil's and Colombia's) have already taken advantage of falling inflation and relatively stable currencies to stimulate the economy through lower policy rates. This will hopefully lessen the negative effects of monetary policy normalization in 2018-2019.

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# Appendices

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## Appendix A

### Debt Sustainability Assessment

Assuming that (i) time is discrete; (ii) all debt has a maturity of one period; (iii) debt is real in the sense that its face value is indexed to the price level; (iv) debt pays a constant real interest rate; and (v) seigniorage revenues are zero, the government's flow budget constraint can be written as

$$b_t = (1 + r)b_{t-1} - x_t, \quad (A.1)$$

where subscript  $t$  indicates the evaluated year,  $b_t$  is the end-of-period stock of real debt, and  $x_t$  is the real primary surplus.

Taking into the account the transversality condition,

$$\lim_{j \rightarrow \infty} (1 + r)^{-(j+1)} b_{t+j} = 0, \quad (A.2)$$

and forward-iterating (A. 1) we obtain

$$b_{t-1} = \sum_{i=0}^{\infty} (1 + r)^{-(i+1)} x_{t+i}, \quad (A.3)$$

which is the government's lifetime budget constraint. This equation states that the government finances its debt at the end of period  $t - 1$  by running primary surpluses (from here to infinity) with the same present discounted value (PDV).

Following Burnside (2004), a steady-state version of this lifetime budget constraint may be used to derive the constant primary balance whose PDV finances the initial debt stock, which will be referred to as the “debt-stabilizing primary balance” (DSPB).

Rewriting equation (A. 3) in terms of real GDP, where  $\bar{b}_t = b_t/y_t$  and  $\bar{x}_t = x_t/y_t$ , we obtain

$$\bar{b}_{t-1} = \sum_{i=0}^{\infty} (1 + r)^{-(i+1)} \bar{x}_{t+i} \left( \frac{y_{t+i}}{y_{t-1}} \right). \quad (A.4)$$

Consider a steady state in which (i) real GDP grows at a constant rate  $g$ , so that  $y_t/y_{t-1} = 1 + g$  and (ii) the primary surplus as a fraction of GDP is constant and equal to  $\bar{x}$ . Assuming, in addition, that  $r > g$ , equation (A. 4) reduces to

$$\bar{b}_{t-1} = \bar{b} \equiv \bar{x} \left( \frac{1+g}{r-g} \right). \quad (A.5)$$

Rewriting equation (A. 5) in terms of  $\bar{x}$ , we obtain the DSPB:

$$\bar{x} = \bar{b} \left( \frac{r-g}{1+g} \right). \quad (A.6)$$



For the purpose of computing the required change in the current primary balance required to maintain the debt-to-GDP ratio constant from  $t$  onwards, it is necessary to incorporate into the analysis the primary balance of the previous period. Note that this assumes that the country is not yet in the steady state previously described. Lagging one period equation (A.1), and rewriting it appropriately, we can solve for  $\bar{b}_{t-2}$  to obtain

$$\bar{b}_{t-2} = (\bar{b}_{t-1} + \bar{x}_{t-1}) \left( \frac{1+g}{1+r} \right).$$

This expression yields the level of debt-to-GDP ratio in  $t-2$ , which is consistent with the observed primary balance in  $t-1$ . This level of  $\bar{b}_{t-2}$  is the one that would lead to the constant level of debt-to-GDP ratio derived in equation (A.5).

We can then define the required one-time change in the primary balance that would render the debt-to-GDP ratio constant starting in  $t-1$ :

$$\Delta \bar{x}_t = \bar{x} - \bar{x}_{t-1}. \quad (A.7)$$

Notice that this increase in the primary balance will only occur in period  $t$ . For subsequent periods ( $t+1, t+2, \dots$ ), the government needs to run the DSPB (equal to  $\bar{x}$ ). Figure 1.11 reports the value of  $\Delta \bar{x}_t$  for LAC countries. Figure 1.12, Panel A illustrates the corresponding time path for the case of Brazil ( $\Delta \bar{x}_t$  in period  $t$  and the DSPB from  $t+1$  onwards).

### *Achieving a Target Debt Level*

Suppose that a country has a debt-to-GDP ratio at the end of period  $t$  equal to  $\bar{b}_t$  and wishes to achieve some specified debt target,  $\bar{b}^*$ , in  $J$  periods. Dividing both sides of (A.1) by real GDP and assuming a constant real growth rate  $g$  yields

$$\bar{b}_t = \left[ 1 + \left( \frac{r-g}{1+g} \right) \right] \bar{b}_{t-1} - \bar{x}_t. \quad (A.8)$$

Iterating equation (A.8) from time  $t$  to time  $t+J$ , we obtain

$$\bar{b}_t = \left[ 1 + \left( \frac{r-g}{1+g} \right) \right]^{-J} \bar{b}_{t+J} + \sum_{i=1}^J \left[ 1 + \left( \frac{r-g}{1+g} \right) \right]^{-i} \bar{x}_{t+i}. \quad (A.9)$$

Assume the government runs a constant primary balance,  $\bar{x}^*$ , between period  $t$  and period  $t+J$ . If the government is to achieve the debt target  $\bar{b}^*$  by period  $t+J$ , then it follows from (A.9) that its primary balance must be

$$\bar{x}^* = \left( \frac{r-g}{1+g} \right) \left\{ \frac{\left[ 1 + \left( \frac{r-g}{1+g} \right) \right]^J \bar{b}_t - \bar{b}^*}{\left[ 1 + \left( \frac{r-g}{1+g} \right) \right]^J - 1} \right\}. \quad (A.10)$$

Then, just as before, we can compute the one-time increase in the primary surplus that would achieve in  $J$  years a constant level of debt-to-GDP ratio equal to  $\bar{b}^*$ :

$$\Delta \bar{x}_t^* = \bar{x}^* - \bar{x}_{t-1}.$$

Figure 1.13 shows the corresponding values of  $\Delta \bar{x}_t^*$  for LAC countries assuming that the target level is such that it would correspond to an investment grade status (see below). Figure 1.12, Panel B shows the implied time path of primary surpluses for the case of Brazil.

### *Defining a Target Debt Level*

Figure 1.9 is useful in terms of defining a target debt level that would be desirable for LAC countries. Target debt levels for each country are calculated as the debt level for which the regression line (passing through each observation) and the BBB- grade (the first notch of the investment grade category) intersect.

For this purpose, we normalize Fitch ratings (ranging from default to AAA) to fit in a linear scale, and identify the numerical value in the scale consistent with the first investment grade rating, which is BBB-.

Running a simple linear regression with debt as the dependent variable and Fitch ratings as the independent variable for a sample of 19 LAC countries, we get a negative slope of -0.92. Note that the slope between two arbitrary points of a linear function is

$$slope = \frac{debt_{2i} - debt_{1i}}{rating_{2i} - rating_{1i}}. \quad (A.11)$$

If we consider subscripts 1 and 2 as two different moments in time for country  $i$  (with 1 being the present and 2 the time country  $i$  reaches the investment grade debt level), then it is straightforward to solve for  $debt_{2i}$  and obtain the debt level consistent with investment grade, which is then used as the target debt level in Figures 1.13 and 1.14. Note that since  $debt_1$  and  $rating_1$  change across countries, then the target debt levels will be different across countries.

As an illustration, consider the case of Brazil. Debt as a percentage of GDP at the end of 2017 was 74.0. Brazil has a credit rating of BB-, which represents 45.5 points in our scale, and would have to reach a rating of BBB-, which is 59.1 points. Plugging in those numbers in equation (A.11) and solving for  $debt_{2Brazil}$  (remember that the slope is always -0.92) yields a target debt level of 61.5 percent of GDP.

Another way to visualize this exercise in terms of Figure 1.9 is to shift the regression line vertically to the point corresponding to Brazil, and then find the debt level for which the shifted line intersects the BBB- rating.

## Appendix B

This appendix covers the data and methods used in Figures 1.15., 1.16., 2.1. and 2.2. Table B.1. specifies the percentiles and constraints used for the exclusion of outliers in our historical sample. Table B.2. indicates the time coverage of each variable on a country-by-country basis.

**TABLE B.1. Outlier Identification**

Variable	Outlier Identification	
	Threshold(s)	Exclude Observation if:
Average Inflation	100 (95th percentile)	Avg. Inflation > 100
Average Real GDP Growth	-2 (2.5th percentile) and 9(97.5th percentile)	Avg. RGDP gr.<-2 or Avg. RGDP gr.>9
Average Overall Fiscal Balance	-5 (5th percentile)	Avg. Overall Balance < -5
Average Primary Fiscal Balance	-4 (5th percentile)	Avg. Primary Balance < -4

**TABLE B.2. Beginning of Sample, per Country and Variable**

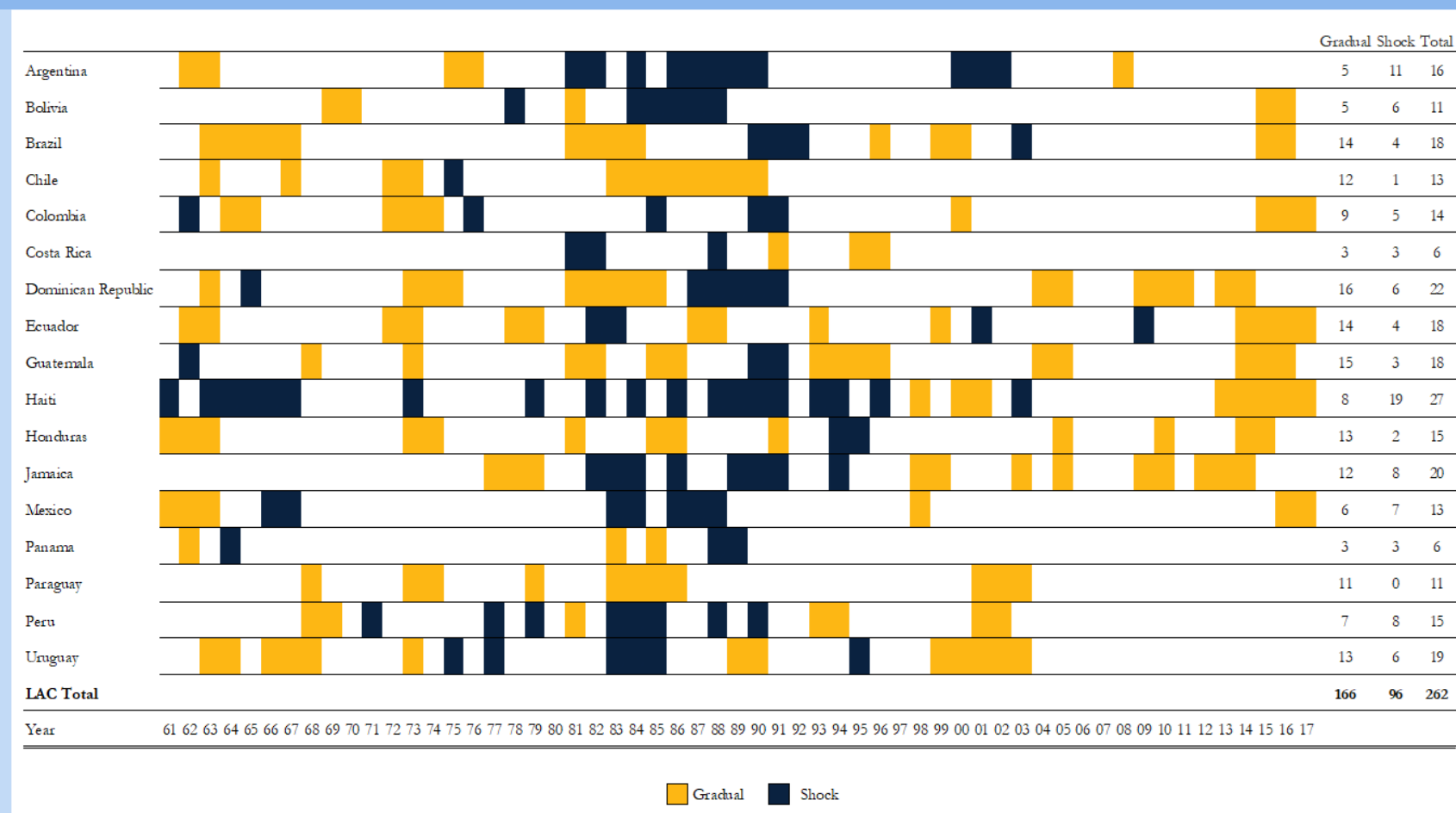
Country	Start Year			
	Inflation	Real GDP	Overall Balance	Primary Balance
Argentina	1865	1864	1864	1900
Brazil	1832	1891	1880	1900
Bolivia	1937	1945	1950	1953
Chile	1751	1820	1810	1940
Colombia	1866	1900	1905	1906
Costa Rica	1937	1921	1956	1956
Ecuador	1940	1939	1939	2000
El Salvador	1938	1920	1990	1990
Guatemala	1938	1920	1995	1995
Haiti	1950	1954	1924	1924
Honduras	1937	1920	1927	1953
Mexico	1887	1900	1900	1925
Nicaragua	1938	1920	1960	1988
Panama	1940	1945	1946	1953
Paraguay	1940	1939	1967	1967
Peru	1896	1896	1900	1970
Dominican Republic	1941	1950	1950	1980
Uruguay	1871	1870	1955	1972
Venezuela, RB	1901	1900	1920	1921

Sources: Mauro et al. (2015), Global Financial Data, MOxLAD, WDI, and WEO (October 2017).

## Appendix C

Figure C.1. shows a timeline for each country in our sample. The sample covers 17 LAC countries for the period 1960-2017. There is a total of 262 adjustment-years in the sample (166 correspond to gradual adjustments and 96 to shock adjustments).

**FIGURE C.1. Type of Fiscal Adjustment per Country and Year, 1961-2017**



Source: Authors' calculations based on data from Global Financial Data, MOxLAD, WDI, and WEO (October 2017).

## *Appendix D*

This appendix computes the output loss caused by fiscal adjustments. We estimate an overlapping rolling-window regression with the 5-year average real GDP growth as the dependent variable, and the fiscal adjustment, the fiscal adjustment squared, and a set of controls as the independent variables. The fiscal adjustment and its squared value are lagged two years, while the set of controls is lagged three years except for the terms of trade. The set of controls includes the inflation rate, institutional quality, the terms of trade, real GDP growth, the stock of debt over GDP, and a dummy variable which takes the value 1 if the country is in default and 0 otherwise. The estimation also includes fixed effects for periods and countries. Formally, the regression is given by

$$\begin{aligned} Growth_t = & 0.02 + 0.03 Adj_{t-2} - 0.17(Adj_{t-2})^2 + 0.00004 ToT_t - 0.003 Default_{t-3} \\ & + 0.26 GDP_{t-3} - 0.006 IQ_{t-3} - 0.00008 Inflation_{t-3} + 0.00008 Debt_{t-3}. \end{aligned}$$

To obtain the spending adjustment multiplier, we use the estimated coefficients from the regression above and compute the change in output after two years in response to a unit spending cut. Formally, we first use  $(0.03 - 0.17 \times \text{adjustment})$  to get an output-to-spending elasticity and then multiply it by five (the average output-to-primary-spending ratio in LAC). Based on these estimations, we first report the spending adjustment multipliers in Figure 2.8 and then the output losses in Figures 1.17 and 2.9.

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