Latin America Macroeconomic Outlook
A Global Perspective
Are the Golden Years for Latin America Over?

Ernesto Talvi

Ignacio Munyo

CERES
Centro de Estudios de la Realidad Económica y Social

B | Global Economy and Development at BROOKINGS

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A Global Perspective

Are the Golden Years for Latin America Over?

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ERNESTO TALVI

Senior Fellow and Director of the Brookings Global-CERES
Economic and Social Policy in Latin America Initiative

Academic Director, CERES

Visiting Professor, Columbia University

IGNACIO MUNYO

Senior Research Economist, CERES

Nonresident Fellow, Brookings Institution

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JUNE 2013

EXECUTIVE SUMMARY

Latin America is cooling off and it is doing so sharply. In contrast with the 6.6 percent average growth rates prevailing between September 2003 and September 2008—the pre-Lehman-crisis "Golden Years" for the region—LAC-7 GDP growth rates in 2012-2013 are decelerating significantly and reverting back to their historical average of 3.7 percent displayed over the last 20 years. Moreover, growth rates are cooling off in almost every major country in the region with the notable exception of Mexico.

This cooling-off has occurred in spite of the fact that external conditions for the region are slightly more favorable today than they were during the Golden Years. If one takes a close look at the key external drivers of Latin America's growth rates identified in Izquierdo, Romero and Talvi (2008), a model that does a very good job of tracking out-of-sample growth rates in the region, the picture that emerges is the following: i) the global growth rate (the G-7 plus China) is currently 0.8 percentage points below the observed rates during the Golden Years; ii) commodity prices are 40 percent above the average prices observed during the Golden Years and very close to the maximum values of that period; iii) emerging markets' bond yields are close to 5 percent, a rate which is not only significantly below the average of 7.4 percent that prevailed during the Golden Years but also is significantly below the minimum rate observed during that period; and iv) capital inflows to the region—currently running at approximately $270 billon—are three times the average observed during the Golden

Years and higher than the maximum level achieved during that period.

In fact, if we use the external factors model just mentioned to simulate future performance under current external conditions and those prevailing during the Golden Years, growth rates and output levels are consistently higher under current conditions. This means that the current combination of external conditions—lower global growth with higher commodity prices and lower capital and borrowing costs—is overall more favorable than the one prevailing during the Golden Years.

How can we explain the paradox of the regional cooling-off in economic activity in a context where external conditions are, on average, even better than those prevailing during the Golden Years? During the Golden Years, external conditions improved significantly relative to the preceding period (1998-2003): Global growth increased from 3.0 percent to 3.8 percent, commodity prices jumped an average of 75 percent, and the yield of the emerging market bonds fell from an average rate of 13.5 percent to 7.4 percent.

Such a huge external impulse during the Golden Years contrasts with current external conditions: They are still very favorable, but have ceased to improve. This is a crucial difference. Since improvements in some key external drivers have level effects and not growth effects, the impact on growth of an improvement in external conditions will dissipate over time. Therefore, the cooling-off we are seeing today is the natural

and predictable outcome of external conditions that remain very favorable for the region, even more favorable than those of the Golden Years, but that have ceased to improve. Given the complex dynamics that link external factors with regional growth rates, the effect of past improvements in external conditions is fading away.

The previous analysis implies that we should be careful when reading Latin America's current growth performance: It is not the case that the region is doing relatively well in a more hostile external environment; rather, the region's growth rates are slowing down significantly in spite of the fact that the external environment remains favorable overall. In other words, unless we anticipate that external conditions will improve significantly relative to current levels, the observed slowdown in growth rates is not an oddity that will go away anytime soon. Rather, it is more likely to be the "new normal" even if external conditions remain favorable.

This report also explores whether idiosyncratic factors in Latin America are playing a role in either mitigating or contributing to the cooling-off set in motion by the dynamics of external factors. After many years of high growth well above the region's historical average, it may be the case that production possibilities are being exhausted in a region where, in many cases, improvements in physical and technological infrastructure and human capital may have not kept up with the strong output growth performance of the past few years. If this were the case, the rate of growth of economic activity should decline due to restrictions in some of the inputs of the production process that make it impossible for output to continue growing at previous rates. For this reason, among the multiple relevant idiosyncratic factors, we focus on identifying countries in the region where supply bottlenecks may have developed.

In order to identify countries with supply bottlenecks, we estimate the production possibility frontier based on the current endowments of natural capital, human capital, physical and technological infrastructure, and total factor productivity for each country in the region and assess which countries are above and below the production possibility frontier.

Not surprisingly, the countries with supply bottlenecks—those above the production possibility frontier according to our identification strategy—are the ones experiencing the greatest growth reversals. If we compare the 2012-2013 growth rates with the growth rate of the Golden Years, the slowdown in countries with supply bottlenecks is 2 percentage points higher on average than in countries without supply bottlenecks.

To conclude, current growth rates in Latin America are cooling off in spite of a still very favorable external environment as the impact of the past improvements in external conditions on growth dissipate through time and supply bottlenecks kick in. Even if external conditions for the region remain favorable, unless they start improving once again they are unlikely to be a renewed source of stimulus for higher growth rates as they were during the Golden Years, when external conditions markedly improved.

Stimulus to higher growth, thus, must come from domestic sources. During the years of very high growth rates, there were visible improvements in macro-prudential policies and successful implementation of targeted social programs in many countries in the region. However, the region still drags substantial deficits—with notable exceptions—in the quality of its human capital, the quality of its physical and technological infrastructure, and its productivity levels.

It is undeniable that Latin America's spell of vigorous growth in the last decade translated into higher incomes, lower poverty rates and a rising middle class (as measured by income). This high growth created a sense of progress, hope and opportunity. If these are to become tangible realities, high growth rates need to be sustained. Policymakers should not expect this to happen due to a new round of good fortune coming from abroad, but rather as a result of their efforts to elicit internal transformations that start closing the region's deficits to rekindle higher growth. Failure to do so may result in a new wave of disappointment.

# I. COOLING-OFF IN LATIN AMERICA: AN EMERGING MARKET PHENOMENON

Latin America is cooling off and it is doing so sharply. In contrast with the 6.6 percent average growth rates prevailing between September 2003 and September 2008—the pre-Lehman-crisis "Golden Years" for the region—LAC-7 GDP growth rates in 2012-2013 are decelerating significantly and reverting back to their historical average of 3.7 percent displayed over the last 20 years (see Figure 1).[1] Moreover, growth rates are cooling off in almost every major country in the region with the notable exception of Mexico.

What lies behind this sharp deceleration of economic growth in LAC-7? Is this cooling-off the result of changes in the external environment? Prima facie, the answer is yes, since this cooling-off in growth rates is not just a Latin American phenomenon but appears to be taking place in every emerging region of the world.

As depicted Figure 2 panel a, growth rates in 2012-2013 in emerging Asia—defined as the simple average of China, India, Indonesia, Thailand, Malaysia and the Philippines, countries that represent 93 percent of the regional GDP—declined to 6.1 percent compared to the 6.9 percent observed during the Golden Years.

Figure 1. GDP Growth in Latin America
(LAC-7, real GDP growth)
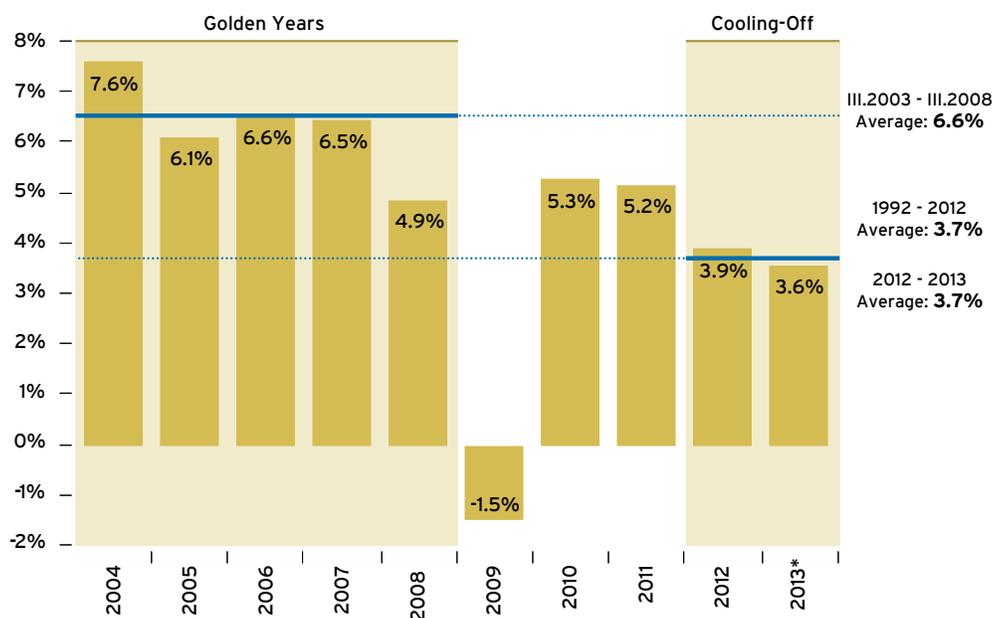
Notes: LAC-7 is the simple average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of Latin America's GDP. "Golden Years" is defined as the period from III.03 to III.08, and "Cooling-Off" is the period 2012-2013. *Forecast
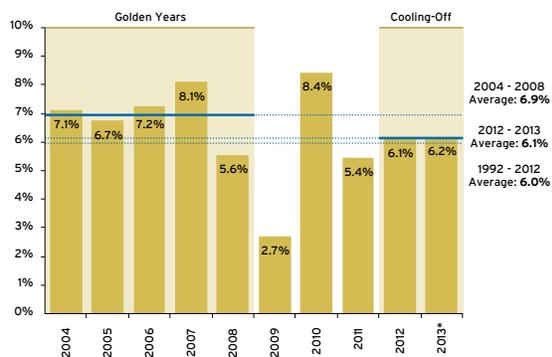Data sources: National Statistics and Focus Economics.

1   LAC-7 refers to the seven largest Latin American economies, namely, Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of the region's GDP.
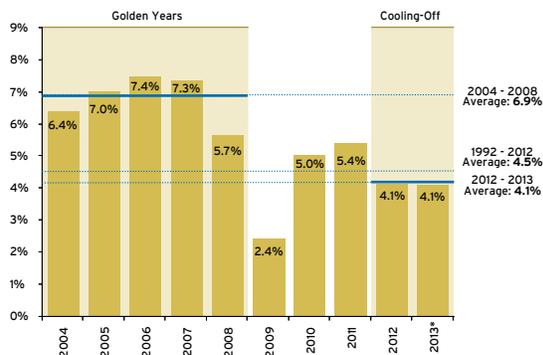
Figure 2. GDP Growth in Other Emerging Regions

a. Emerging Asia (EA-6, real GDP growth)

Golden Years — Cooling-Off

7.1%, 6.7%, 7.2%, 8.1%, 5.6%, 2.7%, 8.4%, 5.4%, 6.1%, 6.2%

2004 - 2008 Average: **6.9%**
2012 - 2013 Average: **6.1%**
1992 - 2012 Average: **6.0%**

b. Emerging Europe (EE-8, real GDP growth)

Golden Years — Cooling-Off

7.7%, 5.8%, 7.3%, 6.1%, 3.5%, -5.3%, 3.9%, 4.4%, 1.3%, 2.5%

2004 - 2008 Average: **6.1%**
1993 - 2012 Average: **2.6%**
2012 - 2013 Average: **1.9%**

c. Emerging Middle East and Africa (MENA and SSA, real GDP growth)

Golden Years — Cooling-Off

6.4%, 7.0%, 7.4%, 7.3%, 5.7%, 2.4%, 5.0%, 5.4%, 4.1%, 4.1%

2004 - 2008 Average: **6.9%**
1992 - 2012 Average: **4.5%**
2012 - 2013 Average: **4.1%**

Notes: EA-6 is the simple average of China, India, Indonesia, Thailand, Malaysia and the Philippines. EE-8 is the simple average of Russia, Turkey, Poland, Ukraine, Czech Republic, Romania, Kazakhstan and Hungary. MENA and SSA is the simple average of Iran, Saudi Arabia, South Africa, Egypt, Nigeria, Algeria, the United Arab Emirates, Morocco, Angola, Ghana and Kenya. The numbers for 2012 are estimates.
*Forecast
Data Source: IMF.

Figure 2 panel b depicts growth rates in emerging Europe—defined as the simple average of Russia, Turkey, Poland, Ukraine, Czech Republic, Romania, Kazakhstan and Hungary, countries that represent 83 percent of regional GDP. In 2012-2013 their growth rates declined to 2.6 percent, significantly below the 6.1 percent growth rates displayed during the Golden Years.

Finally, as illustrated in Figure 2 panel c, growth rates in the Middle East and Africa—defined as the simple average of Iran, Saudi Arabia, South Africa, Egypt, Nigeria, Algeria, the United Arab Emirates, Morocco, Angola, Ghana and Kenya, countries that represent 71 percent of regional GDP—display a very similar pattern. In 2012-2013 growth rates declined to 4.1 percent, well below the 6.9 percent growth rate observed during the Golden Years.

Interestingly, in every emerging region growth rates in 2012-2013 appear to be reverting back to the average growth rates of the last 20 years, as if a "generalized regression to the mean phenomenon" was taking place in emerging markets.[2]

The generalized cooling-off in emerging markets clearly suggests common external factors might be playing a key role in driving this phenomenon. In Section II we explore in depth whether the deceleration in GDP growth rates in Latin America is inherent to the dynamics of the key external drivers that affect the region's economic performance and assess whether the decline in growth rates is a temporary blip or a "new normal." In Section III we analyze what role (if any) idiosyncratic factors play in explaining the cooling-off phenomenon in Latin America. Section IV concludes.

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2 Mean growth rates in the last 20 years for emerging Asia, emerging Europe and the Middle East and Africa are 6 percent, 2.6 percent and 4.5 percent, respectively.

II. THE DYNAMICS OF THE EXTERNAL FACTORS

The literature has long recognized external factors as strong determinants of economic performance in Latin America. In the early 1990s, a seminal paper by Calvo, Leiderman and Reinhart (1993) pointed out the relevance of external factors for the region. More recently, Izquierdo, Romero and Talvi (2008)—henceforth IRT (2008)—expanded in various dimensions the work of Calvo et al. (1993) and developed a Vector Error Correction Model to analyze the impact of external factors on Latin America's growth performance. They identify three key external drivers: global output growth, commodity prices and international capital market conditions for emerging economies. These three factors alone account for more that 50 percent of the variance of LAC-7 GDP. [3]

Has the current external environment facing Latin America deteriorated? Is a more hostile external environment responsible for the cooling-off in growth rates that we are observing in the region? Let us look closely at the three key external drivers one at a time.

First, let us take a glance at global output growth. As illustrated in Figure 3 panel a, global growth rates in 2012-2013 declined to 3 percent, significantly below the growth rates of 3.8 percent observed during the Golden Years (September 2003-September 2008). For an inattentive observer this fact taken in isolation might suggest the region is now facing less favorable external conditions that justify Latin America's slower growth rates.
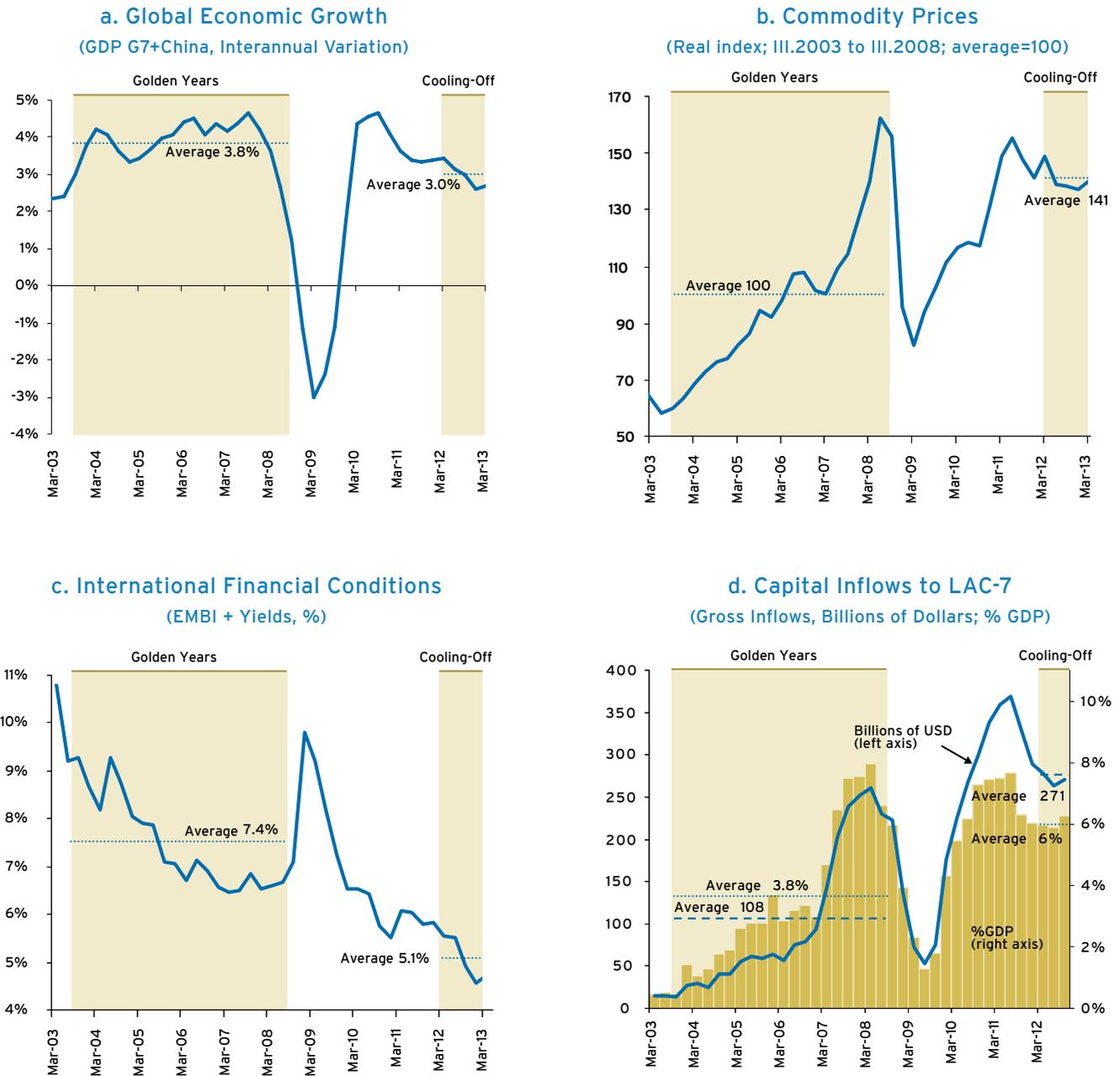
However, this is not the picture that emerges when looking at other equally relevant external determinants of LAC-7 economic performance. In fact, commodity prices are currently 40 percent above the average prices observed during the Golden Years and very close to the maximum values of the 2004-2008 period (see Figure 3 panel b). At the same time, emerging markets' bond yields are currently close to 5 percent, a rate which is not only significantly below the 7.4 percent average of the Golden Years but also significantly below the minimum rate observed during that period (see Figure 3 panel c). This low world interest rate and risk premia environment has led to historically high capital inflows to Latin America—currently running at more than $270 billon a year, three times higher than the average level observed during the Golden Years and even above the maximum levels attained during that period (see Figure 3 panel d).

Given that two out of the three relevant external drivers of economic growth facing the region are more favorable today than in the Golden Years, it is not obvious at first glance that the external environment for LAC-7 has actually deteriorated.

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3   Along the lines of Izquierdo, Romero and Talvi (2008), Österholmand and Zettelmeyer (2008) and Levy-Yeyati and Cohan (2011) present different econometric approaches to quantify the impact of the external factors on economic activity in Latin America.

Figure 3. Key External Drivers of LAC-7 Economic Performance

a. Global Economic Growth
(GDP G7+China, Interannual Variation)

Golden Years

Cooling-Off

Average 3.8%

Average 3.0%

b. Commodity Prices
(Real index; III.2003 to III.2008; average=100)

Golden Years

Cooling-Off

Average 100

Average 141

c. International Financial Conditions
(EMBI + Yields, %)

Golden Years

Cooling-Off

Average 7.4%

Average 5.1%

d. Capital Inflows to LAC-7
(Gross Inflows, Billions of Dollars; % GDP)

Golden Years

Cooling-Off

Billions of USD
(left axis)

Average 271

Average 6%

Average 3.8%

Average 108

%GDP
(right axis)

Notes: LAC-7 is the simple average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of Latin America's GDP. Golden Years is the period from September-03 to September-08. Cooling-off is the period from 2012 to 2013. Data sources: IMF, Bloomberg and national statistics.

To gauge the behavior of external factors affecting LAC-7's economic performance in a systematic way, we developed the External Conditions Index (ECI). The ECI is depicted in Figure 4. This index is a weighted average of the three key external drivers identified by IRT (2008): i) global economic growth (G-7 plus China); ii) commodity prices (oil, metals and foods); and iii) international financial conditions (as measured by EMBI spreads).

The weights of each of the three components were defined by their relative importance in explaining LAC-7's economic growth. The index is quarterly, covers the period ranging from March 1990 to March 2013

and is normalized to take values between 0 and 1. This indicator allows us to classify external conditions faced by LAC-7 into five regions: very unfavorable, unfavorable, neutral, favorable and very favorable (see Appendix 1 for technical details).

The index of external conditions for LAC-7 is intended as a barometer that rigorously measures the pressure that external factors are putting on the region, either in a favorable or unfavorable way. Figure 5 panel a presents the frequency distribution of external conditions for LAC-7. Since the early 1990s, LAC-7 faced neutral external conditions 34 percent of the time. On the negative side, LAC-7 faced unfavorable

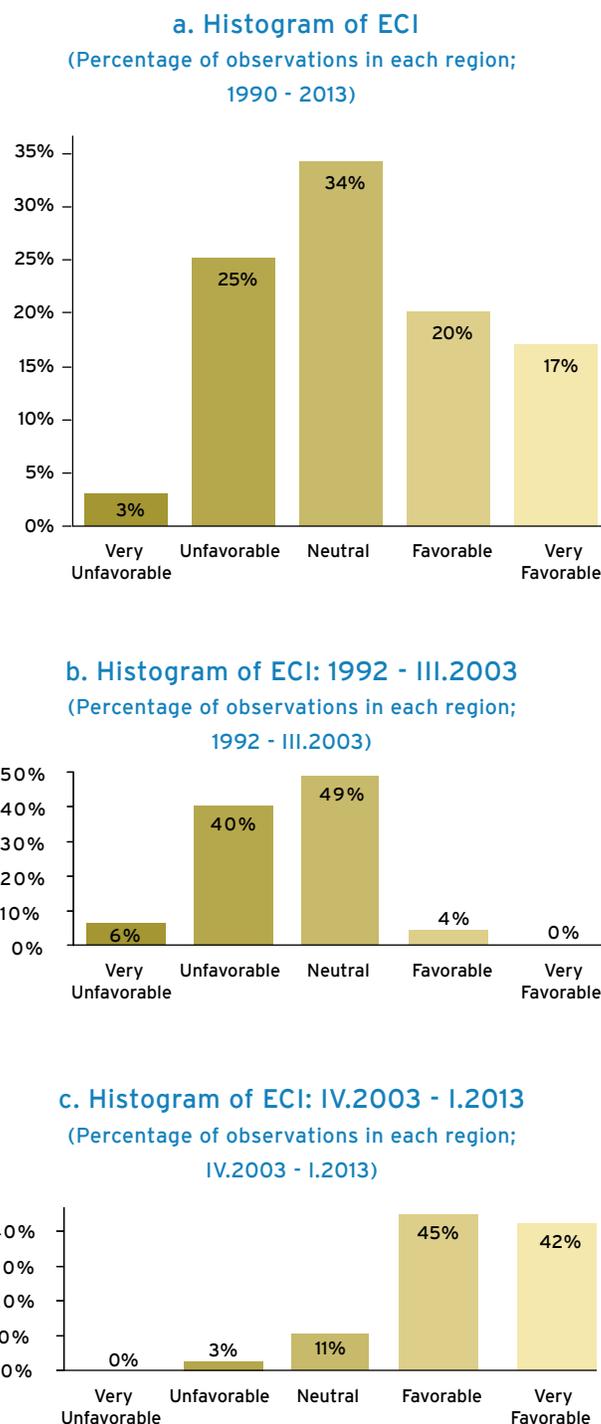## Figure 4. External Conditions Index for LAC-7 (ECI)
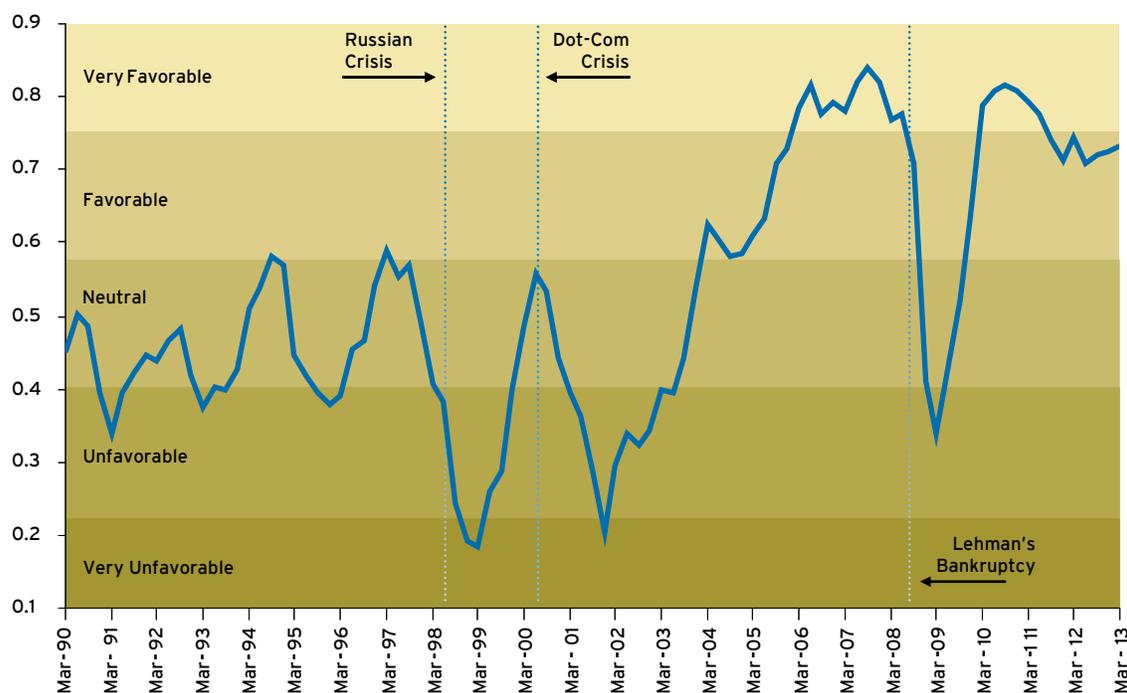
Notes: LAC-7 is the simple average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of Latin America's GDP.
Data Sources: IMF, National Statistics and Bloomberg.

conditions 25 percent of the time and very unfavorable conditions only 3 percent of the time. On the positive side, LAC-7 faced very favorable conditions 17 percent of the time and favorable conditions 20 percent of the time. This frequency histogram for the entire period, which is close to a normal distribution, conceals very different frequency patterns between the 1992-2003 and 2004-2013 sub-periods. During the 1992-2003 sub-period the distribution is skewed to the left, i.e., LAC-7 faced neutral, unfavorable or very unfavorable conditions 96 percent of the time (see Figure 5 panel b). In contrast, during the 2004-2013 sub-period the distribution is skewed to the right, i.e., LAC-7 faced neutral, favorable and very favorable conditions 97 percent of the time (see Figure 5 panel c).

It should come as no surprise that the matching between the regions of the external conditions index and economic performance in LAC-7 is remarkably high (see Figure 6). If we compute the observed average growth rate of LAC-7 GDP, we observe that in the quarters when external conditions were very unfavorable, the region contracted at a yearly rate of 1.6 percent whereas in the quarters when external conditions were unfavorable the region grew at a yearly rate of 1.4 percent. Economic growth accelerated to 3.7 percent, 5.2 percent and 6.2 percent in the quarters when the conditions were neutral, favorable and very favorable, respectively.

According to the ECI, the cooling-off in LAC-7 growth rates has occurred in spite of the fact that current external conditions for the region are slightly more

Figure 5. Histogram of External Conditions Index for LAC-7 (ECI)

a. Histogram of ECI
(Percentage of observations in each region; 1990 - 2013)

b. Histogram of ECI: 1992 - III.2003
(Percentage of observations in each region; 1992 - III.2003)

c. Histogram of ECI: IV.2003 - I.2013
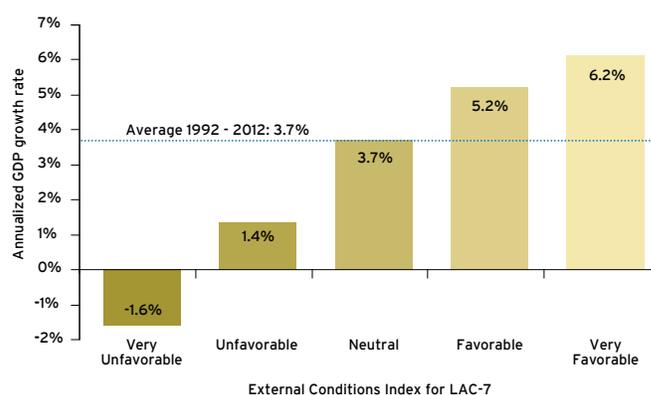(Percentage of observations in each region; IV.2003 - I.2013)

Notes: LAC-7 is the simple average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of Latin America's GDP.

favorable on average than they were during the Golden Years. The current average value of the ECI for the 2012-2013 period is 0.73, compared to an average of 0.7 during the Golden Years. In fact, if we use the IRT (2008) external factors model to simulate future performance under two alternative scenarios, i.e., current external conditions and average conditions prevailing during the Golden Years, growth rates and output levels are consistently higher under current conditions. This means that the current combination of external conditions—lower global growth, but with higher commodity prices and lower capital and borrowing costs—is overall more favorable than the one prevailing during the Golden Years.[4]

The question we now need to answer is how to explain the cooling-off of economic activity in LAC-7 in a context where current external conditions are slightly better than those prevailing during the Golden Years. Why does the party appear to be over? To shed light on this apparent paradox we compare the current dynamic of external factors with the one observed during the Golden Years. From 2003-2008, external factors faced by LAC-7 experienced a dramatic improvement compared to the previous period (1998-2003): Global growth increased from an average 3 percent to 3.8 percent, commodity prices jumped an average 75 percent, and the yield of the emerging market bonds fell from an average rate of 13.5 percent to 7.4 percent.

Such a huge external impulse during the Golden Years contrasts with current external conditions: They are still very favorable, but have ceased to improve. This is a crucial difference. Since improvements in some key external drivers have level effects and not growth effects, the impact on growth of an improvement in external conditions will dissipate over time. Specifically, the external factors that according to the IRT (2008) model have permanent effects on LAC-7 growth rate—such as global growth—have experienced transitory improvements, and the external factors that have transitory effects on growth rates—such as commodity prices and international financial conditions—have experienced persistent improvements.[5]

Figure 6. External Conditions Index and Economic Growth in LAC-7
(Average annual GDP growth)

Note: LAC-7 is the simple average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of Latin America's GDP.

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4   To perform the simulation, we compare the evolution of predicted output under two scenarios. In the first scenario, we impute to the model the average values of the relevant external factors observed during the Golden Years. In the second scenario, we impute to the model the average values of the relevant external factors prevailing in the 2012-2013 period.

5   The IRT (2008) external factors model predicts that a transitory increase of one standard deviation (0.6 percentage points) in the global growth rate produces an increase in LAC-7 growth rate of up to 0.4 percent, while its effects dissipate after 7 quarters. On the other hand, a permanent increase of one standard deviation (2.1 percentage points) in the terms of trade produces an increase in Latin America's growth rate of up to 0.3 percent, and its effects last 10 quarters. Finally, a permanent increase of one standard deviation (65 basis points) in the risk premium produces a fall in Latin America's output growth rate of up to 0.3 percent, and its effects dissipate after 10 quarters.

Therefore, the cooling-off that LAC-7 is currently experiencing is the natural and predictable outcome of external conditions which remain favorable for the region—even more favorable on average than those of the Golden Years, but that have ceased to improve. Given the complex dynamics that link external factors with regional growth rates, the effect of past improvements in external conditions is fading away. In fact, given the observed dynamics displayed by the relevant external factors (see Figure 7), the IRT (2008) external factors model would have predicted the slowdown in economic activity in LAC-7.[6]

The analysis of this section implies that we should be careful when reading Latin America's current growth performance. In our view, it is not the case that the region is doing relatively well in a more hostile external environment, but, rather, the region's growth rates are slowing significantly in spite of the fact that the external environment remains overall very favorable. In other words, unless we anticipate external conditions to improve significantly relative to current levels, the observed slowdown in growth rates is not an oddity that will go away any time soon. Rather, it is more likely to be the "new normal" even if external conditions remain favorable.

Figure 7. GDP Growth in LAC-7: Actual and Predicted
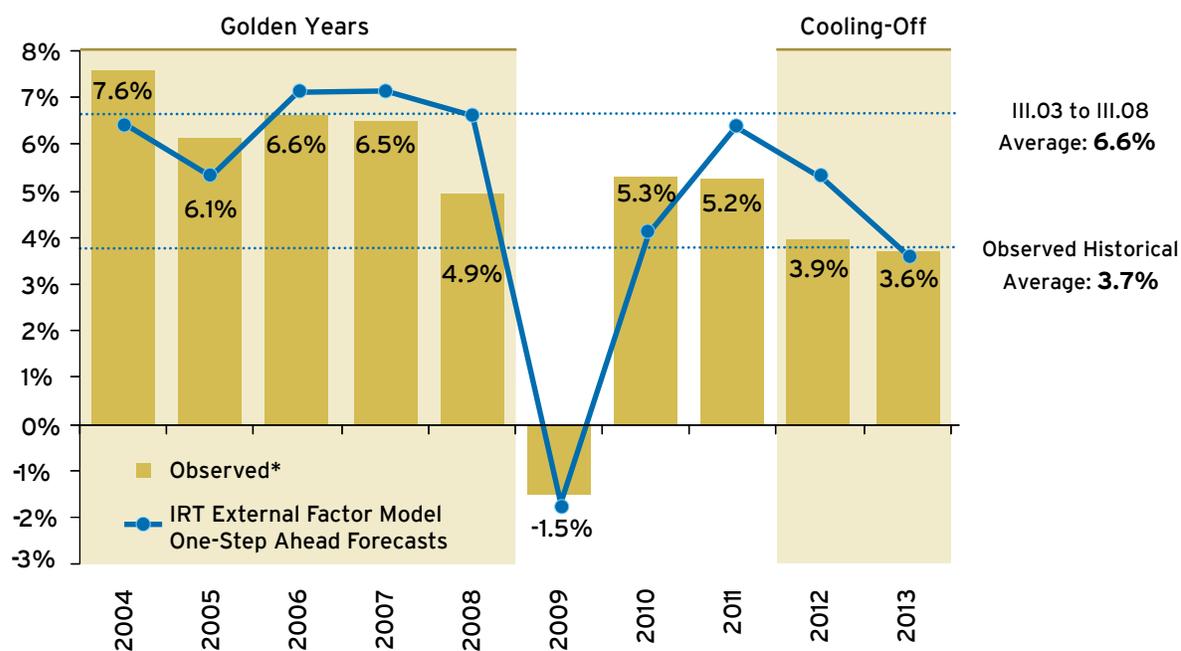
Notes: LAC-7 is the simple average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of Latin America's GDP. 2013 are market forecasts. Historical average refers to the 1992-2012 period. IRT stands for Izquierdo, Romero and Talvi (2008).
Data sources: Own calculations, national statistics and Focus Economics.

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6   It is interesting to note that the out-of-sample forecasts of the model estimated up to 2006 remain very similar to the one-step-ahead forecasts.

III. IDIOSYNCRATIC SUPPLY BOTTLENECKS

In this section we explore whether idiosyncratic factors in Latin America are also playing a role either in mitigating or contributing to the cooling-off set in motion by the dynamics of external factors.

After many years of high growth, well above the region's historical average, it may well be the case that production possibilities are being exhausted in a region where in many cases improvements in the physical and technological infrastructure and in human capital may have not kept up with the strong output growth performance of the past few years. If this were the case, the rate of growth of economic activity should decline due to restrictions in some of the inputs of the production process that make it impossible for output to continue growing at previous rates. For this reason, among the multiple relevant idiosyncratic factors, we focus on identifying countries in the region where supply bottlenecks might have emerged.

Paradigmatic examples of supply bottlenecks are spread all around the region. For instance, physical infrastructure shortfalls such as inland logistics trucking are a big concern in Brazil. In fact, the line of trucks waiting to unload soybeans at the port of Santos—the biggest in Brazil—has surged to 15 miles long, the longest ever, and an all-time high of more than 200 ships may have to wait for as many as 54 days to be loaded.[7]

In Argentina and Venezuela, energy shortages have curbed production. In Venezuela, the state-run utility company (Corpoelec) schedules rolling blackouts in several regions in order to reduce electricity consumption, while in Argentina a dysfunctional energy market has also resulted in natural gas cuts for factories.[8]

In the labor market there are also illustrative examples. According to a recent study contracted by Cisco to the International Data Corporation (2013), the current mismatch in Latin America between the supply and demand of trained workers in information and communication technologies will hinder productivity and production in the near future. Cisco estimates that in 2011 the gap between supply and demand of professionals trained in network planning, design, management and support, and information technologies was 27 percent, and it is expected to jump to 35 percent in 2015.

In order to identify countries with supply bottlenecks in a systematic way, we estimate for each country in the region the production possibility frontier (PPF) based on the current endowment of natural capital, human capital, physical and technological infrastructure, and total factor productivity. Based on these estimates, we assess which countries are producing above the PPF and thus are likely to be experiencing problems of supply bottlenecks.

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7   See Bloomberg (2013).
8   See Financial Times (2010) and Huff Post World (2011).

For empirical implementation, we consider a sample of 89 developed and emerging countries around the world that have data availability. We then perform a regression analysis to estimate the relationship that links current levels of per capita GDP with the observed endowment of production factors (see Appendix 2 for technical details). This empirical relationship is used to compute the PPF of 18 countries in Latin America. Results are presented in Figure 8. The 45 degree line separates Latin American countries where current levels of output are above the estimated PPF from countries where current levels of output are below the estimated PPF. According to Figure 8, 50 percent of the countries, mostly located in South America, are above their PPF while the rest of the countries, mostly located in the Mexico and Central America region, are below their PPF.

It should come as no surprise that it is predominantly South American countries that are experiencing supply bottlenecks. According to Talvi, Munyo and Perez (2012), South American countries were strong beneficiaries of what they call the "New Global Economic Geography" due to their structural characteristics: i) net commodity exporters, who benefited from historically high commodity prices;

Figure 8. Production Possibility Frontier and Observed Output
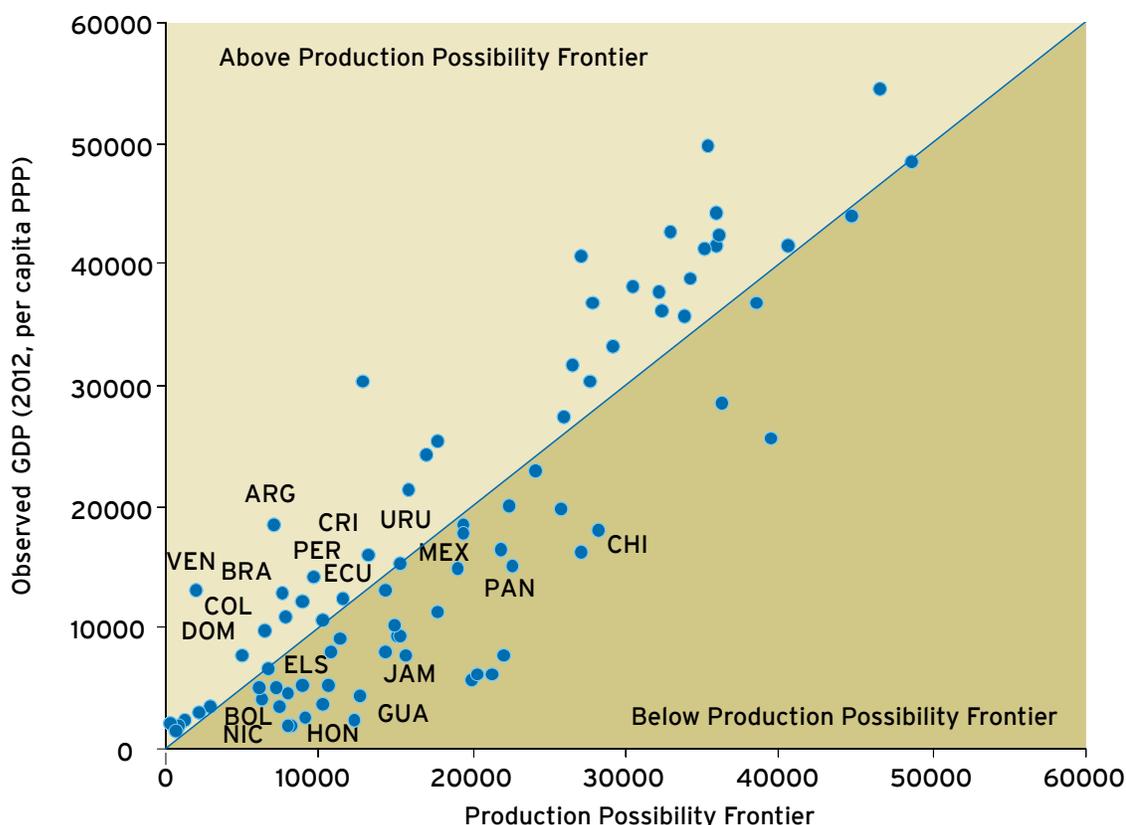
Notes: Production Possibility Frontier calculated considering the following four factors: a) Natural Capital: Net Present Value of Natural Resources (World Bank 2011). b) Human Capital: Average level of education of population over 25 years old (Barro-Lee 2010). c) Physical Capital: Quality of Overall Infraestructure (World Economic Forum 2012). d) Total Factor Productivity: Sum of Quality of Instituions and Development of the Financial Sector (World Economic Forum 2012). Growth Reversal is the difference between 2012-2013 annualized growth and III.2003-III.2008 annualized growth.

ii) economies with a large share of exports of goods and services to dynamic emerging economies who benefited from the migration of economic vitality from advanced to emerging economies; iii) economies with low dependence on remittances flowing from advanced economies; and iv) economies with high levels of integration to global capital markets that benefited from a low-interest-rate, low-risk-premium environment. As a result, many South American countries were the recipients of large inflows of capital and displayed very high rates of growth.

For robustness, we use an alternative strategy to identify countries with supply bottlenecks. We consider countries where current levels of output are above their pre-crisis trend levels as those with supply bottlenecks, while countries where current levels of output are below their pre-crisis trend levels as those without supply bottlenecks.[9] There is a strong matching between both identification strategies: 87 percent of the countries where current output is above their PPF, and presumed to be constrained by supply bottlenecks, are also above their pre-crisis trend levels.

Interestingly, Latin American countries with supply bottlenecks—those where output is above the PPF—are the ones experiencing the greatest growth decelerations when comparing growth rates of the period 2012-2013 to those of the Golden Years. This fact can be illustrated in two ways. Figure 9 panel a shows there is a high and negative correlation (-0.74) between the ratio of the PPF to current output and the size of the growth deceleration, i.e., the smaller the ratio and thus the larger the observed GDP relative to the possibility frontier, the larger the observed growth deceleration.

Figure 9. Supply Bottlenecks and Cooling-Off in Latin America

a. Distance to Production Possibility Frontier and Growth Deceleration
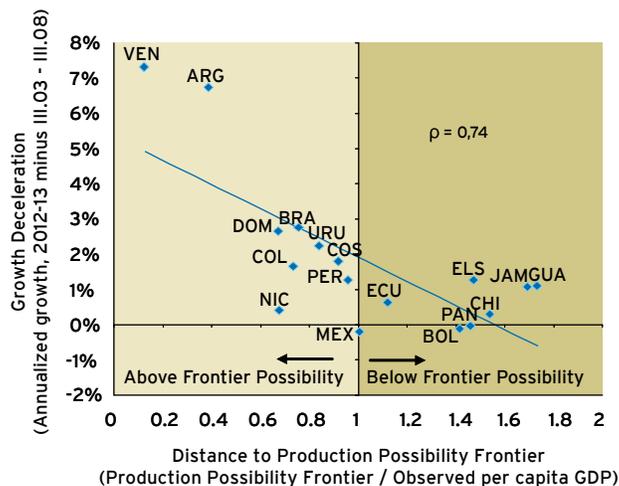
b. Position with Respect to Production Possibility Frontier and Growth Deceleration
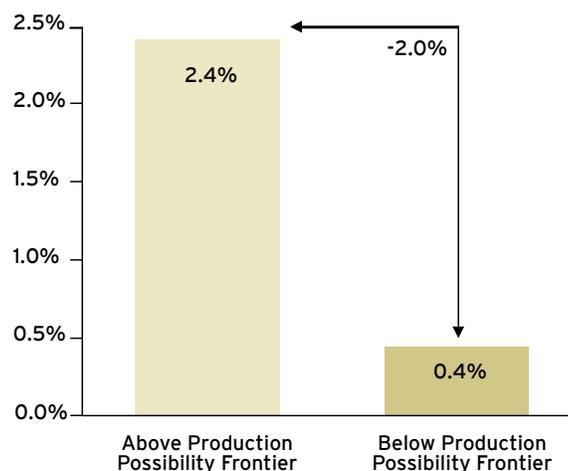
Notes: Growth deceleration is the difference between 2012-13 annualized growth rate and III.2003-III.2008 annualized growth rate.

9   Pre-crisis trend levels were calculated for the period 2000–2006. Both linear and exponential trends were considered, and the one that yielded the best fit was chosen.

Alternatively, if we separate Latin American countries into two groups, those where current output is above their PPF and those where it is below their PPF, and then compute the average growth deceleration in 2012-2013 relative to the Golden Years of 2003-2008 for each of the groups, we observe a significantly larger deceleration in the former than in the latter: 2.4 percentage points vs. 0.4 percentage points, respectively (see Figure 9 panel b).[10]

To summarize, the evidence presented in this section suggests that supply bottlenecks in several countries in the region are amplifying the impact of external factors that point in the direction of a generalized cooling-off for Latin American economies.

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10   Results are very similar if we consider trend GDP as the alternative identification strategy of supply bottlenecks.

IV. FINAL THOUGHTS

Current growth rates in Latin America are cooling off in spite of a still very favorable external environment as the impact of past improvements in external conditions on growth dissipate through time and supply bottlenecks kick in.

Even if external conditions for the region remain favorable, unless they start improving once again, they are unlikely to be a renewed source of stimulus to higher growth rates as they were during the Golden Years, when external conditions improved markedly.

Stimulus to higher growth must thus come from domestic sources. During the years of very high growth rates, there were visible improvements in macro-prudential policies and successful implementation of targeted social programs in many countries of the region. However, the region still drags substantial deficits, with notable exceptions, in the quality of its human capital, the quality of its physical and technological infrastructure, and its productivity levels. According to comparable international data on

each of these dimensions, the average country in the region ranks in the third quintile in human capital and productivity and in the fourth quintile in infrastructure. Moreover, 76 percent, 88 percent and 79 percent of the countries of the region rank below the third quintile in human capital, infrastructure and productivity, respectively.[11]

There can be no denial that Latin America's spell of vigorous growth in the last decade translated into higher incomes, lower poverty rates and a rising middle class (as measured by income). This high growth created a sense of progress, hope and opportunity. If these are to become tangible realities, high growth rates need to be sustained. Policymakers should not expect this to happen due to a new round of good fortune coming from abroad, but rather as a result of their efforts to elicit internal transformations that start closing the region's deficits to rekindle higher growth. Failure to do so may result in a new wave of disappointment.

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11   See Barro and Lee (2010), Kaufmann et al. (2010) and World Economic Forum (2012).

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12   LAC-7 refers to the seven largest Latin American economies, namely, Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela, which together account for 93 percent of the Latin America's GDP.

13   Weights are 0.39 percent for US, 0.21 for China, 0.12 for Japan, 0.08 for Germany, 0.06 for UK, 0.06 for France, 0.05 for Italy and 0.04 for Canada.

14   Source: IMF Primary Commodity Prices.

APPENDIX 1. THE EXTERNAL CONDITIONS INDEX FOR LAC-7 (ECI)

The External Conditions Index for LAC-7 (ECI) is a quarterly indicator that ranges from I.1990 to I.2013 and measures the conditions of the external environment facing LAC-7 countries.[12] The ECI includes the three variables indentified by Izquierdo, Romero and Talvi (2008) as the key drivers of LAC-7's economic performance, namely global economic activity, commodity prices and international financial conditions.

Global economic activity is measured by economic growth in the G-7 countries and China weighted by GDP at purchasing power parity.[13] To compute commodity prices we consider the IMF commodity price index that includes oil, foods, metals and raw materials.[14] The international financial conditions are measured by the JP Morgan EMBI+ spreads.

ECI is a weighted average of these three external factors whose weights depend upon the influence of each factor on the LAC-7's economic performance. To determine the weights we use impulse-response analysis to compute the cumulative response on GDP after 20 quarters of a one-standard-deviation shock to each external factor individually. We then compare LAC-7's GDP after each impulse response exercise and the LAC-7's GDP without any shock. These three differences (in absolute values) are added together and weights are determined by the percentage that each factor represents within the sum. Global economic activity weights 33 percent, commodity prices 36 percent and international financial conditions for emerging markets 31 percent. Building the weights from a variance decomposition analysis yields similar results.

The index is linearly normalized in such a way that the extreme observations of the sample take values 0 and 1, and the sample median a value of 0.5. The value 0 represents the worst external conditions for LAC-7 and a value of 1, the best possible external conditions for the period I.1990 - I.2013.

Finally, the ECI is designed to classify external conditions in five different zones or regions. The very unfavorable region ranges from 0 to the sample median minus 1.5 standard deviations. The lower bound of the unfavorable region is given by the median minus 1.5 standard deviations and its upper bound by the median minus 0.5 standard deviations. For the neutral region the limits are the median minus 0.5 standard deviations and the median plus 0.5 standard deviations. For the favorable region the limits are given by median plus 0.5 standard deviations and the median plus 1.5 standard deviations. The very favorable region ranges from the median plus 1.5 standard deviations to the value of one.

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15   Hall and Jones (1999) consider other set of structural variables, in particular social infrastructure.

APPENDIX 2. THE PRODUCTION POSSIBILITY FRONTIER MODEL

In this appendix we present the technical details of the model we developed to compute the production possibility frontier (PPF) for a sample of 89 developed and emerging countries around the world that have data availability. In order to do so, we consider inputs of the production process and total factor productivity as independent variables and the level of per capita GDP as the dependent variable in a simple ordinary least squares (OLS) regression. Then, estimated output—the production possibility frontier—is compared with the observed output. We define countries in which observed per capita output lies above their production possibility frontier as those with supply bottlenecks for a given endowment of production factors.

Literature regarding potential output and production frontiers is usually divided in three groups: trend methods, filtering methods and production function methods. Among the latter, most of the research deals with growth accounting methods that consider output, labor and capital, and obtain total factor productivity as a residual (Cotis, Elmeskov and Mourougane 2005). Our approach can be classified as a production function method, though the selected inputs of our model aim at explicitly measuring the structural base of each country's production function.[15]

The inputs considered are natural capital, human capital, physical and technological capital, and total factor productivity, similar in scope to those chosen by Corbo, Hernández and Parro (2005).

Natural capital is obtained from the World Bank Database, "The Changing Wealth of Nations," which offers valuations of disaggregated natural endowments for a large sample of countries. For our model we consider the category *natural capital*, which is the simple sum of crop, pasture land, timber, non-timber forest resources, protected areas, oil, natural gas, coal and minerals. Further information on this data can be obtained in World Bank (2011).

Human capital is a variable that weights the population over 25 years old according to the educational level attained following Barro and Lee (2010). The value of 100 was assigned to the percentage of the population with complete tertiary education and the value of 0 was assigned to the percentage of the population with no schooling. We then linearize between these extreme values for the other five intermediate categories of schooling, i.e. primary not completed, primary completed, secondary not completed, secondary completed and tertiary not completed.

Physical and technological capital is computed as the result of a survey question: "How would you assess the general infrastructure (e.g., transport, telephony and energy) in your country?" stated in World Economic Forum (2012). The value of 1 equates with "extremely underdeveloped" infrastructure and the value of 7 equates with "extensive and efficient by international standards."

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16   Results do not change significantly if one uses Kauffman et al. (2010) indicators to proxy for institutional quality.

Total factor productivity is proxied by a composite index of the quality of institutions and financial market development. The former corresponds to the quality of both public and private institutions while the latter refers efficiency and trustworthiness of the financial market, both as measured in the Global Competitiveness Index of the World Economic Forum (2012). The index is the simple average of both indicators previously normalized to range from 1 to 7.

The production possibility frontier is estimated for 2012, using as independent variables data for 2011 in the case of *infrastructure* and *total factor productivity*, 2010 for *human capital* and 2005 for *natural capital* in order to reduce endogeneity problems. While the potential endogeneity problems of such a regression may not be completely avoided by the lagged explanatory variables, the nature of the bias

only makes our identification strategy even more restrictive. Although endogeneity problems could still remain and thus bias estimated coefficients of production factors, due to the nature of this potential endogeneity the bias would overestimate the true PPF. Therefore, potential endogeneity would make the identification criterion of supply bottlenecks more restrictive.

Every coefficient in the OLS regression has the expected sign, and they are all statistically significant at the 1 percent level, except for *total factor productivity*, which is significant at the 10 percent level (see Table 1).

After running the regression we calculate the gap between observed per capita GDP and the estimated production possibility frontier. Countries whose output per capita exceeds the production possibility frontier are presumed to be facing supply bottlenecks.[16]

Table 1. OLS Regression Coefficients

Dependent Variable pc GDP (PPP)	OLS Coefficient
Constant	-32097.07*** (2840.71)
Natural Capital	0.15*** (0.02)
Human Capital	299.25*** (57.70)
Physical and Tech. Capital	6237.07*** (893.86)
Total Factor Productivity	5155.17* (2705.92)

Notes: White heteroskedasticity-consistent standard errors are in parentheses. R-squared: 0.79. Number of Observations: 89.
*Significant at 10 percent level.
***Significant at 1 percent level