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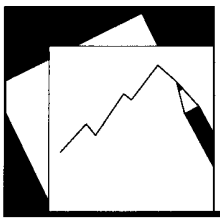

IMF Working Paper

Slowdown in Emerging Markets: Sign of a Bumpy Road Ahead?

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Slowdown in Emerging Markets: Sign of a Bumpy Road Ahead?*

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Abstract

Following very strong growth during the period 2000–12, emerging market economies (EMEs) experienced a slowdown in the last couple of years. This paper examines the supply-side drivers of the strong growth performance of 63 EMEs and investigates if the recent slowdown in growth is transitory or a more permanent phenomenon. We find that on average the recent slowdown is explained equally by structural and cyclical factors, although there are large variations across countries and regions. While the cyclical component of the slowdown can be corrected by countercyclical policies (provided that there is sufficient policy space), structural bottlenecks are harder to address. Given the expected moderation of capital accumulation and some natural constraints on labor, the strong growth momentum of 2000–12 is unlikely to be repeated going forward, unless TFP performance improves significantly via structural reforms.

JEL Classification Numbers: O11, O47

Keywords: economic growth, potential growth, total factor productivity, emerging market economies

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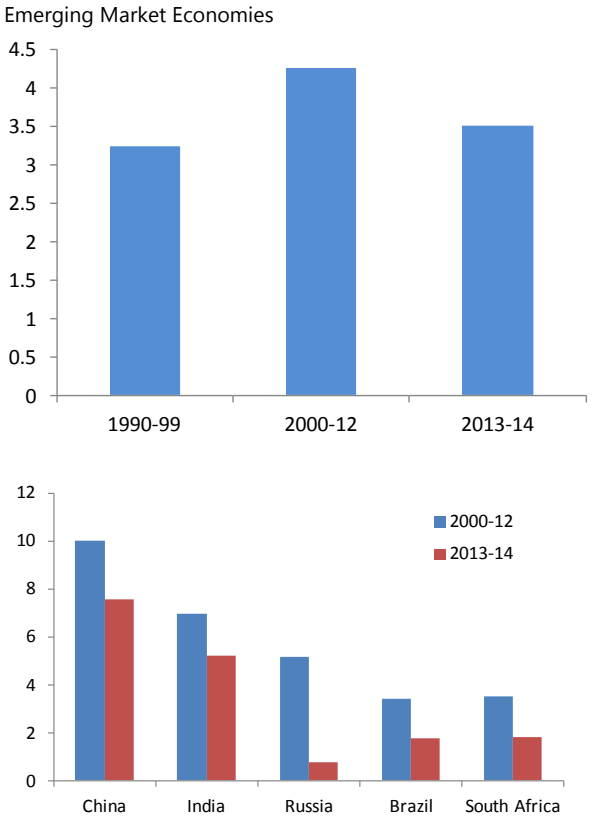
Contents **Page**

I. INTRODUCTION

Strong commodity prices and favorable external financial conditions coupled with prudent macroeconomic policies, trade liberalization, and financial integration bolstered GDP growth in most emerging markets during 2000–12. On average, emerging market economies (EMEs) grew by about 4¼ percent annually during 2000–12—one percentage point higher than on average in the 1990s (Figure 1).[1]

Figure 1. Real GDP Growth Rate
(Annual simple average, percent)



Sources: International Monetary Fund, World Economic Outlook; Penn World Table 7.1, and author's calculations.

However, in 2013–14 economic growth in EMEs has declined to just 3¼ percent, with notable slowdowns in the largest EMEs (Brazil, Russia, China, India, and South Africa (the "BRICS")). For example, Brazil's growth is now about 2¼ percentage point lower than the 2000–12 average, India's is about 1½ percentage points lower and China's growth rate has declined to single digits, albeit from very high levels.

The decline in growth has prompted concerns that the strong momentum recorded by EMEs in 2000–12 might not be sustainable. Indeed, the slowdown has raised a number of questions. What was driving the strong growth momentum until 2012? What is behind the recent slowdown—supply side constraints or tightening external conditions? Is the slowdown temporary or more permanent in nature, with more profound implications for the global economy as a whole?

This paper addresses these questions by identifying the proximate (supply-side) causes of the recent strong growth performance and estimating potential growth rate *ranges* for the period ahead based on a standard (Solow-style) growth accounting methodology (see Sosa and others (2013) for more details). Our analysis is based on a group of 63 EMEs with data starting in 1980.[2] First, we decompose the sources of output growth into production factor accumulation and total factor productivity (TFP). Then, we project potential growth rate

[1] We use simple averages across countries and years throughout the analysis.

[2] See the Appendix for a list of the countries included in the sample.

ranges for each country for the period 2013–17 using the production function approach.[3] To this end, we use a battery of commonly used filtering techniques to measure the trend of the sub-components of output (namely, capital, labor, and TFP), smoothing out cyclical fluctuations. To investigate if the recent slowdown is merely driven by the tightening in global financial conditions or by more homegrown issues, we then decompose the recent growth slowdown into structural and cyclical factors.

While a number of recent studies have looked into the drivers of the recent slowdown in EMEs, most of them concentrate on the BRICS or a few EMEs in a particular geographic area (e.g., IMF (2013a). In addition, this study is unique in that it estimates potential growth rates using a uniform methodology for a group of over 60 EMEs.

Our main findings are as follows:

What was driving the strong growth momentum until 2012? The growth pickup in 2000–12 is mainly explained by higher TFP. Our estimates suggest that TFP alone explains the 1 percentage point of the increase in the average growth rate in EMEs in the period 2000–12. With the exception of Asia, the growth contribution of physical capital also increased but to a much lesser extent.

Is the strong growth momentum of the past sustainable? The growth rates recorded in 2000–12 are unlikely to be sustainable if recent historical trends continue for capital accumulation and TFP, given some natural constraints on labor. While EMEs have, on average, grown by 4¼ percent during 2000–12, our estimates suggest that the average potential GDP growth rate in 2013–17 is only 3½ percent.

What is behind the recent slowdown? On average, almost half of the recent slowdown in EMEs is explained by structural factors.[4] Cyclical factors appear to be more prevalent in explaining the slowdown in Asia while structural factors are particularly binding in the Middle East and Northern Africa (MENA) and the Caucasus and Central Asia (CCA) regions, and some countries in Europe and Latin America and the Caribbean (LAC).[5] For the BRICS we find that primarily structural factors are behind the slowdown in China, Russia and South Africa, while in Brazil and India, the slowdown appears to be to a large extent cyclical.

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[3] Given uncertainties in estimating potential growth rates, we choose to present a *range* of estimates rather than a point estimate. It is important to note that our estimates of potential growth rate differ from those reported by the IMF country desks, including due to differences in methodologies/assumptions used. Given these differences, our analysis may differ from that of country desks on the factors explaining the recent growth slowdown.

[4] Fayad and Perrelli (forthcoming) find that the recent slowdown was highly synchronized in most EMEs.

[5] The aggregate for the MENA region includes Pakistan but excludes Saudi Arabia, Iran, Iraq, Algeria, and the United Arab Emirates due to data limitations.

The paper is structured as follows. Section II describes the growth accounting exercise and explains what has been driving the strong growth momentum until 2012 from a supply side perspective. Section III investigates if the slowdown will be more permanent in nature by estimating potential growth rate *ranges*, and Section IV analyzes the factors behind the recent slowdown. Section V concludes and discusses policy implications.

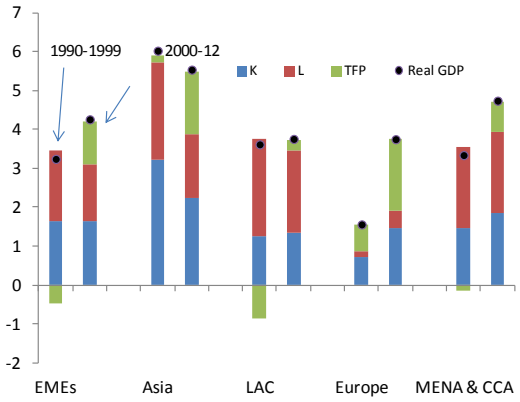
II. What Explains the Strong Growth Performance During 2003–11?

While there is consensus that the robust growth performance of EMEs until 2012 was to a great extent driven by favorable external conditions (such as strong global growth, high commodity prices, and easy external financing conditions) that fueled external and domestic demand, it is less clear what the main drivers were from a supply side perspective.[6] To study this, in the flavor of Sosa and others (2013) we use a simple accounting framework that decomposes output growth into contributions from the accumulation of capital and (quality-adjusted) labor, and changes in TFP (see Annex 1 for a description of the methodology).

Our main findings from this exercise are as follows:

Stylized fact 1. *Factor accumulation (especially labor) has been the main driver of growth in emerging market economies since the1990s* (Figure 2). This is in line with other findings in the literature, which find that factor accumulation, rather than TFP, accounts for most of the output growth observed in EMEs.[7] Specifically, we find that TFP contributed positively to growth in Asia and Europe, and was a drag on growth in the other regions in the 1990s.

Figure 2. Contribution to Real GDP Growth
(Annual simple average, percent)



Sources: Penn World Table 7.1; IMF, *World Economic Outlook; and* author's calculations.
Note: EMEs refers to Emerging Market Economies, LAC refers to Latin America and the Caribbean, MENA refers to Middle East and North Africa, and CCA refers to Caucasus and Central Asia.

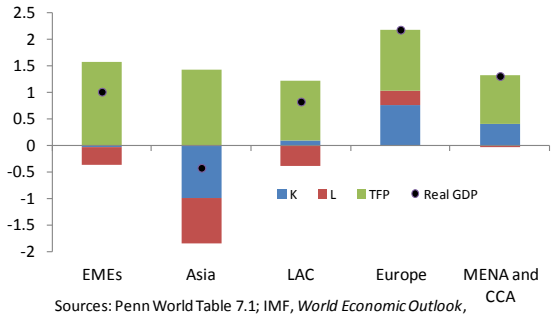
Stylized fact 2. *The 2000–12 pickup in growth in EMEs is mainly explained by higher TFP.*[8] Since 2000, TFP has increased in all regions, with an impressive turnaround (from negative growth rates) in LAC, MENA, and the CCA.

[6] For an analysis of the determinants of the growth performance in emerging markets from a demand perspective, please refer to Culiuc (forthcoming) and Cubeddu and others (2014).

[7] See Anand and others (2014) for emerging Asia, Sosa and others (2013) and Inter-American Development Bank (2010) for LAC, IMF (2013b) for emerging Europe and Makdisi and others (2007) for the MENA and CCA regions.

[8] Emerging Asia's growth has decelerated somewhat in the last decade, compared to the period 1981–2002; though it remains high in regional comparisons.

Figure 3. Decomposition of the Growth Gap between 2000–12 and 1990–99
(Annual simple average, percent)



Sources: Penn World Table 7.1; IMF, *World Economic Outlook*, and author's calculations.

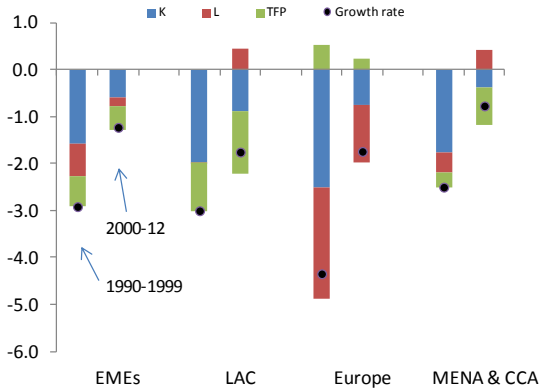
Sources: Penn World Table 7.1; IMF, *World Economic Outlook;* and author's calculations.

Our estimates suggest that TFP explains the 1 percentage point increase in growth rate in EMEs in the period 2000–12 (Figure 3). With the exception of Asia, the contribution of physical capital also increased, though to a much lesser extent, reflecting high investment (including foreign direct investment) spurred by improved macroeconomic policies, favorable external financial conditions, and in many cases associated with booming commodity prices. In contrast, since 2000, the labor contribution to growth has declined in EMEs on average, with particularly large declines in Asia.

Stylized fact 3. *Growth in Asia remains well above the EME average, with most of the growth differential being explained by differences in TFP performance.* On the positive side, the growth gap vis-à-vis Asia has narrowed for all regions in the last decade compared with the 1990s, on account of a reduction in differences in capital accumulation and—to a smaller extent–labor contributions (Figure 4). However, large TFP growth differentials remain, accounting for most of the GDP growth gap in the period 2000–12, for LAC, MENA and the CCA. The labor contribution to growth has been historically smaller in Europe than in Asia, while declining unemployment rates in LAC, MENA and the CCA led to a positive labor contribution gap in those regions vis-à-vis Asia in 2000–12.

Stylized fact 4. *TFP performance generally improved in 2000–12, although important differences across regions and countries remain.* China continues to exhibit the largest TFP growth in Asia, though its TFP growth rate has diminished considerably following the global financial crisis (see Anand and others (2014) for more details).[9] Europe's TFP growth was also strong during 2000–12; however, this average measure masks large disparities before and after the global financial crisis (in many European countries, TFP contracted since 2009). Many of the countries that experienced large improvements in their TFP growth rates

Figure 4. Decomposition of the Growth Gap with respect to Emerging Asia
(Annual simple average, percent)

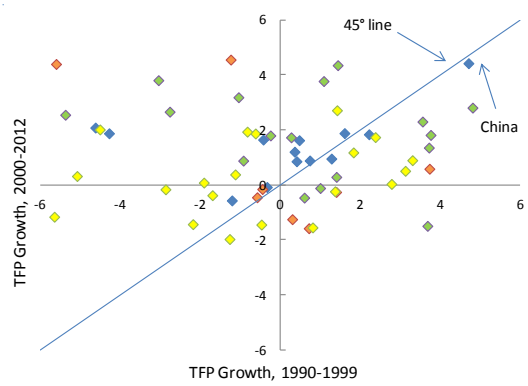


Sources: Penn World Table 7.1; IMF, *World Economic Outlook;* and author's calculations.

[9] TFP has risen by about 3 percent annually since end-2008 compared to over 5 percent in the early 2000s.

(albeit from very low rates) have been in LAC, MENA and the CCA (Figure 5). This partly reflects the expansionary phase of the economic cycle in most of these economies during 2000–12, as well as idiosyncratic factors in some cases (such as the canal expansion in Panama).[10]

Figure 5. TFP Growth, 1990–99 versus 2000–12
(Annual simple average, percent)



Source: Author's Calculations.
Note: Yellow refers to Latin America and the Caribbean, Blue to Asia, Orange to Middle East and North Africa & Caucasus and Central Asia, and Green to Europe.

III. Is the Strong Performance of the Past Sustainable?

To assess whether the strong performance of the past is sustainable, we estimate potential growth rate *ranges* for 2013–17 for our sample of EMEs. Various methodologies have been employed in the literature to estimate potential growth rates, such as constructing measures of the trend in actual GDP that smooth out business cycle fluctuations, or computing the trend of the various subcomponents of GDP—typically using a production function approach, or using econometric models (including structural VARs and Kalman filters).[11] In this paper the production function method was chosen given its flexibility and intuitiveness.[12]

In order to estimate potential growth rates for the years ahead, we need to project how factors of production and TFP would evolve in the next few years. For labor accumulation we rely on assumptions for demographic developments, which are well established in the literature. However, there is no consensus of how capital accumulation and TFP will evolve over time; in our case we assume that past trends (of the period 2000-12) will continue, noting that this assumption (as explained below) is rather optimistic. Specifically, we make the following assumptions:

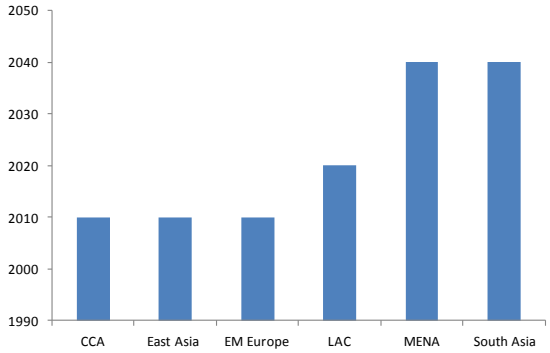
[10] As discussed in the Annex, our capital stock measure does not capture changes in the level of capital utilization, due to the lack of adequate measures for most of the countries in the sample. To the extent that capacity utilization has been generally above average in the 2000–12 period, our TFP estimates may be an upper bound.

[11] For a detailed description of the various methodologies employed in the literature see Anand and others (2013).

[12] See Sosa and others (2013) for a discussion of the merits of using this methodology. Annex 2 describes the methodology in estimating potential growth rate *ranges.*

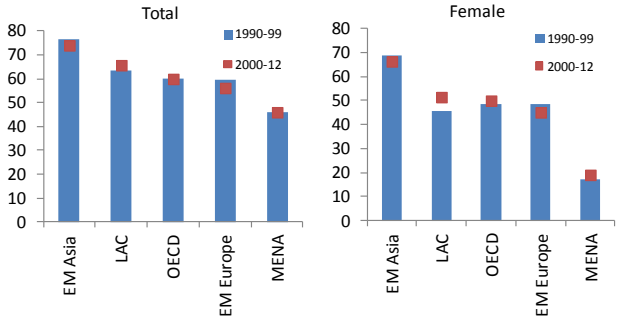
Labor accumulation. We assume that labor grows in line with the working-age population projections (from the UN Population Projections database) adjusted by the unemployment rate (using projections from the April 2013 World Economic Outlook). We also assume that labor force participation rates are unchanged at their latest observation. As a result, our scenario analysis assumes a decline of the contribution to growth from labor accumulation. This reflects a combination of factors—in most of Asia, Europe and LAC natural constraints to labor growth are expected to emerge including due to population aging (Figure 6); there is limited room to further increase labor force participation rates (including for women), which are already relatively high by international standards [13] (Figure 7); and there is limited space for further increases in employment rates, as unemployment rates have declined significantly in many emerging markets in recent years.[14] Countries in the MENA and CCA region have the largest potential to increase growth through labor contributions given their favorable demographics (aging constraints will not emerge until the middle of the century) and very low participation rates (particularly for women). However, they still face constraints amid a stubbornly high unemployment rate (including among the youth).

Figure 6. Year with Dependency Ratio at its Minimum
(Greatest demographic dividend) 1/



Source: United Nations (2009), World Population Projections.
1/ Dependency ratio= (population aged 0–19)+ population aged 65 and over)/(population aged 20–64)*100.
Note: EM refers to Emerging Market..

Figure 7: Labor Force Participation
(simple average, percent)



Sources: World Bank, World Development Indicators; and authors' calculations.
Note: OECD refers to the Organization for Economic Cooperation and Development.

Capital accumulation and TFP. Given that there is more uncertainty on what could be the trajectory for capital and TFP performance in the coming years, we assume that they both grow at the same average annual rate as in the 2000–12 period. This assumption is rather optimistic given that both TFP and capital accumulation are procyclical and growth was

[13] It is worth noting that these constraints on labor are less binding in countries with a large informal sector (e.g., Colombia, India, Mexico, Peru, several Central American countries, and South Africa just to name a few; see UN University (2013) for a discussion of women participation in the informal sector).

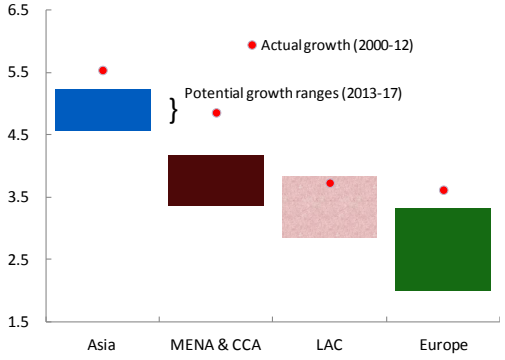
[14] Some countries may be able to enjoy higher contribution to growth from labor if the informal sector becomes formal, underemployment declines or immigration flows pick up.

particularly high in the 2000s by historical standards.[15] This performance is unlikely to persist in the years ahead as commodity prices are expected to fall and easy global financial conditions that attracted domestic and foreign direct investment are expected to tighten (Box 1). Debt problems in core and peripheral European markets would also continue to weight on Europe's capital accumulation prospects, while political strains could affect investment prospects in MENA and the CCA. As a result, our assumption of taking a historical average growth rate may actually be a bit optimistic for the years to come.

Human capital accumulation. We assume that human capital will continue to accumulate at its recent historical growth rate (average of 2005–10). This assumption is neither conservative nor too optimistic.[16] While in the period ahead, EMEs can enhance their labor contribution to growth with stronger contributions from human capital, such improvements would take time to materialize and will require important improvements in the quality of schooling, especially in the LAC, MENA, and CCA regions.[17]

Figures 8 and 9 present the average annual potential growth rate *ranges* by region and by country, respectively, for the period 2013–17. The estimated ranges are constructed using four filtering techniques described in Annex 2. We find that potential growth rate ranges vary significantly across regions and countries, with the Asian, MENA and the CCA regions expected to have the highest growth rates in the period ahead. In contrast, going forward, European and Caribbean countries would be facing the bigger growth challenges, with the largest Latin American economies (notably Brazil and Mexico) also facing low potential growth estimates.[18] While this paper does not attempt to explain cross-country differences in growth potential, these often reflect differences in economic institutions (e.g., barriers to entry and innovation), natural resource endowments, geography, financial sector depth, and trade openness.

Figure 8. Potential Growth Rate Ranges by Region (2013–17)
(Annual average, percent)



Source: Author's calculations.

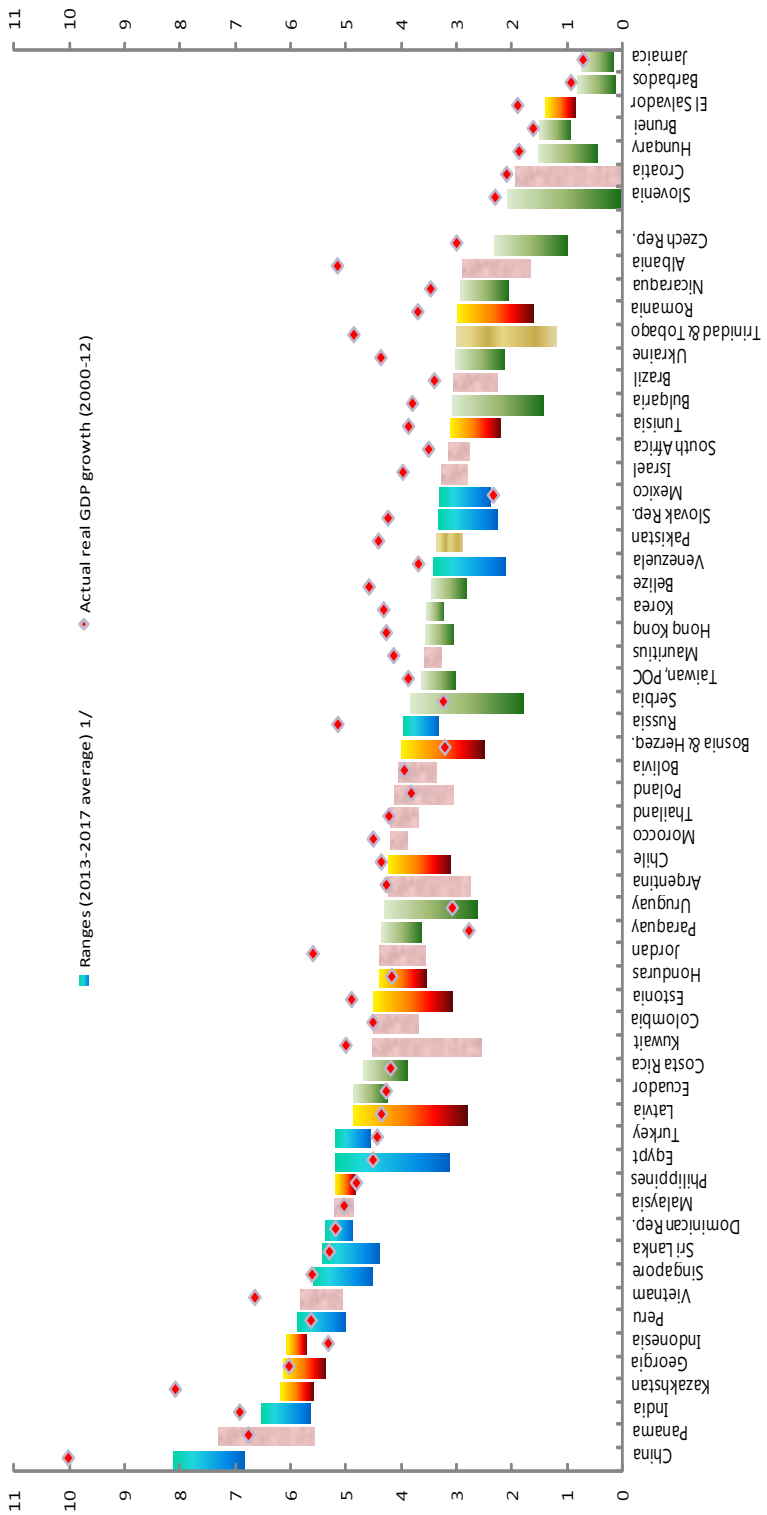
[15] The 2000s was an exceptionally strong period for EMEs; both capital spending and TFP are typically procyclical, implying that as output gaps close and growth moderates to potential—TFP and capital spending would grow at rates closer to a historical average.

[16] We decided not to use the 2000–12 average growth rate to better reflect the significant changes in education that took place in recent years due to technological improvements.

[17] The quality of education has ample room for improvement in MENA, CCA and LAC regions which generally underperform in terms of standard international tests. Specifically, all MENA and LAC countries that participated in the standardized Program for International Student Assessment (PISA) tests in 2012 were placed at the lower quartile of the 65-country ranking (OECD, 2013).

[18] On the bright side, Mexico's potential growth would be higher from its recent actual growth performance.

Figure 9. Potential Growth Rate Ranges by Country (2013-17)
(Annual average, percent)



Source: Author's calculations.
1/Colors denote different geographic regions: blue for Asia, orange for Middle East and North Africa and Caucasus and Central Asia regions, green for Europe, pink for Latin America and the Caribbean, and brown for Africa.

Box 1. External Conditions and Capital Accumulation

While high commodity prices and easy external financing conditions supported capital accumulation in emerging economies and developing countries as a whole, their impact varied across regions. In particular:

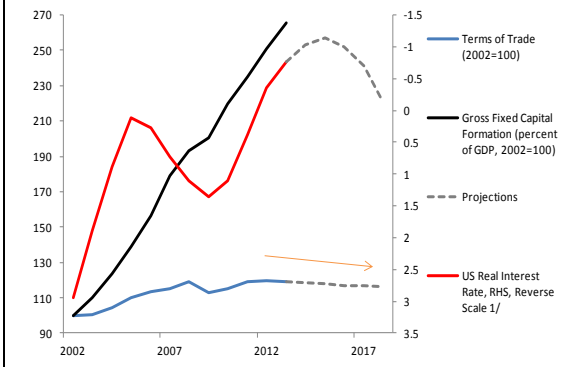
Asia's gross fixed capital formation almost tripled during the last decade, despite a continuous deterioration in the region's terms of trade. Greater financial liberalization was largely behind this impressive performance, with the region, at 38 percent of GDP, enjoying the highest investment share among EMEs.

Europe benefited from the easy global financial conditions despite deteriorating terms of trade. However, debt problems in core and peripheral European markets could weigh heavily on their investment in the last two years (investment was stagnant in real terms, compared to a real annual average increase of 8 percent in 2003–11).

Latin America and the Caribbean benefited significantly from the surge in commodity prices with terms of trade improving by almost 30 percent in the last decade. Financially open economies experienced the biggest gains in capital accumulation amid favorable external financial conditions (see Sosa and others, 2013). In total, gross fixed capital formation more than doubled in the last decade, rising by an annual average of 7 ½ percent (inflation-adjusted).

Middle East saw its gross fixed capital formation more than double (in real terms) since end-2002 amid a 60 percent surge in terms of trade.

Emerging Market Economies: Global Financial Conditions, Terms of Trade and Investment Performance



Sources: IMF, *World Economic Outlook*; Authors' calculations
1/ Five-year moving average of a 6-month LIBOR rate.

Global Financial Conditions, Terms of Trade and Investment Performance by Region

Sources: IMF, World Economic Outlook; Authors' calculations
Note: EM refers to Emerging Market, LAC refers to Latin America and the Caribbean, MENA refers to Middle East and North Africa.
1/ Five-year moving average of a 6-month LIBOR rate.

In sum, given the expected moderation of capital accumulation and the existence of natural constraints on labor, the strong growth momentum in EMEs, on average, is unlikely to be sustainable in the coming years unless TFP performance improves significantly. We find that the recent GDP growth rates are higher than (or close to the upper bound of) the potential output growth ranges for 2013–17 in most countries.[19] Our analysis, which is based on optimistic assumptions for capital accumulation and TFP, suggests that the average potential GDP growth rate in 2013–17 would be between 3 and 4 percent in EMEs, compared to an average of 4¼ percent in the 2000–12 period.

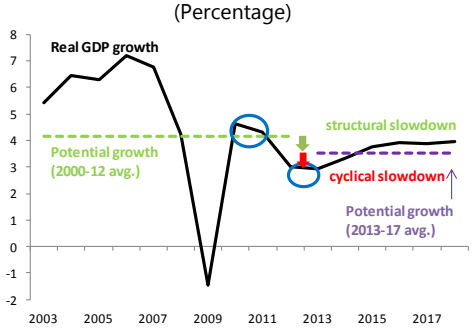
IV. What Explains the Recent Growth Slowdown?

This section looks at the factors behind the recent slowdown in EMEs, and importantly how long it will last. To answer these questions, we split the recent slowdown into a structural (reflecting longer-lasting changes in potential growth) and a cyclical (reflecting a temporary deviation from potential growth component). The structural slowdown is represented by the difference between the estimated potential growth rates for 2013–17 and the historical average (2000–12), while the cyclical part is the remaining difference in actual growth rates (between 2012-13 and 2010-11) that is not explained by the structural component).

Figure 10 suggest that while the recent slowdown in EMEs has a large cyclical component (possibly related to external conditions), about half of it is explained by structural factors (i.e., part of the recent growth slowdown reflects an endogenous decline in EMEs potential growth estimates). [20]

Figure 10. Emerging and Developing Economies: Decomposition of Growth Slowdown

(Percentage)



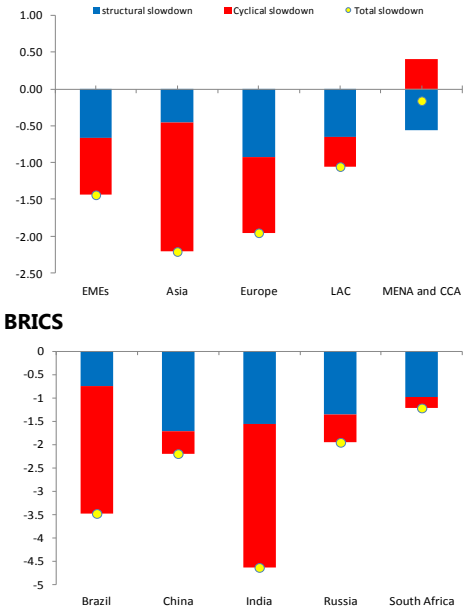
Sources: IMF World Economic Outlook; Author's calculations

[19] Mexico (strongly affected by the 2008–09 global financial crisis given its tight linkages with the U.S. economy) and Paraguay (owing to some idiosyncratic shocks) are notable exceptions.

[20] Cyclical factors that played a role include the unwinding of monetary and fiscal stimulus that was enacted during the global financial crisis, the tightening in global financial conditions, the slowdown in global export demand and the weakening in commodity prices (IMF, 2013a).

However, there are large inter- and intra-regional disparities in the decomposition of the slowdown (Figure 11). The recent growth slowdown in the MENA and CCA regions is largely explained by structural factors, while that in Asia is largely cyclical. Looking at the BRICS, we find that most of the recent slowdown in Brazil and India has been cyclical, while in China, Russia and South Africa it has been largely structural in nature (broadly consistent with the findings in IMF (2013a) and Credit Suisse (2013), Table 1).[21] Even in Brazil and India potential growth rates have actually declined by about ¾ and 1½ percentage points in recent years, respectively, implying that their past strong growth momentum could not be repeated unless structural reforms are enacted.

Figure 11. Composition of the Growth Slowdown
(Growth change 2012–13 versus 2010–11, average)



Source: Author's calculations.

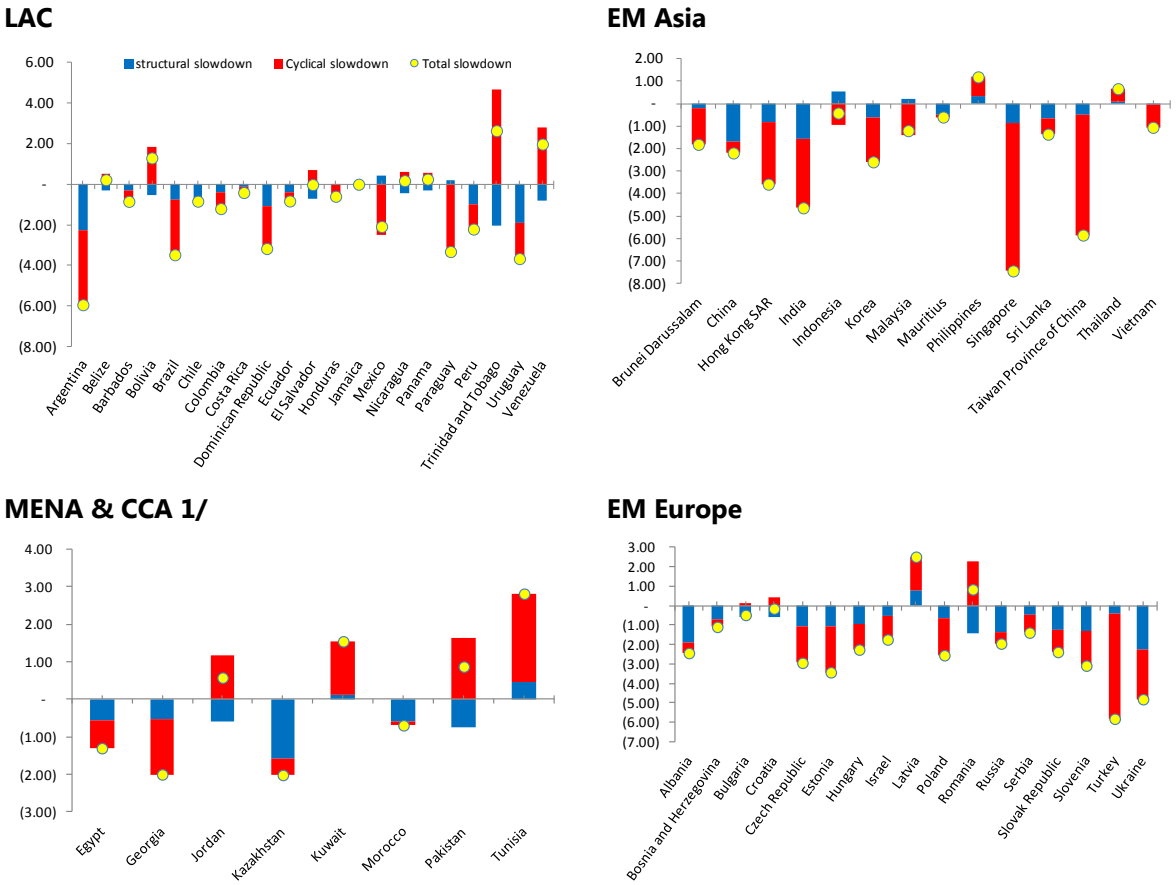
Looking beyond the BRICS, we find that (Figure 12):

- In Asia, Singapore, Hong Kong SAR and Taiwan Province of China have experienced large growth decelerations largely due to cyclical factors. The slowdown in Sri Lanka has been driven by both cyclical and structural factors. In contrast, there was an acceleration of growth in the Philippines and Thailand given cyclical advantages and rising potential growth rates.[22] Interestingly, Indonesia has experienced a growth slowdown despite increasing potential growth rates.

[21] For a discussion of structural impediments to growth in India please refer to IMF (2014b).

[22] For example, Philippines' strong growth momentum was supported by accommodative monetary and financial conditions and growing remittances. Potential growth has also risen, led by improved productivity and faster capital accumulation.

Figure 12. Composition of the Recent Growth Slowdown by Region
(Growth change 2012–13 versus 2010–11, average)



Source: Author's calculations.
Note: EM refers to Emerging Market, LAC refers to Latin America and the Caribbean, MENA refers to Middle East and North Africa, and CCA refers to Caucasus and Central Asia.

- With the exception of Latvia and Romania, all European countries have experienced a slowdown in 2012–13.[23] In most cases, the slowdown was driven by both structural bottlenecks and cyclical considerations. Cyclical impediments were more prevalent in the case of Czech Republic, Estonia, Hungary, Israel, Poland, Serbia, and Slovenia. However, these countries have also faced lower potential growth rates during the same period. In Turkey, most of the slowdown appears to be cyclical, though our

[23] EM Europe's boom-bust cycle over the last decade makes the growth slowdown decomposition less accurate, hence the results should be interpreted with a "grain of salt." For a more detailed discussion, please refer to Bakker and Klingen (2012).

estimates suggest a decline in the potential growth rate of about ¾ percentage points.[24]

- Turning to Latin America, most of the slowdown in Chile is found to be structural in nature, possibly reflecting subdued productivity developments, while the slowdown in Peru and Colombia is largely cyclical, notwithstanding some declines in their potential growth rates. Mexico is an interesting case since it is predicted to have an increasing potential growth rate in the coming years (facilitated by its recent structural reforms, including in the energy and telecommunication sectors), in line with the analysis of Credit Suisse (2013) and IMF (2014a). Mexico's slowdown appears to be entirely driven by cyclical issues, possibly related to the subdued economic recovery in the United States. Despite the projected increase, Mexico's potential growth would remain relatively modest given low levels of investment (23 percent of GDP in 2012) and low productivity growth.[25] In Venezuela, potential growth rate is estimated to have declined by over ¾ percentage points in the last couple of years though growth did not slow down owing to cyclical conditions.
- According to our analysis, the picture for MENA and CCA countries is more mixed. Among countries that experienced a slowdown, cyclical factors were dominant in about half of the cases and structural factors in the other half.

A few caveats about the analysis are worth mentioning, which imply that the results should be interpreted with some caution. Potential GDP is an unobservable variable and thus its accuracy relies to a large extent in the estimation method used and the assumptions used. In our analysis, given resource constraints, we use a uniform methodology for all countries and our assumptions for projecting TFP and capital growth are the same across all countries (based on the historical average of 2000-12). These assumptions, which ensure uniformity in the analysis, imply that country-specific considerations (e.g., structural breaks, changes in the investment climate) are not taken into consideration. However, in our view, this exercise is one of the best basis available to understand what is behind the current slowdown and thus provide policymakers with a reasonable sense of the economy's potential for growth.

V. Conclusions and Policy Implications

This paper shows that the growth pickup in EMEs in 2000–12 was mainly explained by higher TFP and that based on historical trends the past strong growth momentum is unlikely to be sustained going forward. We also find that on average the recent slowdown in EMEs is explained equally by cyclical and structural factors.

Notwithstanding the limitations from this simple exercise, our findings could provide important policy implications. In countries in which the slowdown has a large cyclical component, there could be an argument to introduce countercyclical macroeconomic policies

[24] Our estimates for some European countries are much more optimistic than those presented in IMF (2013b), though the latter study acknowledges that the "estimates of the drop in potential output growth may in due course prove to be too somber" since "potential output growth tends to ….get underestimated during busts."

[25] Productivity is hindered by the high degree of informality in the labor market, low quality of education, substandard infrastructure and insufficient market competition in telecommunications and energy (IIF, 2013).

to the extent that this has not been done already, policy space is available and market pressures are contained. In contrast, in countries in which the economy has slowed mainly due to structural factors, the attention of policymakers should focus on reforms to, among other, reduce distortions in the allocation of resources, alleviate infrastructure bottlenecks, and improve education access and quality. While the specific policies will depend on the circumstances of each country, Dabla-Norris and others (2013) find that lower-middle income countries would receive the highest growth dividend by focusing on banking and agricultural sector reforms, reducing barriers to FDI, and increasing competition in product markets. Improving the quality of secondary and tertiary education, and efforts to alleviate infrastructure bottlenecks would also be a priority. In upper-middle income countries, reforms should focus on deepening capital markets, developing more competitive and flexible product and labor markets, fostering higher-skilled labor force, and investing in research and development and new technologies.

Over the longer term, demographic factors will also play an increasingly important role for growth in all regions, although the expected impact would be larger in Europe and some Asian countries. While aging is less severe in many MENA, CCA and African countries, their relatively young populations also provide challenges. High unemployment rates (especially for youth), limited employment prospects, and limited opportunities for women to enter the labor force could weigh heavily on growth. Policies to achieve job-rich growth and enhance female participation rate could help raise growth potentials in these countries.

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Appendix

The analysis covers the following group of countries:

Sample Countries

EM Asia	EM Europe	LAC	MENA and CCA	Africa
Brunei Darussalam	Albania	Argentina	Egypt	Mauritius
China	Bosnia & Herzegovina	Belize	Georgia	South Africa
Hong Kong SAR	Bulgaria	Barbados	Jordan	
India	Croatia	Bolivia	Kazakhstan	
Indonesia	Czech Rep.	Brazil	Kuwait	
Korea	Estonia	Chile	Morocco	
Malaysia	Hungary	Colombia	Pakistan	
Philippines	Israel	Costa Rica	Tunisia	
Singapore	Latvia	Dominican Rep.		
Sri Lanka	Poland	Ecuador		
Taiwan, POC	Romania	El Salvador		
Thailand	Russia	Honduras		
Vietnam	Serbia	Jamaica		
	Slovak Rep.	Mexico		
	Slovenia	Nicaragua		
	Turkey	Panama		
	Ukraine	Paraguay		
		Peru		
		Trinidad & Tobago		
		Uruguay		
		Venezuela		

Annex 1. Growth Accounting Methodology and Data

We assume the following standard Cobb-Douglas production function:

$$Y_t = A_t\, K_t^{\alpha} (L_t h_t)^{(1-\alpha)} \qquad (1)$$

where Y_t represents domestic output in period *t*, K_t the physical capital stock, L_t the employed labor force, h_t human capital per worker, and A_t total factor productivity. We set α, the capital share of output at 0.4, since Gollin (2002) estimates that the capital share of output fluctuates around this value for a variety of countries.[26]

We use annual data for most variables from the Penn World Table 7.1 (PWT) for the period 1980 until 2010 and other sources—mainly the IMF's World Economic Outlook (WEO) database for the subsequent years.[27] Specifically, data on output, measured by real GDP, are obtained from PWT until 2010 and extended up to 2012 using WEO.[28,29] The capital stock series is constructed with investment data from the PWT using the perpetual inventory method until 2010, and investment data from WEO for 2011–12.[30] We assume that the economy is on a balanced growth path at time zero and compute the initial capital stock, K_0, according to the expression:

$$K_0 = \frac{I_0}{(1+g)(1+n)-(1-\delta)} \qquad (2)$$

where I_0 is the initial investment expenditure, g is the technological progress rate, n is the population growth rate, and δ is the rate of capital depreciation. Following Ferreira et al. (2013) we use the average investment of the first five years as a measure of I_0 in order to minimize the impact of economic fluctuations, with 1950 being the initial year. We assume that g is equal to 1.53 percent; δ is equal to 3.5 percent (as in Ferreira et al., 2013, and FIEL,

[26] For Latin America and the Caribbean, we use country-specific alphas based on Sosa and others (2013). Our main findings for all countries in the sample are robust to a range of reasonable values for alpha.

[27] Following the completion of our data work, PWT 8.0 has been released. Our results remain consistent to the new database since PWT's documentation indicates that most of the major revisions involve low income countries, not included in our sample.

[28] We use the *rgdpl* series from PWT—PPP converted GDP per capita (Laspeyres), at 2005 constant prices—multiplied by total population (POP).

[29] A possible limitation of our analysis is that we do not analyze separately commodity and non-commodity GDP which could be important in the case of many oil exporting MENA countries such as Kazakhstan and Kuwait. In addition, we use the same parameters for all countries (e.g., for depreciation rate and capital share) and do not take into account structural changes when estimating TFP. However, in Sosa, Tsounta and Kim (2013) we find that different values for depreciation rates and TFP do not significantly change our results of LAC's growth accounting exercise.

[30] We use the *ki* series from PWT—investment share of PPP converted GDP per capita at 2005 constant prices.

2002);[31] and n is equal to the average annual growth rate of population for each country between 1960 and 2012, using PWT data up to 2010 and WEO data afterwards.

Our labor input series (measured by employment) refers to inputs effectively used in the production process. By considering the employed labor force rather than the entire stock of labor available for production (i.e., labor force), we ensure that changes in the unemployment rate are not reflected into changes in TFP. Employment series are obtained using the labor force series from PWT (up to 2010) and the employment rate (one minus unemployment rate) from WEO. For 2011–12, we assume that the labor force rises in line with United Nation's (U.N.) Population Projections (constant fertility scenario) for people aged 15 and over. To get quality-adjusted labor, we follow Bils and Klenow (2000) and Ferreira et al. (2013) and model human capital as a function of the average years of schooling:

$$h = exp\,\varphi(s) = exp\left(\frac{\theta}{1-\psi}s^{1-\psi}\right) \qquad (3)$$

where s stands for years of schooling of the population aged 15 years old and over, using data from Barro and Lee (2010).[32]

Using equation (1), we can decompose GDP growth as follows (denoting by $\hat{x}$ the growth rate of a variable x):

$$\hat{Y} = \hat{A} + \alpha\hat{K} + (1-\alpha)\hat{L} + (1-\alpha)\hat{h} \qquad (4)$$

where changes in GDP are explained by changes in factor accumulation (quality-adjusted labor and capital) and TFP.[33]

[31] Results are robust to different depreciation rates (see Sosa, Tsounta and Kim (2013) for robustness analysis on LAC).

[32] Following Bils and Klenow (2000) we set $\psi = 0.58$ and $\theta = 0.32$.

[33] TFP is by definition a residual so it might be capturing measurement errors such as changes in the quality of the capital and labor stocks that we fail to account for, changes in the level of capital utilization, and changes in the use of land.

Annex 2. Estimating Potential Growth Rate Ranges

To estimate potential growth rates, we first estimate TFP using equation (1) from Annex 1, which can be rewritten as:

$$A = \frac{Y}{K^{a}(Lh)^{(1-a)}}$$

We then obtain trend series for capital, labor, human capital, and TFP (K^T, L^T, h^T, A^T) for the period 1980–2017 using the Hodrick-Prescott (for both $\lambda = 6.25$ and $\lambda = 100$), Baxter and King, and Christiano and Fitzgerald filters. To avoid the end-of-sample bias we include projections through 2019, based on the following assumptions about *K*, *L*, *h*, and *A*:

i. Both capital and TFP grow at the 2000–12 average annual rate (see Table A.2);

ii. To project the labor input we use projected unemployment rates (from WEO) and assume that labor force grows in line with working-age population from U.N.'s Population Projections database, while labor force participation rates are assumed to remain constant at their latest observation;[34] and

iii. Finally, our measure of human capital increases at the 2005–10 average annual rate.

The average point estimate of potential output growth $(\widehat{Y^P})$ is then computed as follows, (where $\hat{x}$ denotes the growth rate of a variable x):

$$\widehat{Y^p} = \widehat{A^T} + \alpha\widehat{K^T} + (1-\alpha)\widehat{L^T} + (1-\alpha)\widehat{h^T} \qquad (5)$$

Where $\widehat{x^T}$ is the average trend growth rate of variable x from the four filtering techniques. To obtain potential growth *ranges*, we take the maximum and minimum estimate from the four filtering techniques.

[34] We do not use unemployment data for India due to data constraints. Instead we assume that there is full employment.