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The longer-term prospects for Emerging Market Economies: Is the era of rapid convergence coming to an end?

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Background
Paper



**Emerging
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The longer-term prospects for Emerging Market Economies

Is the era of rapid convergence coming to an end?

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Context and main findings

In the past sixty years, the world has witnessed a dramatic rise in the incomes and living standards of humanity as a whole. While performance has varied over different time periods and between the 180 plus different economies, overall the trends have been consistently driven by the continued convergence between the developed and developing economies. As a result, more people have been lifted out of abject poverty in our lifetimes than perhaps at any other point in economic history.

The economic future of the world can be discussed with a focus on concepts like technological change, regional and international cooperation, inclusion, environment, and climate change. It also can be determined on the basis of a single measure: the Emerging and Developing Economies (EDE)'s share of world GDP. Today, by this measure (in terms of purchasing power parity), EDEs far surpass the advanced economies—55 percent of the total global GDP according to IMF data.

Since 2000, the average rate of growth for the emerging economies has been two and a half times that of advanced countries. To a large part, this large differential reflects the emergence of China in the world scene in the last quarter century, but the trend goes well beyond that, as a number of other large EDEs (such as India, Indonesia, Turkey, Korea, Brazil, Mexico, Saudi Arabia, and Nigeria) have also grown significantly.

However, given the global economic turbulence since 2007, the still sluggish growth in much of Europe and Japan, a possible erosion in the global productivity growth rate, the bursting of the recent super commodity cycle, and, most recently, the slowdown in many large emerging economies (e.g., China, Brazil, Turkey, Mexico, South Africa, Nigeria), questions have arisen whether the convergence achieved by a majority of emerging markets during the past sixty years was an aberration and whether we are about to witness an end to this “golden era of rapid convergence.” Can the global economy community resume its march towards ever increasing living standards through

technological development and productivity gains? Or would more and more countries fall in the middle-income trap?

For much of human history, until the advent of the industrial revolution, almost all human beings, irrespective of what part of the world they inhabited, lived in abject poverty. Everyone was almost equally poor (except for a very thin ruling class). And they were unable to save or invest much in economic assets in order to improve their longer term productivity and income. The life span of an average human being was much shorter (maybe half or less) than today. The quality of life of almost everyone was miserable, and human survival remained a constant challenge over the millennia. All this started to change with the industrial revolution.

The discovery of the steam engine and related technologies, supported by evolving industrial management techniques gradually raised economic productivity of the countries and people concerned. Steady industrial jobs, in turn, induced workers to move from the rural to urban areas leading to the development of modern cities, with better infrastructure and social services. Around the same time, the European maritime nations opened and controlled global shipping lanes, starting a long lasting boom in global trade, economic specialization and the creation of comparative advantages amongst countries. National productivity and income levels, first of European countries and then of North American countries, rose steadily making the “Western countries” both richer and more developed. The rest of the world, in many instances ruled by European colonial powers, kept falling further and further behind in terms of productivity and per capita income.

Just before the industrial revolution, China and India alone accounted for over 50 percent of global GDP, not because they were richer than the rest of the world but because Asia had almost 60 percent of the global population. By the mid-1950s, Asia's share fell to as low as 14 percent before reversal of a trend that had lasted over two hundred years.

The steady convergence of many large developing economies (led by East Asian countries plus India) with the developed countries has led to a dramatic improvement in the output, income levels, and well-being of the emerging market societies.

Given this economic history, developments since 1960 are all the more unique. The share of G7 economies of the global output (in PPP terms) has gradually dropped from 57 percent in 1960 to only 32 percent in 2015. Developing economies as a whole now account for as much as 55 percent of global output. Almost all other development indicators also tell an equally encouraging story. The proportion of absolute poor (those living at or below \$1.25 per day) has dropped from 52 percent in 1981 to 17 percent in 2015. The percentage of people classified as middle income has jumped from 27 percent of the world's population in 1990 to an estimated 47 percent of the world's population in 2015. People are healthier and living longer (71 years in 2015 vs. 65 years in 1990).¹

The steady convergence of many large developing economies (led by East Asian countries plus India) with the developed countries has led to this dramatic improvement in the output, income levels, and well-being of the emerging market societies. Whether this process will continue over the long term would have a decisive impact on the lives of billions of people in Africa, Asia, Latin America, and indeed the world as a whole. Although, the past journey has been far from smooth, as the Great Recession of 2007-08, and the more recent collapse of commodity prices show, we expect the process to continue, except for any unexpected cataclysmic events somewhere in the world. Furthermore, as more and more of EDE citizens join the ranks of the middle class, they would exert even greater effect on the world economic structure, societal values and governance.

The path ahead cannot be taken for granted. The strong performance of recent years was the result of a combination of fortuitous (even some one time) factors, like the greater opening up to world trade, a process of internal and external resource mobilization, a steady process of improvement in education levels, the effects of the demographic (population growth) dividend, new technological

and medical breakthroughs, the development of global value chains, and for many in Africa and Latin America, the “super” commodity cycle of the first decade of the century.

The proprietary long-term econometric models developed by Centennial Group² specifically for studies like this provide scenarios for EDEs, not definitive projections, in order to allow testing of what if questions. As discussed in Annex 2, looking out to 2050, one such a scenario for the global economy suggests that the EDEs business-as-usual or past average performance will result in a further sharp increase in their participation in global output. The EDEs GDP may grow at 4.2 percent a year over the long-term, about one percent higher than the world (3.3) and 2.3 percentage points higher than the AEs, which stand at 1.9 percent. The ratio of their income to that of advanced countries would increase, particularly in the case of Asia, with Latin America showing a subpar performance. This pattern would hold at both PPP and at market exchange rates. This is in part the reflection of a demographic dividend—its labor force is still growing more rapidly than its population, a trend that will continue for the next twenty years or so for many of the regions, but more markedly so for Africa.

Certain EDEs have the clear potential to do even better. As elaborated in more detail below and discussed elsewhere,³ this study also envisages a more optimistic scenario with an average annual growth of 4.8 percent per year between now and 2050 (on a PPP basis). However, if conditions deteriorate in their performance and more countries get mired in the middle income trap, averages in the region were to converge, growth would be in the order of 2.3 percent a year, clearly a disappointing result compared to the other two scenarios.

1. http://www.who.int/gho/mortality_burden_disease/life_tables/situation_trends_text/en/

2. Kohli, Szyf, & Arnold (2012)

3. The appendix provides a discussion of the methodology used for these scenarios. The annex is based on Kohli (2011), updated with the methodology revisions detailed in Kohli, Szyf, & Arnold (2012), in which more details about the methodology and its derivation can be found.

The rate of growth of the emerging and developing economies from 1990 to 2014 averaged 6.0 percent, while the rate of growth of the advanced economies amounted to only 2.2 percent.

The past sixty years and drivers of this transformation

A review of the recent performance of the EDEs paints an impressive picture that has resulted in a dramatic change in the existing paradigm that prevailed for millions of years and until the end of the 20th century. The rate of growth of the EDEs from 1990 to 2014 averaged 6.0 percent, while the rate of growth of the AEs amounted to only 2.2 percent. As a consequence, the share of EDEs in world GDP has risen from 24.9 percent in 1980 to 39.1 percent in 2014 on the basis of current US dollars and from 32.6 percent to a very impressive 57 percent on the basis of PPP. The difference between the two measurements is caused by different price levels, in addition to fluctuations in terms of trade, and relative exchange rate movements, which affected their relative standing.

Of course, the past performance has not been uniform throughout the past sixty years, either in the levels of per-capita income or in terms of human development.⁴

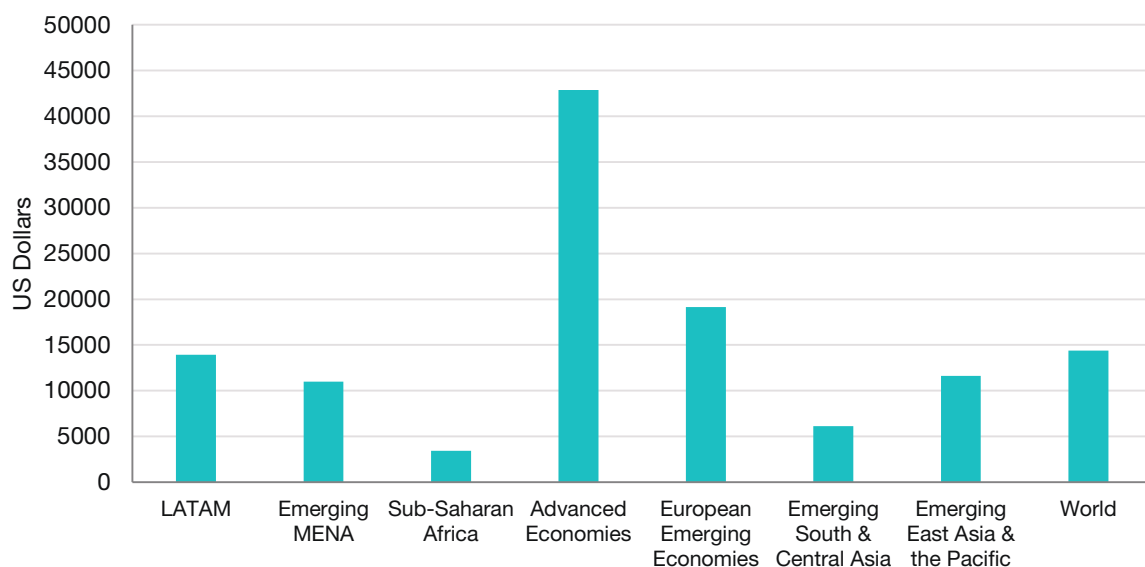
4. The Human Development Index (HDI) is a composite statistic of life

Today, on a PPP basis, per-capita income of the AEs is US\$45,800 (2015 dollars) that of the Latin America is US\$15,600, that of Emerging and Developing Asia is about US\$10,000, and that of Sub Saharan Africa is only less than US\$4,000, as shown in Figure 1; there are even more significant discrepancies in terms of the HDI (Figure 2). Also, the ratio of per capita income to advanced economies only increased significantly in the case of the East Asian countries.

In terms of changes in shares of world GDP, Latin America accounted for 7.8 percent of global GDP in PPP terms in 1950 (Madisson, 2004), and 8 percent in 2015 (Figure 3). In other words, it has remained essentially stagnant relative to the world as a whole. In current dollar values, Latin America's share in global GDP has fluctuated around similar figures: it declined from around 8 percent in 1980 to 5 percent in the mid-1980s, but rose during 1990s and early 2000s subsequently, reaching 8 percent in 2011;

expectancy, education, and per capita income indicators, which is used to rank countries into four tiers of human development.

Figure 1: Per capita income by region 2015 (thousands, PPP)



Asia's share of world GDP reached a low point of the last three centuries in 1950, at approximately 17 percent, but has risen dramatically since then to its current level in 2015 at 41.4 percent.

Figure 2: Human Development Index 2013

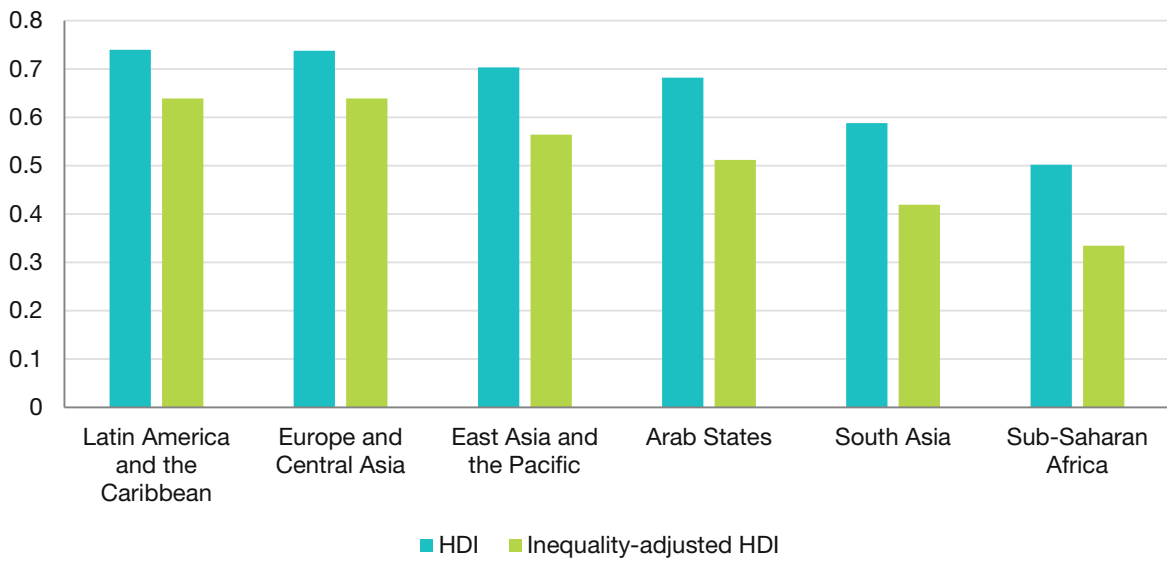
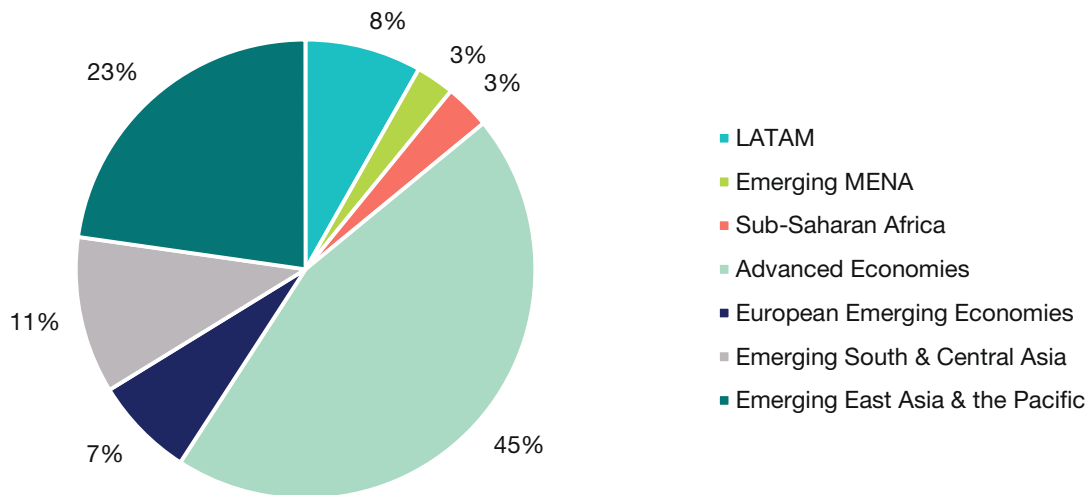


Figure 3: Regional Shares of world GDP 2015 (PPP)



Asia's strong performance can be explained by many factors, such as much higher savings and investment rates, greater openness and export orientation, better human capital development, and stronger global competitiveness and "cost of doing business" rankings.

it declined to 7.4 percent by 2014 (Figure 4). Meanwhile, Asia's share of world GDP reached a low point of the last three centuries in 1950, at approximately 17 percent, but has risen dramatically since then to its current level in 2015 at 41.4 percent (Figure 5).

But there has been a noticeable performance divergence with other EDEs: while Latin America accounted for 35 percent of the EDEs' GDP in 1981, this share dropped to only 8.6 percent in 2015. By contrast, Emerging Asia rose from 35.2 percent to 61.4 percent, led by China, but also by India and a number of other countries. Other EDEs regions have remained also more or less in line with world GDP.

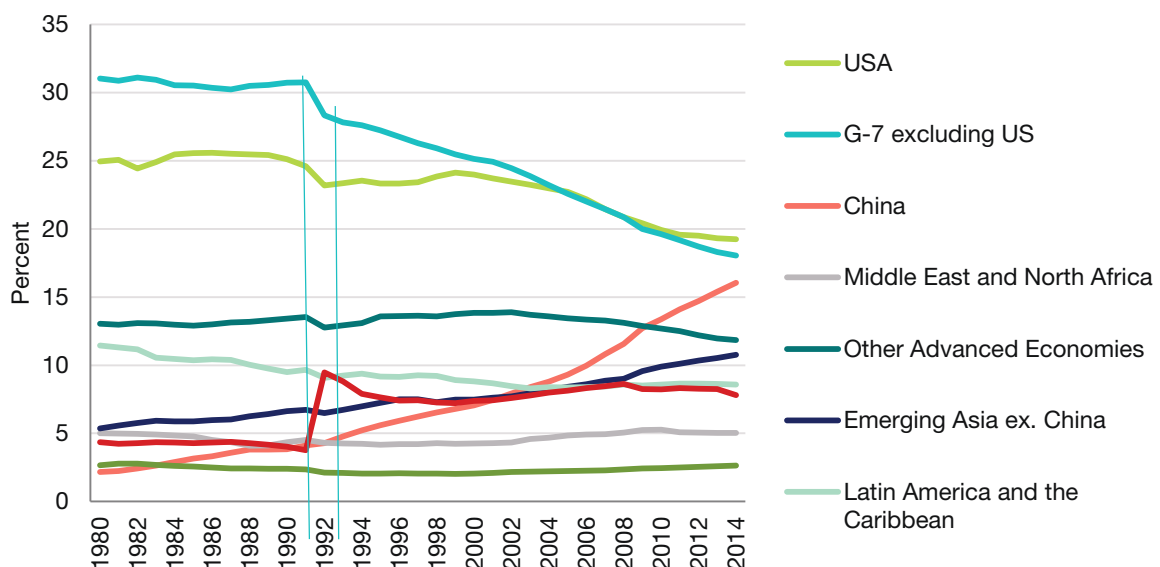
Comparative numbers on the potential future growth performance show great divergence. Although the income of Latin America has stabilized or at times even declined relative to the US over the last three decades, those of the Asian Emerging Market Economies rose considerably, marching towards convergence with the US. African

countries and Emerging European countries also showed a decline in the ratio of per capita income to that of the US.

Within these regional performances, the per capita income of South Korea was 14 percent of that of the US in 1981 and reached 64 percent by 2013. In terms of individual countries, China has risen from 1.2 percent to 22 percent. Brazil, Mexico, and Argentina each enjoyed a slightly higher GDP than China in 1981, but their fortunes have been dramatically reversed. Mexico's GDP was 49 percent higher than India's in 1981, but the latter was 58 percent larger than Mexico's in 2013. Argentina's economy was almost double that of Indonesia in 1981, a country with almost six times the population, but Indonesia's GDP was almost double that of Argentina by 2013.

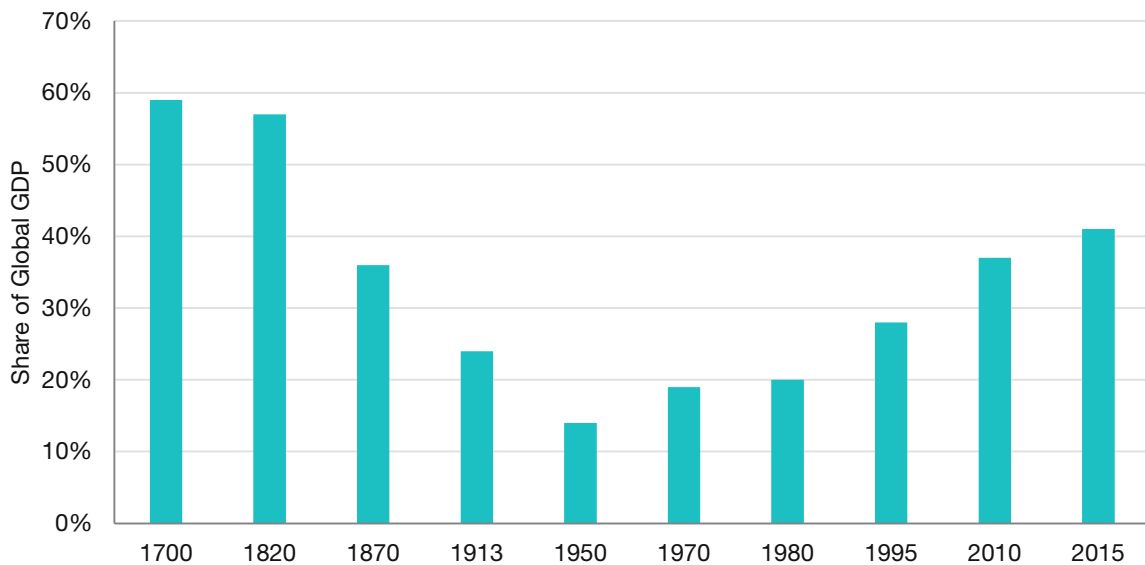
Asia's strong performance can be explained by many factors, such as much higher savings and investment rates, greater openness and export orientation, better human capital development, and stronger global competitiveness and "cost of doing business" rankings. That was also the case with certain countries in Europe, and

Figure 4: Various regions - Share in world GDP (PPP)



Latin America, and to a lesser extent Africa and the Middle East countries have continued to suffer from structural weaknesses, lack of an effective long-term development strategy, and a short term focus of both its political and economic leaders.

Figure 5: Asia's share of world GDP 1700-2015 (PPP)



in Africa. However, Latin America, and to a lesser extent Africa and the Middle East countries have continued to suffer from structural weaknesses, lack of an effective long-term development strategy, and a short term focus of both its political and economic leaders. This was reflected, amongst other indicators, in relatively poor growth in total factor productivity for many of these regions (see Figures 6 and 7).

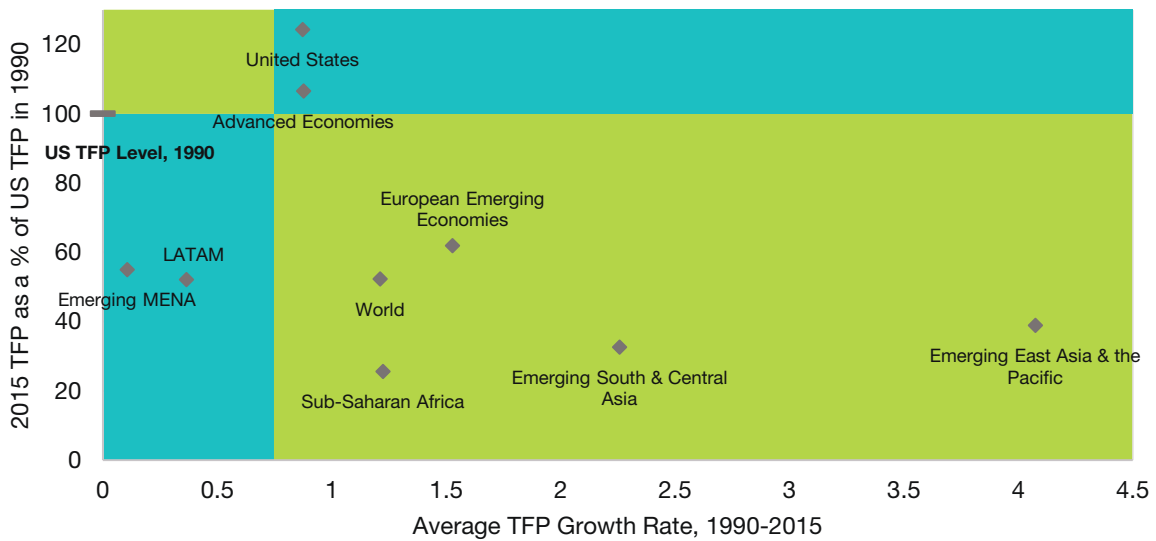
Moreover, the savings and investment have not been uniform around the world. With the highest per capita income, the AEs may be justified to have had greater propensity towards consumer spending resulting in low levels of savings and investment levels. However, from Figure 8, it can be observed that savings and investments in many developing regions, with the clear exception of Emerging East Asia and Middle East and North Africa, have suffered from low savings and investments almost throughout the past five to six decades; as a result, these regions were impaired in their growth rate,

particularly as TFP growth was sluggish compared to fast growing East Asia.

Under these circumstances, while the aggregate performance of the EDEs shows a rapid progress in converging toward the income of the US, not all regions performed the same (Figure 9). Almost all EDEs did so much better in relative terms, as their per capita income moved from the equivalent of 10.5 percent of US GDP in 1978, to 17.5 percent in 2014, with only limited reversal. Concurrently the AEs remained virtually stagnant in the relationship with per capita income of the US, but with large fluctuations (Figure 10). However, when the performance is observed for Latin America, its relative position has declined from 35 to 27 percent, the Middle East, from 23.5 to 21.5, and Africa from 8 to 6.5 percent. The ratio to US GDP for Emerging Europe rose by 2.5 percentage point to 37.5 percent, but with an intermediate decline of 10 points. Finally, Emerging Asia rose from 4.5 to 16.5 over the same period, resulting in a sharp increase in their share of the world GDP (Asia is home to about 55 percent of total world population).

Almost all emerging and developing economies did so much better in relative terms, as their per capita income moved from the equivalent of 10.5 percent of US GDP in 1978, to 17.5 percent in 2014, with only limited reversal.

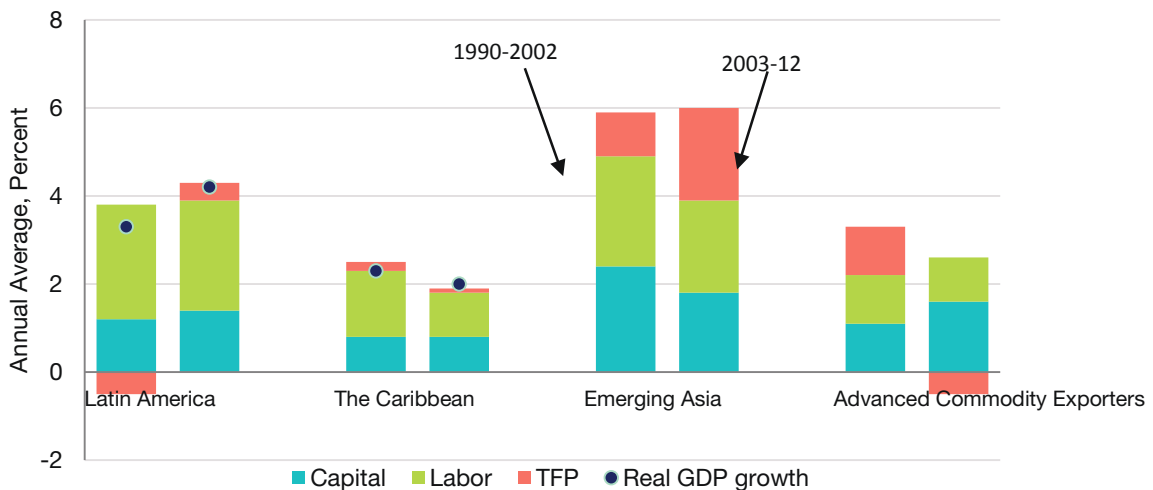
Figure 6: TFP growth vs. TFP level 1990-2015



Source: Centennial Group International 2015

IS THE ERA OF RAPID CONVERGENCE COMING TO AN END?

Figure 7: Contribution to real GDP growth (annual average, percent)



Source: IMF 2013, Western Hemisphere Regional Economic Outlook

The pace and trajectory of different countries cannot be summarized easily, because the economic and political conditions varied, but in most cases by now there has been a significant reduction in the volatility of economic growth, and, of equivalent and related importance in Latin America, a sharp reduction in the prevailing rate of inflation.

Figure 8: World average savings and investment rates 1980-2015 (percent of GDP)

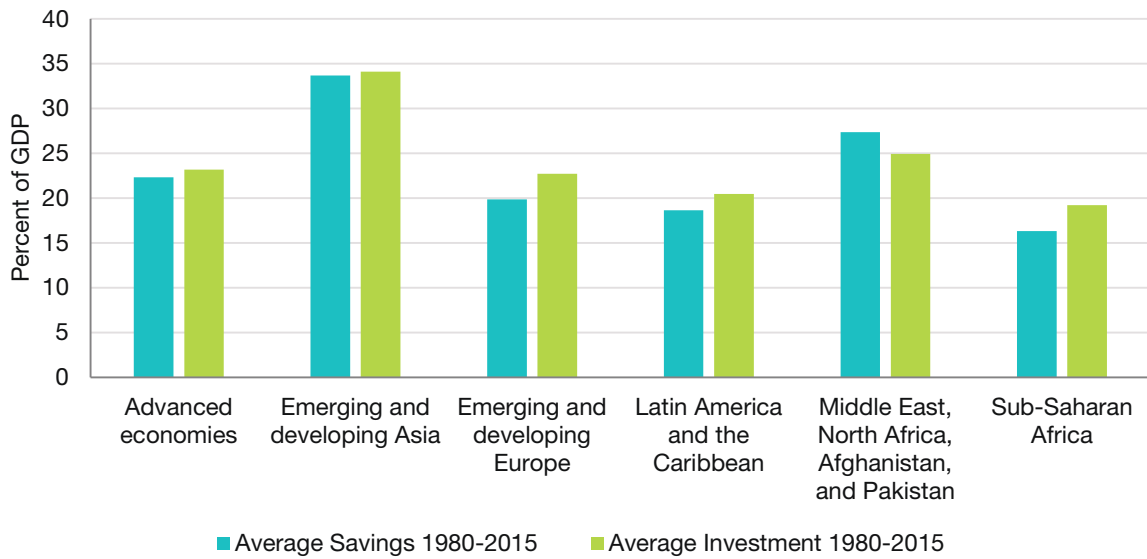
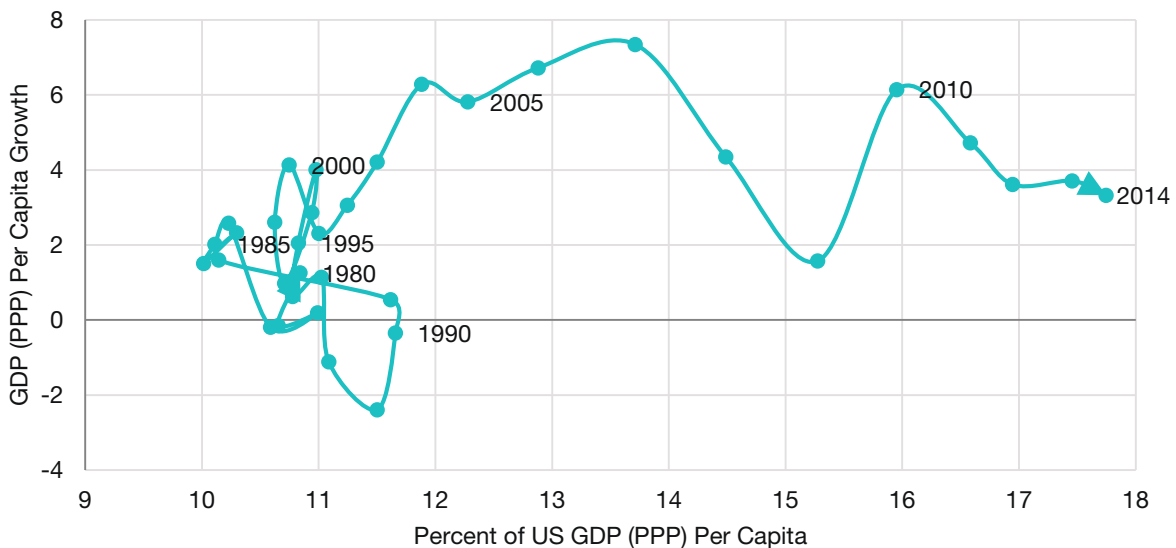


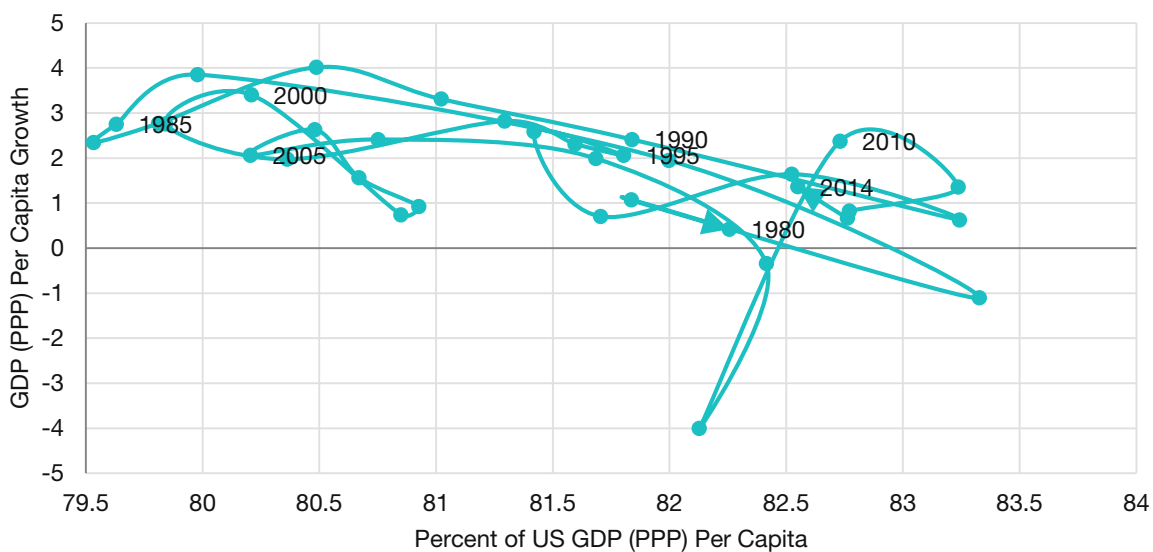
Figure 9: Emerging & Developing convergence 1980-2014



Source: Centennial Group International 2015

Many of the countries in the Emerging World, particularly in Africa, South America and the Middle East, were helped by China's dynamic performance, improved commodity prices and ample international financing, even as they were hit by the Great Recession.

Figure 10: Advanced Economies convergence 1980-2014



Source: Centennial Group International 2015

EDEs started their reform processes at different times. For the main regions of Asia and Latin America, it was in the 1980s and early 1990s, while for Emerging Europe and Africa it was in the 1990s and 2000s. Also, the process of reform was not smooth for many countries. For example, in Latin America the process of reform, even if incomplete, started during the so-called “lost decade” of the 1980s, and the economies became more resilient as they tended to strengthen their macroeconomic policies and advanced in their structural reform. However, this process led to dramatic breaks in growth at different times and in different places over the period.

In simple terms, the pace and trajectory of different countries cannot be summarized easily, because the economic and political conditions varied, but in most cases by now there has been a significant reduction in the volatility of economic growth, and, of equivalent and related importance in Latin America, a sharp reduction in the prevailing rate of inflation.

Moreover, several regions have started to break the previous pattern of non-convergence. Starting early in the last decade, the average annual GDP growth rate of developing Asia, Africa, and Latin America rose rapidly, partly but not exclusively because of the improvement in terms of trade, which extended through 2011-12. As a consequence, by early in the decade, the rate of growth for all EDEs also accelerated their pace and grew at 6.6 percent per year. Many of the countries in the Emerging World, particularly in Africa, South America and the Middle East, were helped by China's dynamic performance, improved commodity prices and ample international financing, even as they were hit by the Great Recession. To a large extent, this episode resembled the 1970s, when the Latin American economy grew rapidly, even when the advanced countries had slowed down.

Over the last three years, however, there has been a significant even if not necessarily a permanent, new trend. World GDP growth has decelerated and growth of the EDEs has slowed to an annual rate of 4.6 percent. The

The differential growth rate of emerging and developing economies with respect to the advanced economies has narrowed on a sustained basis from its peak of more than 6 percent in 2015, to levels comparable to the beginning of the century at 2 percent.

performance of the advanced countries had also been weak, but their growth has tended to recover in recent years (Figure 11); especially in the US, the UK, Germany and many northern European nations (plus Japan though more unevenly).

On this basis, the differential growth rate of EDEs with respect to the AEs has narrowed on a sustained basis from its peak of more than 6 percent in 2015, to levels comparable to the beginning of the century at 2 percent. While it is unlikely the differential may narrow significantly further, it raises questions about the plausibility of a sharp change in relative shares in world output, at least in the shorter term. Also, inflation has remained higher in the emerging world compared to the AEs (Figure 12). Indicators of income distribution as shown on Figure 13, also show the considerable differences among regions, even if they may follow a somewhat different classification.⁵

5. While income distribution in Latin America remains the most skewed, the numbers have improved in the recent past, while those of Asia (China and India), and the Advanced Economies (the US) have showed an increase in inequality.

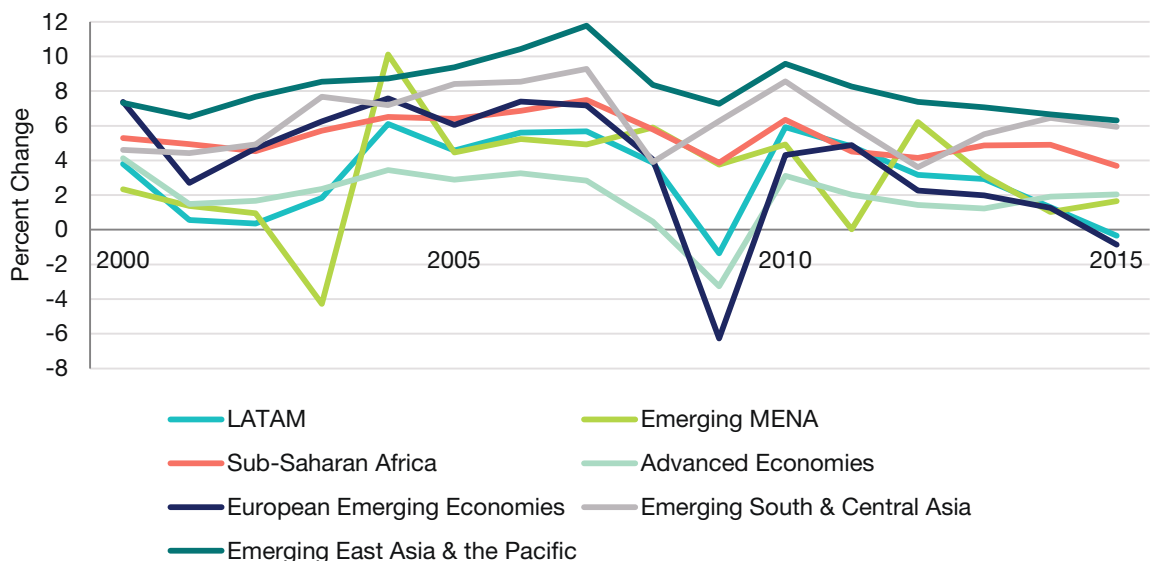
Commodity Price Cycles, Terms of Trade⁶ and Impact on Growth Rates

Over the past sixty years, many emerging regions have developed their commercial links with the rest of the world on the basis of commodity exports. Over time this has changed for some countries, like India, South Africa, Brazil, Mexico, and South Africa, which moved up the technology scale, with more complex industrial exports. Nonetheless, commodities continue to be at the center of the exports of emerging market economies of the Middle East, Latin America, and Africa, be it agricultural products, minerals, or oil.

As of 2014, commodities represented about 60 percent of Latin America and the Caribbean exports (based on UNCTAD statistics). For Africa, the numbers were 95 percent and for the Middle East, as approximated by

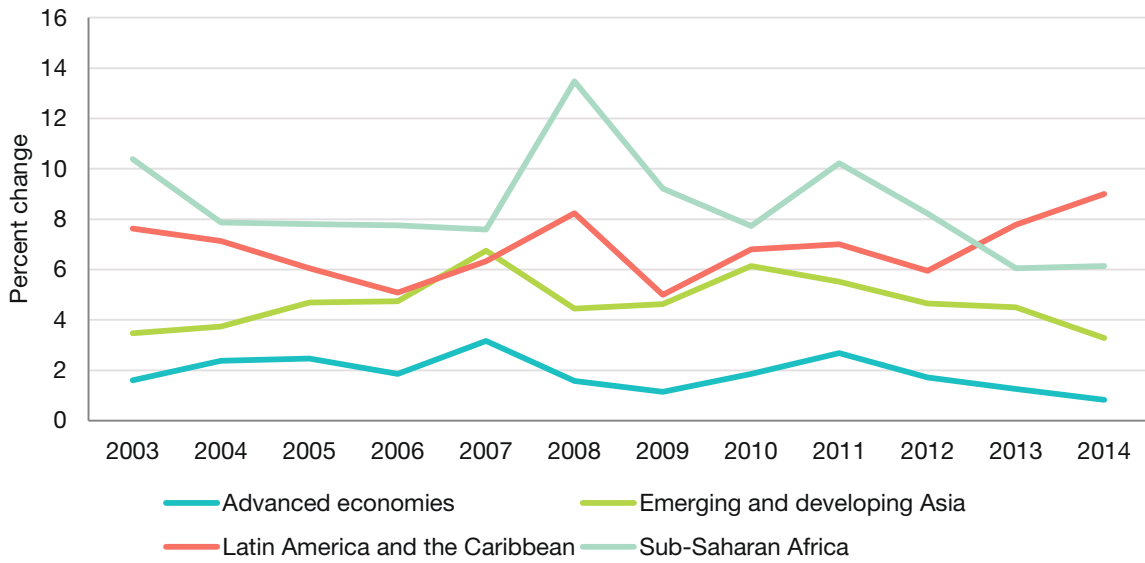
6. This is based on "Commodity Terms of Trade in Emerging Markets: A Fragile Blessing," by Claudio M. Loser, presented in the Global Journal of Emerging Market Economies (Sage Publications, May 2013), and updated 2014.

Figure 11: Comparative GDP growth rates 2000-2015



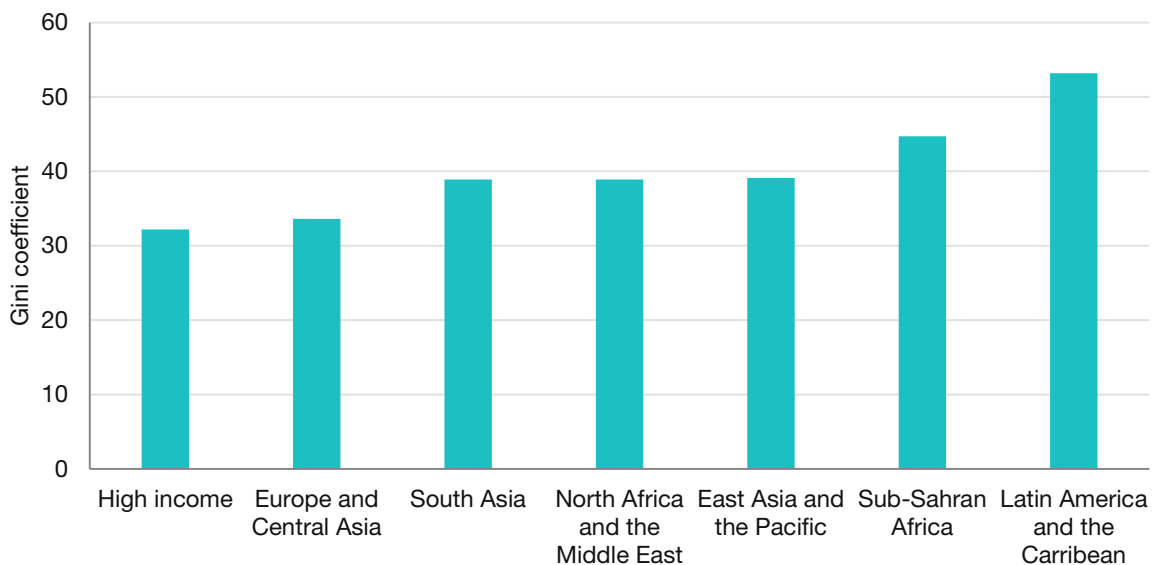
Commodities continue to be at the center of the exports of emerging market economies of the Middle East, Latin America, and Africa, be it agricultural products, minerals, or oil.

Figure 12: Inflation rates



Source: IMF WEO 2015

Figure 13: GINI coefficient



Source: ECLAC and Centennial Group International

A reversal of commodity prices has a major impact on income of commodity exporters, and thus on their economic growth through the expected multiplier effects of a decline in export income.

Western Asia, the ratio of primary commodity exports was 74 percent. By contrast, Asian exports of commodities represented 30 percent of total exports, and 26 percent for high-income OECD countries.

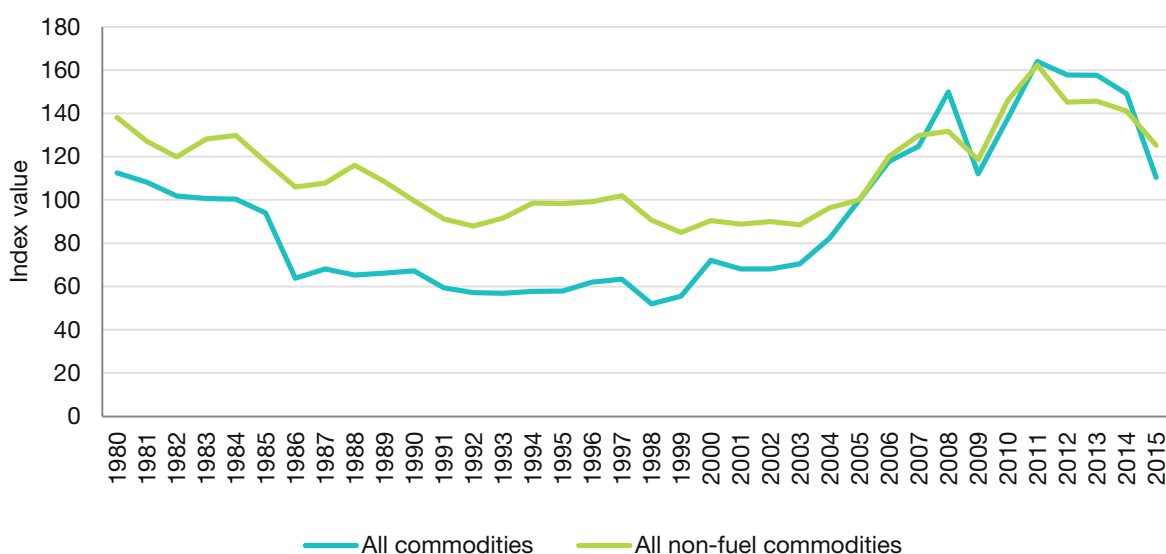
The increase in commodity prices, well in excess of these regions' import prices, has resulted in a marked improvement in their terms of trade. Even after declining in recent years, they have increased by 50 percent since 2000 for Latin America and the Caribbean and Sub-Saharan Africa and about 54 percent for the Middle East and North Africa.

Clearly the impact of this enormous change in relative prices has resulted in a large transfer of resources to an extent that had not been observed in the last 30 years. The rise of China and India, as well as the NICs and other Asian countries, has led to an increase in the demand for commodities that outpaced the rise in their supply. Accordingly, Latin American and African countries experienced stronger growth and prosperity for about a decade until 2012.

However, in recent years, commodity prices have declined sharply, putting in jeopardy the prosperity that was considered to be on a strong footing. These concerns are evidenced by the declines observed since 2012, and particularly since mid-2014, when the price of oil declined by more than 50 percent in only a few months, and the price of metals, coal, and some food stuff also fell almost equally dramatically. There is no easy answer to the consequence of this situation.

A reversal of commodity prices has a major impact on income of commodity exporters, and thus on their economic growth through the expected multiplier effects of a decline in export income. A slowdown in the advanced and emerging world due to cyclical issues is already and will continue to cause a shock. While the relative prices of raw materials have not declined to the levels observed in the 1990s, the sharp decline of recent years, brings them back to levels that had not been observed for a decade (Figure 14).

Figure 14: Commodity prices deflated by advanced economy export prices (2005 = 100)



As commodity-importing emerging economies such China, India, Turkey, and Mexico have matured demographically and economically, the increase in demand observed in the last few decades will not be sustained and exporters will need to adapt to these new circumstances.

More fundamentally, as commodity-importing emerging economies such China, India, Turkey, and Mexico have matured demographically and economically, the increase in demand observed in the last few decades will not be sustained and exporters will need to adapt to these new circumstances. Moreover, a significant increase in output is taking place for many products, in response to the high prices of recent years. Complacency among policymakers tends to reflect a benign view of the future. However, the past may repeat itself in terms of periods of growth and prosperity followed by times of crisis and needed reform.

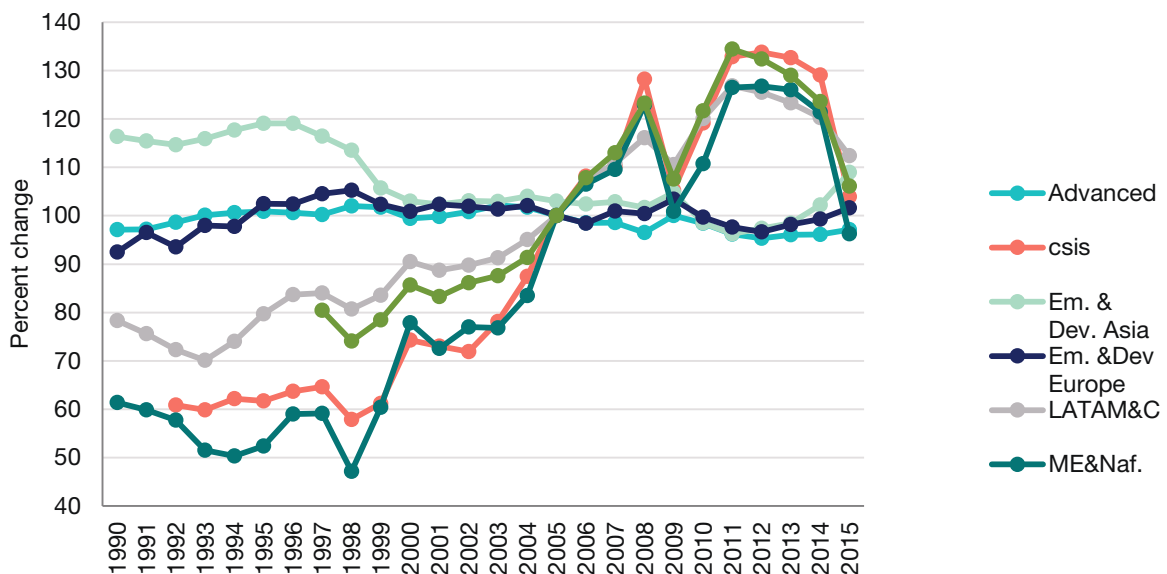
Throughout the past sixty years, terms of trade for commodity-exporting regions and countries have shown a marked cyclical path. Over the long haul, terms of trade have had a strong secular cyclicity, and even if they increased on a sustained basis for a full decade from 2001 to 2011, the common perception in much of Africa, Middle East, and Latin America that the rise of commodity markets would continue has reversed, with great volatility as can be seen on Figure 15, has been much more marked than

that of the advanced economies and Emerging Europe. Movements in terms of trade were much more limited in developing Asia, particularly starting in the late 1990s.

Table 1 presents the average annual rate of change in terms of trade and the standard deviation for each region through 2014. While the Middle East shows the highest average annual change over the period, it also has the greatest volatility, as measured by the standard deviation. Africa follows, although with smaller average rates of increase, and the rate of change and the volatility are much higher for export-intensive countries. Non-export intensive countries have tended to show changes and volatility in line with what is observed in Latin America. By contrast, developing Asia, the more dynamic destination of exports shows a negative trend in terms of trade, as is the case for most of the advanced economies, with relatively low volatility.

In summary, gains in terms of trade in recent years have been a source of unprecedented prosperity in Africa, Latin America, and the Middle East. The evidence is that

Figure 15: Terms of trade by region 1990-2015



The impact of lower terms of trade can be staggering—a decline in GDP of one half percentage point for each percentage change in terms of trade.

Table 1: Annual terms of trade changes (in percent, 2000-2014)

Region	Average	Standard Deviation
Sub-Saharan Africa	3.6	6.8
Latin America	3.1	6.3
Middle East & North Africa	4.5	10.4
Advanced Economies	-0.4	1.7
Emerging Market & Developing Economies	1.8	3.3
Developing Asia	-0.4	2.2

Source: IMF, WEO, Oct 2012, UNCTAD STAT, and Centennial Group International 2015

disposable income and GDP have been directly and positively influenced by this. However, it is also clear that these trends are being reversed in some countries and regions. The impact of lower terms of trade can be staggering—a decline in GDP of one half percentage point for each percentage change in terms of trade. With the certainty that prices will fluctuate and that they can show a secular downward trend, it is essential to prepare EDEs for the lower price contingencies. Otherwise, volatility will take over and hinder growth.

Regional Comparisons of Other Indicators that could influence future growth

Progress has been significant in many areas, but even for Developing East Asia, the star performer among current EDEs, there is still considerable room to gain. Different indices show the relative position of different regions in other key indicators; Figures 16 and 17 show a clear ranking in performance.

From Figure 16, it is clear that after the AEs, the two best performing regions are the Middle East and North Africa, and Developing and Emerging Europe. In contrast, the worst performer in terms of non-income development indicators is Sub-Saharan Africa, generally followed by Latin America, with Emerging Asia in the middle (except in technological readiness where it falls behind Latin America)

The ease of doing business ratings exhibit somewhat different rankings (Figure 17). They show the AEs countries in first place and Sub-Saharan in last place, followed

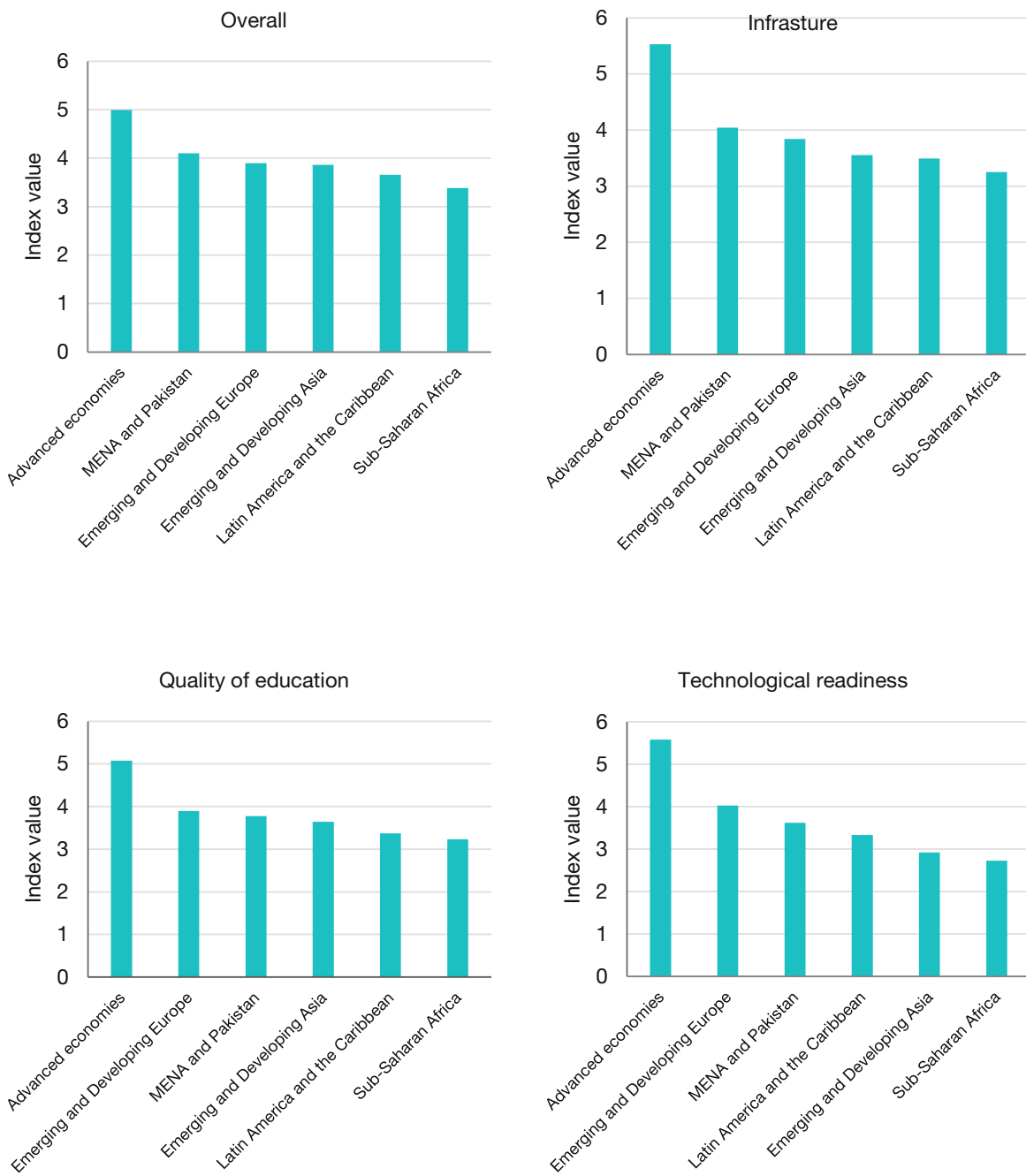
by South Asia (mainly India). However, East Asia and the Pacific ranks higher than both Latin America and the Middle East and North Africa. The split between South and East Asia explains the different behavior relative to the previous series, but the Middle East falls sharply in the rankings.

The above discussion demonstrates that emerging market economies as a whole have not been at a standstill even during and after the Great Recession. Even if registering a slowdown in growth, most emerging economies have become stronger in many areas considered important for modeling of growth:

- After suffering repeated economic crises from the 1970s to the early 2000s, many EDEs have entered a new era of economic progress and robust growth. Most countries had stable macroeconomic positions, while very few have experienced high inflation; this bodes well for future growth prospects.
- Higher growth has resulted in lesser inequalities, a fast rising in middle class, and demand for more satisfying jobs. A combination of these factors is leading to an explosion in the peoples' expectations and aspirations.
- Prudent domestic macroeconomic policy reforms in the last quarter century or so (plus flexible or more realistic exchange rates, weaning out of weak banks and stronger supervision of both bank and non-bank financial institutions) played a critical role

Progress has been significant in many areas, but even for Developing East Asia, the star performer among current EDEs, there is still considerable room to gain.

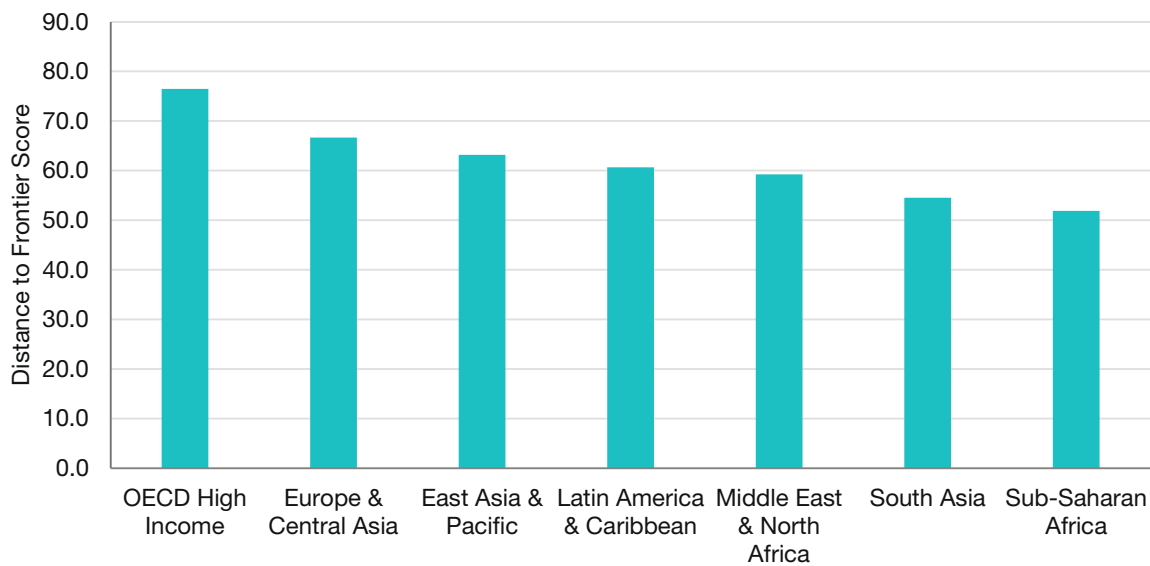
Figure 16: Regional performance for various indices - Global Competitiveness Index 2014-15



Source: Global Competitiveness Report 2014-2015

As the advanced began to recover from their dismal performance, the relative attractiveness of emerging and developing economies, maybe with the exception of Sub-Saharan Africa, narrowed considerably, and capital inflows declined and became more volatile.

Figure 17: Ease of Doing Business 2015: Distance to the frontier score (average)



Source: Ease of Doing Business 2015

in keeping inflation low and removing vulnerabilities. The newly-acquired macroeconomic strength was also in evidence in recent years in the face of the Great Recession.

- Greater financial and economic stability has yielded major benefits over the longer term through increased consumer and investor confidence, with better business climate and a deepening of financial systems.
- There have been continuous efforts to integrate the EDEs (South-South integration) both in terms of infrastructure and institutional cooperation, although these efforts have not been pursued consistently over time and in different sub-regions.

In summary, the EDEs can derive satisfaction from their economic performance during the decade, through 2012. Thanks to the advances noted above, the 2008-09 global economic crisis (Great Recession) hit EDEs to a lesser extent than the advanced countries. They also recovered relatively well in the following years though a

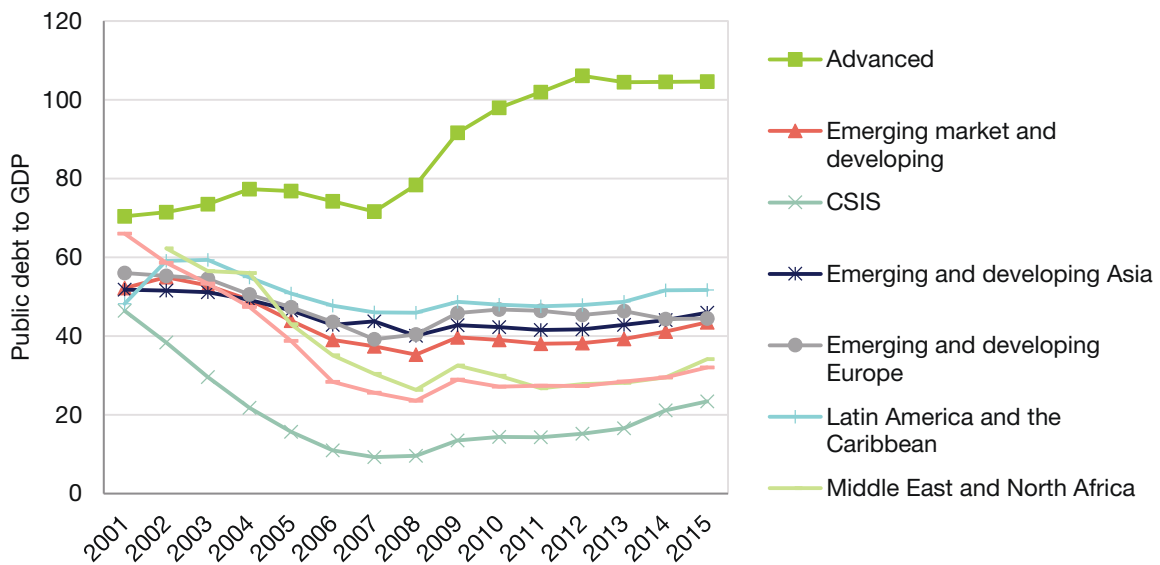
V-shaped bounce back, by becoming a major sanctuary for international capital inflows and, for many countries, a recovery in commodity prices. Improved economic conditions and better management also resulted in reduced levels of public debt relative to GDP (Figure 18) improving resilience to shocks.

However, the improvement in past performance also seems to have generated an excessive sense of self-satisfaction and complacency in some countries; such countries have had a rough awakening recently, as global rate of growth started to decelerate and commodity prices peaked in 2012.

As the AEs began to recover from their dismal performance, the relative attractiveness of EDEs, maybe with the exception of Sub-Saharan Africa, narrowed considerably, and capital inflows declined and became more volatile. In part, this was associated with an increasing perception that growth was sustained by extraordinarily expansionary (fiscal) policies in the G-7 economies, well in excess to what was considered prudent in the past.

The emerging and developing economies face the disappointing reality that growth has decelerated from the high level observed during the period 2003-11.

Figure 18: Public debt



Source: IMF WEO 2015

This perception may have been only temporary, although, there is a clear change in relative rates of growth among regions, with East Asia (plus India) still growing at the fastest, though somewhat declining, rate of growth. Moreover, one of the main drivers of world growth during the past thirty years, China, has experienced a steady (and long anticipated) decline in growth. It appears that China will likely moderate its future demand for commodities—as its structure of demands shifts from exports and investment to domestic consumption—thus hitting exports of many EDEs.

More recently, commodity prices have fallen considerably, which compounded by concerns about the removal of quantitative monetary easing in the US and the associated tightening of capital markets. In the face of these difficulties, structural issues that have been masked by the boom period are becoming more evident. With the slowdown, there are heightened downside risks that progress toward improving incomes, and equity may lose some of its past momentum.

Future Sources of Growth in Emerging Market Economies

The last quarter century has brought about an economic revolution and a total transformation of the world economy. However, there is significant additional work to be done in EDEs, as can be seen from the previous discussion. The required policy adjustments have to be framed in the context of another key aspect of analysis: the possible sources of growth, in light of the world's economic prospects. In this regard, the EDEs face the disappointing reality that growth has decelerated from the high level observed during the period 2003-11. The deceleration has taken place world-wide with very few exceptions, but it has been most remarkable in Latin America, as had been the recovery from the very low and volatile experience of 1998-2002. Given its heavy reliance on commodity exports, Africa can too be expected to suffer a similar slowdown.

But, even some strong performers of the past have experienced a decline in the rate of growth (China, Indonesia, Mexico), while a few countries have performed very

Emerging and developing economies, except for possible short term cyclical movements, will need to adjust to a downward or at best stagnant performance of commodity prices.

poorly (Brazil, South Africa). As noted, a dominant factor in this performance is the deceleration of world economic activity, particularly in Europe, Japan, and China, three economies that have been the four major drivers of global economic growth. This effect is hitting the EDEs directly in terms of demand for commodities—the main source of export receipts for many regions. Moreover, the price declines reflect also actual and expected increases in supply, not the least in fuels, metals and food, and lower global demand owing to technological changes induced by the high prices prevailing through 2011.

In these circumstances, EDEs, except for possible short term cyclical movements, will need to adjust to a downward or at best stagnant performance of commodity prices. As such, even with declining growth, the world cannot rely on simplistic demand management measures to sustain economic activity, as some have done and are continuing to do so far.

The EDEs can base their future growth on a number of favorable factors:

- On average, macroeconomic management is good. To assure its sustainability over the long term, a political consensus to entrench these policies would be important.
- Financial conditions are generally good. Banking systems are stronger than they used to be, with prudential regulations and supervision working well. However, the systems remain relatively small and most of them unsophisticated, as compared to Advanced Economies.
- Commodity output and exports will remain at the core of the productive structure of several areas of the world.
- Even, with this broadly positive outlook, the prospects are complex.
- Industrialization, as a source of employment, investment, and technological change have proven elusive, except for countries like China, Mexico, and several specific Asian and European

countries, which embraced an open trade, productive integration approach, without any strong guidance from the government. Thus, countries need to adopt an open economic structure and reduce government intervention in the economy to achieve a degree of industrialization.

- Many experiments with high import barriers proved to be a mixed and short-lived blessing that could not be solved with an inward-looking integration strategy.
- Primary goods production can remain an important source of growth, based on technological improvements, and a reasonable long term income stabilization system, but new sources of growth, including in services will be required.
- In order to attain sustained growth, within the parameters of good management, attention will need to be focused on the following principles:
- Value added will originate from continued production and exports of commodities, preferably with higher value added
- More complex value added based on education and technology intensive processes, with a likely specialization in services
- A process of integrated value added chains of production among countries within and among regions.
- The approach will require
- A fundamental change in the emphasis of secondary and tertiary education, toward technical studies at the University and vocational levels
- Greater integration and cooperation between productive sectors and the academic institutions, namely in the form of a consultative process of adaptations of labor to new market requirements, and in a more practical focus of academic research, in close connection and being partly financed by the private sector
- Greater use of Public Private Partnership mechanisms

If the rest of emerging economies could enter the club of fast growing “convergers,” it could make a radical difference to the world’s overall prospects.

- In many cases, increased savings-investment
- Change in priorities from indiscriminate consumer subsidies to targeted expenditure
- Rational use of credit institutions, without emphasis on champion companies or sectors
- Appropriate Environmental policies
- Open trade regimes
- In general terms, a very cautious and measured role for the government, beyond supervision and the enforcement of non-discriminatory rules of the game.
- Continued physical and communication integration
- Reduced emphasis of top-down and more on bottom-up consultation and cooperation
- Greater research cooperation through the academic process, government research institutions, and in the private sector through the work of regional companies

Three alternative scenarios of Emerging Economies’ long-term growth performance

For this study, our team has generated three different scenarios from Centennial’s proprietary econometric model: i) a business-as-usual (BAU) scenario; ii) an optimistic scenario, and iii) a pessimistic scenario. These three scenarios are amongst dozens if not hundreds of scenarios that could have been derived from the history by varying movements in the three main drivers of growth: capital (investment), labor force (human capital), and total factor productivity (technological change), in any of the 180 plus countries individually handled in the model for each year between 2015 and 2050.

Business-as-usual envisions a future where countries continue with their historical patterns and remain on the same trajectory they achieved in the past. In the optimistic scenario, some of the countries are assumed to have learned the lessons of history and demonstrated a capacity to break with their historical path and achieve even higher levels of growth and prosperity. Finally, in the pessimistic

scenario, countries diverge from history in the wrong direction, failing to learn the lessons from other regions and stagnating at their current levels, or even falling lower than in previous years. Beyond the internal decisions of countries, which scenario they face is also related to several external megatrends that have been discussed elsewhere in this study and which, in the study team’s view, could dramatically impact the global economy as a whole between now and 2050.

Business-as-usual scenario

Under the BAU scenario, today’s emerging economies would grow at an average annual rate of about 4.2 percent over the 2016-2050 period, in comparison to a rate of growth of 1.9 percent for the advanced economies (Figure 19). Two other important results must stand out: there is a significant dispersion in regional rates of growth, and the pace of growth declines throughout the next 25 years: The average rate of growth for Sub-Saharan Africa would be in the order 5.1 percent, and that of Emerging Asia, 4.7 percent. The projected rate of growth of GDP in Latin America is 3 percent and the Middle East is about 3.2 percent, and that of Emerging Europe, 1.7 percent, about in line with the advanced economies. Over time, the rate of growth declines, as countries tend to converge toward their target.

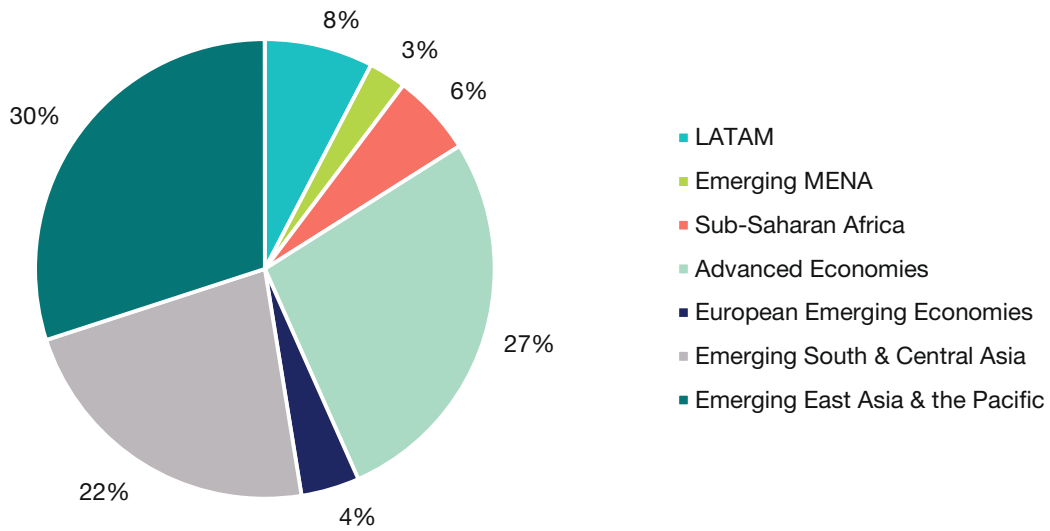
In the BAU scenario, emerging Asia shows the fastest growth in per capita income, followed by Sub Saharan Africa and Latin America, and the Middle East. The slowest pace of growth will be observed for emerging Europe and the advanced economies.

The optimistic scenario

If the rest of emerging economies could enter the club of fast growing “convergers,” it could make a radical difference to the world’s overall prospects (Figure 20). To investigate this, the model is rerun with the other countries slowly graduating from non-converger to converger status at various country-specific dates determined by how close

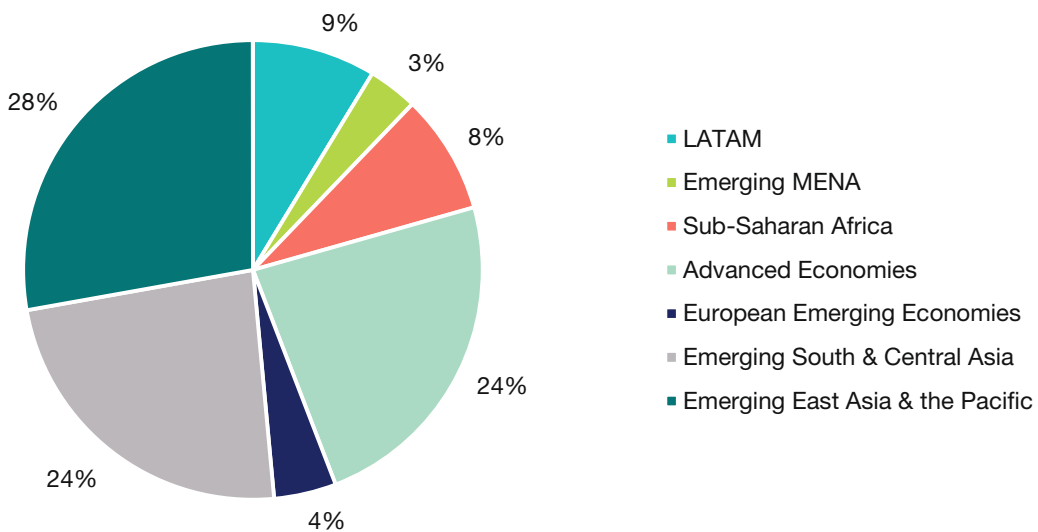
The optimistic scenario attributes to most economies the same phenomenon of technological catch-up as in the rest of the converging world.

Figure 19: Business-as-usual scenario - Regional shares of world GDP 2050



Source: Centennial Group International

Figure 20: Optimistic scenario - Regional shares of world GDP 2050



Source: Centennial Group International

Without speculating about the myriad of difficulties that may arise, may they be beyond the control of the authorities, or because of poor policies, GDP would slow down enormously.

their recent TFP growth has been to the TFP growth the model would predict if they were convergers (see Annex 1).

This means they successfully undertake the policy and institutional reforms needed to benefit from catch-up growth. By 2050, the difference for the concerned emerging economies become very significant; increasing the average rate of growth of the group as a whole from an average annual rate of 4.3 percent in the BAU to 4.9 percent in the optimistic scenario. As a result, by the end of the period, the global GDP would also be significantly higher, with output levels exceeding the BAU by about a quarter. The regional differences remain significant, though the total difference may seem relatively modest. This is explained by the fact that the largest contributors to growth in Asia are already convergers: China, India, Indonesia and Vietnam. By contrast, growth in the less dynamic regions under BAU (Africa, the Middle East, and Latin America) is much faster in the optimistic scenario. With catch-up, many countries could expect TFP growth of 2 to 3 percent per year. By 2050, some major economies would already have the

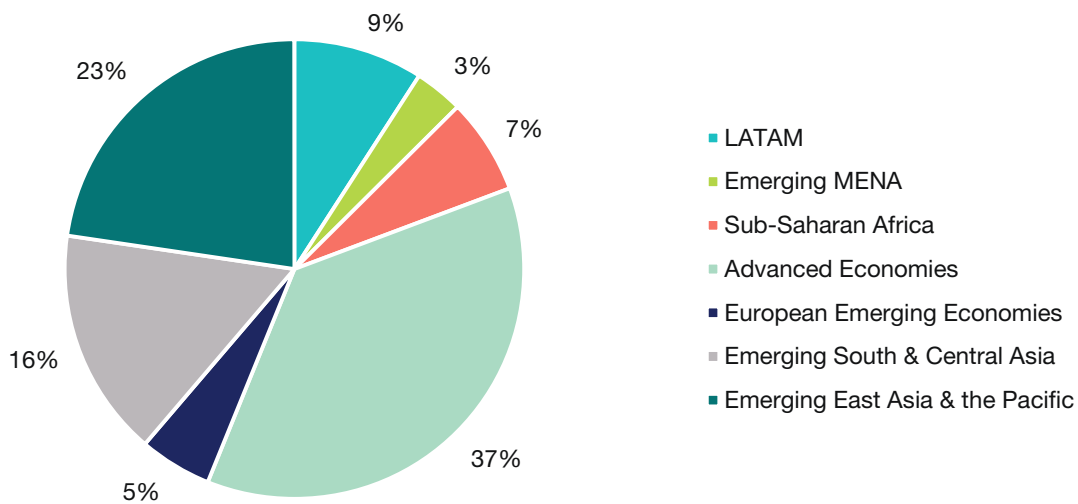
same productivity on average as that in the United States in the 1990s.

The optimistic scenario attributes to most economies the same phenomenon of technological catch-up as in the rest of the converging world. That is to say, it is an estimate of what can be considered as the potential growth for these countries. Compounded over many years, the impact is significant.

The pessimistic scenario

As a counter example of what could happen if policies were not to work as expected in most countries, including in the case of China and India, the results would be dramatically worse (Figure 21). Without speculating about the myriad of difficulties that may arise, may they be beyond the control of the authorities, or because of poor policies, GDP would slow down enormously. Average annual world GDP growth would be reduced by 1.4 percentage points, compared to the BAU, and 2 percent lower compared to the optimistic case. The fall would be particularly harsh

Figure 21: Pessimistic scenario - Regional shares of world GDP 2050



Source: Centennial Group International

It is noteworthy that a small group of countries will account for the bulk of the expected increase in world output in the next 25 years.

in the case of Asia, but all regions would suffer, even not taking into account the links between them because of trade and finance. These links would further aggravate the situation, as it benefits the world if policies are right. World GDP would be 40 percent lower than in the case of BAU, and one half of the possible optimistic outcome. The range of possible results is a function of the set of policies, but it shows clearly the dramatic differences of good and poor policies.

The Global Long Term Growth Prospects

The past regional rates of growth have varied considerably, with average rates of growth for the period 2000-15 ranging from 7.8 percent for Emerging Asia, 5.4 percent for Sub-Saharan Africa, 4.7 percent for the Middle East and North Africa, 3.6 percent for Emerging Europe, and 3.2 percent for Latin America and the Caribbean. By contrast the advanced economies showed a growth rate of only 1.8 percent. Such growth has brought the average EDE per capita GDP in 2015 to about US\$9,350 (in current PPP dollars), compared with \$43,000 for the advanced economies. The regional GDP was \$15,400 for Central and Eastern Europe, \$9,000 for Developing Asia, \$14,000 for Latin America, \$11,000 for the Middle East and North Africa, and \$3,400 for Sub-Saharan Africa.

As discussed, the study scenarios postulate alternative paths through 2050, on the basis of the world growth model described in the Annex. As a long-run model, the results and assumptions are stylized, and are not intended to predict the future, but to provide a context for policy formulation and reform. Annex 1 briefly outlines key characteristics of the updated 2015 model used in this work.

In PPP terms, the global economy measured US\$104,600 billion in 2015,⁷ dominated by China with US\$ 18,000 billion followed by the United States with US\$17,000 billion, just over one fifth of the global total, and followed by Japan, with US\$ 4,500 billion. In 2015 in PPP terms, North America (18 percent), Europe (23 percent),

and Asia (41 percent) dominate the world economy. Latin America's share was about 8 percent. This is a relatively recent phenomenon, driven largely by China, which has expanded its global market share to 17 Percent. Importantly, the advanced countries account for 45 Percent of global output now (based on PPP values), compared to almost 70 percent in 1990.

By 2050, the global economy may total \$398 trillion in 2011 PPP dollars.⁸ Such a world is very different from the one we see today. It is significantly wealthier, with per capita incomes averaging close to \$36,000 as compared to \$11,000 today. By then, the center of gravity of the global economy will have shifted to Asia, which accounts today for about 34 percent of global activity, but by 2050 could account for 56 percent of global output. China and India, among emerging economies, and Japan, among advanced economies, would lead the way in the region. The rise of Asia would bring Asia's economic share into line with its share of world population and bring the balance that prevailed in the 18th and early 19th centuries, before the Industrial Revolution.

It is noteworthy that a small group of countries will account for the bulk of the expected increase in world output in the next 25 years. Table 2 shows the top ten contributors to world GDP; China and India alone would contribute 46 percent of the estimated increase in world GDP, and together with the US, the value increases to over half (almost 53 percent). The top 10 contributors to global GDP from 2015-2050 explain about 70 percent of GDP. Of these 10, only four are classified today as advanced economies (United States, Japan, Germany, and the United Kingdom).

There may be an upward bias in the above rate of growth for the world, because the share of more rapidly growing economies has increased, while the share of slow growing countries has fallen. However, with a longer term

7. Centennial Group estimates.

8. Natural resource constraints and the effects of climate change have been ignored in this scenario. This may prove to be quite unrealistic but to take these into account would require a far more sophisticated model of global growth.

Overall, the world will add 2 billion people by 2050, but the population in today's rich countries will grow by only an estimated 100 million.

Table 2: Share of contribution to world growth by top 10 contributors, 2015-2050

	Share of Change in World GDP			Cumulative Share of World GDP Change			Cumulative Emerging Economies			Cumulative Advanced Economies		
	2000-2015	2016-2030	2031-2050	2000-2015	2016-2030	2031-2050	2000-2015	2016-2030	2031-2050	2000-2015	2016-2030	2031-2050
China	30.9%	23.2%	20.9%	30.9%	23.2%	20.9%	30.9%	23.2%	20.9%			
India	15.7%	22.1%	25.6%	46.6%	45.4%	46.5%	46.6%	45.4%	46.5%			
United States	13.1%	7.6%	7.1%	59.8%	52.9%	53.5%				13.1%	7.6%	7.1%
Indonesia	3.5%	5.4%	5.7%	63.3%	58.3%	59.2%	50.2%	50.7%	52.1%			
Mexico	1.6%	2.2%	2.0%	64.9%	60.5%	61.2%	51.8%	52.9%	54.2%			
Germany	1.5%	0.6%	0.6%	66.4%	61.1%	61.9%				14.6%	8.2%	7.7%
United Kingdom	1.5%	1.1%	1.0%	67.9%	62.2%	62.9%				16.1%	9.2%	8.7%
Korea	1.4%	1.0%	0.8%	69.3%	63.2%	63.7%	53.2%	54.0%	55.0%			
Iran	1.4%	0.8%	0.6%	70.6%	64.0%	64.3%	54.5%	54.7%	55.6%			
Japan	1.3%	1.4%	1.1%	71.9%	65.4%	65.4%				17.4%	10.7%	9.8%

Source: Centennial Group International 2015

Table 3: Share of contribution to world growth by region, 2015-2050

	Share of Change in World GDP			Cumulative Share of World GDP Change		
	2000-2015	2016-2030	2031-2050	2000-2015	2016-2030	2031-2050
Emerging East Asia & the Pacific	38.9%	34.1%	32.1%	38.9%	34.1%	32.1%
Advanced Economies	29.0%	19.6%	17.4%	67.8%	53.7%	49.5%
Emerging South & Central Asia	20.5%	26.5%	29.7%	88.4%	80.3%	79.3%
Sub-Saharan Africa	3.8%	5.9%	8.2%	92.2%	86.2%	87.5%
Emerging MENA	3.5%	2.7%	2.5%	95.7%	88.9%	89.9%
European Emerging Economies	2.5%	3.1%	2.5%	98.2%	92.0%	92.4%
Latin America	1.8%	8.0%	7.6%	100.0%	100.0%	100.0%

Source: Centennial Group International 2015

tendency for growth to decline for the major emerging countries, this bias will be more than offset by the declining trend. One reason that developing countries are growing faster than developed countries is that they are younger and in an earlier stage in their demographic transition.

These global demographic shifts are changing the distribution of global economic activity. Overall, the world will add 2 billion people by 2050, but the population in today's

rich countries will grow by only an estimated 100 million. 95 percent of the population increase (excluding migration) will be in developing countries, mostly in Africa. Of course, there is a slowdown in population growth worldwide and not only in the rich countries of Europe and Asia. China, Latin America, and many Middle Eastern countries are experiencing the same phenomenon, and thus it is most likely that all countries will see a decline in growth rates.

The various scenarios generated by the Centennial's model of the world economy suggest that the ongoing shift in relative economic power is likely to continue, though its pace at different time periods would also be influenced by the global business cycles.

Moreover, as countries converge, they will see a decline in per capita growth.

Concluding remarks

As noted throughout this chapter, EDEs share in world GDP is already higher than that of the advanced economies—when measured in terms of PPP— although the EDEs are still well behind the AEs in terms of per capita income.

The various scenarios generated by the Centennial's model of the world economy suggest that the ongoing shift in relative economic power is likely to continue, though its pace at different time periods would also be influenced by the global business cycles. Since 2000, the average rate of growth for the emerging economies has been two and a half times that of advanced countries. China's presence explains a significant part of the change, but the list of protagonists goes well beyond that, as many other countries have helped drive this historic transformation of global economic output and relative economic power.

The scenarios included here, suggest that ten countries (of which only four will be Advanced Economies) will explain almost 70 percent of growth in the next 35 years. Furthermore, as more and more of EDE residents become part of the middle class, they will have greater impact on the world economic structure, societal values, lifestyles, and governance.

However, the path ahead will not be easy. It also cannot be taken for granted. The superior performance of recent years was also the result of a number of important one-time events, like the opening up to trade, a process of internal mobilization, the improvement in education levels, the effects of the demographic dividend, the acquisition of new technologies, major medical breakthroughs, the commodity boom of the first decade of the century, and, above all, the success of the world community to contain regional conflicts and avoiding a full-fledged global war for almost 60 years.

Clearly, many of these factors that positively influenced economic development during the past 60 years cannot and are not going to be repeated, at least to the same degree. Other factors—like the dramatic improvements in terms of trade of commodity exporters, were cyclical and have either been already been reversed. Furthermore, the largest advanced economy (the US) appears ready to ease back on the massive stimulus (including close to zero interest rates) launched eight years ago to fight the dangers posed by the Great Recession. As the Federal Reserve reverts to more normal monetary policy, there will be huge adjustments in the world economy, including return of massive capital flows back to the G7 countries. This, combined with the ongoing changes in the structure of domestic demand in China and repeated crises of growth in many of the countries, mean the past engines of growth for the global economy may not continue (with the same force and impact). But despite such uncertainties and downside risks, overall, our study team remains persuaded that most likely actual outcomes would indeed fall within the range of the three scenarios.

The main message to the political, economic, and business leaderships is to remain very vigilant against complacency, to continuously enhance resilience to external as well as domestic shocks, and equally important, to pursue relentlessly the creation and strengthening of institutions that will be needed to steer the economies and watch over the private sector as the economies become both more complex and more globalized. In other words, the long-term future of the emerging economies will be in the hands of their own leaders.

Annex 1: Projections Methodology

This section estimates GDP as a function of labor force, capital stock, and total factor productivity for 185 countries between 2015–2050 under three different growth scenarios that we call “optimistic,” “pessimistic,” and “business-as-usual”. This section offers an abbreviated description of the model; a more detailed exposition, in Kohli, Szyf, and Arnold (2012), is available on request.⁹ As seen in equation (1), a Cobb-Douglas function with constant returns to scale is assumed, with α equal to two-thirds:

$$GDP = TFP \times L^\alpha \times K^{1-\alpha} \quad (1)$$

GDP figures are generated for three different measures: real GDP (constant 2010 prices), GDP PPP (constant 2010 PPP prices), and GDP at expected market exchange rates, which incorporates expected exchange rate movements and serves as this chapter’s best proxy for nominal GDP. The model first estimates annual real GDP growth for each country between 2012 and 2050. These estimates are applied to the previous values of real GDP, GDP PPP, and a measure equal to nominal GDP deflated by US inflation (on which GDP at market exchange rates is based) to derive the full series. Finally, to derive GDP at market exchange rates, real exchange rate changes are calculated and multiplied by the measure equal to nominal GDP deflated by US inflation to obtain GDP at market exchange rates.

Labor force growth stems from population growth and from changes in labor force participation rates. Population growth is based on the 2010 Revision of the UN’s World Population Prospects, while labor force participation rates are projected separately, by gender, for seven age cohorts (15-19, 20-24, 25-29, 30-49, 50-59, 60-64, and 65+) to better capture cohort-specific trends. Male rates are projected directly; female rates are derived by projecting the difference between male and female rates for each age group. Labor force participation rates from 1980 through 2011 are taken from the International Labor Organization. The cross-country, cohort-specific equations to forecast male rates are simple auto regressions of the following form:

$$\ln(M_{age,t}) = m_{age} \times \ln(M_{age,t-1}) \quad (2)$$

Where m_{age} is the percent of males in age group age who are active in the labor force and D_{age} is a constant that

varies for each age group. The cross-country, cohort-specific equations to forecast the differentials between male and female participations rates are:

$$\ln(D_{age,t}) = d_{age} \times \ln(D_{age,t-1}) \quad (3)$$

Where d_{age} equals the difference between the percentage of males in age group age in the labor force and the percentage of females in age group age in the labor force, and D_{age} is a constant that varies by age group. In both male and female models, for certain cohorts, rough upper or lower bounds are incorporated to address outliers. Observations that begin in 2011 beyond these bounds are not governed by the regressions but instead gradually converge over time towards the bounds. Capital stock growth, based on an initial capital stock and yearly investment rates and depreciation, is defined as:

$$(1 + K \text{ Growth}_t) = \frac{K_t}{K_{t-1}} = \left(\frac{I_{t-1}}{K_{t-1}} \right) - 0.06 \quad (4)$$

Where K is the capital stock, 0.06 represents the yearly depreciation of 6 percent, and I_{t-1} is the capital investment from the previous year, which is defined as the previous year’s GDP (measured in constant 2010 PPP dollars) multiplied by the investment rate as a share of GDP. The initial capital stock is calculated using the Caselli method, with the following equation:

$$K_0 = \frac{I_0}{g + 0.06} \quad (5)$$

Where K_0 is the initial capital stock, g is the average GDP growth over the subsequent ten years, 0.06 is the depreciation rate, and I_0 is the initial year’s investment. For I_0 , for each country, the earliest year for which there exists capital investment data (year y) is identified. The average of the investment rate values for year y and the two subsequent years is computed and treated as the initial investment rate. This smoothing out of fluctuations in the initial investment rate is necessary to yield better estimates for certain countries in which there is much volatility in the earliest investment rate values. This rate is then multiplied by the GDP in year y to determine I_0 . The earliest year possible is chosen for this estimate because the longer the timeframe before the projections commence the more the yearly depreciations will reduce the effects on the model of any initial imprecisions in capital estimates.

The model is calibrated by calculating total factor productivity (TFP) for an initial year (2013)¹⁰ based on labor

9. This annex is based on Kohli (2011), but it has been updated with the methodology revisions detailed in Kohli, Szyf, & Arnold (2012), in which more details about the methodology and its derivation can be found.

10. 2 IMF WEO GDP growth projections are used for 2012 and 2013.

force, capital stock, and historical GDP, with GDP and capital stock measured in purchasing-power-parity dollars at constant 2010 PPP prices. For subsequent years, TFP is projected. For the TFP projections, we differentiate four tiers of countries: rich or developed, converging, non-converging, and fragile. The model treats non-converging middle-income countries the same as non-converging low-income countries. Therefore, in this annex we classify countries into four tiers, whereas the chapter classifies them into five.

All countries begin with a default TFP growth rate of 1 percent, which, to a strong level of statistical significance, equals the average US rate over the past 40, 30, 25 and 20 years, and which, also to a strong level of statistical significance, equals the average rate of all non-converging countries over the same four periods. In our model, this is the fixed rate of productivity growth for non-converging, non-fragile countries. Research shows that some growth differences between developing countries can be successfully modeled by separating them into two groups: converging (Tier 2) and non-converging (Tier 3) countries (Gill and Kharas, 2007). A country is deemed to be converging if its per-capita income has rapidly converged over a 20-year period to that of best practice economies or if its 2001–2011 TFP growth is closer to what the model would predict for a converger (see below) than to what it would predict for a non-converger; the lower its productivity relative to the global best practice, the more quickly it converges. This convergence reflects technology transfers from richer innovating countries, technology leapfrogging, the diffusion of management and operational research from more developed countries, and other ways that a country can shortcut productivity-improvement processes by learning from economies that are already at the productivity frontier.

In the model, the lower the country's productivity relative to that of the US, the larger the boost, and the quicker the catch-up.¹¹ The productivity growth of 14 of the 36 rich (Tier 1) countries is treated the same as that of Tier 2 countries. On the other hand, non-converging (Tier 3) countries and 22 of the 36 rich countries have only a 1 percent yearly

productivity growth and no boost. The general equation for TFP growth is:

$$TFP_{Growth} = 1.0\% + CB - FP \quad (6)$$

Where CB is the convergence boost benefiting “converging” countries and FP is the productivity growth penalty suffered by failing or fragile states.

The convergence boost is defined as follows:

$$CB = c \times 2.69\% \times \ln\left(\frac{TFP_{USA,t-1}}{TFP_{i,t-1}}\right) \quad (7)$$

where i is the country, 2.69 percent is the convergence coefficient (derived from historical data), TFP is the total factor productivity, and c takes a value between 0 and 1 and identifies whether a country is treated as a converger ($c=1$) or as a non-converger or fragile state ($c=0$), or in an intermediate state of transition between being a converger and non-converger ($0 < c < 1$).

The failed-state penalty FP is defined as:

$$FP = f \times 1.5\% \quad (8)$$

Where f plays a role analogous to that of c in equation (7) above. For each fragile (Tier 4) nation, f is set equal to 1, corresponding to a penalty in productivity growth of 1.5 percent, so that its yearly productivity is assumed to fall by 0.5 percent a year. The coefficient of negative 1.5 percent and the list of such fragile states is derived by identifying state failures and debilitating wars prior to the global financial crisis that lasted at least 2 consecutive years in 44 nations.

The projections of GDP growth are completed by applying the labor growth, capital deepening, and productivity changes to each country over the period 2012–2042. The measure of GDP at expected market exchange rates adjusts the GDP estimate by expected changes in the real exchange rate. First, an equation is derived to establish a theoretical relationship between a country's real exchange rate and its PPP income relative to that of the US. Then, the country's modelled exchange rate converges towards the value that corresponds to its income in this theoretical equation. These relationships are not linear, and the countries for which increases in GDP PPP per capita most appreciate their real exchange rates are the countries whose incomes are between a third and two-thirds that of the United States, and not the poorest or richest countries. The model also projects the sizes of the low, middle, and high-income populations, again following Kharas, by

11. TFP is used in the convergence term instead of the per-capita income used by others for three reasons: first, if the equation were to use GDP per capita, over time the TFP of a converging country would not converge to that of the US but instead to other values. Also, since the convergence equation represents convergence of TFP, we use TFP in order to make the equation consistent with its purpose. Third, using the convergence coefficient from past research in tandem with an income-based convergence term yields large discrepancies with the recent historical data for TFP growth for many countries; using TFP yields a better fit

measuring the number of people in each country with living standards—in PPP terms— within a certain absolute range. An income distribution for each country is derived from the World Bank's International Comparison Program.

The model calculates what share of the nation's income is available for consumption, and it distributes this consumption income over the population according to the income distribution. As the country's overall consumption income increases, the purchasing power of those at the bottom of the distribution increases, raising more to middle-income status.

For purposes of computing consumption income classes, the model projects changes in what share of the country's income is available for consumption using the following equation:

$$\ln(C_{i,t}) = \alpha_1 \times \ln(C_{i,t-1}) + \alpha_2 \times \ln(GDPPCCap_{i,t}) + \alpha_0 \quad (9)$$

where t is the year, i is the country, C is the ratio of consumption to GDP, $GDP\ PCCap$ is the minimum of each country's GDP PPP PC and \$50,000 PPP (in 2010 PPP international dollars), and α_0 , α_1 , and α_2 are constants.

The section makes separate projections for the revival and business-as-usual scenarios. The difference between the scenarios is how countries are classified, either as converging, non-converging, or failed, and how countries gradually transition between classifications. For both scenarios, the starting point is the countries' statuses in 2012: 14 countries are rich and converging, 22 are rich and non-converging, 34 (5 Latin American) converging, 103 (24 Latin American) non-converging, and 11 (1 Latin American) failed.¹² The business-as-usual scenario assumes that all countries will maintain their original tiers through 2042, with the exception of the failed states, which gradually stop failing beginning in 2041. The second scenario is the revival scenario. Here, Brazil and Colombia in 2012, and Mexico in 2016, first begin experiencing an investment boost and then gradually start becoming convergers. The specifications and timing of this sequence is detailed in Kohli, Szyf, and Arnold (2012). In addition, all other non-converging Latin American countries begin experiencing an investment boost and then begin converging in either 2016 or 2021, depending on how high their 2001–2011 average TFP growth rate is relative to what the model's convergence equation would predict if they were convergers. Again, these criteria and the sequence of their investment boost

and convergence are detailed in Kohli, Szyf, and Arnold (2012).

In both scenarios, the transition of individual countries between converging and non-converging, or from failed to non-converging, is gradual. That is, countries are made to adopt an intermediate state between failed and not-failed, or between converging and non-converging, by varying the values of f and c in the previous equations.

The updated growth model

The growth model used for this work differs in a number of ways from the model presented in the book *Latin America 2040: Breaking Away from Complacency: An Agenda for Resurgence*. The differences mostly reflect changes in the global and regional economic environment over the last several years. They also reflect efforts to improve the model and its methodology. A short description of key differences with the earlier model follows.

The 2014 model projects lower global growth than the previous model in all scenarios. For example, global GDP in PPP terms under business-as-usual is \$250 trillion in 2040 in the new model compared to \$214 trillion in the previous model. These changes can be explained by a number of factors, including:

- The previous model was based on GDP historical data through 2011. The new model incorporates newer data reflecting the decline in commodity prices. To do so, it uses the October 2015 WEO for its post-1980 growth rates, including actual and projected GDP growth rates through 2018. The model's projections then start beginning in 2019. Therefore, the revised model incorporates into its long-run projections the last three years of low growth in the world, particularly for some EDEs, and some recovery. These events lower the base and the projected global GDP.
- As in previous exercises, the current version of the model uses a rate of 1 percent growth in TFP, which matches the 40-year, 30-year, 25-year, and 20-year averages of the US.
- Based on recent experience, the model reclassified 20 high-income countries to be non-convergers. This significantly lowered their future GDP growth.

The scenarios in the model are defined as follows:

Baseline scenario: China has a convergence coefficient of .0268566 from 2025 on. Other countries' and other years' are 0.0215533 from 2025 on. Failed states begin to stop failing from 2040.

12. These add up to 186 economies. We say 185 countries because not all 186 economies are considered separate countries. The classification is taken from Kohli, Szyf, and Arnold (2012), which explains how it is derived.

Optimistic: The convergence coefficient is .0268566 for all countries and years.

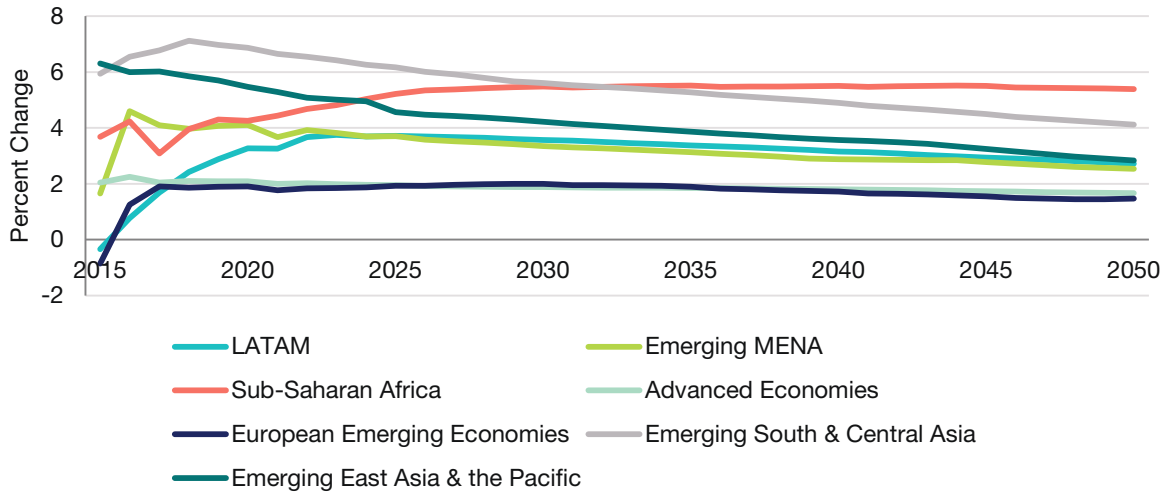
All the countries start converging as described in the journal article (possibly with some minor changes not worth noting). Failed states start stop failing from 2025.

Pessimistic: The convergence coefficient is 0.01625 for all countries and years, except China pre-2017, for which it is .0268566. All the countries start falling into the middle income trap (i.e., stop converging).

Annex 2: Additional Model and Country-Specific Results

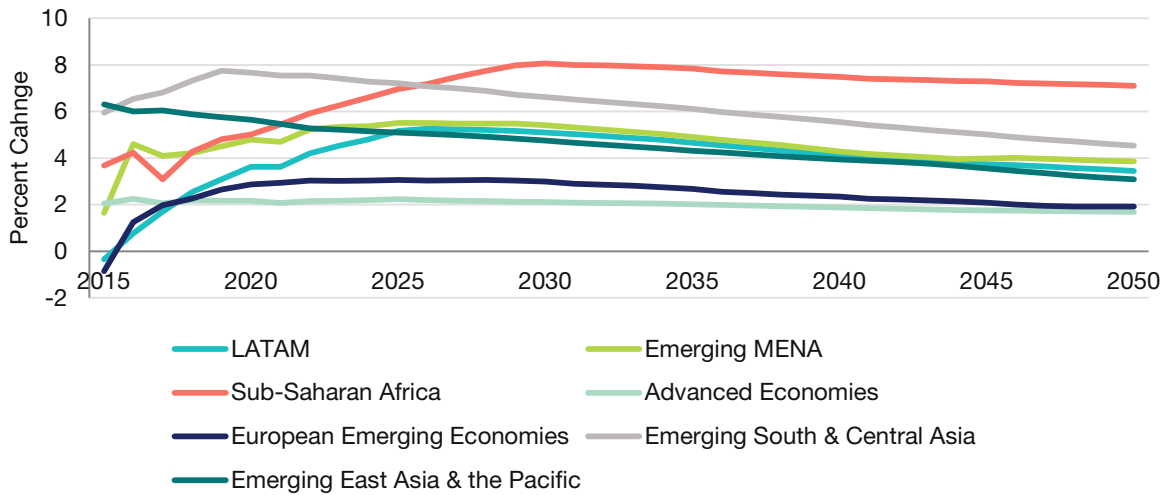
GDP under alternative scenarios 2012-2050

Figure A1: Regional GDP (PPP) growth rates, 2015-2050, BAU



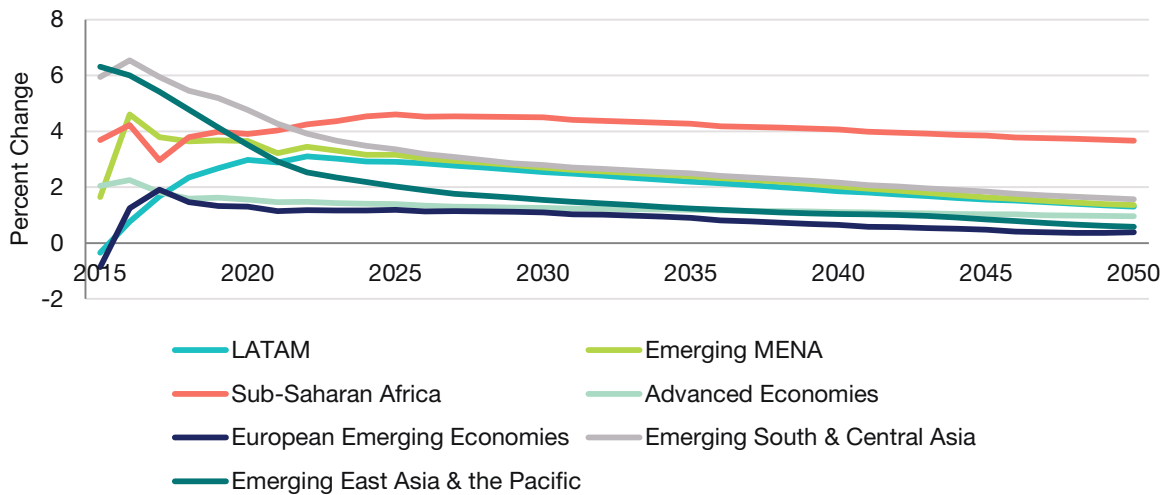
Source: Centennial Group International 2015

Figure A2: Regional GDP (PPP) growth rates, 2015-2050, optimistic



Source: Centennial Group International 2015

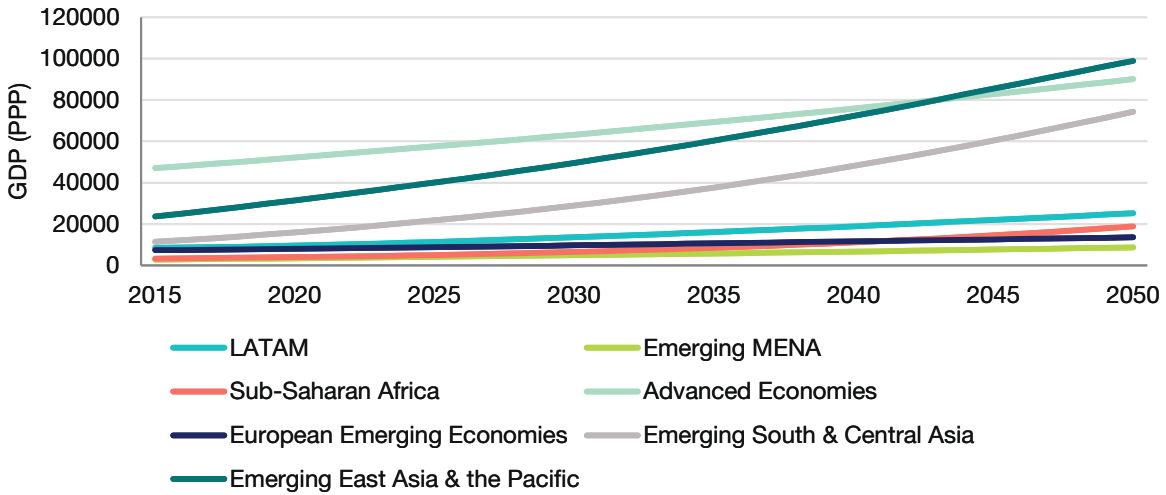
Figure A3: Regional GDP (PPP) growth rates, 2015-2050, pessimistic



Source: Centennial Group International 2015

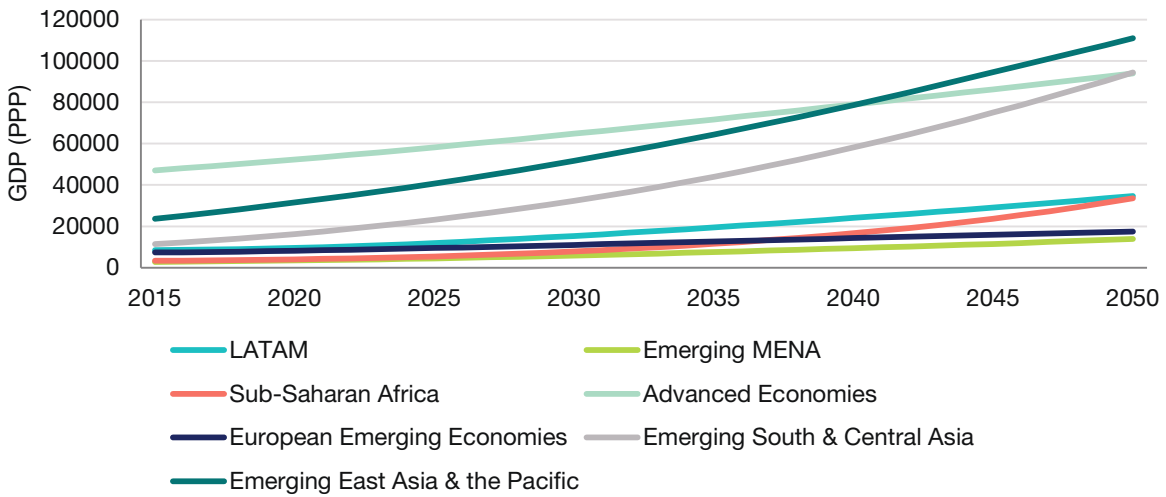
THE LONGER-TERM PROSPECTS FOR EMERGING MARKET ECONOMIES

Figure A4: Regional GDP (PPP), 2015-2050, BAU



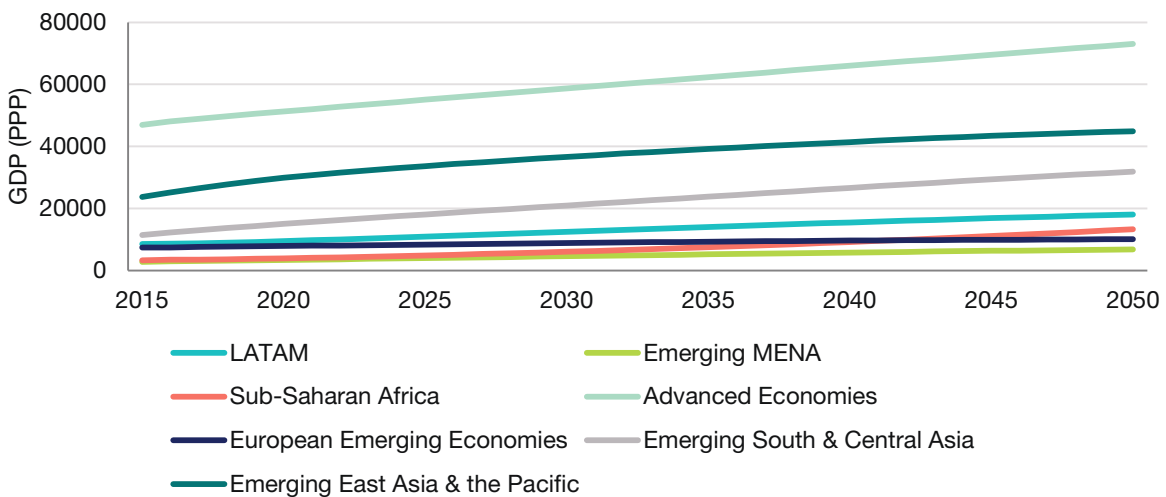
Source: Centennial Group International 2015

Figure A5: Regional GDP (PPP), 2015-2050, optimistic



Source: Centennial Group International 2015

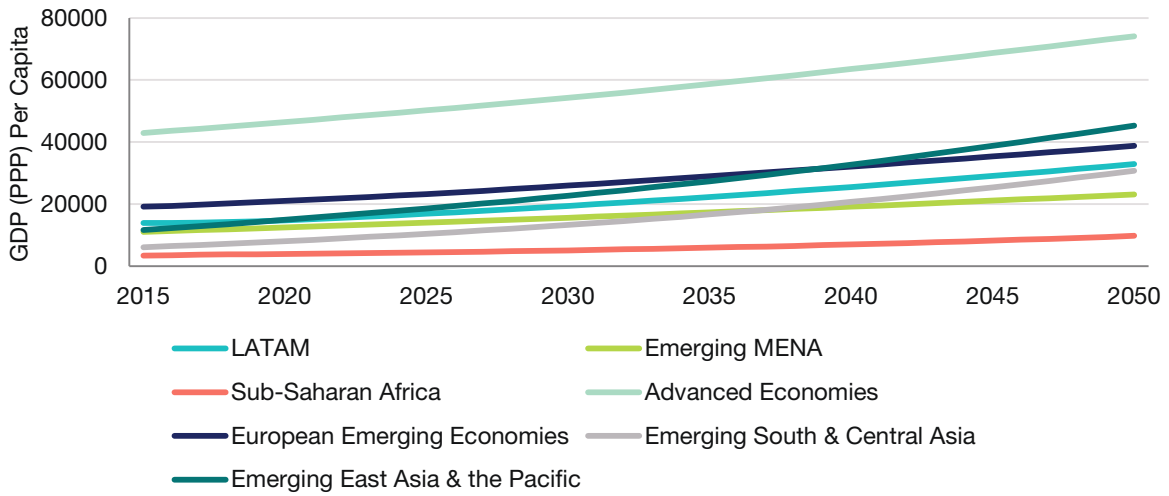
Figure A6: Regional GDP (PPP), 2015-2050, pessimistic



Source: Centennial Group International 2015

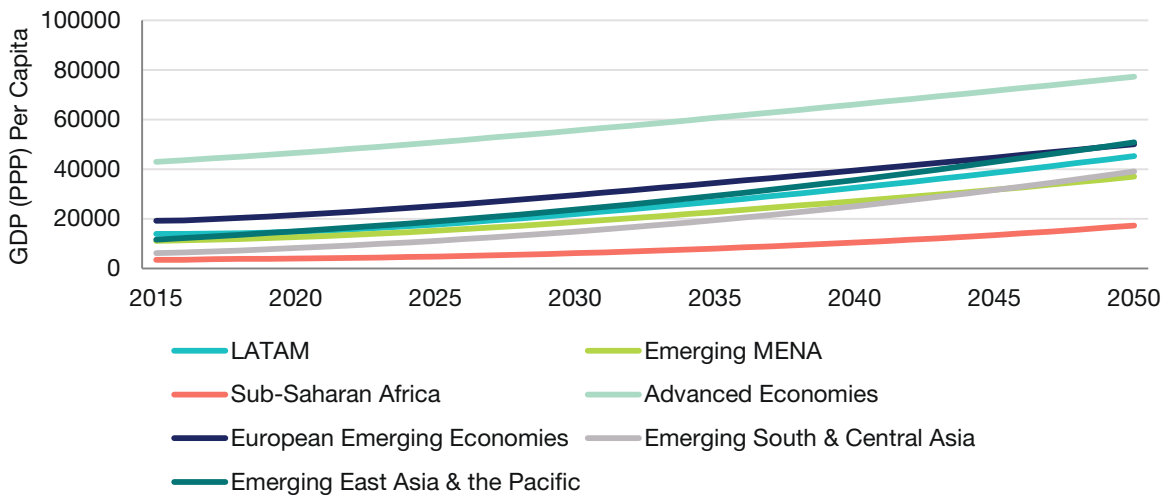
Per capita income under alternative scenarios (2015-2050)

Figure A7: Regional GDP (PPP) per capita, 2015-2050, BAU



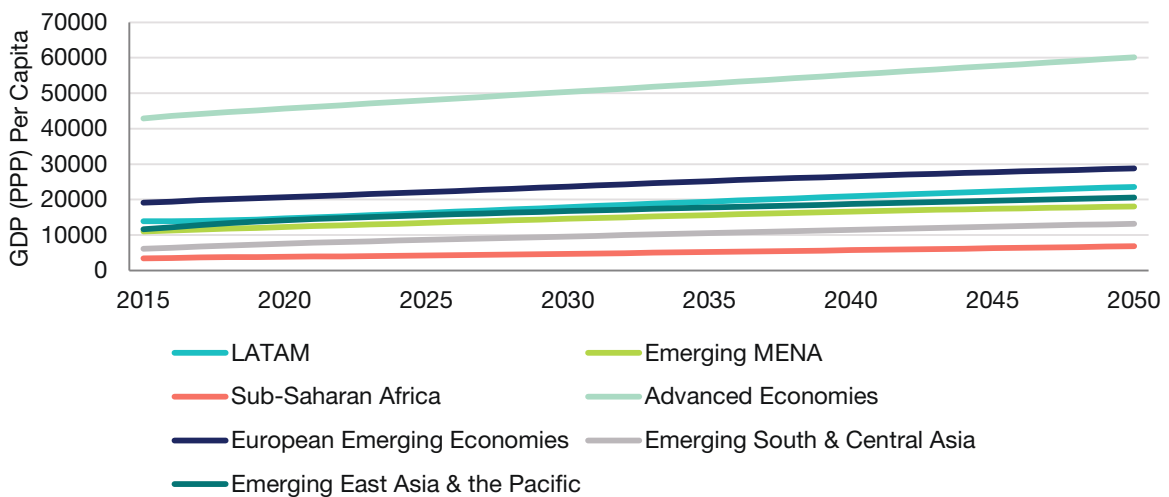
Source: Centennial Group International 2015

Figure A8: Regional GDP (PPP) per capita, 2015-2050, optimistic



Source: Centennial Group International 2015

Figure A9: Regional GDP (PPP) per capita, 2015-2050, pessimistic



Source: Centennial Group International 2015

Growth in regions at GDP (PPP), percentage and absolute Change, 2015-2050, under alternate scenarios

Table A1: Growth in regions at GDP (PPP), 2015-2050, BAU

Country	2015	2030	2050	2015-2030			2030-2050			2015-2050		
	GDP (PPP)	GDP (PPP)	GDP (PPP)	Annual %	%	Absolute	Annual %	%	Absolute	Annual %	%	Absolute
LATAM	8534	13584	25195	2.9	59%	5050	3.2	85%	11611	3.0	195%	16661
Emerging MENA	2807	4909	8712	3.7	75%	2102	2.9	77%	3803	3.2	210%	5905
Sub-Saharan Africa	3296	6521	18923	4.7	98%	3224	5.5	190%	12402	5.1	474%	15626
Advanced Economies	46976	63199	90030	2.0	35%	16222	1.8	42%	26831	1.9	92%	43053
European Emerging Economies	7358	9682	13550	1.7	32%	2324	1.7	40%	3868	1.7	84%	6192
Emerging South & Central Asia	11472	28896	74306	6.3	152%	17424	4.9	157%	45410	5.5	548%	62834
Emerging East Asia & the Pacific	23694	49564	98940	5.1	109%	25870	3.6	100%	49377	4.2	318%	75246
World	104138	176355	329656	3.5	69%	72217	3.2	87%	153301	3.3	217%	225517

Source: Centennial Group International 2015

Table A2: Growth in regions at GDP (PPP), 2015-2050, optimistic

Country	2015	2030	2050	2015-2030			2030-2050			2015-2050		
	GDP (PPP)	GDP (PPP)	GDP (PPP)	Annual %	%	Absolute	Annual %	%	Absolute	Annual %	%	Absolute
LATAM	8534	15349	34678	3.7	80%	6814	4.2	126%	19329	4.0	306%	26144
Emerging MENA	2807	5876	13931	4.8	109%	3069	4.5	137%	8055	4.6	396%	11124
Sub-Saharan Africa	3296	7874	33540	5.9	139%	4577	7.5	326%	25666	6.8	917%	30244
Advanced Economies	46976	64748	93890	2.2	38%	17772	1.9	45%	29142	2.0	100%	46913
European Emerging Economies	7358	11029	17514	2.5	50%	3671	2.4	59%	6485	2.4	138%	10156
Emerging South & Central Asia	11472	32358	94364	7.1	182%	20886	5.6	192%	62006	6.2	723%	82892
Emerging East Asia & the Pacific	23694	51685	110922	5.4	118%	27991	3.9	115%	59237	4.6	368%	87228
World	104138	188917	398839	4.0	81%	84779	3.8	111%	209922	3.9	283%	294701

Source: Centennial Group International 2015

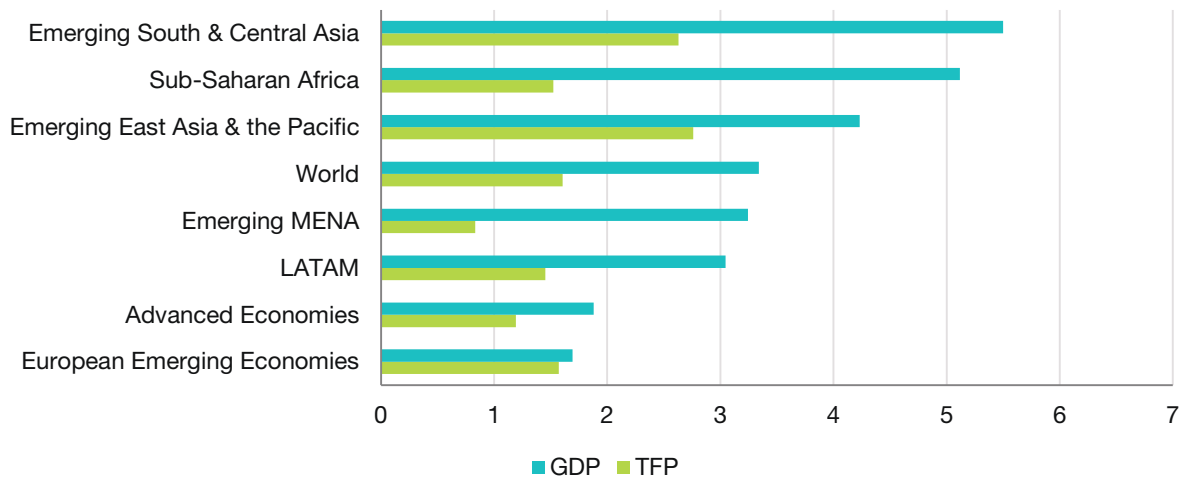
Table A3: Growth in regions at GDP (PPP), 2015-2050, pessimistic

Country	2015	2030	2050	2015-2030			2030-2050			2015-2050		
	GDP (PPP)	GDP (PPP)	GDP (PPP)	Annual %	%	Absolute	Annual %	%	Absolute	Annual %	%	Absolute
LATAM	8534	12508	18070	2.4	47%	3974	1.9	44%	5562	2.1	112%	9536
Emerging MENA	2807	4588	6797	3.2	63%	1781	2.0	48%	2209	2.5	142%	3990
Sub-Saharan Africa	3296	6051	13329	4.2	84%	2755	4.1	120%	7277	4.1	304%	10032
Advanced Economies	46976	58701	73048	1.5	25%	11725	1.1	24%	14347	1.3	55%	26071
European Emerging Economies	7358	8843	10080	1.1	20%	1485	0.7	14%	1237	0.9	37%	2722
Emerging South & Central Asia	11472	20929	31880	4.2	82%	9457	2.2	52%	10951	3.1	178%	20408
Emerging East Asia & the Pacific	23694	36627	44898	3.2	55%	12932	1.0	23%	8271	2.0	89%	21203
World	104138	148248	198102	2.4	42%	44109	1.5	34%	49854	1.9	90%	93963

Source: Centennial Group International 2015

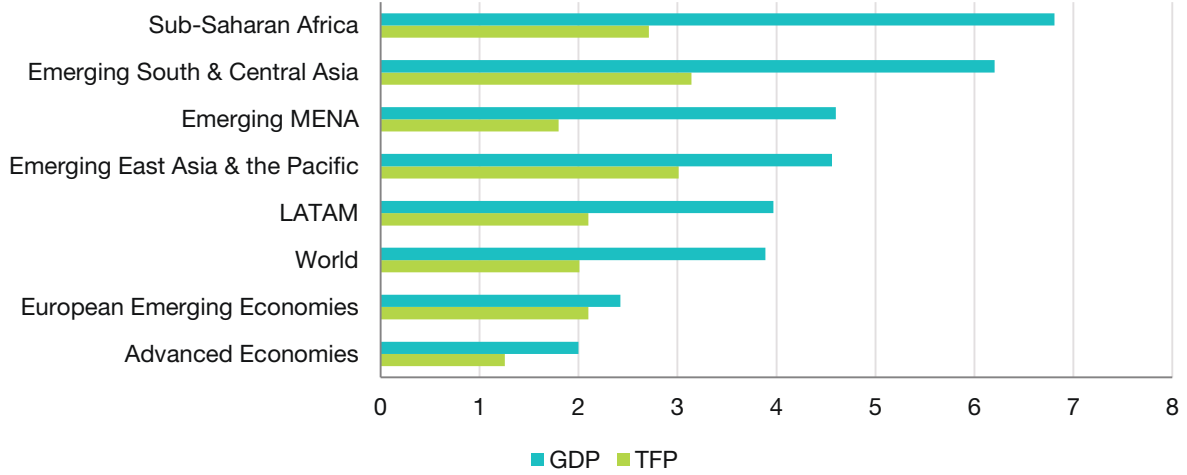
Average regional GDP (PPP) growth and TFP growth, 2015-2050

Figure A10: Average GDP (PPP) and TFP growth, 2015-2050, BAU



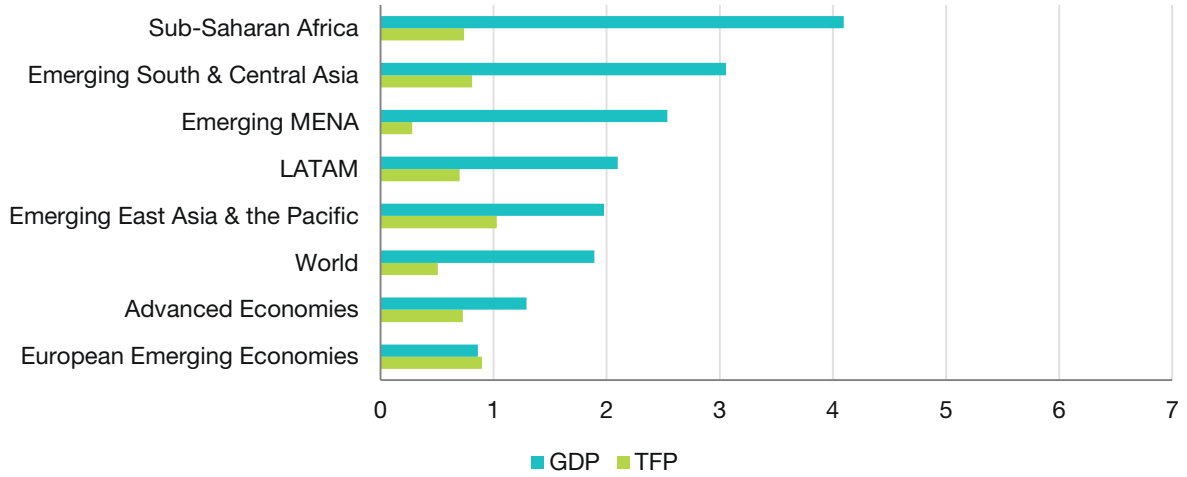
Source: Centennial Group International 2015

Figure A11: Average GDP (PPP) and TFP growth, 2015-2050, optimistic



Source: Centennial Group International 2015

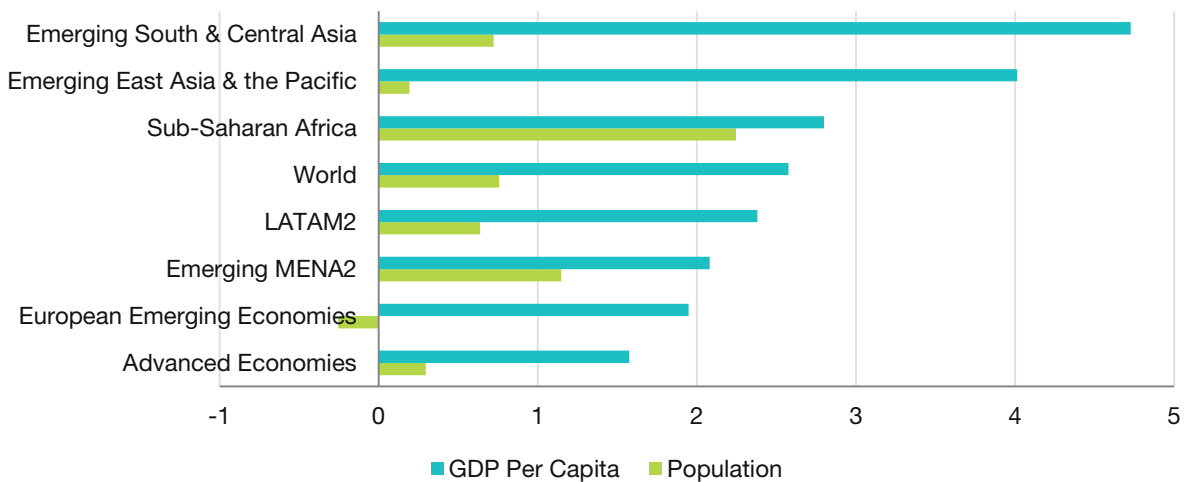
Figure A12: Average GDP (PPP) and TFP growth, 2015-2050, pessimistic



Source: Centennial Group International 2015

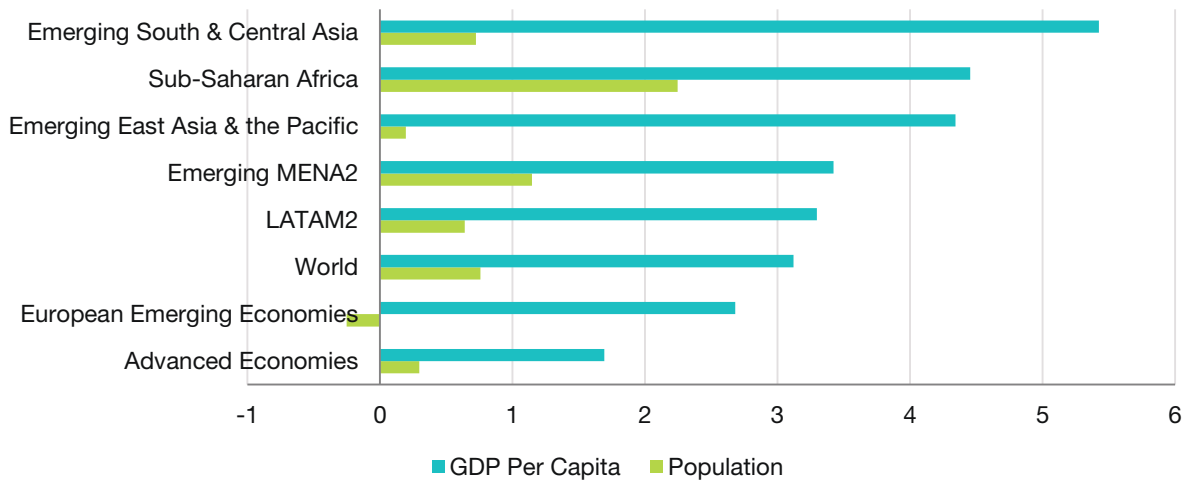
Average country GDP per capita (PPP) growth and population growth, 2015-2050

Figure A13: Average GDP per capita (PPP) and population growth, 2015-2050, BAU



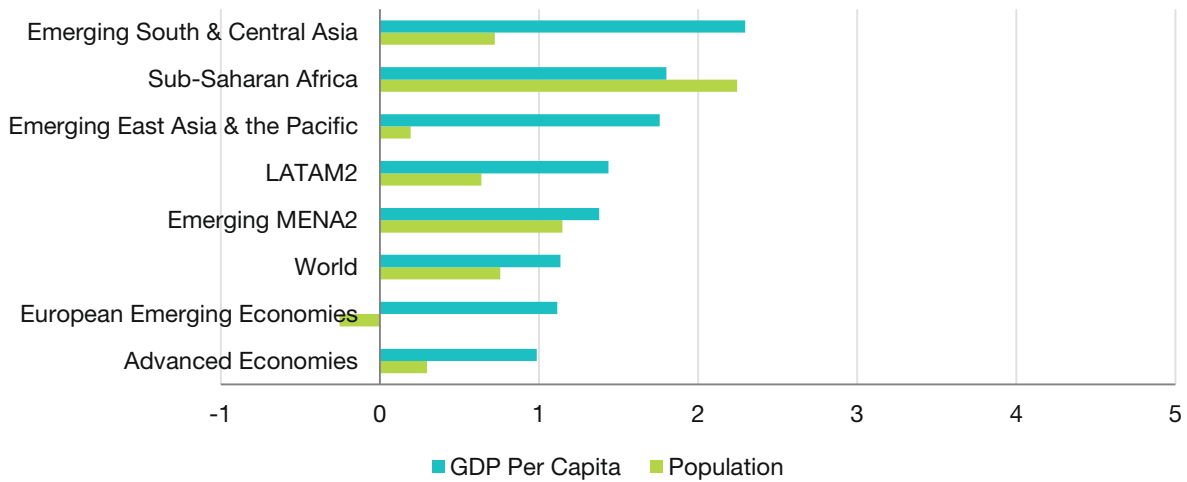
Source: Centennial Group International 2015

Figure A14: Average GDP per capita (PPP) and population growth, 2015-2050, optimistic



Source: Centennial Group International 2015

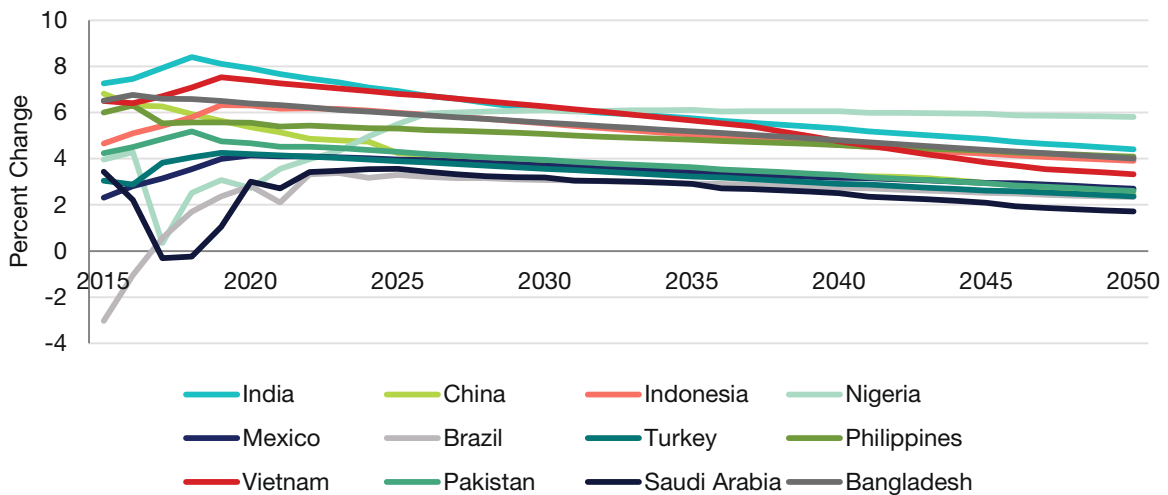
Figure A15: Average GDP per capita (PPP) and population growth, 2015-2050, pessimistic



Source: Centennial Group International 2015

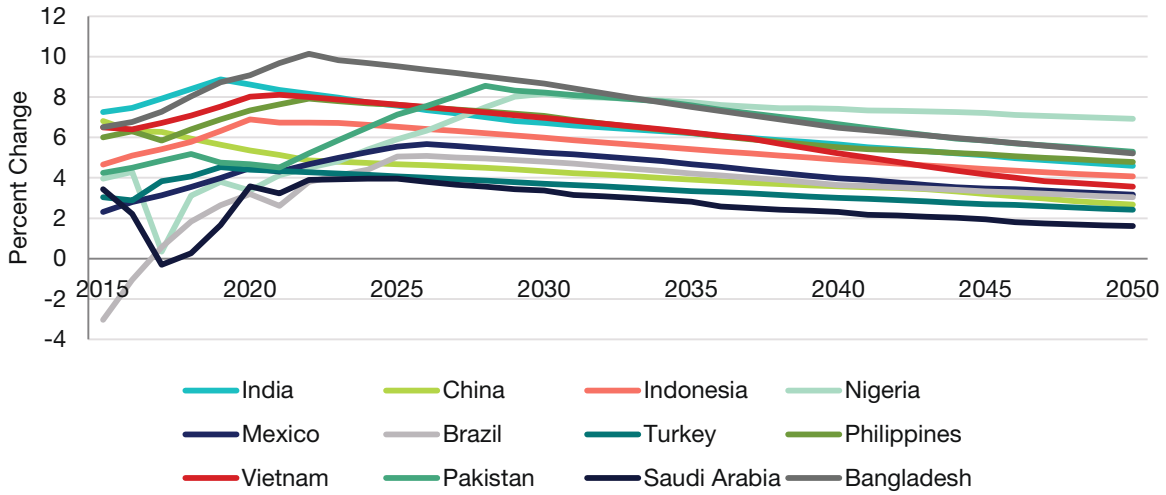
Country GDP (PPP) growth rates under alternate scenarios

Figure A16: GDP (PPP) growth rates under alternate scenarios, BAU



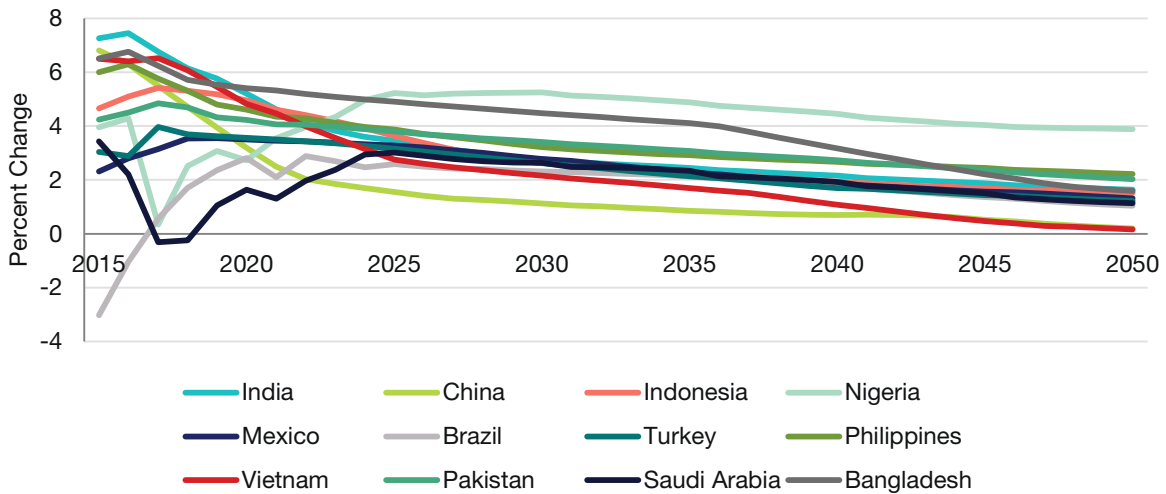
Source: Centennial Group International 2015

Figure A17: GDP (PPP) growth rates under alternate scenarios, optimistic



Source: Centennial Group International 2015

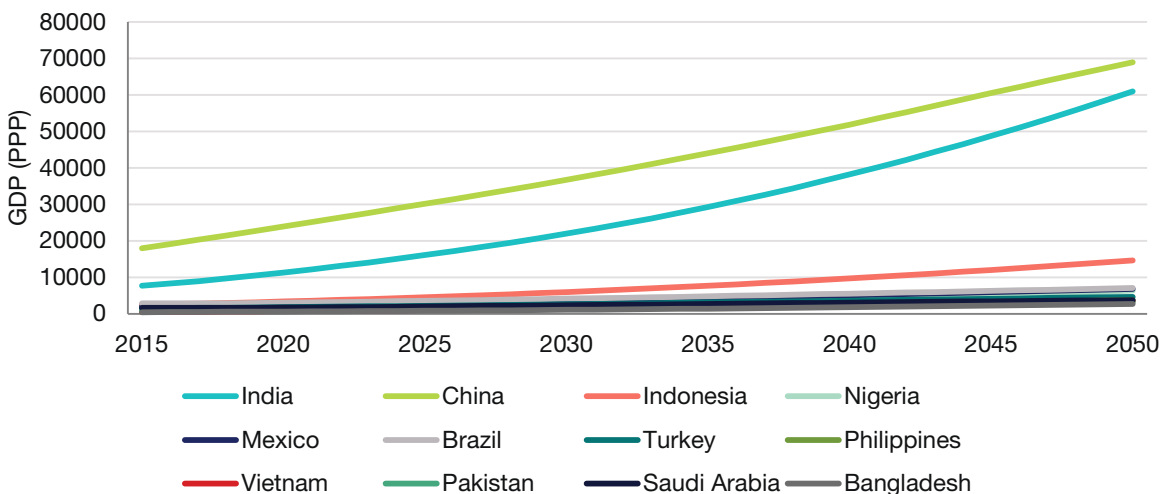
Figure A18: GDP (PPP) growth rates under alternate scenarios, pessimistic



Source: Centennial Group International 2015

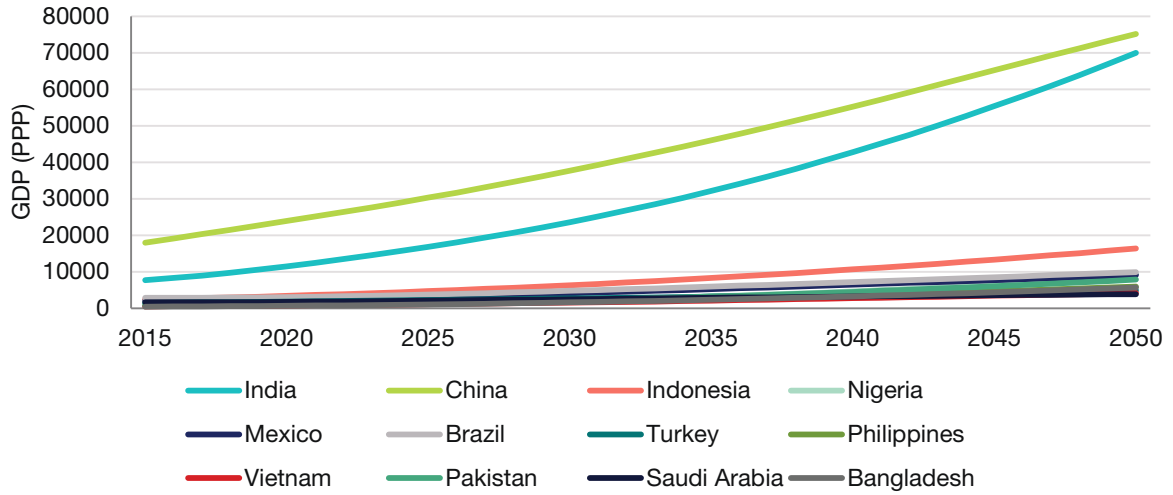
Country GDP (PPP) under alternate scenarios

Figure A19: GDP (PPP) under alternate scenarios, BAU



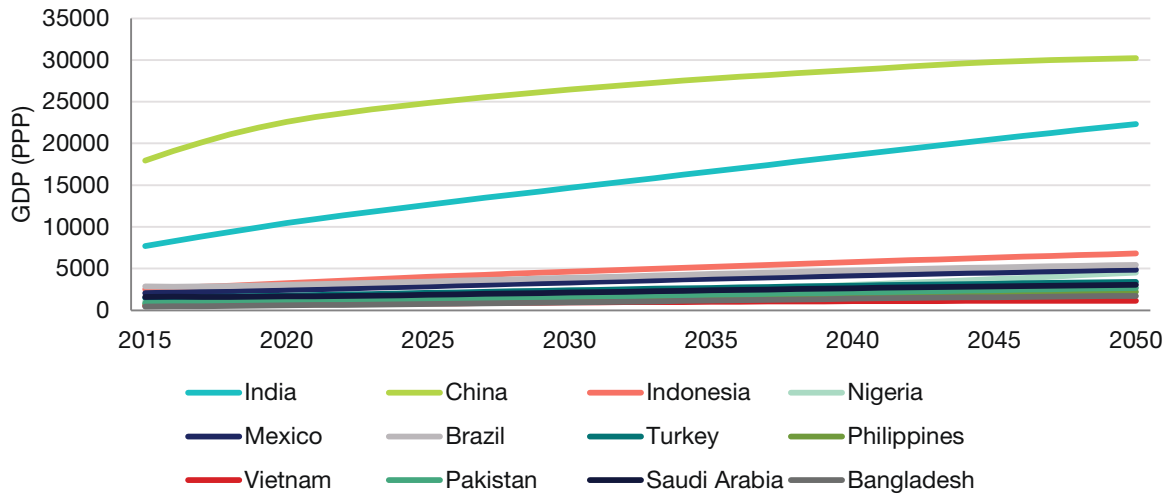
Source: Centennial Group International 2015

Figure A20: GDP (PPP) under alternate scenarios, optimistic



Source: Centennial Group International 2015

Figure A21: GDP (PPP) under alternate scenarios, pessimistic



Source: Centennial Group International 2015

Growth in major countries at GDP (PPP), percentage and absolute change, 2015-2050, under alternate scenarios

Table A4: Growth in major countries at GDP (PPP), 2015-2050, BAU

Country	2015	2030	2050	2015-2030			2030-2050			2015-2050		
	GDP (PPP)	GDP (PPP)	GDP (PPP)	Annual %	%	Absolute	Annual %	%	Absolute	Annual %	%	Absolute
India	7708	21942	60941	7.2	185%	14234	5.3	178%	38999	6.1	691%	53233
China	17947	36722	68915	5.0	105%	18775	3.2	88%	32193	4.0	284%	50968
Indonesia	2533	5959	14620	5.8	135%	3426	4.6	145%	8661	5.1	477%	12088
Nigeria	1045	1979	6328	4.3	89%	934	6.0	220%	4349	5.3	506%	5283
Mexico	2072	3623	6761	3.7	75%	1551	3.2	87%	3138	3.4	226%	4689
Brazil	2860	4132	7050	2.1	44%	1272	2.7	71%	2919	2.5	147%	4191
Turkey	1484	2616	4638	3.8	76%	1132	2.9	77%	2022	3.3	213%	3155
Philippines	699	1540	3748	5.4	120%	841	4.6	143%	2208	4.9	436%	3049
Vietnam	519	1401	3500	6.8	170%	882	4.8	150%	2099	5.6	575%	2981
Pakistan	877	1679	3173	4.4	91%	802	3.3	89%	1494	3.8	262%	2296
Saudi Arabia	1583	2318	3734	2.6	46%	736	2.5	61%	1416	2.5	136%	2152
Bangladesh	439	1073	2711	6.2	144%	634	4.8	153%	1638	5.4	517%	2272
World	104138	176355	329656	3.5	69%	72217	3.2	87%	153301	3.3	217%	225517

Source: Centennial Group International 2015

Table A5: Growth in major countries at GDP (PPP), 2015-2050, optimistic

Country	2015	2030	2050	2015-2030			2030-2050			2015-2050		
	GDP (PPP)	GDP (PPP)	GDP (PPP)	Annual %	%	Absolute	Annual %	%	Absolute	Annual %	%	Absolute
India	7708	23575	69926	7.7	206%	15867	5.6	197%	46351	6.5	807%	62218
China	17947	37701	75127	5.2	110%	19754	3.5	99%	37427	4.3	319%	57181
Indonesia	2533	6294	16351	6.2	149%	3762	4.9	160%	10057	5.5	546%	13819
Nigeria	1045	2199	9200	5.0	110%	1154	7.5	318%	7001	6.4	780%	8155
Mexico	2072	4106	9055	4.5	98%	2035	4.1	121%	4949	4.3	337%	6984
Brazil	2860	4753	9902	3.1	66%	1894	3.8	108%	5148	3.4	246%	7042
Turkey	1484	2673	4830	3.9	80%	1189	3.0	81%	2157	3.4	226%	3346
Philippines	699	1978	5918	7.1	183%	1280	5.7	199%	3939	6.3	747%	5219
Vietnam	519	1518	4128	7.4	192%	999	5.2	172%	2610	6.1	695%	3609
Pakistan	877	2175	7847	6.1	148%	1298	6.7	261%	5673	6.4	795%	6971
Saudi Arabia	1583	2443	3850	3.0	54%	861	2.4	58%	1407	2.6	143%	2267
Bangladesh	439	1581	5676	8.8	260%	1142	6.7	259%	4095	7.6	1193%	5237
World	104138	188917	398839	4.0	81%	84779	3.8	111%	209922	3.9	283%	294701

Source: Centennial Group International 2015

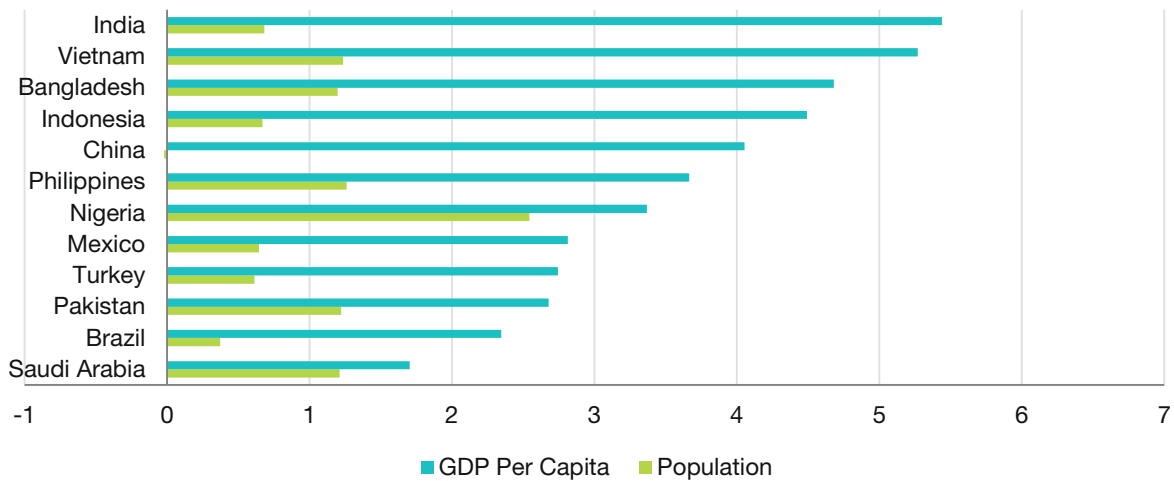
Table A6: Growth in major countries at GDP (PPP), 2015-2050, pessimistic

Country	2015	2030	2050	2015-2030			2030-2050			2015-2050		
	GDP (PPP)	GDP (PPP)	GDP (PPP)	Annual %	%	Absolute	Annual %	%	Absolute	Annual %	%	Absolute
India	7708	14666	22332	4.6	90%	6958	2.2	52%	7665	3.2	190%	14624
China	17947	26468	30224	2.9	47%	8521	0.7	14%	3756	1.7	68%	12277
Indonesia	2533	4628	6819	4.1	83%	2096	2.0	47%	2191	2.9	169%	4286
Nigeria	1045	1899	4517	4.1	82%	854	4.5	138%	2618	4.3	332%	3472
Mexico	2072	3335	4863	3.2	61%	1264	1.9	46%	1527	2.5	135%	2791
Brazil	2860	3889	5447	1.8	36%	1029	1.7	40%	1558	1.7	90%	2587
Turkey	1484	2394	3396	3.2	61%	910	1.8	42%	1002	2.4	129%	1912
Philippines	699	1315	2218	4.4	88%	616	2.7	69%	903	3.4	218%	1520
Vietnam	519	924	1138	4.1	78%	405	1.1	23%	214	2.4	119%	619
Pakistan	877	1580	2679	4.0	80%	703	2.7	70%	1099	3.3	206%	1803
Saudi Arabia	1583	2120	3049	2.1	34%	537	1.9	44%	929	1.9	93%	1467
Bangladesh	439	942	1717	5.3	115%	503	3.1	82%	774	4.1	291%	1278
World	104138	148248	198102	2.4	42%	44109	1.5	34%	49854	1.9	90%	93963

Source: Centennial Group International 2015

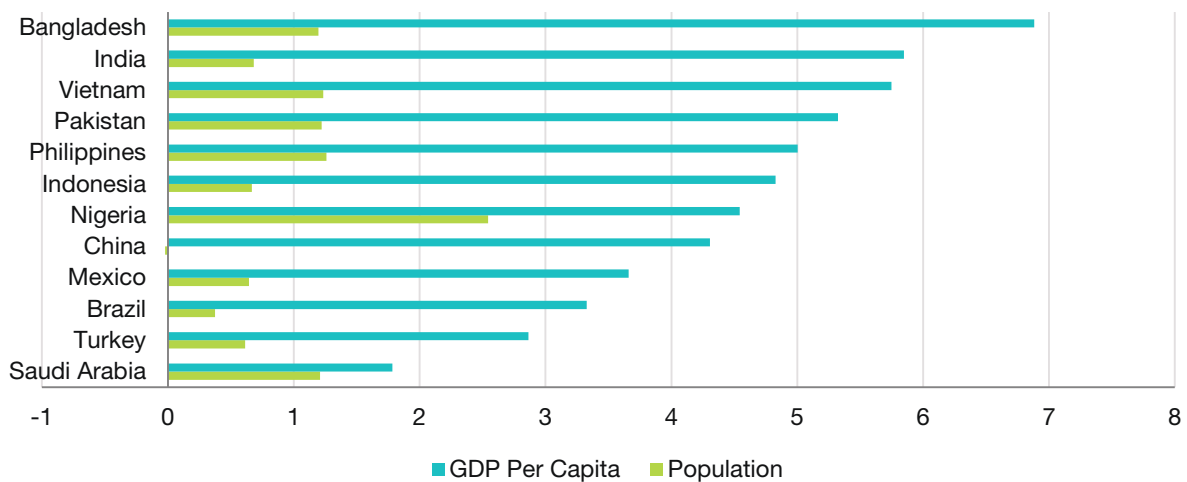
Average country GDP per capita (PPP) growth and population growth, 2015-2050

Figure A22: Average GDP per capita (PPP) and population growth, 2015-2050, BAU



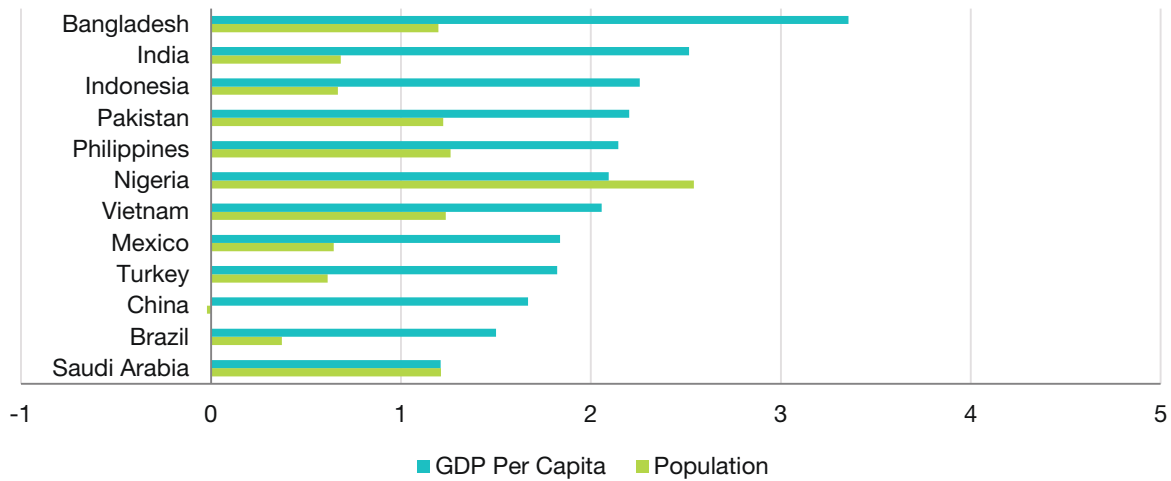
Source: Centennial Group International 2015

Figure A23: Average GDP per capita (PPP) and population growth, 2015-2050, optimistic



Source: Centennial Group International 2015

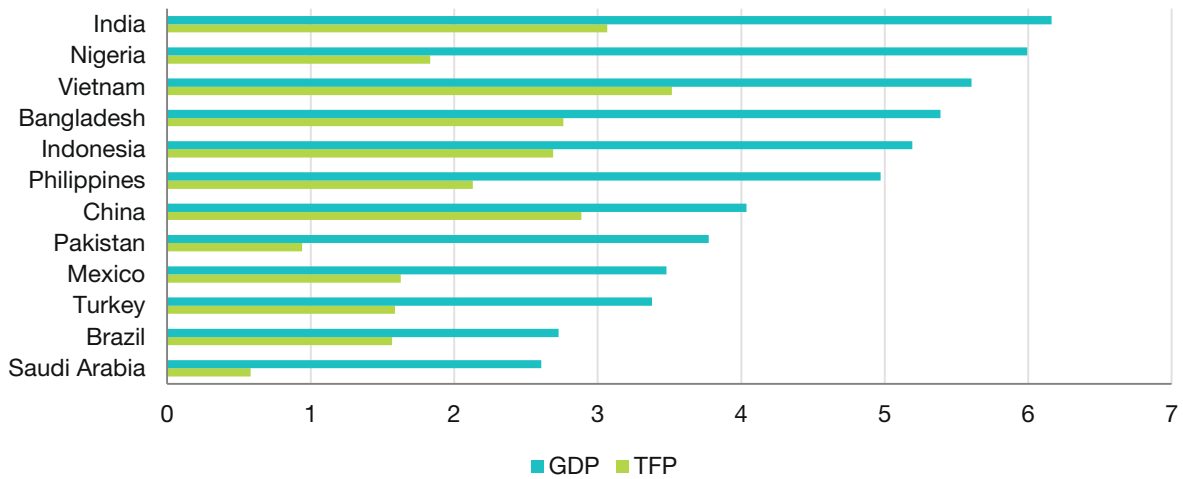
Figure A24: Average GDP per capita (PPP) and population growth, 2015-2050, pessimistic



Source: Centennial Group International 2015

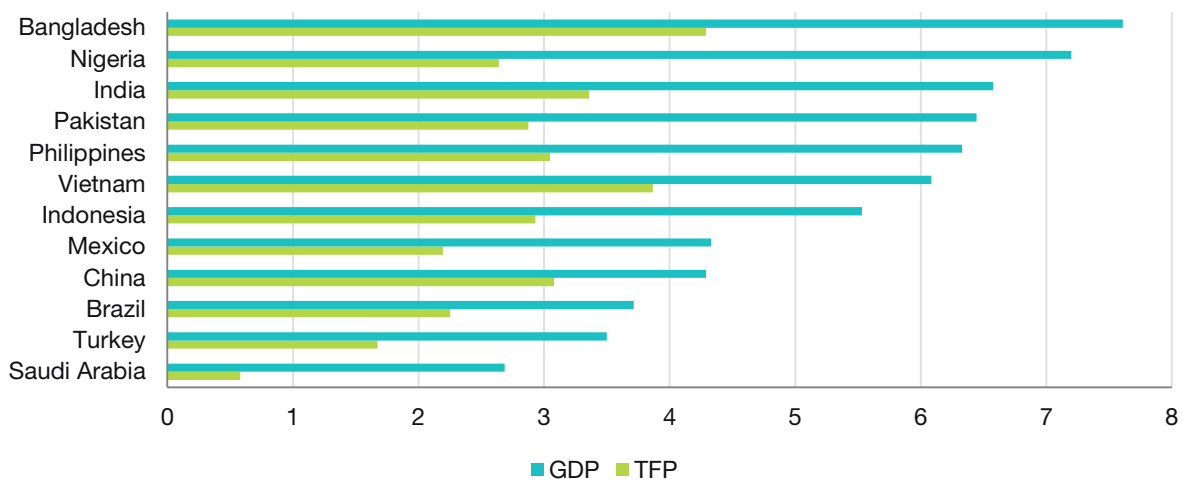
Average country GDP (PPP) growth and TFP growth, 2015-2050

Figure A25: Average country GDP (PPP) and TFP growth, 2015-2050, BAU



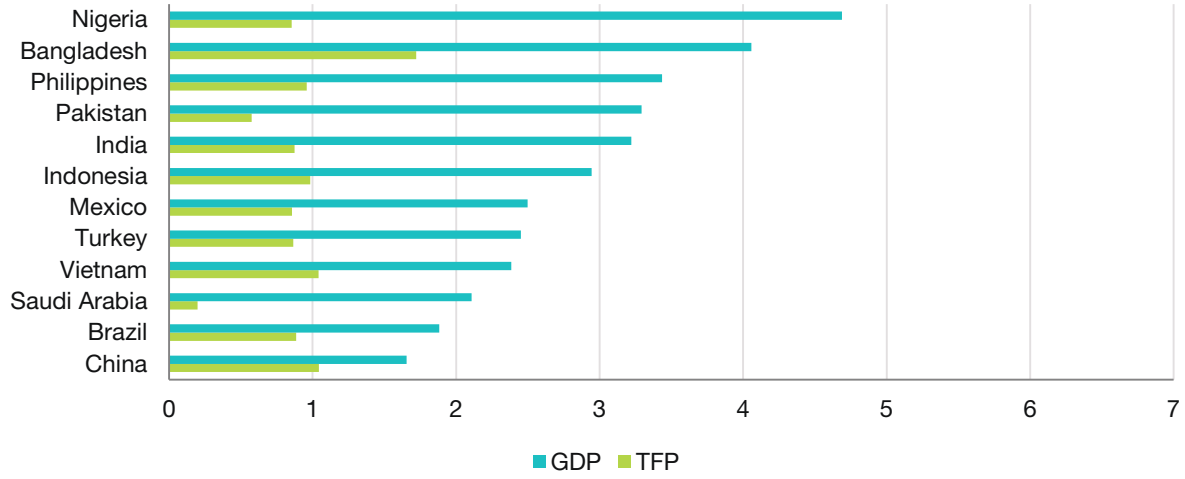
Source: Centennial Group International 2015

Figure A26: Average country GDP (PPP) and TFP growth, 2015-2050, optimistic



Source: Centennial Group International 2015

Figure A27: Average country GDP (PPP) and TFP growth, 2015-2050, pessimistic



Source: Centennial Group International 2015

Annex 3: Assessment of long-term fiscal and current account sustainability

While the long-term scenarios of the Centennial model provide a very good idea of the prospects for Emerging Economies, they tend to assume that the macroeconomic conditions will adapt to the underlying growth conditions. In practice, this may not be a straightforward result, and corrections may be required in macroeconomic policies. For this purpose, it is possible to incorporate an additional facet of the analysis of medium term growth, namely the sustainability of the external outcome and of fiscal policies, broadly based on the debt sustainability methodology developed by the World Bank and the IMF.¹³ The methodology helps determine the consistency of policies and the ability of the economy to absorb domestic and external resources over the medium- to long-term for the attainment of higher growth. Specifically, it is possible to assess, in aggregate and stylized terms, the impact of higher growth on (i) the external current account and, as a consequence, the level of indebtedness of the economy; and (ii) the fiscal outcome and the corresponding increase in public sector debt.

Using this methodology, for example under the BAU scenario, without changes in the pattern of the fiscal and external variables, the economic growth path, while showing a continued increase in per-capita income based on investment and TFP, does not necessarily entail a sustainable position over time, as both the external current account and the fiscal position may deteriorate, as is the case in a number of regions, although the opposite is clearly the case for others

The projections reflect the high dependence of exports and revenues on world (foreign) income and changes in terms of trade for several regions, particularly, Africa, the Middle East and Latin America and the Caribbean. Specifically, export behavior over the last two decades has been explained to a large extent by world income and changes in terms of trade, as is the case with imports and government revenue, and to a much lesser extent regarding public expenditure, which is a function of domestic income.

Econometric analysis suggests¹⁴ high elasticities of exports to world GDP and to terms of trade, and in the case of imports, high dependence to domestic GDP.

Under the assumption that terms of trade remain stable, during the period under consideration, the external current account shows a progressive increase in the current account surplus ratio to GDP, over time for the Advanced Economies and a stable ratio for all Emerging and Developing countries (Figures A28-35). However, regional projections show sharp increases in the current account surplus for Asia, and sharp declines for Latin America and Sub-Saharan Africa, with moderate increases or stability for others for the period 2015-25. Of course, a decline in terms of trade has a significant impact on the current accounts of all regions, being particularly relevant for the emerging economies.¹⁵

Regressions for revenue and expenditure, show a high correlation to domestic GDP and terms of trade (except for the Advanced Economies). The fiscal outcome deteriorates for all regions over time as the economies grow, and without changes in terms of trade, with the exception of Developing Asia with significant improvements in its fiscal position and Emerging Europe, which shows stability. This suggests that fiscal policies will need to adjust as the economies continue to grow, if an indebtedness problem is to be avoided. While no estimates have been made specifically for debt, the ratios of external debt and of public debt to GDP would become untenable in a number of cases. The results are worse when it is assumed that the terms of trade deteriorate, in most cases. The clear exceptions are the Advanced Economies and Emerging Europe that show improvements in the fiscal position as terms of trade deteriorate, possibly related to increased revenues from sales taxes, and arguably, an experience of adjustment in fiscal accounts as terms of trade worsen. The regressions are significant, but cover only 21 years for trade and 15 years for fiscal numbers, because of limited availability of data.

In order to correct for these problems, the macroeconomic strategy will require specific policies to correct the fiscal and the balance of payments position as needed. For example, it will be important to increase the non-export related revenues, to reduce dependence on commodities. Expenditure would have to be slowed down, even assuming increased infrastructure spending and social expenditure. It may be argued that increasing external deficits in some regions may be offset by “naturally increasing” surpluses in others, but that would entail large increases in inter-regional indebtedness or FDI, two assumptions that cannot be accepted in simple terms.

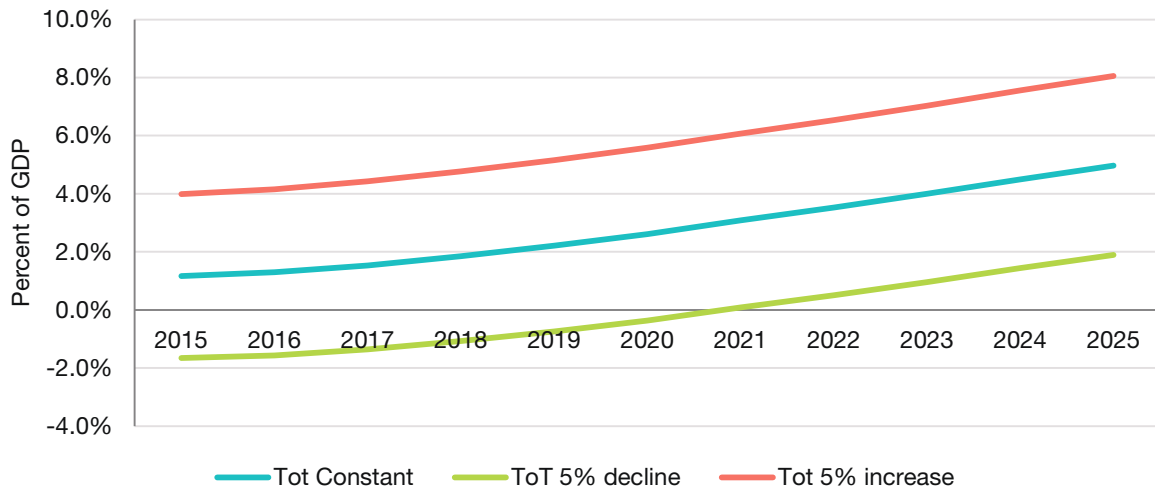
13. See www.imf.org/external/pubs/ft/dsa/mac.htm for a discussion of the methodology currently being utilized by the IMF and World Bank

14. The econometric results are not presented in this paper, to preserve conciseness but can be provided to the authors by request. Exports of goods and services (in real terms) are regressed against terms of trade and world GDP, while imports are regressed against domestic income and terms of trade. The current account is projected as the difference between exports and imports. Revenue and expenditure projections are regressed against domestic GDP and terms of trade.

15. The variability of terms of trade is low in the case of Advanced and Emerging Asian Economies

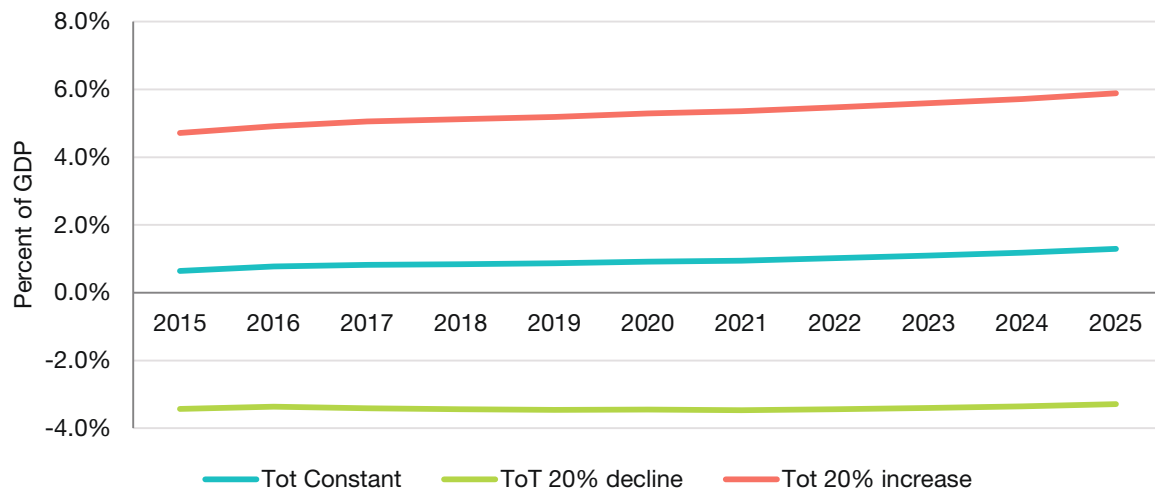
Actions are needed in order to strengthen or consolidate the sustainability of many regions. In practice, these scenarios suggest that any solution to the problems of many emerging economies would need to be multi-pronged. While education, infrastructure, and technology will help, there is an overwhelming need to pursue adequate macroeconomic policies, and allow for a competitive environment, helped, as conditions require, by more depreciated currencies than is the case at present.

Figure A28: Advanced economies current account simulation



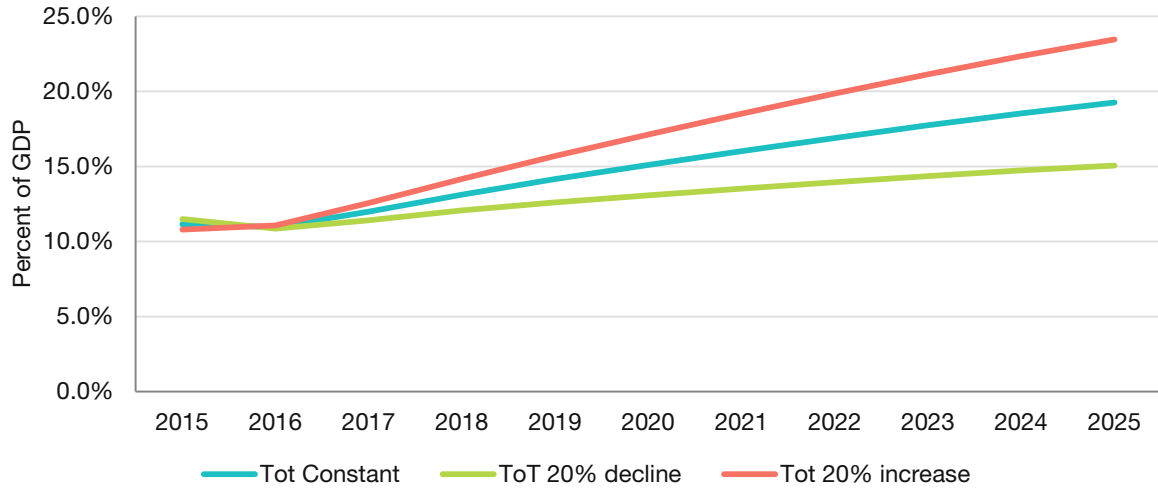
Source: Centennial Group International 2015

Figure A29: Emerging economies current account simulation



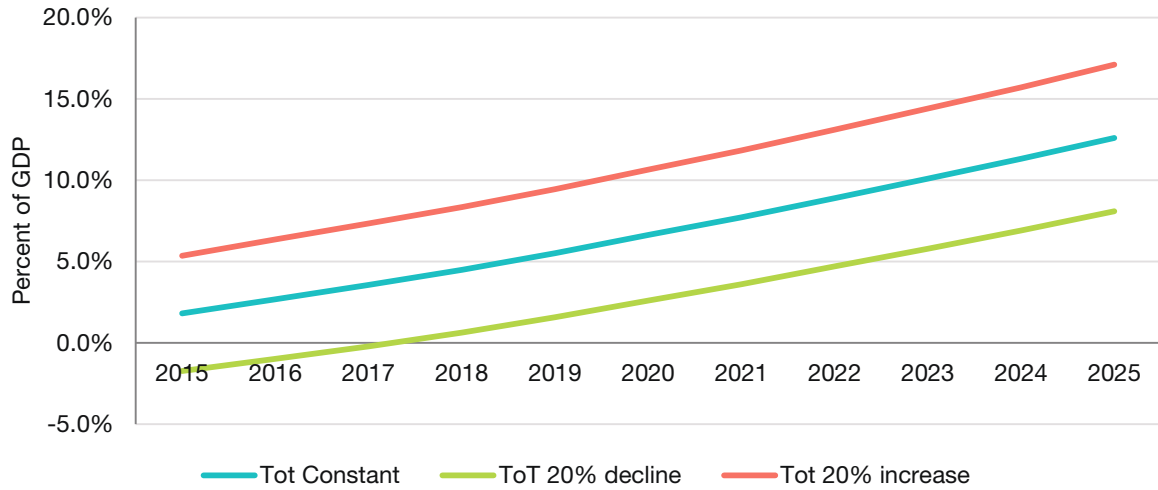
Source: Centennial Group International 2015

Figure A30: Commonwealth of Independent States current account simulation



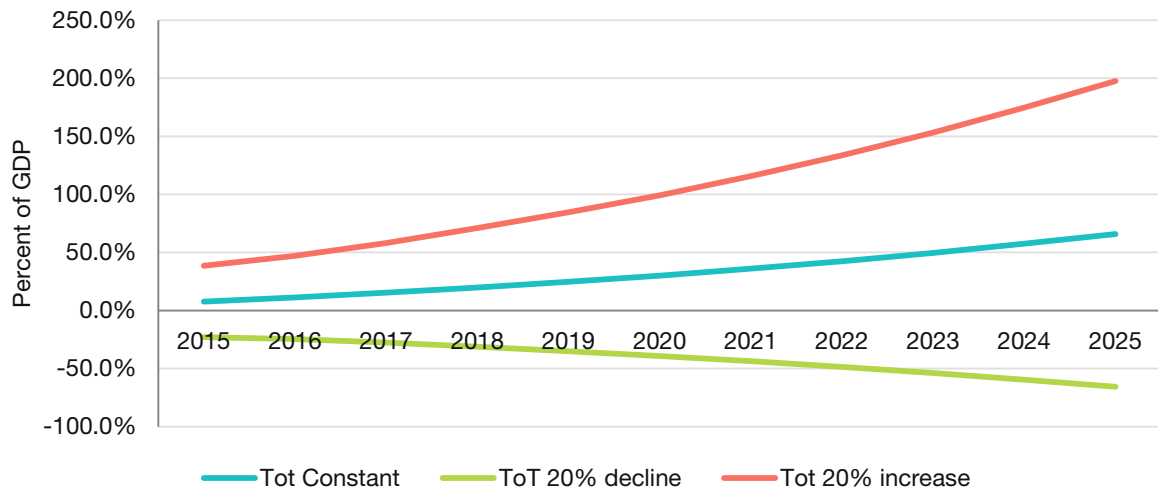
Source: Centennial Group International 2015

Figure A31: Emerging Asia current account simulation



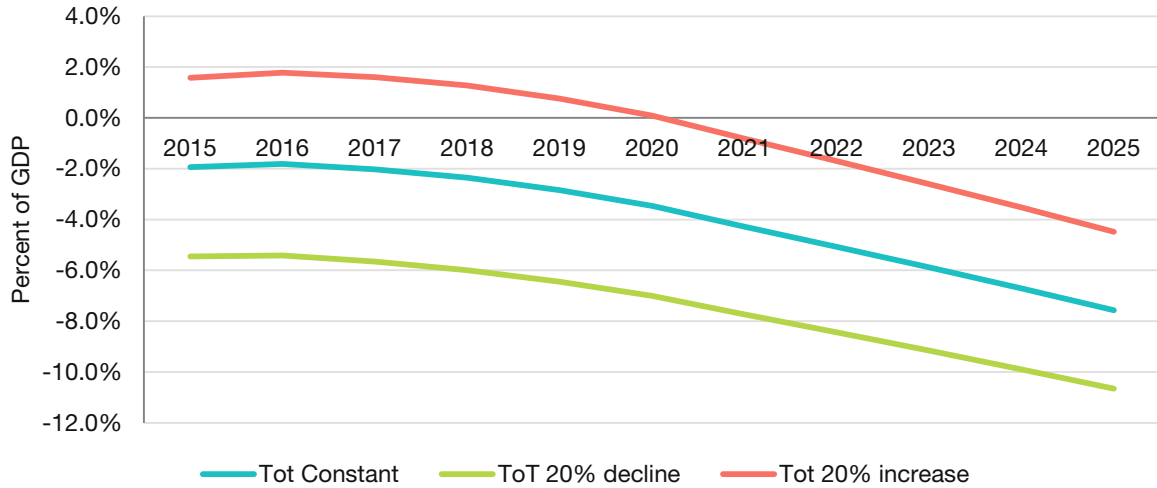
Source: Centennial Group International 2015

Figure A32: Emerging Europe current account simulation



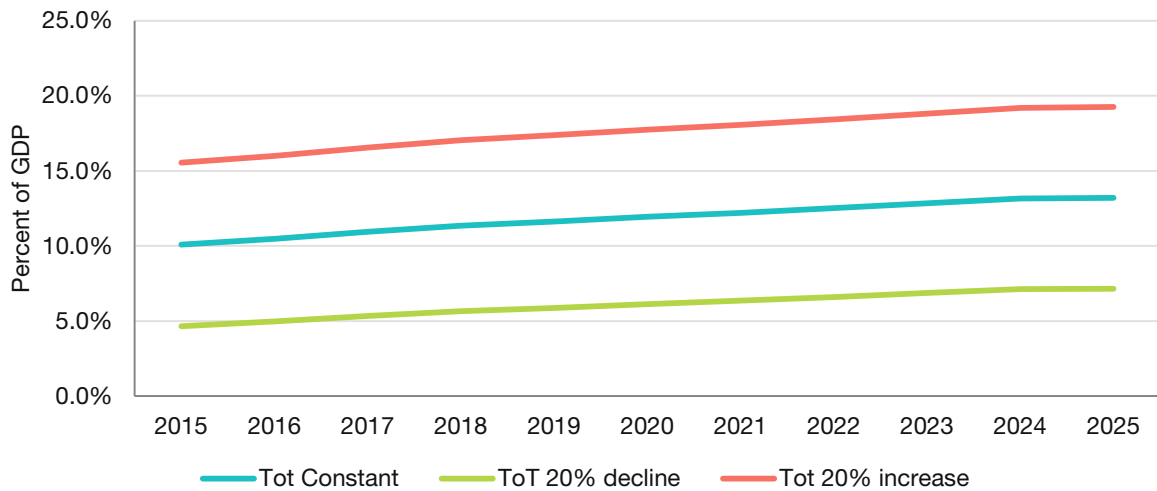
Source: Centennial Group International 2015

Figure A33: Latin America current account simulation



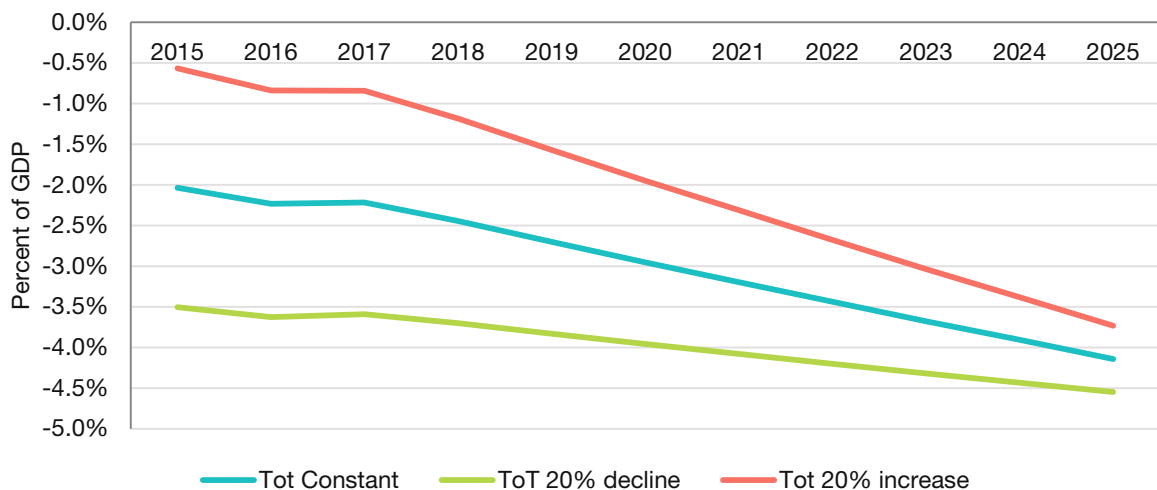
Source: Centennial Group International 2015

Figure A34: Middle East and North Africa current account simulation



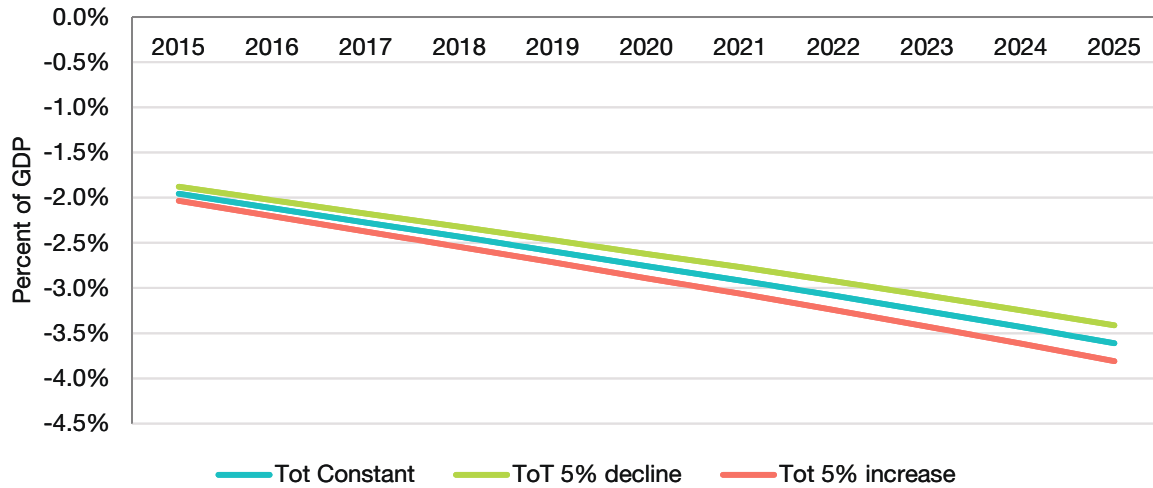
Source: Centennial Group International 2015

Figure A35: Sub-Saharan Africa current account simulation



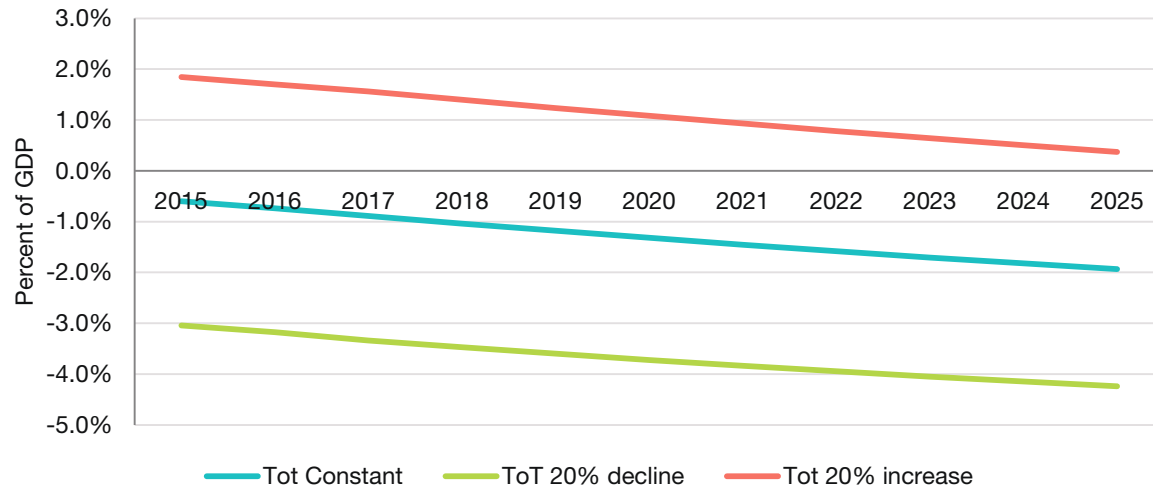
Source: Centennial Group International 2015

Figure A36: Advanced economies fiscal account simulation



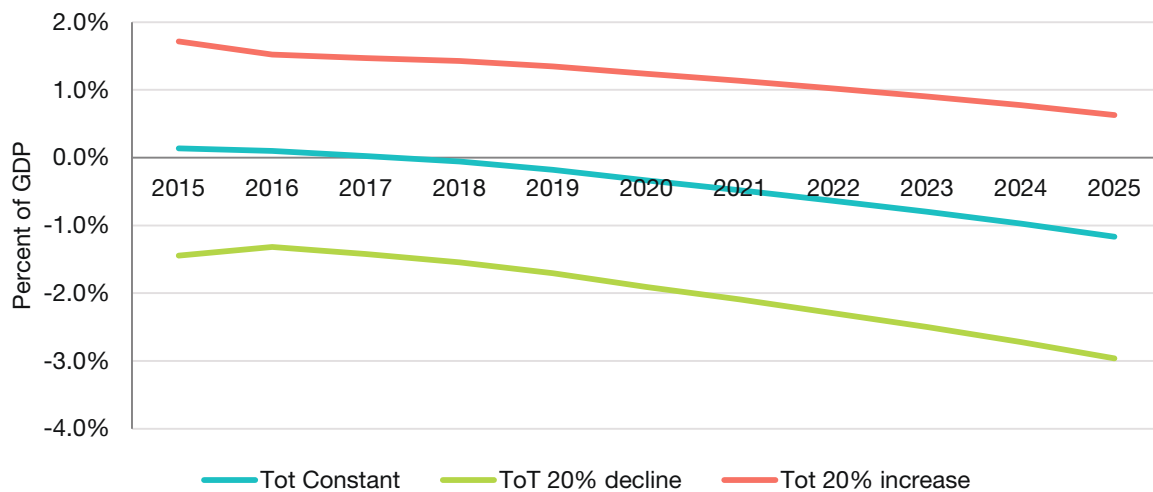
Source: Centennial Group International 2015

Figure A37: Emerging economies fiscal account simulation



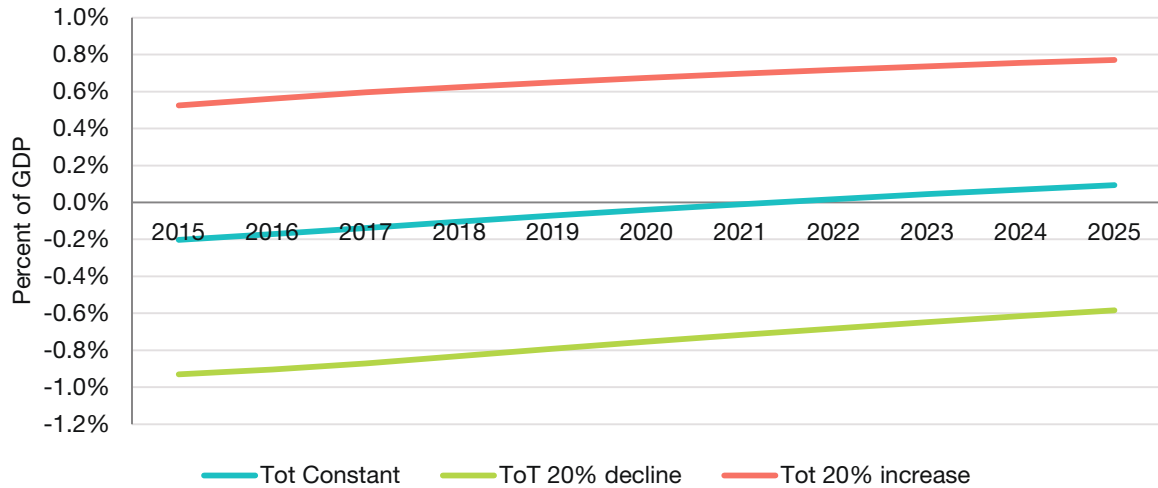
Source: Centennial Group International 2015

Figure A38: Commonwealth of Independent States fiscal account simulation



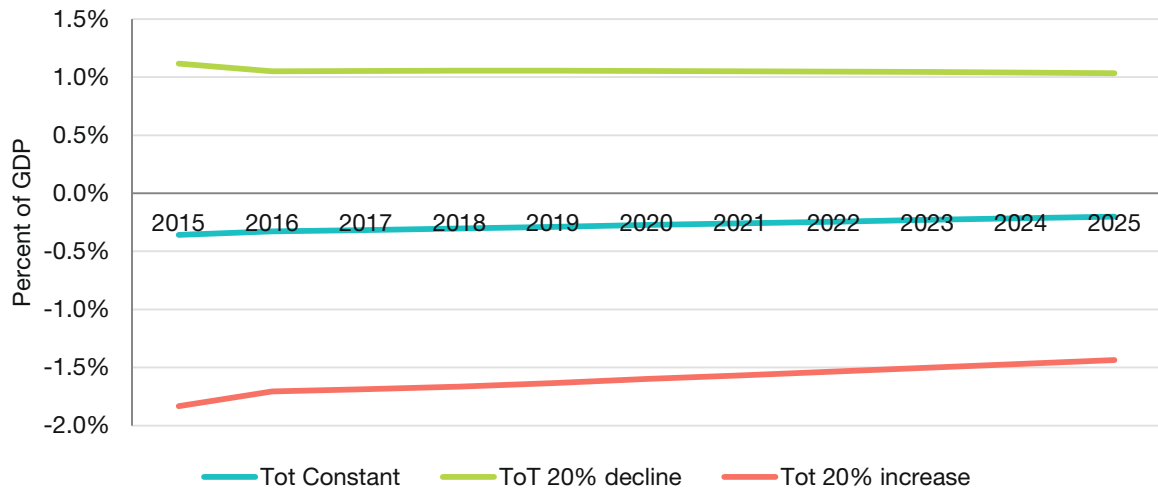
Source: Centennial Group International 2015

Figure A39: Emerging Asia fiscal account simulation



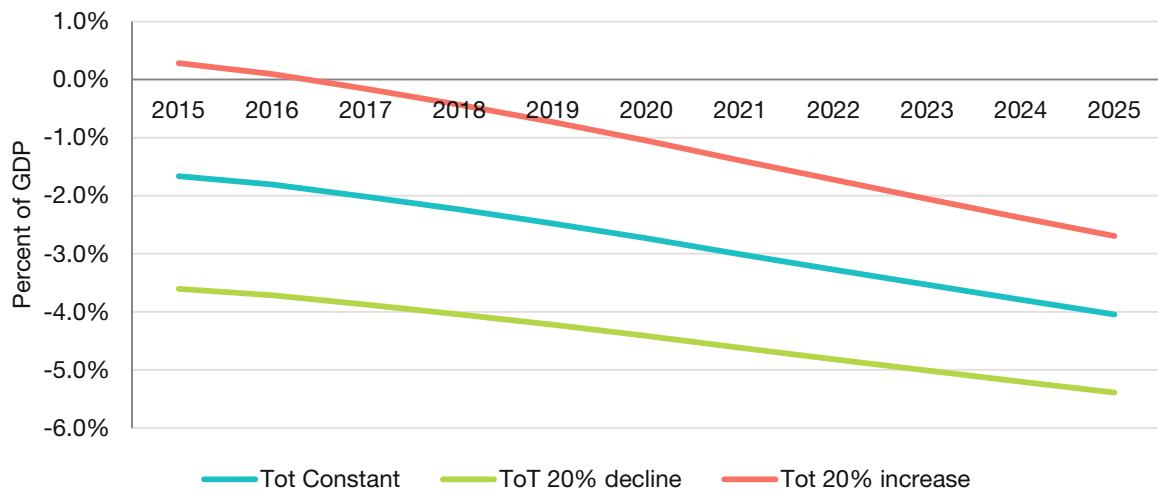
Source: Centennial Group International 2015

Figure A40: Emerging Europe fiscal account simulation



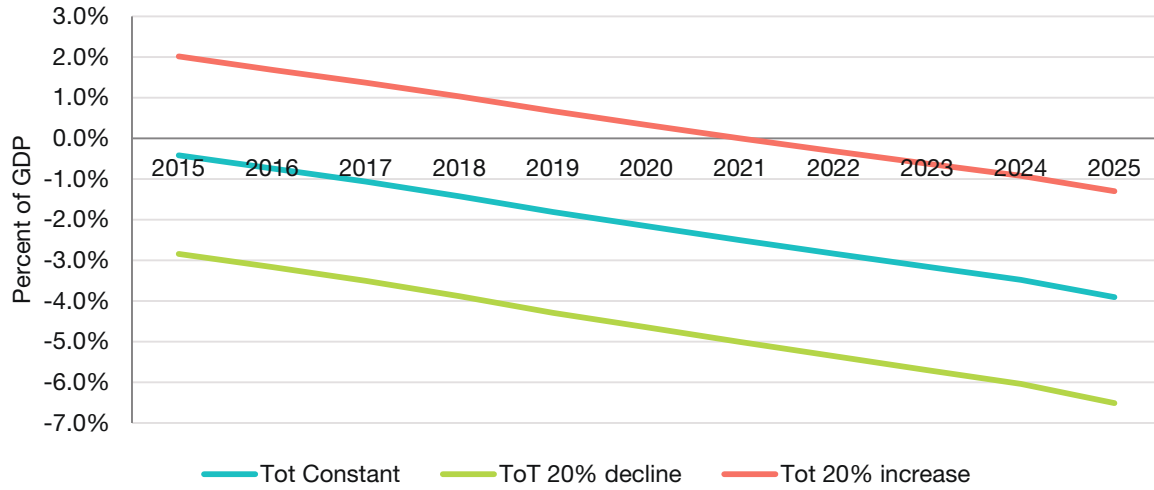
Source: Centennial Group International 2015

Figure A41: Latin America fiscal account simulation



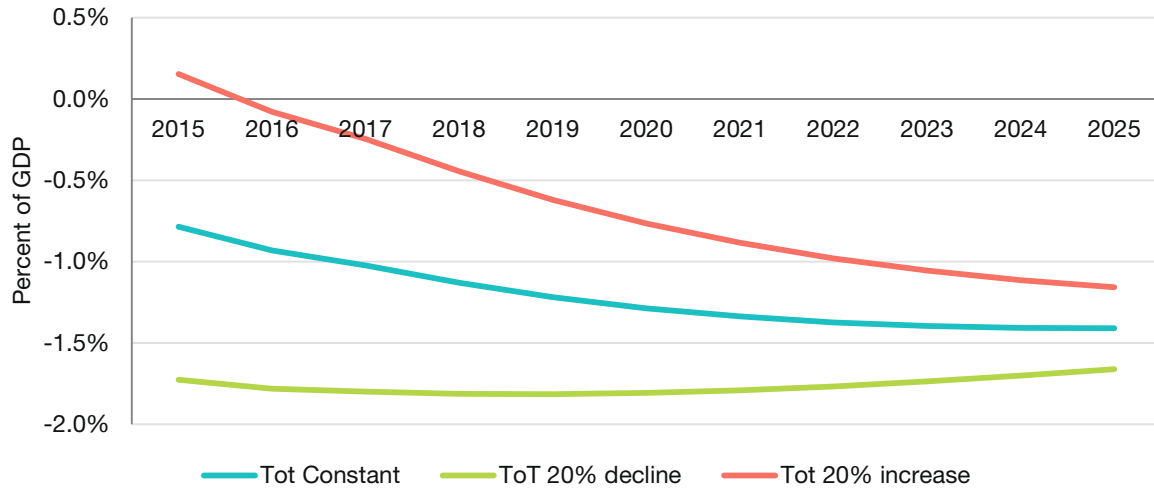
Source: Centennial Group International 2015

Figure A42: Middle East and North Africa fiscal account simulation



Source: Centennial Group International 2015

Figure A43: Sub-Saharan Africa fiscal account simulation



Source: Centennial Group International 2015

