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Growth Accelerations, Structural Change, and Poverty Reduction in Africa

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Abstract

This paper proposes an assessment of African countries' growth patterns through the identification of acceleration episodes. About two-thirds of African countries have experienced at least one growth acceleration episode since the 1950s. In some cases, accelerations hardly contributed to long-term growth, as they led or lagged a crisis episode, but in most cases, which we define as growth spike episodes, growth accelerations have directly determined the long-run pattern of growth. Hence studying these growth spike episodes specifically contributes to better understanding of African growth performance. We observe several cases of multiple growth spikes, similar to what has been observed in emerging economies. Growth spike episodes are generally associated with substantial total factor productivity gains. They are also associated with reduction of dualism through sectorial reallocation of labour from low-productivity sectors to high-productivity sectors. Growth spikes are additionally associated with poverty reduction, but we challenge the conventional wisdom that growth causes poverty reduction. In several cases, data on income distribution observed during the growth spike episodes are more consistent with the reverse causation, with poverty reduction causing economic growth. The paper concludes with a policy discussion that emphasizes the necessity of building a pro-poor and shared growth strategy.

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Growth Accelerations, Structural Change, and Poverty Reduction in Africa

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1. Introduction

This working paper proposes an analysis of growth accelerations in Africa. Since the seminal paper by Hausmann et al. (2005), growth economists have paid a lot of attention to periods in which economic growth accelerates from low growth to high growth, namely, growth accelerations. This new interest in growth accelerations is based on empirical and analytical considerations. From an empirical point of view, many acceleration episodes have been observed in recent decades, in Africa as well as in other regions. The analytical interpretation of growth acceleration proposed by Hausmann et al. (2005) is that accelerations can be the result of a change of the growth fundamentals of the economy. In a conventional growth economics framework, growth fundamentals determine a steady state toward which the economy would converge in the long run. Such fundamentals may be external or internal factors, and include terms of trade, technology, economic institutions, and governance. Those fundamentals may change over time and the long-term prospects evolve accordingly, which leads to growth acceleration if such changes are positive. Hausmann et al. (2005) studied in particular terms of trade shocks, market economy reforms, and changes in polity as determinants of growth accelerations.

We adopt this general framework, but we complement it in two directions.

First, while Hausmann et al. (2005) clearly defined the inception of growth acceleration episodes, they did not study their conclusion. Growth acceleration episodes generally end after a while. Eichengreen et al. (2013) approached this question when studying the so-called middle income trap. The idea is that the observed growth acceleration would not be sufficient to bring a developing or emerging economy to a level of development comparable to that of advanced economies. Berthélemy (2011) already pointed to the fact that successful emerging countries have experienced multiple growth accelerations since the 1950s. A growth acceleration could be followed by a period of further acceleration or by a period of stagnation—or, even worse, by a period of crisis. Only in the case of further acceleration could the country possibly escape the middle-income trap. In the African context, where many crisis episodes have been observed, it is necessary to separate middle-income traps related to post-acceleration stagnations from middle-income traps related to post-acceleration crises, which have not been considered explicitly in this literature.

Second, the reasons why we observe growth accelerations may go beyond the causes envisaged by conventional growth economics, which considers standard market reforms to be the primary economic causes of growth accelerations. The divergence of dynamics observed in the world economy, leading to so-called convergence clubs (Baumol, 1986), suggests that there is a diversity of potential growth paths, consistent with the possibility of multiple equilibriums

(Chatterji, 1992): two economies with the same fundamentals may converge to different steady states. In such a framework, some growth accelerations may be related to jumps from a low equilibrium to a higher equilibrium steady state. Berthélemy (2017) linked this analysis of multiple equilibriums at the macroeconomic level to its equivalent at the microeconomic level, which is known as poverty trap analysis (Carter and Barrett, 2006). A poverty trap is defined by a self-reinforcing mechanism, which causes poverty to persist. A dynamic of poverty exits—a dynamic through which individuals escape the poverty trap—may lead at the aggregate level to growth acceleration. Studying this possibility sheds new light on the growth-poverty nexus. In the conventional wisdom, growth acceleration leads to poverty reduction, whose magnitude may be altered by exogenous changes in income distribution. In the poverty exit and growth acceleration framework, poverty reduction may instead cause growth. In the African context, where poverty reduction is a major objective of policymaking, this new vision of the growth-poverty nexus is worth exploring.

This paper starts, in the second section, with an empirical exploration of the growth accelerations observed in Africa. We find that many growth accelerations have been observed in Africa, and that overall the long-run performances of African economies are closely related to such growth accelerations. We must however separate growth accelerations from failed take-offs—that is, accelerations followed by crisis. Similarly, we should analyse separately growth accelerations that are merely post-crisis recoveries. In the third section, we analyse for each country the full chronicle of its acceleration and crisis episodes over time, from the late 1950s or early 1960s to recent years, which contributes to a more precise assessment of the contribution of growth accelerations to long-term performances of African economies. In the remainder of the paper, we study some structural aspects of growth accelerations that neither lead to a crisis nor are led by a crisis, which we call growth spike episodes. In the fourth section we perform a standard growth accounting exercise to study the respective contributions of factor accumulation and total factor productivity to growth during the growth spike episodes. In the fifth section we consider the contribution of structural changes in terms of sectorial composition of economic activity, and we show that sectorial labour reallocations have played an important role in African growth spikes. Finally, in the sixth section, we consider the growth-poverty nexus and study the possible reverse causality from poverty reduction to growth acceleration.

2. African growth accelerations

We start from the definition of growth accelerations proposed by Hausmann et al. (2005):

"*We define the growth rate gt,t+n at time t over horizon n to be the least squares growth rate of GDP per capita (y) from t to t+n defined implicitly by the following:*

$ln(yt+i)=a+gt,t+n*t,\ i = 0, \ldots, n.$

The change in the growth rate at time t is simply the change in the growth over horizon n across that period:

$\Delta gt,n = gt,t+n - gt-n,t$.

We identify growth accelerations by looking for rapid growth episodes that satisfy the following conditions.

(1) $gt,t+n \geq 3.5$ *ppa, growth is rapid,*

(2) $\Delta gt,n \geq 2.0$ *ppa, growth accelerates,*

(3) $yt+n \geq max\{yi\},\ i \leq t$, *post-growth output exceeds pre-episode peak.*

We set the relevant time horizon to be eight years (i.e., $n = 7$*).*" (Hausmann et al., 2005)

This definition does not uniquely define start dates of acceleration episodes, as several consecutive dates may satisfy it. To choose a given start date, Hausmann (2005) used a procedure based on statistical inference. We preferred, instead, to follow Jong-A-Pin and De Haan (2011) and chose as start dates of acceleration episodes the earliest possible dates, consistent with conditions (1) to (3).

Then we needed to define end dates of acceleration episodes. A standard acceleration episode inevitably ends after a while—otherwise the accelerating country would steadily catch up with advanced economies, which we do not observe, particularly in Africa. This end of an acceleration episode is characterized by very slow growth unless another acceleration episode starts immediately after the previous one or the acceleration is immediately followed by a reversal crisis. We used this criterion, which we applied to series of GDP per capita transformed by a Hodrick-Prescott filter to eliminate their short-term cyclical component.[2] Specifically, we determined the end date of an acceleration episode as the first date when the growth rate of the filtered series goes below 1%. In some instances a further acceleration starts before this point is reached, in which case the end date of the previous acceleration is the start date of the next one.

We applied these criteria to data available in the Penn World Tables 9.0.[3] We made this choice to be consistent with Hausmann et al. (2005), who used a previous version of the Penn

[2] We use a smoothing factor of 6.4, as recommended by Ravn and Uhlig (2002) for annual time series.
[3] Source: Feenstra et al. (2015)

World Tables. Growth accelerations are observed in 33 African countries, out of 50 countries for which data were available.

Figure 1 illustrates the fact that such accelerations have played a major role in determining the relative successes of African countries in their attempt to develop, as it shows clearly that, over the period of observation, the growth rate of countries with at least one acceleration is significantly higher than that of countries without acceleration, and that all countries without acceleration have known growth rates of less than 1.1% per year or even negative.

[Figure 1 about here]

Figure 2 illustrates the dynamics of these 33 countries. It displays, using filtered series of GDP per capita, the growth rate of each year in relation to the level attained the previous year.

[Figure 2 about here]

In this figure, countries move to the right along the horizontal axis when their growth rate of GDP per capita (measured along the vertical axis) is positive, and move to the left when it is negative. A peak of the growth rate, implying a period of fast progress in GDP per capita, visualizes acceleration. Sometimes, like in Botswana, Burkina Faso, or Egypt, this peak is repeated several times, while some countries have so far exhibited only one peak, e.g., Ghana, Kenya, and Swaziland. In yet other cases, there are big troughs, with negative growth rates, which reduce GDP per capita over time, like for instance in Côte d'Ivoire, Nigeria, or Zimbabwe, following initial accelerations. The history of African economic growth cannot be studied without paying careful attention to crisis episodes, which have been rather frequent over time. A crisis is defined here as a prolonged sequence of negative growth rates observed in the filtered series. A crisis episode ends when the growth rate comes back to close to zero. Table 1 provides a synthesis of the acceleration and crisis episodes, which we study more precisely in the next section.

[Table 1 about here]

3. African growth history analysed through sequences of accelerations and crises

Countries with series of growth spikes

We define as growth spikes all acceleration episodes that are not merely recoveries after a crisis and do not lead to a crisis. There are many such growth spike episodes in Africa: 38 in total, in 18 countries. In two-thirds of such countries, there have been multiple growth spikes. Looking for multiple growth spikes is a way to start answering the recent growth literature's middle-

income trap question. Originally the middle-income trap notion was developed to study the ability of upper-middle-income countries to catch up with developed countries. It can be however generalized to all cases of countries stuck at a relatively low income level after having experienced at least one spike of growth. Escaping the middle-income trap would require several growth spikes. Berthélemy (2011) showed that such multiple growth spikes have characterized the dynamics of emerging countries since the 1950s, notably in East Asia. Of course, the final outcome of the process of emergence is unknown until a country has caught up with advanced economies but observing African countries with several growth spikes is interesting as it suggests that such countries could become emerging economies.

Table 2 reports that a dozen African countries have known several growth spikes (on average 2.7 spikes, with an average length of 12.3 years). Such growth spikes have increased their per capita GDP by 158% on average, which accounts for most of their achievements over the observation period. Of course, within this group, some are lagging and others (Botswana and Egypt) are ahead.

[Table 2 about here]

In addition, six countries have experienced a single spike of growth so far, of length and depth comparable to those of the previously mentioned countries (Table 2). Of course, the total economic growth in GDP per capita achieved by these countries is lower than for countries with multiple spikes, but it is still substantial (44% on average, for an average length of 10.5 years). Such data tend to underestimate the contribution of growth spikes to the economic progress of these countries. First, in two cases, South Africa and Lesotho, the observed spike of growth accounts for only a minor part of the progress they have made over the whole observation period. In these two cases the acceleration criteria defined by Hausmann et al. (2005) appear quite restrictive. In particular, if a threshold a little lower than 3.5% had been chosen to detect accelerations, South Africa would have registered several growth spikes, as suggested by Figure 2. In the case of Lesotho, an initial acceleration was not detected for lack of enough historical data: Figure 2 suggests that there was an acceleration starting in the 1950s, for which data are not available in PWT 9.0 for Lesotho. Second, in all but one country (Lesotho), the observed growth spikes end in 2014, that is, in the last year of observation available in PWT 9.0, while at that date the rate of growth is still significant in most cases; this suggests that the length of these growth spikes is underestimated.

A number of acceleration episodes either precede or follow a crisis episode. Obviously, these do not have the same meaning as growth spikes.

Sequences of acceleration and crisis

Some growth acceleration episodes are followed by crisis episodes. We name these failed take-offs. Table 1 identifies a dozen such cases: Algeria, Cameroon, Congo, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, Malawi, Nigeria, Sierra Leone, Zambia, and Zimbabwe.

In a failed take-off sequence, the crisis has often economic roots, possibly related to characteristics of the previous acceleration episode that make it unsustainable. This was particularly true in the early 1980s, when a number of countries, such as Côte d'Ivoire and Nigeria, had financed fast growth in the 1960s and 1970s with excessive external borrowing or short-ended positive terms of trade shocks, and then faced a debt crisis. In other cases—Zimbabwe, for example—the failed take-off was due to political events. Whatever the reasons leading to a sequence of acceleration and crisis, the acceleration observed initially cannot be considered as having actually contributed to economic progress. On average, the total growth observed after a failed take-off sequence is slightly negative, meaning that the countries in question return to below their initial GDP per capita at the end of the failed take-off sequence.

In half the failed take-off countries (Cameroon, Congo, Côte d'Ivoire, Malawi, Zambia, Zimbabwe), this failed take-off is not followed by a further acceleration (in Côte d'Ivoire, it is even followed by a further crisis). Conversely, for Algeria, Equatorial Guinea, Ethiopia, Gabon, Nigeria, and Sierra Leone, the failed take-off was followed by a recovery. This second, post-crisis acceleration episode may be considered a mere recovery in Sierra Leone and Nigeria, whose GDP per capita is in the end still below the level attained before the failed take-off. But Algeria, Equatorial Guinea, Ethiopia, and Gabon are better off after the end of the sequence of failed take-off and recovery. In such cases, the second, post–failed take-off, acceleration could possibly be considered equivalent to a spike of growth, instead of a mere recovery. Symmetrically, in Cameroon, Congo, and Zimbabwe, we observe an early acceleration in the 1960s followed by a further (failed take-off) acceleration and a deep crisis from the 1980s. In this sequence, the first acceleration episode could possibly be also considered similar to a spike of growth.

Sequences of crisis and recovery

Some growth acceleration episodes follow a crisis episode. We call these recoveries. This sequence is observed in Angola, Mozambique, and Rwanda. Although these recoveries suggest substantial growth potentials, it is too early to analyse their accelerations as growth spikes because a large part of observed growth corresponds merely to the post-crisis recovery.

4. Growth accounting of growth spikes

In what follows we use simple growth accounting to characterize the dynamics of African growth spikes. To perform this exercise we use estimates of GDP at constant national prices, which are more relevant when analysing factor productivity than real GDP in purchasing power parity (PPP) terms.[4] Analysing factor productivity amounts to comparing the growth of GDP with the growth of factors of production used in production processes. Standard economic analysis defines two main factors of production: labour, which is approximated here by the number of employees, and capital, which is measured as an aggregate of past investment, minus depreciation, valued at constant national prices. Both variables come from PWT 9.0.

The exercise starts with an assessment of the contribution of the dynamics of employment rates to the growth of GDP per capita. After eliminating cases in which employment data are missing, we are left with 29 episodes, as reported in Table 3. Then growth of labour productivity—i.e., GDP growth per employee—is decomposed between the contribution of capital deepening and the contribution of total factor productivity growth.

Employment rates

Table 3 decomposes growth of income per capita in growth of labour productivity and growth of employment rate in total population, consistently with the following definition

$$\frac{Y}{P} = \frac{Y}{E} \times \frac{E}{P}$$

where Y stands for GDP, P for population, and E for employment. Table 3 sheds light on the extent to which growth of income per capita could be due to increasing employment rates. In turn, employment rates depend on two factors: the ratio of the working-age population, and the proportion of working-age individuals who are actually employed. The former variable is determined by demographic patterns; in particular it is expected that during a demographic transition the share of working-age population in the total population increases, as observed in demographic transitions in Asia and Latin America. The latter variable is called the participation rate, and it depends on the functioning of the labour market. Given uncertainties surrounding the measurement of participation rates, we also document in Table 3 the growth

[4] The difference of valuation between GDP at national constant prices and GDP in PPP may be related to changes in relative prices, notably the real exchange rate, but also to discrepancies between the various sources of data. Given large uncertainties surrounding these data in Africa, we should avoid over-interpreting trends that would merely rely on errors of measurement. To be on the safe side, we do not consider cases in which the difference between growth measured in national constant prices and growth measured in PPP is very large, suggesting inconsistencies in data (Equatorial Guinea, Gabon, Sudan, and Swaziland).

rates of the working-age population.[5] This variable is positively correlated with the growth rate of the employment, although comparisons of the two variables cast some doubt on the measured magnitude of growth of labour participation in some countries (in Algeria, Egypt, Ghana, Morocco, and Namibia, the observed gap between the growth of working-age population and the growth of employment is higher than 1.5 percentage points per year).

[Table 3 about here]

Overall we observe that demographic factors have played a role in the past two or three decades in Northern African country acceleration episodes (Algeria 1999–2009, Egypt 1988–2002 and 2002–2014, Morocco 2002–2007 and 2007–2014, and Tunisia 1989–1999) as well as in acceleration episodes of some relatively advanced sub-Saharan economies (Botswana 1994–2008, Cabo Verde 2000–2014, Ghana 2006–2014, Mauritius 1981–1999 and 2005–2014, Namibia 2001–2014, and South Africa 2001–2014). Attributing their acceleration to such demographic transition factors would be debatable, given the moderate magnitude of the direct contribution of employment rate increases to income per capita growth. Nevertheless, these factors may have also indirectly played a non-negligible role in recent accelerations of these countries. In the presence of poverty traps, the reduced proportion of dependents in households could contribute to exits from poverty, which in turn could contribute to economic growth.

To validate the conclusion that growing employment rates have contributed to growth spikes, we need to check that this growth of employment rates has not been at the cost of labour productivity. Among the growth spikes episodes, only Algeria (1999–2009) has a decline of labour productivity. In this case the rate of employment has presumably been increasing too fast, as new entries in the labour force have resulted in the decline of labour productivity. For Egypt 2007–2014, Morocco 2002–2014, and South Africa 2001–2014, labour productivity progress has been modest, which may weaken our conclusion of a positive outcome of demographic changes. For all other growth spike episodes, labour productivity gains have been substantial, close to 3% per year on average, during the phases of increasing employment rates.

Labour productivity, capital deepening and total factor productivity

Labour productivity may increase for two main reasons: either labour is associated with other factors of production, which increases its productivity, or the productivity of factors overall is increasing. We use here the conventional framework in which only two factors are considered, namely, labour and capital, and in which GDP is related to capital and labour through an

[5] We define working-age population as the population aged 15–65. Data are extracted from World Bank's World Development Indicators (WDI).

aggregate production function.[6] Given the uncertainties of the measurement of capital and of estimation of aggregate production functions, we did not attempt to estimate the parameters of the production function. We based our analysis on a standard Cobb-Douglas function with elasticity of output to capital assumed to be 0.3. As a way to check the robustness of our conclusions, we also provide results obtained with an elasticity equal to 0.4.

To do so we used PWT 9.0 data on stock of capita and GDP measured at national constant prices and on total employment, and applied the following formula:

$$g_{TFP} = g_{GDP} - \alpha g_K - (1 - \alpha) g_L$$

where *g* stands for the (logarithmic) growth rate of total factor productivity (TFP), GDP, capital stock (*K*), and employment (*L*), and α is the elasticity of output to capital. The growth of TFP is the growth of GDP that cannot be explained either by the growth of capital or the growth of labour, respectively weighted in this assessment by the elasticities of GDP to capital and labour, α and $1-\alpha$.

The results of our calculations are reported in Table 4. Overall, our growth spike episodes are characterized by total factor productivity growth playing a significant role. This is a very positive conclusion, as growth generated by productivity gains may be more sustainable than growth obtained merely through the accumulation of factors. There are a few exceptions, including Algeria 1999–2009, whose labour productivity declines, and Egypt and Morocco in their recent episodes, where labour productivity is explained solely by capital deepening. In such circumstances, economic progress is hardly sustainable, as it relies on capital accumulation, whose return to scale is usually declining. Conversely, in most of other growth spike episodes the contribution of total factor productivity growth is massive. It represents on average 64% of total growth of labour productivity. Even if we assume a higher elasticity of output to capital of 0.4, the average contribution of total factor productivity growth stays substantial in most countries, in which it contributes on average to more than 50% of total growth of labour productivity.

[Table 4 about here]

[6] See Berthélemy and Söderling (2001) for an early application to African data.

5. Contribution of sectorial allocation of labour

The sources of factor productivity may be numerous. In this section, we focus on the role played by the sectorial distribution of labour. In African economies, there are vast differences of productivity among sectors. Economists describe this situation as a dual economy. Typically, in a dual economy, modern sectors with high productivity coexist with traditional sectors with low productivity. In a dual economy, an interesting question is whether productivity gains could be related to a reduction of dualism, through the transfer of factors of production from low-productivity sectors to higher-productivity sectors. Usually, in a dual economic structure, economic development rests in part on the reallocation of labour from low-productivity sectors to high-productivity sectors (McMillan et al., 2014)

We consider in this exercise labour productivity instead of total factor productivity because it is impossible with available data to allocate capital by sector. This is a limitation, but at the same time this approach helps us understand the growth-poverty nexus: if labour moves from the lower-productivity to higher-productivity sectors, this has at the same time a positive effect on growth and reduces poverty. Conversely, if growth results mainly from the fact that the most productive sectors enjoy productivity progress but do not attract labour force from the other sectors, we observe a growth path that is less conducive to poverty reduction.

The method, originally proposed by Syrquin (1982), decomposes labour productivity growth, g_y, using the following equation, where g_{yi} is the growth rate of labour productivity of sector i, g_{li} is the growth rate of the share of sector i in total employment, and w_i is the weight of sector i in total GDP.

$$g_y = \sum_i w_i g_{yi} + \sum_i w_i g_{li} + \sum_i w_i g_{yi} g_{li}$$

The first term in this equation measures the contribution of productivity gains of the different sectors to aggregate productivity growth. The second term measures the contribution to aggregate productivity growth of the reallocation of labour from low-productivity to high-productivity sectors. The third term, which is usually a residual, compared with the first two, measures the contribution of reallocation of labour from slowly growing sectors to fast-growing sectors.

To perform this exercise, we used two sources of data. The first is from Timmer et al. (2015) and provides a decomposition of GDP at constant prices and of labour employment in ten sectors: (1) agriculture, hunting, forestry, and fishing, (2) mining and quarrying, (3) manufacturing, (4) electricity, gas, and water supply, (5) construction, (6) wholesale and retail

trade, hotels, and restaurants, (7) transport, storage, and communication, (8) finance, insurance, real estate, and business services, (9) government services, and (10) community, social, and personal services. These data are available from 1960 to 2011 or 2012 for eight of the African countries where we have observed growth spikes: Botswana, Egypt, Ethiopia, Ghana, Kenya, Mauritius, Morocco, and South Africa.[7]

The second source comes from the World Bank's WDI and provides decompositions of GDP at constant prices and of employment in three sectors: agriculture, industry, and services, over 1991–2016. The advantage of providing more recent data is countered by uncertainties about the quality of the data, which has led us to make parsimonious use of this source. We have in particular chosen not to use this source when the aggregate labour productivity was inconsistent with PWT 9.0 data. This led us to drop from our analysis Algeria, Mali, and Cabo Verde, where WDI data show very low growth of labour productivity over the recent growth spikes, inconsistent with PWT 9.0 data.[8] Additionally the decomposition in three sectors is probably too coarse to provide an adequate assessment of the sector reallocation effects and we have instead used the ten-sector source when it was available. In spite of the many deficiencies of the available data sources, Table 5 exhibits a number of interesting results.

[Table 5 about here]

We observe in Table 5 a significant contribution of the sectorial reallocation of labour to aggregate labour productivity growth, up to two-thirds of total growth in some countries. To a large extent this reallocation effect comes from the relocation of labour from agriculture, where productivity is relatively low, to non-agricultural sectors.

However, we observe a large variance. Inevitably, in countries where the weight of agriculture in economy has already declined, the factor reallocation effect only plays a modest role. This is the case in South Africa and Namibia and in Northern Africa. In Northern Africa, the factor reallocation effect declines over time. The same decline is observed in Botswana and Mauritius, which have become less and less dependent on agriculture over time.

In some growth spike episodes, the positive effect of reallocation of labour out of agriculture is dampened by the fact that labour moves to service sectors, which usually have low-productivity gains. De Vries et al. (2015) concluded that this negative contribution of reallocation to less dynamic sectors was a systematic pattern of recent decades in Africa. Our conclusion is more nuanced: this negative effect increases over time for Egypt and Morocco

[7] In Egypt and Morocco, the decomposition does not include the 10th sector, for which employment data are unavailable.

[8] In addition, data inconsistencies led us to restrict our use of the WDI source to data beyond 2005 for Mauritius and Namibia, beyond 2008 for Uganda, and up to 2005 for Burkina Faso.

but peaks in the 1970s for Botswana and Mauritius, and is absent in the recent growth spikes in Ghana, Kenya, and Uganda.[9]

Overall, we conclude that sectorial reallocation from low-productivity to high-productivity sectors, which can be associated with a gradual reduction of dualism, has played a notable role in the initial steps of development in Africa during growth spike episodes. The conclusion is in some cases nuanced by a negative effect of reallocation to less dynamic sectors, but without any systematic pattern.

6. The growth-poverty nexus

The disaggregation of economic activity by sector may produce a distorted assessment of the dualism of the economy. It is true that labour productivity is lower in agriculture than in other sectors, but there may be low-productivity workers in all sectors of activity—e.g., in informal service sectors. As a complement to the previous section we suggest here a new approach based on income distribution data that are now available in a standardized format for many countries from the 1980s.[10] The idea is to link productivity with incomes as they are observed in income distribution data. Low-productivity workers by definition have low incomes. In a dual economic structure where workers would be divided into two categories—low- and high-income—we propose to associate low-income individuals with low-productivity workers in traditional activities, and higher-income individuals with higher-productivity workers in modern activities. This assignation is accordingly simplistic, but no more so than a definition of dualism based on a sectorial decomposition of economic activity.

In this framework the line separating the traditional and modern-sector workers corresponds to the poverty line separating poor from non-poor individuals. Consistent with standard international definitions of poverty lines, we use here the $1.9 and $3.1 (in 2011 PPP terms) poverty lines to separate the traditional and the modern sectors.

Using data available on poverty incidence and poverty gaps, the poverty headcount corresponds to the share of the workforce employed in the traditional sector, while the poverty gap can be used to measure the average income in this traditional sector, y_L, through the following formula

$$y_L = \theta(1 - \frac{\gamma}{h})$$

[9] In the latter case, the reallocation of labour is instead in favour of the most dynamic sectors.

[10] Data in this section come from the World Bank's povcalnet website: http://iresearch.worldbank.org/PovcalNet/povOnDemand.aspx

where θ is the poverty line, h is the poverty incidence, and γ is the poverty gap. Additionally, we can measure by deduction the average income in the modern sector y_H as follows:

$$y_H = \frac{y - hy_L}{1 - h}$$

where y is the average income measured in the total population.

We applied these definitions to data observed during growth spike episodes. Given the different nature of macroeconomic data and income distribution data, there is no exact correspondence of incomes measured on both sides. Moreover, income distribution data are not available on a yearly basis, and we could observe the evolution of income distribution during (approximately) the same period as growth spike episodes for only nine countries. Among these countries two (Mauritius and Tunisia) have a very low poverty incidence at the standard $1.9 and $3.1 thresholds and for this reason we could not consider them in this exercise. Our assessment is then based on the recent growth spikes of seven countries: Botswana, Burkina Faso, Mali, Mauritania, Namibia, South Africa, and Uganda. As a complement, we also included in this analysis two recovery episodes: those of Mozambique and Rwanda.

Overall, the data show an association of economic growth and poverty reduction during the considered growth accelerations. Poverty has receded substantially, with a decline of the poverty incidence of 1.4 percentage points of total population per year (1.3 if we use the $3.1 poverty line), as shown in Table 6.

Interpreting this association between growth and poverty reduction must be done with caution. In a first step, we adopt the conventional approach to the growth and poverty nexus, in which poverty reduction is considered as the result of the combination of aggregate growth and changes in income distribution. Knowing the shape of the income distribution available in the povcalnet website, we compute how much poverty would have diminished if all individuals had equally benefited from aggregate income growth, which amounts to assuming that the income distribution structure has stayed unchanged.

The results are reported in Table 6. In all countries considered, a large part of the observed poverty reduction can be attributed in this framework to aggregate growth. This proportion is higher than or close to 100% for Botswana and South Africa, as well as in recovery episodes, but about only two-thirds in other growth acceleration episodes considered here. Hence, although the role of economic growth in poverty reduction looks overwhelming during growth spikes, it does not explain all of it. Part of the observed poverty reduction results from changes in income distribution.

[Table 6 about here]

This preliminary interpretation is based on the assumption that economic growth and income distribution are actually exogenous to poverty reduction. However, a reverse causation from poverty reduction to growth could be also considered.

The dual economy framework that we have adopted in this section may be consistent with poverty trap theories, where poverty reduction would instead cause economic growth. Berthélemy (2017) proposes a model in which the poor are in the traditional sector, and their low income prevents them from adopting modern modes of production. Exits from the poverty trap would then cause economic growth, through exactly the same mechanism as studied in the previous section: labour reallocation from low-productivity sectors to high-productivity sectors leads to economic growth. Specifically, we assume that individuals, who, for whatever reason, escape the poverty trap, enjoy an average income progress from y_L initially to y_H at the end of the process. Similarly, individuals who would initially be in the modern sector, with an average income equal to y_H, and fall below the poverty line are supposed to have at the end of the process an income equal on average to y_L. Using the same formula as in Section 5, we computed how much growth could be attributed in this sense to the reduction of the poverty headcount. Table 7 reports that the share of aggregate growth that could be attributed to poverty reduction is overwhelming if we use the $1.9 poverty line. Results are however very sensitive to the choice of the poverty line, as shown in right-hand side of Table 7 (using the $3.1 poverty line), where aggregate growth attributed to poverty reduction averages two-thirds of total growth.

So, does growth cause poverty reduction or does poverty reduction cause growth? To document this discussion, we propose to study the actual dynamics of incomes in the traditional sector and compare it to the dynamics of incomes in the modern sector. Our assumption is that if poverty reduction came from overall economic progress, this progress should start in the modern sector and be transmitted to the traditional sector. In other words, we would expect productivity to grow faster in the modern sector than in the traditional sector.

An analytical difficulty in this exercise comes from the fact that the rate of growth of income in the traditional sector cannot be correctly inferred by merely comparing the observed average incomes of individuals below the poverty line at the start and end dates of the acceleration episode, because for any given positive income growth impulse enjoyed in the traditional sector, the least poor individuals in this sector have a higher probability of escaping poverty than do the poorest individuals. As a consequence, the poor who escape poverty initially have an average income higher than y_L, which means that we underestimate the rate of growth in the traditional sector if we merely compare the average y_L at the start and end dates of acceleration. Berthélemy (2017) proposed a way to solve this issue, based on the neutral

assumption that the growth rate of incomes would be uniform across all individuals staying from the start date to the end date in the traditional sector. Results obtained with this method are reported in Table 7.

[Table 7 about here]

In most cases observed in Table 7 the rate of growth of incomes in the traditional sector is high, and typically much higher than the rate of growth of incomes in the modern sector, which is low when not negative. This observation points to the fact that poverty reduction is associated with a dynamic specific to the traditional sector, and it suggests that poverty reduction has led growth rather than the other way around in most of our growth spike episodes. The only exceptions are Botswana and South Africa, where income grows faster in the modern than in the traditional sector, when one uses the $1.9 poverty line and is similar to it when one uses the $3.1 poverty line.

This conclusion is of course tentative, but it sheds new light on the debates on poverty reduction and growth in Africa. It implies that in the countries considered, poverty reduction strategies have succeeded, as such, in reducing poverty, and that in turn they have actually contributed to aggregate economic growth. A detailed analysis of the outcomes of policies implemented to reduce poverty would be necessary to substantiate this conclusion, but that is beyond the scope of this paper. But in keeping with the broad historical perspective of this paper, it is interesting that since the early 1990s a major turnaround in policies has been initiated in the context of the HIPC initiative, which has resulted in substantial aid flows (granted through large debt relief programs) earmarked for poverty reduction strategies. This may help explain our findings for Burkina Faso, Mali, Mozambique, Rwanda, and Uganda, which have been significant beneficiaries of the HIPC initiative. It is also interesting to consider the role of agricultural productivity, given that a majority of the poor work in agriculture. Progress in agricultural productivity may help explain the poverty decline in Burkina Faso, Mozambique, Rwanda, and South Africa, where labour productivity in agriculture has grown fast, between 3.0% and 3.6% per year during their acceleration episodes.

7. Conclusion and policy discussion

This paper proposes an assessment of growth patterns of African countries and finds that many growth accelerations have been observed in Africa. About two-thirds of African countries have experienced at least one growth acceleration episode since the 1950s. Usually, experts on African economies make do with observing that many African countries have known failed take-offs—that is, that accelerations have been followed by deep crises, particularly in the 1960s and 1970s. Our intent is not to underestimate these events, but we found it more relevant

to shed light on success stories, i.e., accelerations that do not lead to crises or are not led by crises. These success stories, which we call growth spikes, should be a source of inspiration for African policymakers, even as it is important to understand the reasons why some accelerations became failed take-offs. These are the two faces of the same coin: understanding what made accelerations sustainable is also a way to avoid failed take-offs.

A first striking characteristic of growth spikes is that in these events capital deepening plays a smaller role than do total factor productivity gains. In the 1960s and 1970s African governments attempted to promote growth by infrastructure building, and more generally through policies promoting physical capital investment. This has often been associated with unsustainable growth paths—and resultant crises—for various reasons that were often combined. Such policies may have been financed by short-ended terms of trade booms or by excessive foreign borrowing, they may have relied on natural resource depletion, or they may have involved overly large investment programs leading to absorption capacity constraints and ending in the building of "white elephants." But we believe that some lessons have been learnt and that this pattern belongs to the past. It is more instructive to study success stories, including some early ones in Northern Africa and Southern Africa, which relied on a balanced mix of investment and productivity gains. Sustainable growth acceleration must to some extent be intensive rather than merely extensive, and must rely on productivity improvements.

Accordingly, factor productivity cannot be decided by decree. Progress must come to a large extent from private initiatives. The role of public policy is to facilitate and accompany these initiatives. Among them, this paper studied the role played by the movements of workers from low-productivity activities to higher-productivity activities. These movements represent a significant source of growth potential in Africa, given the dual structure of African economies combining traditional sectors and modern sectors. These movements depend in part on the capacity of modern sectors to create jobs, which can be helped by market reforms and infrastructure building promoting competitiveness. We do not delve into such reforms in this paper, as they are relatively well known and documented in reports, including the most recent World Bank (2017) *Doing Business* report, which is precisely on reforming to create jobs. We wish to insist here on the importance of complementary aspects, related to the fact that labour reallocation also depends on the capacity of workers to move out of traditional activities. Sectorial labour reallocation does not rely only on pull factors such as policies that would in the end increase labour demand in high-productivity sectors; they also rely on push factors such as the facilitation of movement of labour out of low-productivity activities.

Extreme poverty is a powerful brake on such movements, simply because moving to a different activity has a cost that the poor cannot afford to pay. Hence, the bottom line of this

paper is to challenge the conventional wisdom that growth causes poverty reduction. In several cases, data on income distribution observed during growth spike episodes are more consistent with the reverse causation, from poverty reduction to economic growth, which can be related to our analysis of the push factors in labour movements out of low-productivity jobs.

African governments should therefore place policy instruments that target poverty reduction at the heart of their strategies to promote growth; they should not merely wait until economic growth reduces poverty. We have found that, in several recent growth spikes, acceleration is associated with progress in traditional sector labour productivity, which has triggered exits from poverty. In many African contexts, promoting agricultural productivity may be a relevant instrument to initiate the process, as most of the poor are living in rural areas and are occupied in traditional agriculture. This is a path that has been observed earlier in emerging countries elsewhere, notably in East Asia. But there are also lessons to be learnt from past experience with broader poverty reduction strategies that have been promoted and financed by debt reduction programmes since the HIPC initiative. In this context, many policy instruments, which this paper has not studied directly, are obvious candidates. Building well-distributed human capital, through public policies aiming at improving the education and health of the poor, is certainly a way to help the poor move to better jobs. Building entrepreneurship may also contribute to the process. Helping families to better plan and control births may be another way to help them get out of the poverty trap; this can be facilitated by the empowerment of women.

Obviously, growth spikes need a relatively peaceful environment. Many African crises had their origin in the polity, not in the economy. But to some extent political instability may be amplified by economic factors. Economic growth that would not benefit the poor may increase political risks: this adds to the case for urging African governments to pay more attention to the growth and poverty nexus. This is only one of the many dimensions of a policy strategy that must be based on consensus building amidst the population. Growth policy must not only be pro-poor, it must be also inclusive.

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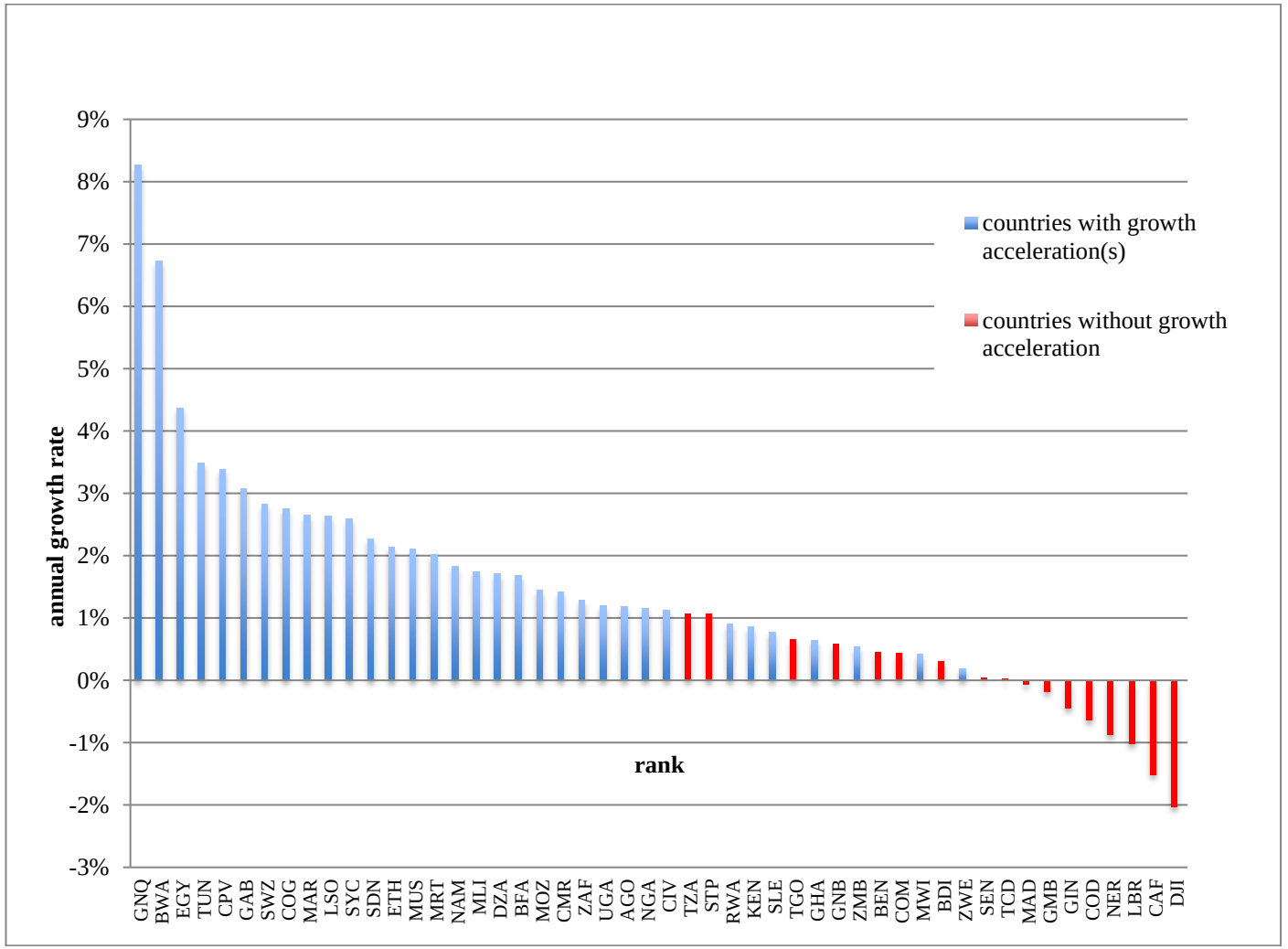
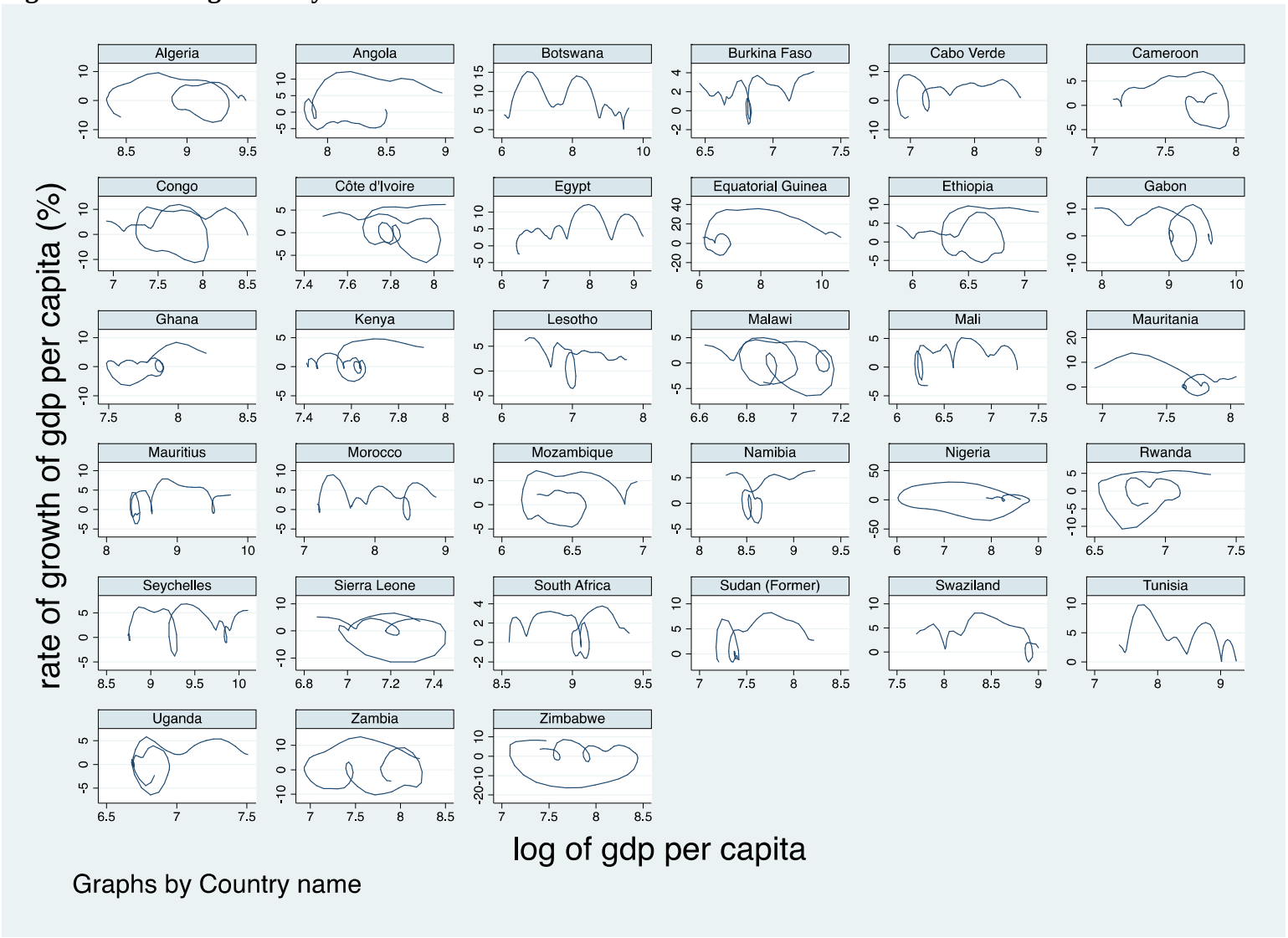
Figure 1: Growth rates with and without accelerations, 1960–2014



Source: Author's calculations based on PWT 9.0. For some countries the period is longer (1950–2014) or shorter (1970–2014) due to data availability.

Figure 2: African growth dynamics



Source: Author's calculations based on PWT 9.0.

Table 1: Growth acceleration and crisis episodes in Africa

Decade starting	1950s & 1960s			1970s			1980s			1990s			2000s		
Country	**start**	**end**	**episode**	**start**	**end**	**episode**	**start**	**end**	**episode**	**start**	**end**	**episode**	**start**	**end**	**episode**
Algeria	1968	1983	failed take-off				1983	1995	crisis	1999	2009	recovery			
Angola				1973	1994	crisis							2003	2014	recovery
Botswana	1967	1979	growth spike	1979	1984	growth spike	1984	2008	growth spike						
Burkina Faso										1994	2007	growth spike	2007	2014	growth spike
Cabo Verde				1976	1990	growth spike				1992	2000	growth spike	2000	2014	growth spike
Cameroon	1967	1976	growth spike	1976	1985	failed take-off	1985	1995	crisis						
Congo	1968	1975	growth spike	1975	1985	failed take-off	1985	1997	crisis						
Côte d'Ivoire	1961	1978	failed take-off	1978	1984	crisis				1998	2005	crisis	2007	2014	recovery
Egypt	1958	1979	growth spike	1979	1988	growth spike	1988	2002	growth spike				2002	2014	growth spike
Equatorial Guinea	1969	1979	failed take-off	1979	1990	crisis				1990	2014	growth spike			
Ethiopia				1977	1985	failed take-off	1985	2002	crisis				2006	2014	recovery
Gabon	1968	1982	failed take-off				1982	1989	crisis	1998	2008	recovery	2006	2014	growth spike
Ghana													2004	2014	growth spike
Kenya													2004	2014	growth spike
Lesotho				1971	1979	growth spike									
Malawi	1962	1974	failed take-off	1974	1980	crisis									
Mali	1974	1987	growth spike							1991	2012	growth spike			
Mauritania	1961	1972	growth spike										2000	2014	growth spike
Mauritius	1969	1979	growth spike				1981	1999	growth spike				2005	2014	growth spike
Morocco	1957	1967	growth spike				1981	1997	growth spike				2002	2007	growth spike
													2007	2014	growth spike
Mozambique				1977	1993	crisis				1995	2008	recovery			
Namibia													2001	2014	growth spike
Nigeria	1967	1978	failed take-off	1978	1997	crisis				1997	2014	recovery			
Rwanda							1983	1996	crisis				2003	2014	recovery
Seychelles	1967	1979	growth spike				1982	2000	growth spike						
Sierra Leone							1986	1994	failed take-off	1994	2001	crisis	2007	2014	recovery
South Africa													2001	2014	growth spike
Sudan										1996	2001	growth spike	2001	2014	growth spike
Swaziland							1980	1985	growth spike						
							1985	1998	growth spike						
Tunisia	1967	1989	growth spike				1989	1999	growth spike				2003	2011	growth spike
Uganda													2003	2014	growth spike
Zambia	1962	1969	failed take-off												
Zimbabwe	1964	1975	growth spike	1977	1994	failed take-off				1994	2008	crisis			

failed take-off
failed take-off

Source: Author's calculations based on PWT 9.0

Table 2: Growth of GDP per capita during growth spikes

Country	Average growth during acceleration (%)	Average length of acceleration (years)	Number of accelerations	Total growth during accelerations (%)	Contribution to historical growth (%)
Countries with multiple growth accelerations					
Botswana	75	13.7	3	309	85
Burkina Faso	3.0	10.0	2	60	65
Cabo Verde	4.2	12.0	3	152	83
Egypt	5.0	14.0	4	283	101
Mali	3.5	17.0	2	118	125
Mauritania	5.2	12.5	2	129	119
Mauritius	4.6	12.3	3	169	126
Morocco	4.1	9.5	4	157	92
Seychelles	5.2	15.0	2	155	111
Sudan (Former)	5.2	9.0	2	94	94
Swaziland	5.3	9.0	2	95	77
Tunisia	4.3	13.3	3	171	91
Average	4.8	12.3	2.7	158	97
Countries with a single growth acceleration					
Ghana	5.0	8	1	40	107
Kenya	4.1	10	1	41	73
Lesotho	5.4	8	1	43	30
Namibia	5.1	13	1	67	68
South Africa	2.3	13	1	30	36
Uganda	4.0	11	1	44	57
Average	4.3	10.5	1	44	62

Source: Author's calculations based on PWT 9.0.

Table 3: Growth and demographic factors

Country episode	Growth of GDP per capita PPP (%)	Growth of GDP per capita at constant prices (%)	Growth of GDP per employee (%)	Growth of rate of employment (%)	Population growth (%)	Growth of employment (%)	Growth of working-age population (%)
Algeria3	3.7	2.4	–0.5	2.9	1.4	4.3	1.4
Botswana3	6.3	4.3	2.0	2.3	2.3	4.6	2.3
Burkina Faso1	2.8	3.1	3.8	–0.6	2.9	2.2	2.9
Burkina Faso2	3.4	2.8	2.5	0.3	3.0	3.3	3.0
Cabo Verde2	5.5	5.1	4.2	0.9	2.5	3.4	2.5
Cabo Verde3	4.5	3.1	1.1	2.0	1.1	3.1	1.1
Cameroon1	3.2	2.2	2.8	–0.6	2.5	1.8	2.5
Egypt1	3.6	3.7	4.7	–1.0	2.2	1.3	
Egypt2	3.8	4.9	5.6		2.6	2.0	2.6
Egypt3	7.5	2.7	1.7	1.0	2.0	3.0	2.0
Egypt4	5.7	2.2	0.5	1.7	1.9	3.7	1.9
Ethiopia3	9.1	7.6	6.3	1.3	2.6	3.9	2.6
Ghana1	5.0	4.8	3.0	1.9	2.5	4.3	2.5
Kenya1	4.1	2.5	2.5	0.0	2.6	2.6	2.6
Mali1	3.9	2.8	2.9	–0.1	1.8	1.7	1.8
Mali2	3.2	1.7	1.2	0.5	2.9	3.4	2.9
Mauritania2	3.6	2.2	2.5	–0.3	2.7	2.4	2.7
Mauritius2	5.2	4.3	3.3	1.0	1.0	2.1	1.0
Mauritius3	4.0	3.6	2.5	1.2	0.4	1.6	0.4
Morocco1	4.4	4.3	5.7	–1.5	2.6	1.1	
Morocco2	4.0	1.5	1.1	0.4	1.9	2.3	1.9
Morocco3	2.6	3.8	1.1	2.7	1.0	3.6	1.0
Morocco4	5.1	2.8	0.2	2.7	1.3	3.9	1.3
Namibia1	5.1	2.9	1.2	1.8	1.7	3.4	1.7
South Africa1	2.3	1.8	0.5	1.4	1.3	2.7	1.3
Tunisia1	4.6	3.9	4.0	–0.2	2.4	2.2	2.4
Tunisia2	4.8	3.1	1.8	1.3	1.8	3.1	1.8
Tunisia3	2.6	2.7	2.9	–0.2	1.0	0.8	1.0
Uganda1	4.0	3.3	2.6	0.7	3.3	4.0	3.3

Note: Numbers of episodes are as described in Table 1.
Source: Author's calculations based on PWT 9.0 and World Bank's WDI for demographic variables.

Table 4: Growth accounting

Country episode	Growth of labour productivity (%)	Contribution of capital deepening (%)	Contribution of total factor productivity (%)	Share of TFP in growth (%)	Contribution of capital deepening (%)	Contribution of total factor productivity (%)	Share of TFP in growth (%)
		□=0.3			□=0.4		
Algeria3	–0.5	–0.5	0.0		–0.6	0.1	
Botswana3	2.0	1.0	1.1	52.2	1.3	0.7	36.3
Burkina Faso1	3.8	0.7	3.0	80.2	1.0	2.8	73.6
Burkina Faso2	2.5	1.7	0.7	30.2	2.3	0.2	6.9
Cabo Verde2	4.2	0.4	3.8	90.4	0.5	3.7	87.2
Cabo Verde3	1.1	0.8	0.2	22.9	1.1	–0.0	
Cameroon1	2.8	0.4	2.4	84.4	0.6	2.2	79.1
Egypt1	4.7	1.0	3.7	78.4	1.3	3.3	71.2
Egypt2	5.6	2.2	3.4	60.8	2.9	2.7	47.8
Egypt3	1.7	0.5	1.2	68.2	0.7	1.0	57.6
Egypt4	0.5	0.7	–0.2		1.0	–0.5	
Ethiopia3	6.3	2.0	4.2	67.9	2.7	3.6	57.2
Ghana1	3.0	1.2	1.7	59.3	1.6	1.3	45.7
Kenya1	2.5	0.8	1.7	68.0	1.1	1.4	57.4
Mali1	2.9	0.8	2.2	74.1	1.0	1.9	65.5
Mali2	1.2	0.0	1.2	96.3	0.1	1.2	95.1
Mauritania2	2.5	1.9	0.6	25.3	2.5	0.0	0.4
Mauritius2	3.3	0.6	2.7	80.6	0.9	2.4	74.1
Mauritius3	2.5	1.0	1.5	60.4	1.3	1.2	47.2
Morocco1	5.7	0.0	5.8	100.8	–0.1	5.8	101.0
Morocco2	1.1	0.4	0.7	62.5	0.6	0.6	50.0
Morocco3	1.1	0.4	0.8	67.1	0.5	0.6	56.2
Morocco4	0.2	0.3	–0.1		0.4	–0.2	
Namibia1	1.2	1.1	0.1	7.9	1.4	–0.3	
South Africa1	0.5	0.2	0.2	46.9	0.3	0.1	29.2
Tunisia1	4.0	1.0	3.1	76.4	1.3	2.8	68.5
Tunisia2	1.8	0.0	1.8	101.9	0.0	1.8	102.5
Tunisia3	2.9	0.9	2.0	69.0	1.2	1.7	58.6
Uganda1	2.6	1.9	0.8	29.2	2.5	0.1	5.6
Average	2.5	0.8	1.7	63.9	1.1	1.5	57.3%

Note: Numbers of episodes are as described in Table 1.
Source: Author's calculations based on PWT 9.0 data.

Table 5: Contribution of sectorial reallocation of labour

Country episode	Source	(number of sectors)	Contribution of average sectorial productivity gains (%)	Contribution of sectorial reallocation (%)	Contribution of dynamic sectorial reallocation (%)
Botswana1	10		20.1	58.1	21.7
Botswana2	10		80.4	54.8	–35.3
Botswana3	10		105.8	1.5	–7.3
Burkina Faso1	3		93.4	6.4	0.2
Egypt1	10		70.5	10.9	18.6
Egypt2	10		121.0	–19.3	–1.7
Egypt3	10		125.6	–14.7	–10.9
Egypt3	3		84.6	32.1	–16.6
Egypt4	10		140.0	–8.8	–31.2
Egypt4	3		87.3	22.1	–9.4
Ethiopia3	10		50.0	61.7	–11.7
Ghana1	10		57.1	33.1	9.8
Ghana1	3		62.6	45.8	–8.4
Kenya1	10		81.0	17.1	1.9
Kenya1	3		66.2	28.0	5.8
Mauritania2	3		39.0	58.0	3.1
Mauritius1	10		103.7	28.8	–32.5
Mauritius2	10		68.4	41.2	–9.5
Mauritius3	10		87.5	22.8	
Mauritius3	3		83.3	18.4	–1.7
Morocco1	10		59.4	43.6	–3.0
Morocco2	10		65.2	33.9	0.9
Morocco3	10		31.5	74.9	–6.4
Morocco4	10		88.1	25.4	–13.5
Namibia1	3		100.1	–0.4	0.3
South Africa1	10		116.3	–12.0	–4.3
South Africa1	3		86.9	13.1	0.0
Tunisia3	3		92.9	7.5	–0.4
Uganda1	3		0.9	45.4	49.0

Source: Author's calculations based on Timmer et al. (2015) for ten-sector data and World Bank's WDI for three-sector data.

Table 6: Analysis of incidence of growth on poverty reduction

				Poverty line $1.9 (2011 ppp)				Poverty line $3.1 (2011 ppp)			
Country	**Start year, growth spike episode**	**End year, growth spike episode**	**Annual income growth (%)**	**Initial poverty headcount (%)**	**Reduction of poverty headcount per year (%)**	**Reduction of poverty attributed to growth (%)**	**Share of poverty reduction attributed to growth (%)**	**Initial poverty headcount (%)**	**Reduction of poverty headcount per year (%)**	**Reduction of poverty attributed to growth (%)**	**Share of poverty reduction attributed to growth (%)**
Botswana	1985.57	2009.25	3.6	42.6	1.0	1.3	123	62.5	1.1	1.5	129
Burkina Faso	1994.25	2003	6.5	83.1	2.9	2.1	72	92.4	1.5	1.2	83
Mali	1994	2009.89	4.2	84.9	2.2	1.4	62	93.0	1.0	0.8	84
Mauritania	2000	2014	1.7	19.6	1.0	0.6	65	43.9	1.6	0.9	60
Namibia	2003.67	2009.54	2.0	31. 5	1.5	1.0	67	54.7	1.5	0.9	61
South Africa	2006	2011	5.4	25.4	1.8	2 0	112	46.8	2.4	2.3	96
Uganda	2005.33	2012.45	3.6	53.2	2.6	2.2	86	76.3	1.6	1.5	94
episodes of recovery											
Mozambique	1996.27	2008.67	3.4	85.4	1.3	1.4	103	94.0	0.5	0.6	109
Rwanda	2005.75	2013.75	2.1	68.0	0.9	1.0	101	84.1	0.4	0.5	121

Source: Author's calculations based on World Bank's povcalnet data.

Table 7: Traditional sector income growth and poverty reduction

			Poverty line $1.9 (2011 ppp)				Poverty line $3.1 (2011 ppp)			
Country	Start year of growth spike episode	End year of growth spike episode	Reduction of poverty headcount per year,	Share of total growth attributable to poverty reduction (%)	Annual income growth in traditional sector (%)	Annual income growth in modern sector (%)	Reduction of poverty headcount per year	Share of total growth attributable to poverty reduction (%)	Annual income growth in traditional sector (%)	Annual income growth in modern sector (%)
Botswana	1985.57	2009.25	1.03	90.3	2.2	2.6	1.13	32.3	2.7	2.2
Burkina Faso	1994.25	2003	2.95	110.3	6.9	0.0	1.50	65.8	8.0	–0.5
Mali	1994	2009.89	2.24	125.2	8.8	[illegible]	0.96	67.2	7.7	–1.4
Mauritania	2000	2014	0.98	199.5	1.7	0.9	1.56	80.8	3.4	0.2
Namibia	2003.67	2009.54	1.51	601.2	5.1	0.2	1.54	121.8	2.9	–0.6
South Africa	2006	2011	1.78	296.6	2.9	3.5	2.43	59.0	3.4	2.1
Uganda	2005.33	2012.45	2.60	190.6	4.9	0.8	1.60	65.8	4.8	0.5
episodes of recovery										
Mozambique	1996.27	2008.67	1.34	94.7	3.1	0.3	0.52	48.2	3.4	0.6
Rwanda	2005.75	2013.75	0.95	169.1	3.5	0.2	0, 43	53.5	2.7	0.4

Source: Author's calculations based on World Bank's povcalnet data.