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Economic Growth in sub-Saharan Africa, 1885-2008

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Abstract:
Estimates of GDP per capita are provided on an annual basis for eight Sub-Saharan African economies for the period since 1885. Although the growth experienced in most of SSA since the mid-1990s has had historical precedents, there have also been episodes of negative growth or "shrinking", so that long run progress has been limited. Despite some heterogeneity across countries, this must be seen as a disappointing performance for the region as a whole, given the possibilities of catch-up growth. Avoiding episodes of shrinking needs to be given a higher priority in understanding the transition to sustained economic growth.

1. Introduction

The field of African economic history has enjoyed a recent 'renaissance' based on newly digitized sources of data and the application of innovative techniques (Austin and Broadberry 2014; Fourie 2016). This work has shed new light on the patterns of trade, living standards, inequality and institutions of African states over the course of the nineteenth and twentieth centuries, and in some cases for even earlier periods. A number of insights have emerged from this research, particularly about the ways in which Africans responded to changing market conditions and the changing role of state institutions in structuring the interactions of African producers with the global economy. The picture of the region that emerges is not one of ubiquitous stagnation, but rather of frequent but inconsistent periods of economic expansion (Frankema and van Waijenburg

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2012; Frankema et al. 2018; Jerven 2010). Largely missing, however, are aggregate estimates of the economic performance of African countries across this period which would allow for more systematic comparisons across both space and time. For most countries, GDP per capita estimates based on contemporary data are available only for the period after 1950.[2]

This paper addresses this gap by providing a quantitative overview of economic growth in Sub-Saharan Africa (SSA) over the long twentieth century, encompassing the colonial era as well as the post-independence period. This is done by presenting annual estimates of GDP per capita for a number of countries covering the major regions of southern, west, east and central Africa for the period 1885-2008`. Working carefully with disaggregated data, it is possible to reconstruct the path of economic activity for the eight economies considered here during the colonial era. These estimates can be linked to post-war data to provide an annual database covering the period 1885-2008. We then use this database to show that although the growth experienced in most of SSA since the mid-1990s does have historical precedents, it is clear that there have also been many episodes of negative growth or "shrinking", so that overall progress has been limited.

The data also show considerable heterogeneity in Africa's growth experience across the different regions of the continent. In southern Africa, although the Cape Colony provided high living standards for a small number of European settlers from the eighteenth century, GDP per capita in South Africa as a whole was no higher than in the richest West African economies as late as 1910. South Africa forged ahead only with industrialization after World War I. Zimbabwe has experienced levels of per capita GDP on a par with the richest West African economies during boom periods, but has also experienced severe growth reversals, most recently since the late 1990s as the rest of SSA has experienced a

[2] Estimates of GDP per capita growth during the twentieth century have been published by Jerven (2014b; 2018) for a couple of individual countries while Prados de la Escosura (2012) provides conjectural estimates for a wider sample of countries using trade data.

growth boom. In West Africa, Nigeria and Ghana have experienced several episodes of sustained shrinking, linked to declining prices for exports and political instability, along with episodes of growing. In East Africa, episodes of growing have more than outweighed episodes of shrinking in Kenya and Uganda, although most of the long run gain occurred before World War II. In Central Africa, Zambia experienced a dramatic copper boom between the 1930s and the 1970s, but this was followed by a severe case of shrinking, which allowed Malawi to catch up.

The paper proceeds as follows. Section 2 describes the approach to the reconstruction of historical national accounts for the economies of South Africa, Zimbabwe, Ghana, Nigeria, Kenya, Uganda, Zambia and Malawi. A data appendix provides further details of this exercise. Section 3 then explores the experience of growth in each of the economies, while section 4 places the experience of SSA in a wider comparative perspective. Section 5 concludes.

2. Historical national accounting for sub-Saharan Africa

Despite its central importance in the modern economic history of most regions, until recently there has been relatively little use of national accounting in the economic history of Africa (Manning 1987: 51). This can be seen as reflecting a general scepticism concerning quantitative methods amongst a generation of economic historians of Africa, which left the impression that there was little data available. Alternatively, another literature has unhelpfully exaggerated shortcomings in African GDP data without providing any practical remedies (Jerven 2013). However, recent work in African economic history has demonstrated the availability of large amounts of data for the colonial era, as well as for the period since independence (Austin and Broadberry 2014). Those data are used here to provide historical national accounts for a number of important Sub-Saharan African economies in the main regions of southern, west, east and central Africa. The estimates of GDP per capita derived in this way can

be linked up to the post-war national accounts produced during the final years of the colonial era and in the early years of independence. Details of the reconstruction of national income are provided in Appendix 1 for the colonial period before 1950 and Appendix 2 for the post-1950 period. The basic approach is set out below, providing summary information on the economies analysed: South Africa (and earlier the Cape Colony), Zimbabwe (formerly Southern Rhodesia), Ghana (formerly the Gold Coast), Nigeria, Kenya, Uganda, Zambia (formerly Northern Rhodesia), and Malawi (formerly Nyasaland). We also address some of the critiques of African GDP data.

It should be noted that our study covers only countries that were British colonies. This has a number of advantages for a study of economic growth. First, the underlying data were collected on a comparable basis during the colonial period, and the methods adopted during this era continued to influence the statistical offices of the independent states following decolonization. Second, our sample covers a large share of the GDP and population of Sub-Saharan Africa; in 1950, these eight countries accounted for just over 50 per cent of the GDP of the region and just under 40 per cent of the population. Third, with two countries in each of southern, west, east and central Africa, our sample includes a wide geographic spread. However, it also means that there are large parts of the continent that we have not been able to cover, and it is possible that British colonies were on average more affluent than areas colonized by other countries (Burbank and Cooper 2010: 315). We hope that our efforts will inspire further studies to fill in these gaps.

2.1 Historical national accounts for South Africa

South Africa is the only one of the eight countries for which it is possible to draw on existing estimates, produced by Fourie and van Zanden (2013) for the Cape Colony over the period 1701-1910 and for the whole of South Africa from 1910, derived from a number of different sources that have been spliced together. Fourie and van Zanden (2013) use primary sources to estimate both population

and nominal GDP for the period 1701-1793, during which time the Cape Colony served as a victualling station for the Dutch East India Company (VOC)[3]. They use an output approach which distinguishes an agricultural sector, the VOC sector and the rest of the economy. Agricultural output is estimated from data on wheat, wine and meat, taking account also of capital formation in agriculture in the form of livestock, land and vines. Output of the VOC sector consists of wages and salaries of company employees, augmented by income in kind and income from their own trading activities, plus income earned by the VOC from imports and exports to the Cape Colony. Output of the rest of the economy takes account of the slave trade, the sale of wine and other goods to visiting sailors and the population of Cape Town, the value adding activities of bakers and butchers, construction activity and the activities of other craftsmen. Nominal GDP is deflated using a price index constructed by de Zwart (2013).

For the period 1804-1910, estimates of nominal GDP were made by Greyling et al. (2010) from primary material for the British Cape Colony. These were converted to constant price terms by Fourie and van Zanden (2013) using de Zwart's (2013) price index.[4] Although official data for nominal GDP and a consumer price index are available from the Bureau of Census and Statistics for the period from 1910 onwards, they have not been used by Fourie and van Zanden (2013) for the period 1910-1924, since they produce an implausibly large drop in GDP between 1910 and the mid-1920s. An alternative series of real GDP from Schumann (1938) has instead been used for the period 1910-1924, and spliced to the official series for 1924-1946. For the period since 1946, real GDP per capita is taken from South African Reserve Bank (2015).

[3] Vereenigde Oostindische Compagnie.
[4] A later version of the Greyling et al. (2010) GDP per capita series for the Cape Colony covering the period 1861-1909 has been published in Magee et al. (2016). Although it shows the same pattern of fluctuations as the old series, the new series exhibits much stronger trend growth, which would mean either an implausibly low level of per capita GDP in 1861, well below bare bones subsistence, or an implausibly high level of per capita GDP in 1909.

2.2 Historical national accounts for the colonial era

For the other seven economies considered here, it has been necessary to reconstruct historical national accounts from primary sources. For the colonial era, GDP has been estimated from the output side, dividing the economy into four main sectors covering traditional agriculture, domestic industry and services, the export sector and government.

2.2.1 Traditional agriculture

It has been conventional in African economic history to assume that outside the modern export sector, there is a large traditional agricultural sector, where most people live at bare bones subsistence, eking out a living from the land. Output in this sector is assumed to grow in line with population, with no improvement in living standards over time. This view can be seen in the work of Szereszewki (1965), who provided estimates of GDP in Ghana for the benchmark years of 1891, 1901 and 1911 and compared them with 1960. It is also implicit in the work of Deane (1953), who prepared estimates of GDP for Northern Rhodesia (Zambia) and Nyasaland (Malawi) in the 1940s. Furthermore, Deane went on to apply this approach to the estimation of agricultural output in Great Britain during the eighteenth century, thus making it a standard tool of early historical national accounting in Europe, as well as Africa (Deane and Cole 1962). In Europe, however, the assumption of constant per capita consumption of food over long periods of time has increasingly been challenged, particularly where there are good reasons to believe that there were significant changes in real income (Crafts 1976; Malanima 2011; Álvarez-Nogal and Prados de la Escosura 2013).

Rather than assuming constant per capita consumption of food, output of traditional agriculture can be estimated from data on population and the real wage using an assumed income elasticity to derive the demand for food. Broadberry et al. (2015) have also recently applied this approach to India, and here it is applied to a number of African economies. Confidence in this demand approach has been strengthened by cross-checking against supply-side estimates

of agricultural output derived from data on the amount of cultivated land and crop yields (Allen 2005; Broadberry et al. 2015). The population data in Table 1 are taken from Frankema and Jerven (2014b), who refine the path-breaking attempt by Manning (2010) to project backwards from a firm census benchmark in the post-war period, taking account of population growth estimates of countries with similar levels of development, as well as situational modifications informed by region-specific conditions and developments. Frankema and Jerven (2014a) suggest two adjustments to Manning (2010), affecting both the level of the 1950 benchmark and the rate of population growth before 1950. This results in two important modifications of Manning's estimates. First, there is an upwards adjustment of the population level in 1950 by around 10 per cent, derived from an examination of the bias in African censuses before and after 1950. Second, whereas Manning applied a growth rate derived from India as the starting point for African population growth before 1950, together with situational modifications, Frankema and Jerven point to tropical land-abundant economies in Southeast Asia as a more appropriate comparator than India for the tropical regions of Africa.

Presented in absolute terms, the population estimates in Table 1 demonstrate the relative size of each economy at every point in time, as well as the growth of population over time. Population grew quite rapidly at around 1.1 per cent per annum over the period 1870-1950 in the two West African countries of Ghana and Nigeria, with Nigeria remaining Africa's most populous country. Population growth was more modest at an annual rate of 0.6 per cent in the East African economies of Kenya and Uganda, and slower still in the Central African countries of Zambia and Malawi. The most rapid population growth during this period was in South Africa, at an annual rate of 1.5 per cent, making South Africa one of the continent's most populous economies. Zimbabwe also shared in this rapid rate of population growth.

The real wage data in Table 2 are derived mainly from Frankema and van Waijenburg (2012). The nominal wages are those of unskilled urban workers, available from the *Blue Books* for the period before World War II and from other official sources for later years. The weights for the items in the price index are based on an adaptation of Allen's (2009) subsistence basket to African circumstances. The cost of the basket is very heavily dependent on the price of grain, so that the real wage computed using this price index is close to a grain wage. For Zimbabwe, Mosley's (1983) composite money wage index has been used. This is based on the money wages of agricultural workers and miners, deflated with a price index that again relies heavily on grain, but combined with import prices for products that featured heavily in the consumption basket of African workers. The real wage trended upwards in all countries, but there was also a high degree of volatility, with alternating periods of positive and negative growth.

These trends in population and real wages are converted into the output of traditional agriculture via a demand for food function. The approach can be traced back at least as far as Crafts (1985) and was developed further by Allen (2000) using consumer theory. Allen (2000: 13-14) starts with the identity:

$$Q^A = rcN \qquad (1)$$

where Q^A is real agricultural output, r is the ratio of production to consumption, c is consumption per head and N is population. Real agricultural consumption per head is assumed to be a function of its own price in real terms (P^A/P), the price of non-agricultural goods and services in real terms (P^{NA}/P), and real income per head (y). Assuming a log-linear specification:

$$\ln c = \alpha_0 + \alpha_1 \ln(P^A / P) + \alpha_2 \ln(P^{NA} / P) + \beta \ln y \qquad (2)$$

where α_1 and α_2 are the own-price and cross-price elasticities of demand, ß is the income elasticity of demand and α_0 is a constant. Consumer theory requires that the own-price, cross-price and income elasticities should sum to zero, which sets tight constraints on the plausible values, particularly given the accumulated

evidence on elasticities in developing countries (Deaton and Muellbauer 1980: 15-16, 60-82).

For early modern Europe, Allen (2000: 14) works with an own-price elasticity of -0.6 and a cross-price elasticity of 0.1, which constrains the income elasticity to be 0.5. Allen assumes that agricultural consumption is equal to agricultural production, an assumption which has also been followed here for traditional agriculture, which produced the basic grains for domestic consumption. Although there were significant exports of food crops, these are accounted for separately in the export sector. Following Broadberry et al. (2015), a restricted version can be implemented using the grain wage (the daily wage divided by the cost of the subsistence basket) for unskilled urban labourers and an assumed income elasticity of 0.5. One way to justify this would be if the cross-price elasticity is zero and real income is the wage divided by the overall price level. The own-price elasticity must then equal the negative of the real wage elasticity. But then the overall price level used to deflate the wage cancels out with the overall price level used to deflate the grain price, leaving a single term in the grain wage.[5]

2.2.2 Domestic industry and services

The series for domestic industry and services is derived using a similar demand approach to that used for traditional agriculture. However, in this case, an explicit allowance can be made for imports. Also, the income elasticity of demand for industrial goods and services is assumed to be higher than for food, in line with Engel's Law (Deaton and Muellbauer 1980: 193). Here, the income elasticity has been set to unity, which leaves room for an income elasticity of demand for imported goods greater than one. It should also be noted that the income elasticity of demand for services is normally higher than for industrial goods. The nominal value of per capita consumption of industrial goods and services thus moves in line with wages, and the total nominal demand for industrial

[5] For all the African economies considered here, the overall price index is very heavily dominated by the grain price, making the path of the grain wage very similar to the path of the real consumption wage, and also making it difficult to put much faith in any allowance for a cross-price elasticity effect.

goods and services is obtained by multiplying per capita nominal consumption by the population. However, to obtain the value of domestic production of industrial goods and services, it is necessary to subtract the value of imports. The nominal value of domestic production can then be obtained in constant prices using the general price deflator for each country from Frankema and van Waijenburg (2012).

2.2.3 The export sector

The data on production for the export sector are much more abundant than for traditional agriculture or domestic industry and services, where participation in the market was more limited. Table 3 sets out indices of export volumes for each country, constructed with weights for three or four benchmark years. The weights for 1950, based on export value shares, are shown in Table 4 and indicate a high degree of specialization. In West Africa, Ghana focused increasingly on cocoa and gold as the previously dominant exports of palm products and rubber declined, while Nigeria specialized in palm products and groundnuts as well as cocoa. In East Africa, Kenya focused on coffee, tea and sisal, while Uganda specialized in cotton and coffee. In Central Africa, Zambia's key exports were blister copper from the 1920s and electrolytic copper from the1930s, while Malawi developed a specialization in tobacco and tea. Exports grew very rapidly in all these countries, but the upward trend was stronger in East Africa than in West Africa, and stronger still in Central Africa.

2.2.4 Government

The government sector is measured by nominal government expenditure deflated by Feinstein's (1972) price index for UK public authorities' goods and services, which is often used in the African economic history literature (Gardner 2012; Jerven 2014b). One rationale for this would be that much of the expenditure was on civil servants, whose salaries were set in London, and stores purchased in Britain. In practice, however, since Feinstein's UK government deflator is highly correlated with the local price indices used to calculate real wages, its use makes

little difference to the overall trend. Comparing Table 5 with Table 3, it is clear that in each country, real government expenditure grew very rapidly in line with the growth of the export sector, thus outstripping the growth of traditional agriculture and domestic industry and services by a large margin. Compared with the export sector, however, government was much less volatile than exports, thus acting as a stabilising force. Because the colonial administration tried to maintain budget balance, this indicates the stability of revenue over the international business cycle and difficulties in cutting expenditure during downturns (Gardner 2012).

2.2.5 Economic structure and the path of GDP

To calculate GDP, it is necessary to apply an appropriate weighting scheme to the production series for traditional agriculture, domestic industry and services, the export sector and government. Sectoral value added weights for all the economies considered here, circa 1950, are shown in Table 6, derived from early national accounting sources. In all cases, this involved rearranging information on sub-sectors, relying particularly on distinctions made by early national accounting statisticians between domestic and export agriculture and classifying mining as an export sector.

As noted earlier, the export and government sectors grew much more rapidly than traditional agriculture and domestic industry and services. However, the export and government sectors still accounted for a relatively small share of GDP by 1950, which means that the trend in aggregate GDP was driven largely by the slower growing sectors. However, the much greater volatility of the export sector, which was subject to sharp booms and busts, meant that short run fluctuations in GDP tended to be driven by the export sector.

2.3. National accounts for the post-1950 period

In this paper, we link our new estimates of pre-1950 GDP per capita to the early national accounting series begun in the final years of the colonial period, and

built on by newly independent governments in the post-colonial period. It has long been common for economists to point to shortcomings in these national accounts produced by African statistical offices (Samuels 1963; Lury 1964). More recently, however, Jerven (2013; 2014a) has argued stridently that the errors are so large that they systematically distort the picture of African growth and cannot be used to support the common perception of poor economic performance in Africa since World War II. Since these data form the basis of the post-1950 GDP per capita estimates used in this study, a consideration of Jerven's arguments is called for. A number of points can be made to suggest that Jerven overstates his case.

First, many of the issues raised by Jerven concerning the calculation of a GDP series for a particular country are not unique to Africa, and apply equally to other regions. It is therefore not so clear that they seriously distort the comparative picture. For example, the distortions arising from the rebasing and splicing of national accounts, widely discussed for the case of Nigeria, are analysed by Prados de la Escosura (2016) for the case of Spain. Second, Jerven (2014a) particularly focuses on disagreements between GDP series reported by different international datasets, taken from national statistical offices (official series), the Maddison dataset, the Penn World Table (PWT) and the World Bank's World Development Indicators (WDI). However, the differences in long run trends reported by these agencies are much smaller than the differences in annual growth rates that Jerven emphasizes. Also, the different agencies agree closely on country rankings of performances over the medium run, as can be seen clearly in Table 7. Indeed, as van Waijenburg (2014: 302) notes, the correlation coefficients of relative rankings of countries across the various datasets are higher for Africa than for Asia, and are not uniformly lower than for Latin America or even for Western countries. As always, criticism of data quality needs to be accompanied by a careful assessment of the purposes for which the data are being used. If the question concerns the performance of African economies over periods of more than a year or two and if account is taken of levels and growth

rates together, then Jerven's bleak assessment of the state of post-colonial African national accounts loses much of its force.

Furthermore, it is worth noting that although Jerven (2013; 2014a) provides no alternative series to GDP per capita, other authors have responded to the allegations of an African "statistical tragedy" by suggesting the use of other data to track African economic growth in recent decades (Deverajan 2013). Henderson et al. (2011) suggest using satellite maps of lights at night, but they find that the GDP per capita data neither overstate nor understate economic growth consistently. Although Young (2012) claims that indices of asset ownership from the World Bank's Demographic and Health Survey (DHS) have grown much more rapidly than GDP per capita in African countries in recent years, Harttgen et al. (2013) find no evidence of a recent African growth miracle beyond that which is visible in the GDP per capita data, once account is taken of the weakness of the relationship between growth in assets and growth in income.

Given the importance of the issue, a decision was nevertheless taken to go back to the original national accounting sources for the post-1950 period and examine the scale of the disagreements with the Maddison (2010) series. The results are shown in Appendix 2 in Figure A2.1, labelled as "official series" and plotted together with the Maddison (2010) series. In all cases, the two series agree very closely over the long run, and in most cases the agreement is also close even over the short run. There is certainly nothing in the case of these countries, at least, to warrant Jerven's suggestion of a major disagreement between Maddison and the official series over the long run growth performance of Sub-Saharan Africa.

3. Economic growth in sub-Saharan Africa

The estimates of GDP and population from the colonial and post-independence periods can be put together to construct a quantitative analysis of economic growth in Sub-Saharan Africa since 1885. As the figures above show, patterns of

growing and shrinking were in most countries tied tightly to foreign trade and the market for exports. However, the timing and scale of growth in export production varied both between and within countries owing to a range of factors, from local endowments to transport costs and political institutions (Tosh 1980; Frankema et al., 2018). A regional approach is adopted here, beginning with southern Africa, which contains the only large Sub-Saharan African economy to have had a relatively high level of GDP per capita throughout the period since 1885, South Africa. South Africa is compared with Zimbabwe and then used as a benchmark in other regional comparisons involving West Africa (Ghana and Nigeria), East Africa (Kenya and Uganda) and Central Africa (Zambia and Malawi).

3.1 Southern Africa

GDP per capita in the Cape Colony between 1701 and 1910 and in South Africa since 1910 are shown in Figure 1. Fourie and van Zanden (2013) suggest that, as a slave society, the Cape Colony provided high living standards for a small number of European settlers in the eighteenth century. The settlement began as a victualling station for VOC ships making their way around the southern tip of Africa. As it grew larger, settlers produced wool and wine for export, although high transport costs meant that the market for these commodities was limited. Agricultural productivity declined as population grew, leading to an overall downward trend in GDP per capita from the 1770s. The view that living standards were relatively high for the settler community during the eighteenth century runs counter to the traditional view, based largely on qualitative sources, that the Cape Colony was an economic and social backwater before the mineral boom of the late nineteenth century (Feinstein 2005: 2-3). However, the revisionist view is now underpinned by solid quantitative evidence on real wages and probate inventories (de Zwart 2013; Fourie 2013).

A major shift in the GDP per capita of the Cape Colony came with the discovery of diamonds in 1867 and gold in 1886 (Greyling and Verhoef 2015: 10). While the

gold mines were not actually located in the Cape Colony, the transport of mining equipment to the mines and gold from the mines to the coast prompted an influx of capital which constructed one of the densest railway networks on the continent (Gwaindepi 2018; Herranz-Loncan and Fourie 2018). The economy suffered a shock in the first years of the twentieth centuries with the South African War (1899-1902), but resumed its growth ahead of the union with the other constituent territories of what became South Africa in 1910.

From 1910, estimates of GDP per capita are available for the whole of South Africa. With a GDP per capita in 1910 of $1,051, living standards in the Union of South Africa were substantially lower than in the Cape Colony, where per capita GDP was $1,500 (Fourie and van Zanden 2013: 490). Low living standards for the majority population were underpinned by discriminatory policies which both reserved the good agricultural land for the settler community and created landless labourers with no alternative but to work for the white farmers at low wages (Feinstein 2005: 43-46). After a pause across World War I, South African growth picked up during the 1920s, driven at least partly by the rapid growth of the manufacturing sector. The process of industrialization was pursued behind tariff barriers, as a deliberate policy aimed at providing employment for poor white workers (Feinstein 2005: 116-121). Industrial expansion was interrupted by the Great Depression, with industrial output and GDP per capita falling during 1931-32, as South Africa remained on the gold standard for fifteen months after Britain's departure from gold in September 1931 (Fourie and van Zanden 2013: 490). However, growth soon resumed following South Africa's departure from gold in December 1932.

South Africa continued to enjoy a long boom during and after World War II, although in contrast to the period 1913-1950, GDP per capita was now growing more slowly in South Africa than in most of the world outside Sub-Saharan Africa (Feinstein 2005: 7). This was followed by a phase of absolute shrinking between the mid-1970s and mid-1990s, during which the system of apartheid

began to unravel. Following a transition to majority rule in 1994, growth returned to South Africa, which by 2008 had attained a GDP per capita approaching $5,000 in 1990 international prices.

Figure 2 shows the path of GDP per capita in Zimbabwe in comparison with South Africa. Like South Africa, Zimbabwe's early growth was linked to mineral exports, particularly gold. Gold was not a new discovery in Mashonaland as it was in the Transvaal; rather, it had been traded for centuries to the East African coast, fuelling the growth of Great Zimbabwe, one of medieval Africa's largest cities (Iliffe 1995: 101-102; Kea 2015: 258-259). That same gold, along with the prospect of copper to the north, was what had attracted Cecil Rhodes' British South Africa Company to the region in the late nineteenth century. Rhodes had built a fortune in the Kimberley diamond mines and in 1889 his company received a charter to administer what would become the two Rhodesias and Nyasaland (Flint 1974; Gardner, 2012: 23). Southern Rhodesia's gold mines were not as prolific or as profitable as the Transvaal mines, and revenues generated were less than the cost of administering these territories. In 1924 the Company ceded its administrative control to the British government, and a colonial administration dominated by white settlers recruited in previous decades was granted something close to the self-governance of the Dominions, thus setting it apart in British Africa for its degree of autonomy within the colonial state.

The BSA Company's encouragement of European settlement was part of an effort to build alternative export industries. Tobacco became the most important export crop produced by settler farms, growing rapidly through the interwar period, although it came to dominate exports of gold only after World War II (Frankema et al. 2016: 253-256). With the stagnation of the gold mining industry and the comparatively slow growth of other sectors, Southern Rhodesia fell further behind South Africa between 1914 and 1945, with GDP per capita declining in absolute terms across World War I and again across World War II. A period of post-war growth lasted until the mid-1970s, though it was punctuated

by the instability which accompanied the breakup of the Central African Federation and the Unilateral Declaration of Independence by the Ian Smith government. Despite the optimism which came with the achievement of independence in 1980, this period was characterized by economic stagnation until the mid-1990s. Finally, as most of SSA boomed from the mid-1990s, Zimbabwe suffered a further period of negative growth as internal conflict worsened under the increasingly autocratic Mugabe regime (Mlambo 2014; Nugent 2004: 291-294). The postwar period has therefore seen a widening of the gap between Zimbabwe and South Africa.

3.2 West Africa

As noted earlier, the two West African countries in our sample had levels of GDP per capita comparable to those of the Cape Colony in the late nineteenth century, based on exports of palm products and rubber, in the case of Nigeria, and gold in Ghana, known as the Gold Coast during the colonial period. Historically, this region led Sub-Saharan Africa in terms of both trade and commercialization in the nineteenth century and before, with comparatively high levels of population density and substantial centralized states (Frankema 2015: 277). The region had also been a leader in the production of export crops, beginning with the rapid expansion of palm products in the nineteenth century (Law 1995). This was particularly true in coastal areas, which could build on both the commercial networks of the slave trade and the supply of slave labor to expand their export of cash crops. Both Nigeria and Ghana were able to do this during the late nineteenth and early twentieth centuries, when they grew from relatively low levels of trade to join the ranks of the top exporters in the British Empire. Figure 3 suggests that Nigeria and Ghana have vied with each other for per capita income leadership in West Africa throughout the period since 1885.

Havinden and Meredith (1993: 99) note that the value of Nigeria's exports more than tripled over the period 1900-1914. This was during a period when the process of colonial conquest was still ongoing, with outbreaks of unrest

particularly in the north. However, the same period also saw the extension of the railway from the main port at Lagos into Northern Nigeria, reaching Jebba on the Niger River in 1909 and Kano in 1911 (Chaves et al. 2014: 329). Though the railway network remained relatively 'dendritic', in the words of Ralph Austen, 'emanating from the outlets of international trade to the various regions of the African interior but not linking the latter to one another', construction before World War I dramatically enlarged the potential for profitable production of cash crops by reducing transport costs and making new areas of production accessible (Austen 1987: 127). For Nigeria in particular, the extension of the railway network to the north allowed for the expansion of the groundnut industry, which increasingly became one of the country's most important exports (Hogendorn 1978; Salau 2010).

Despite Nigeria's growth, Ghana forged ahead during World War I and remained richer between the 1920s and the 1970s. As in Southern Rhodesia, the foundation of Ghana's economic success during this period was not gold but agricultural produce, in this case cocoa, an imported crop which became Ghana's primary export product with astonishing speed. Gareth Austin (2014: 1035) notes that 'Ghana exported no cocoa beans in 1892, yet 19 years later, at 40,000 tonnes a year, it became the world's largest exporter'. It was introduced to Nigeria and Ghana by African entrepreneurs, many of whom had been involved in the palm oil trades previously. Indigenous farmers took up the crop, balancing it with food production.

Cocoa thus fuelled one of the most successful expansions in export production in Sub-Saharan Africa, but it was not immune to many of the vulnerabilities associated with dependence on a single crop. Volatility in the cocoa price beginning in World War I caused significant hardship for producers who had invested in cocoa trees during periods of high prices, and was also behind the long-term stagnation in Ghana's GDP which persisted from around 1930 through the 1970s (Austin, 1988). The colonial government's response to demands for

price stabilization was to establish a marketing board, which purchased cocoa at fixed prices. This established a precedent for extensive state intervention in the economy, which persisted and expanded through the transition to independence under Kwame Nkrumah. Robert Bates (1981: ch.1) argues that the post-independence use of the same marketing boards as a method of taxing rural producers to serve urban interests hindered growth in the agricultural sector during the first decades of independence. Nkrumah's overthrow in a coup in 1966 was followed by a period of political instability, with alternating military and civilian government up to the adoption of a new constitution in 1981 (Nugent, 2004: 175-178) . It was not until 1984 that Ghana's economy began to grow again, which it continued to do through the 1990s and 2000s.

While Ghana was enduring its long period of relative stagnation, Nigeria's economy was growing, unevenly but positively, due to expansions in both agricultural output and tin mining. There was a sharp but temporary drop in GDP per capita during the Nigerian Civil War (1967-70). The immediate cause of the war was the attempted secession of Biafra from Nigeria, but it reflected regional and ethnic tensions with roots in the colonial period, as well as conflict over control of the country's oil reserves (Achebe 2012; Osaghae 1998: 1-12). Oil production in the 1970s transformed the structure of Nigeria's economy, as well as increasing per capita GDP, and by the end of the decade both agriculture and mining comprised only a small share of total output (Teal 1988: 72)

Both Nigeria and Ghana ended up with per capita GDP slightly above $1,500 by 2008. This represented a modest average increase for both economies over the long run at an annual rate of around 0.7 per cent. Relative to South Africa, however, this slow rate of trend growth represented a substantial decline in the comparative position of the region. Splicing the Cape Colony data to the South African data for 1910 and projecting backwards, suggests that South Africa as a whole had not yet forged decisively ahead of Ghana and Nigeria by 1885, on the eve of the gold boom. Also, as a result of the volatility of GDP per capita in all

three economies, a clear gap between these West African countries and South Africa only opened up in the mid-1930s. Indeed, both Ghana and Nigeria had higher per capita GDP than South Africa in 1900 during the South African War, while Ghana again edged ahead of South Africa in 1931-1932 during the Great Depression.

3.3 East Africa

Kenya and Uganda were both very poor in the early years of the twentieth century, as can be seen in Figure 4. East Africa had a long history of engagement with the Indian Ocean trade, which linked trading enclaves on the coast with rural hinterlands (Alpers 2009). In the interior, as well, there were centres of exchange and manufacture, such as salt mines or textile production (Barrett-Gaines 2004; Clarence-Smith 2014; Frederick 2017). Ivory and cloves became important exports, operating alongside the slave trade which continued through much of the nineteenth century. However, large-scale commercialization and expansion of trade with Europe occurred later than in West Africa (Frankema et al. 2018: 238). In 1911, GDP per capita measured in 1990 international dollars was $449 in Kenya and $441 in Uganda, not far above bare bones subsistence.

As in much of Sub-Saharan Africa, export growth in Kenya and Uganda led to an increase in living standards during the interwar period, but the path of per capita GDP was far from smooth. The construction of the Uganda Railway between 1896 and 1901 changed the economic landscape of East Africa (Jedwab et al. 2017). The railway connected Lake Victoria in Uganda to Mombasa through Kenya, making possible the export of cash crops from regions previously only accessible by caravan or head porterage. Uganda, in particular, experienced a massive increase in exports of cotton, the farming of which was often paired with banana production to ensure the efficient utilization of scarce labour (de Haas 2017: 606). However, there were periods of bust as well as boom, with Uganda suffering a particularly severe growth reversal during the late 1920s and early 1930s.

Kenya's exports expanded less dramatically, but comprised a greater diversity of crops, including coffee, tea, maize and sisal. This diversity partly explains why the Great Depression had less of an impact on Kenya than on Uganda. Kenya's economy was also shaped by imperial politics and its position in the regional economy. Kenya formed a customs union with Uganda and, from 1927, Tanganyika as well. From the 1920s Kenyan settlers were pressing for the imposition of protectionist tariffs on lightly processed manufactured goods. These pressures followed some of the same trends as in South Africa, though on a smaller scale. The 1923 Tariff Act helped foster the production of beer, cigarettes, soap, cement and canned fruit and vegetables, which gave Kenya an early lead in the region in terms of manufacturing production (Gardner 2012: 79; van Zwanenberg and King 1975: 125).

Political instability was another source of vulnerability for both economies. After remaining relatively stable during the 1930s and World War II, Kenya's GDP per capita declined sharply during the Mau Mau uprising of the 1950s. After that, it enjoyed relatively steady growth through the 1990s, but suffered setbacks due to disputed elections in the twenty-first century (Cheeseman et al. 2014: 2). Uganda experienced a catastrophic growth reversal during Idi Amin's presidency between 1971 and 1979, though it is worth noting that rural incomes had begun to lag even before Amin came to power, and continued to stagnate in the period of political instability that followed the end of Amin's erratic dictatorship (de Haas 2017: 607). Uganda recovered from the mid-1990s to reach a per capita GDP of just over $1,000 by 2008, more or less on a par with Kenya. Both Kenya and Uganda already lagged a long way behind South Africa on the eve of World War I, and have since fallen further behind.

3.4 Central Africa

Figure 5 plots GDP per capita in Zambia (Northern Rhodesia) and Malawi (Nyasaland) since the early twentieth century. Both countries were even poorer than Kenya and Uganda on the eve of World War I, with per capita GDP in 1913,

measured in 1990 international dollars, at $367 in Zambia and $315 in Malawi, right at the level of bare bones subsistence. In the pre-colonial period, both were relatively remote from coastal outlets, raising the costs of exports which in the late nineteenth century mainly included ivory and cattle (Gardner 2012: 22).

Despite this, the two countries differed substantially from one another in the precolonial period. With its comparatively fertile land, and reliable supplies of water and fish, Malawi supported a comparatively dense population in the nineteenth century and previously. However, the beginning of colonial rule also marked the end of a long period of upheaval and instability in the region, from the migration of refugees out of southern Africa to the late but severe impact of the slave trade. Agriculture in the region was also subject to significant fluctuations in rainfall and the level of the lakes. (McCracken 2012: 7-9). The impact of these environmental and human factors was exacerbated by the particularly heavy burden placed on Malawi by World War I, through the requisition of manpower as soldiers and, more prominently, porters (McCracken 2012: 151). This, along with trade disruption, helps to explain the decline in Malawi's GDP per capita across World War I.

From the late 1920s, Zambia diverged from Malawi with the opening of the copper mines that would define its economic future. Copper deposits had long been known in the region, and copper production from the neighbouring region of Katanga in the Belgian Congo grew rapidly from 1912. It was not until technological developments of the 1920s, which allowed for the economical processing of the copper ores in Zambia, that the first copper mine was opened in 1928 (Juif and Frankema 2018: 317). While the industry endured a somewhat shaky start with the collapse in copper prices in the 1930s, which resulted in the temporary closure of some of the newly opened mines, it then experienced a long boom which contributed to a rise in GDP per capita from the 1930s to the 1960s (Gardner 2012).

This growth was highly dependent on the copper price. When Northern Rhodesia became independent Zambia in 1964, copper comprised some 90 per cent of its total export values (Juif and Frankema 2018: 315). In turn, the copper mines were a crucial market for agricultural producers in both Zambia and, before 1964, Zimbabwe. Close regional links within British Central Africa, culminating in the establishment of the short-lived Central African Federation in 1953, tied not just Zambia's economy to the fate of the Copperbelt. After independence, in an effort to gain control over copper revenues, the Zambian government under Kenneth Kaunda nationalized the mines. Unfortunately, the nationalization was followed by a period of sustained shrinking during the 1970s and 1980s as the copper boom faded. This had severe consequences not just for the government treasury but also had spillover effects into other sectors that had come to rely on demand from the mines and their workers (Ferguson 1999: 7-12)

Malawi also experienced a boom during the 1930s, based on tobacco and tea, but the relatively small export sector was unable to overcome the dominant effects of a weak domestic economy. Even after the construction of railway links to the coast, the cost of exporting from Malawi remained high. In the 1930s, one calculation suggested that sending tea to the closest port (Beira in Mozambique) cost four times more than in India (Bolt and Green, 2015: 223). Further, environmental fragility continued to have an economic impact in Malawi, with the drying up of Lake Chilwa in the 1930s (Nagoli et al. 2017). A more interventionist approach to colonial development was adopted under the administration of Sir Geoffrey Colby in March 1948, and there was renewed growth in Malawi between the 1950s and the 1970s (McCracken 2012: 238). This was followed by less shrinking than in Zambia, so that Malawi had almost caught up with Zambia by 2008. Both economies remained poor, however, with GDP per capita just $750 in Malawi and $850 in Zambia in 2008, measured in 1990 international dollars. Both Zambia and Malawi fell further behind South Africa over the period as a whole, although Zambia did briefly narrow the gap during the 1950s.

4. Sub-Saharan Africa in a wider comparative perspective

So far, the paper has focused on comparisons within Sub-Saharan Africa. However, it is also instructive to examine how the region performed relative to the rest of the world. The natural comparator is the United Kingdom, since all the economies here were British colonies, and British accounting methods strongly influenced the statistical office that collected the data that have been used in the reconstruction of the historical national accounts. Also, since the United Kingdom was the world's leading economy in the late nineteenth century but was subsequently overtaken by many other Western economies, this does not set too stringent a benchmark against which to measure Sub-Saharan African economic performance over this period.

4.1 Anglo-African comparisons

Figure 6 charts the level of GDP per capita in three leading African economies as a percentage of the UK level. South Africa succeeded in closing the per capita GDP gap with the United Kingdom substantially from under 20 per cent in the 1880s to over 35 per cent by the 1950s, but the catching-up process then stalled until the 1970s, before going decisively into reverse during the 1980s and 1990s. Although there are signs of a return to catching up in the 2000s, the level of GDP per capita in 2008 was only just about back to 20 per cent of the UK level, where it had been in the 1880s. The long run comparative position was even more disappointing in Nigeria and Kenya, where the gap with UK GDP per capita increased substantially over the twentieth century.

4.2 Growing and shrinking

An important factor behind the disappointing long run economic performance of Sub-Saharan Africa during the twentieth century has been the continued importance of shrinking or negative economic growth. Not only have African economies typically experienced much higher rates of shrinking when they experience negative economic growth, but they have also tended to shrink more

frequently than developed economies such as the United Kingdom. Here, we apply the analysis of Broadberry and Wallis (2017) to the eight Sub-Saharan African economies and the United Kingdom to shed light on this issue.

Broadberry and Wallis (2017) make use of an identity for establishing the contributions of growing and shrinking to long run economic performance, which can be measured by the rate of change of per capita GDP over a number of years. Economic performance over the long run is the aggregation of short run changes measured annually. Long run economic performance, *g*, is a combination of four factors: first, the frequency with which an economy grows, *f(+)*; second, the rate at which it grows when growing, or the growing rate, *g(+)*; third, the frequency with which an economy shrinks, *f(-);* and fourth, the (negative) rate at which it grows when shrinking, or the shrinking rate *g(-)*. Thus:

$$g = \{f(+)\, g(+)\} + \{f(-)\, g(-)\} \quad (3)$$

Since the frequency of growing is equal to one minus the frequency of shrinking, equation (3) can be rewritten as:

$$g = \{[1-f(-)]\, g(+)\} + \{f(-)\, g(-)\} \quad (4)$$

which reduces the number of independent factors to three. We can use this identity to decompose long run economic performance into shrinking and growing components.

The first point to note in Table 8 is that when African economies have experienced positive growth, they have typically grown faster than the United Kingdom in all periods for which we have continuous data. During 1885-1910 and 1926-1938, all the African economies for which we have data experienced much more rapid growing rates than the United Kingdom. For most African economies this continued to be the case after 1950, with only South Africa experiencing slower average growing than the UK during 1950-1980, and 5 of the 8 African economies experiencing faster growing than the UK during 1980-

2008. Second, however, rates of growing and rates of shrinking tended to move together, so that high rates of growing were accompanied by high rates of shrinking and low rates of growing were accompanied by low rates of shrinking. This meant that although most African economies in most periods grew faster than the United Kingdom, they also shrank more rapidly.

Turning to Table 9, we see a third significant finding: despite experiencing faster rates of growing, most African economies typically experienced positive growth in fewer years than the United Kingdom. Whereas the United Kingdom shrank in just 17 per cent of years in 1926-1938 and 1950-1980, falling to 11 per cent of years between 1980 and 2002, most African economies continued to shrink in a much higher proportion of years throughout the period. As a result, the long run economic performance of most African economies in all years, which can be seen in Table 10, was disappointing across all four sub-periods. This was the case even compared with the United Kingdom, which was far from a stellar performer over this period. The problem was that although the African economies grew at least as rapidly as the United Kingdom when they were growing, they experienced more years of shrinking with higher rates of negative growth. Hence even if the contribution of growing (the frequency of growing multiplied by the rate of growing) was greater than in the United Kingdom, this was typically offset by an even greater contribution of shrinking (the frequency of shrinking multiplied by the rate of shrinking).

This has important implications for understanding the transition to sustained economic growth, which has still not been securely achieved in much of Sub-Saharan Africa. First, the pattern of growing and shrinking in African economies in the long twentieth century has much in common with the experience of European economies in the pre-modern period, when growing and shrinking occurred in roughly equal proportions of years and average rates of both growing and shrinking were often of the order of 5 to 10 per cent per annum (Broadberry and Wallis 2017). Second, only in the nineteenth century did the frequency of

growing in Europe rise to about two-thirds of years, and only after World War II to around 85 per cent. Third, prosperity came about in Europe without an increase in the rate of growing. Rather, the increase in the frequency of growing, or reduction in the frequency of shrinking, was accompanied by a sharp fall in the rate of growing, but accompanied by an even bigger fall in the rate of shrinking. Perhaps long run performance in Africa would be improved with a shift of priority towards reducing the rate and frequency of shrinking rather than to increasing the rate of growing.

5. Conclusions

This paper has shown that, despite doubts expressed about the quality of African data which have hindered such research in the past, it is possible to construct GDP per capita for countries in all major regions of the continent, based on primary sources, dating back to the nineteenth century. The method proposed here can also be extended to other countries for which data are available to build a more comprehensive picture of African economic performance across the colonial and post-independence periods. This allows African countries to be compared not only to each other but to others around the world.

The construction of GDP per capita series for eight African countries across the long twentieth century overturns some existing hypotheses in African economic history while giving others a stronger empirical foundation. For example, they show that South Africa's exceptional position within the Sub-Saharan region is of relatively recent making. It was not until well into the twentieth century that it overtook coastal West Africa, for example. They also illustrate how close the relationship between export growth and economic growth has been for many countries dating back to the late nineteenth century. This could be both positive and negative: rising prices and demand for African commodities could lead to periods of relatively rapid growth, but this growth was vulnerable to changing global conditions, as both Ghana and Zambia learned to their cost.

Periods of stagnation or shrinking were also exacerbated by political instability. The South African War (1899-1902), the Mau Mau rebellion of the 1950s, and the Nigerian Civil War (1967-1970) all coincided with sharp declines in the level of GDP per capita. Though levels often recovered relatively rapidly after these declines, these were years in which these economies were not growing, and this limited the overall increase in levels of per capita income across this period.

These data allow for the contextualization of the recent period of growth which began for most countries in the middle of the 1990s. They show that the growth experienced during the past two decades is not unprecedented in African history. Rather, most countries have experienced equivalent periods of rapid growth before. To know whether this growth provides a path to convergence, however, requires understanding the extent to which there are still risks of the shrinking which has undermined economic progress in the past. Assessing those risks is beyond the scope of this paper, and there remain debates about whether the changes undergone by many African economies during this period are sufficient to shift towards a path of sustained growth (Frankema and van Waijenburg 2018; Harchaoui and Ungor 2018). A longer term perspective also suggests that reducing such sources of risk should perhaps be a greater focus for policy-makers and aid agencies, rather than increasing the rate of growth during boom periods (see, e.g, African Development Bank 2019).

Table 1: Population of African countries, 1870-1950 (millions)

	S. Africa	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
1870	3.7	0.8	2.2	14.7	3.8	3.2	1.6	2.1
1880	4.1	0.9	2.4	15.5	4,1	3,4	1.6	2.1
1890	4.5	1.0	2.6	16.5	4.3	3.5	1.7	2.1
1900	5.0	1.1	2.8	17.4	4.1	3.5	1.7	2.0
1910	5.9	1.3	3.1	19.1	3.8	3.2	1.6	1.9
1920	6.8	1.5	3.3	20.9	3.7	3.2	1.5	1.8
1930	8.4	1.9	3.8	24.5	4.4	3.8	1.8	2.1
1940	10.3	2.3	4.4	28.4	5.1	4.3	2.0	2.4
1950	12.4	2.7	5.2	34.0	6.1	5.2	2.4	2.9

Sources: Frankema and Jerven (2014b).

Table 2: Real wage in African countries, 1885-1950 (1950=100)

	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Malawi
1885		65.7	72.2			
1911	98.0	78.7	84.9	67.1	74.6	68.3
1926	57.8	90.9	74.5	99.6	120.1	72.0
1929	70.5	118.0	66.4	74.0	86.4	82.2
1933	72.5	108.3	59.0	116.3	65.7	153.4
1938	80.4	108.4	87.8	94.8	78.0	145.3
1943	73.5	105.8	47.6	76.7	108.9	
1950	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Derived from Frankema and van Waijenburg (2012); Mosley (1983).

Table 3: Export volumes in African countries, 1885-1950 (1950=100)

	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
1885		6.0	2.1				
1911	32.3	19.3	19.7	12.5	3.6	0.04	8.3
1926	37.5	73.0	51.5	69.9	40.2	2.6	31.0
1929	46.1	74.6	62.3	68.6	45.3	5.5	33.2
1933	40.7	75.1	59.9	105.8	67.2	41.4	37.3
1938	65.0	98.2	73.5	132.7	96.5	71.8	73.3
1943	62.9	73.5	77.9	92.4	45.8	77.6	78.0
1950	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Derived from *Blue Books* and *Trade Reports* for each country, listed in Appendix 1.

Table 4: 1950 weights of key products in national export volume indicators (%)

	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
Cocoa		86.0	25.4				
Gold	21.0	13.7					
Palm products		0.25	38.4				
Rubber		0.05	3.8				0.1
Groundnuts			20.4				
Tin			8.0				
Cotton			4.0		70.5		7.3
Coffee				37.2	29.5		
Tea				14.2			35.1
Pyrethrum				3.5			
Sisal				42.4			
Maize				0.7			
Wool				2.0			
Blister copper						68.5	
Electrolytic copper						20.8	
Chrome	5.4						
Asbestos	17.0						
Tobacco	56.6					2.2	57.5
Lead						2.9	
Zinc						5.6	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Derived from *Blue Books* and *Trade Reports* for each country, listed in Appendix 1.

Table 5: Real government expenditure in African countries, 1885-1950 (1950=100)

	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
1885		2.6	0.5				
1911	18.9	21.5	31.2	23.0	13.2	6.6	12.2
1926	23.4	59.1	49.5	38.3	32.1	8.5	17.6
1929	30.7	44.0	41.5	56.2	40.2	10.5	22.9
1933	31.6	28.2	34.8	54.5	34.3	15.8	31.6
1938	42.0	40.0	44.3	60.8	49.5	26.3	44.2
1943	41.8	35.3	45.3	74.9	36.9	34.6	33.6
1950	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Derived from nominal government expenditure reported in *Blue Books* for each country, listed in Appendix 1, deflated by the UK price index for government expenditure from Feinstein (1972).

Table 6: Economic structure of African countries, circa 1950 (% of value added)

	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
Trad agriculture		24.3	54.6	24.2	46.3		40.5
Domestic ind/serv		39.6	24.0	47.3	27.9		40.7
Traditional sector	64.6					54.6	
Export sector	28.1	24.1	12.3	14.2	23.3	37.7	9.0
Government	7.3	12.0	9.0	6.0	2.5	7.7	9.8
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Derived from national accounting sources for each country, listed in Appendix 1.

Table 7: Average annual rates of GDP growth in African countries, 1966-1995

	Official series	Maddison	PWT	WDI
Botswana	11.5	10.9	9.8	11.2
Kenya	5.2	4.7	5.0	5.3
Tanzania	3.7	3.2	3.4	n.a.
Zambia	0.9	1.1	1.6	0.9

Source: derived from Jerven (2014a: 50-51).

Table 8: Average rate of change of per capita income in growing years and shrinking years in Africa and the United Kingdom, 1885-2008 (% per annum)

		1885-1910	1926-1938	1950-1980	1980-2008
South Africa					
	Growing	10.49	7.92	2.37	2.15
	Shrinking	-11.06	-4.37	-0.89	-2.53
Zimbabwe					
	Growing		6.75	4.50	4.26
	Shrinking		-2.93	-2.86	-4.70
Ghana					
	Growing	3.47	15.30	4.08	2.28
	Shrinking	-2.15	-9.72	-4.44	-7.17
Nigeria					
	Growing	5.07		5.28	3.33
	Shrinking	-6.38		-6.20	-3.73
Kenya					
	Growing		15.19	3.73	1.93
	Shrinking		-19.74	-4.28	-1.89
Uganda					
	Growing		5.98	3.09	3.32
	Shrinking		-7.03	-3.85	-3.95
Zambia					
	Growing		5.59	5.70	3.08
	Shrinking		-1.40	-4.23	-4.73
Malawi					
	Growing		10.37	3.75	3.88
	Shrinking		-2.40	-2.83	-4.49
UK					
	Growing	2.54	3.07	2.67	2.56
	Shrinking	-1.69	-3.43	-0.88	-1.09

Sources: Derived from Appendix 1 and Maddison (2010).

Table 9: Frequency of growing and shrinking of GDP per capita in Africa and the United Kingdom, 1885-2008

		1885-1910	1926-1938	1950-1980	1980-2008
South Africa					
	Growing	0.64	0.58	0.83	0.61
	Shrinking	0.36	0.42	0.17	0.39
Zimbabwe					
	Growing		0.50	0.67	0.32
	Shrinking		0.50	0.33	0.68
Ghana					
	Growing	0.52	0.42	0.53	0.89
	Shrinking	0.48	0.58	0.47	0.11
Nigeria					
	Growing	0.60		0.70	0.61
	Shrinking	0.40		0.30	0.39
Kenya					
	Growing		0.58	0.73	0.54
	Shrinking		0.42	0.27	0.46
Uganda					
	Growing		0.50	0.47	0.82
	Shrinking		0.50	0.53	0.18
Zambia					
	Growing		0.75	0.53	0.57
	Shrinking		0.25	0.47	0.43
Malawi					
	Growing		0.50	0.77	0.61
	Shrinking		0.50	0.23	0.39
UK					
	Growing	0.64	0.83	0.83	0.89
	Shrinking	0.36	0.17	0.17	0.11

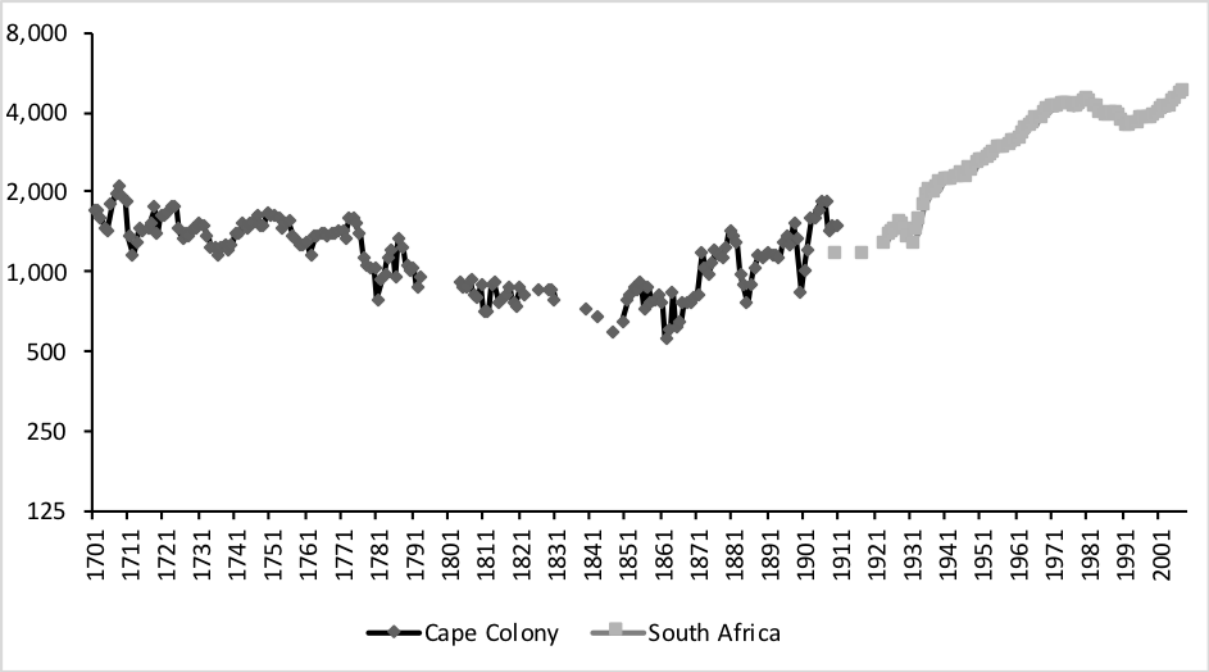
Sources: Derived from Appendix 1 and Maddison (2010).

Table 10: Contributions of growing (frequency*rate) and shrinking (frequency*rate) to long run economic performance (average rate of change of per capita income in all years) in Africa and the United Kingdom, 1885-2008

		1885-1910	1926-1938	1950-1980	1980-2008
South Africa	All years	2.73	2.80	1.83	0.31
	Growing	6.71	4.62	1.98	1.31
	Shrinking	-3.98	-1.82	-0.15	-0.99
Zimbabwe	All years		1.91	2.05	-1.82
	Growing		3.37	3.00	1.37
	Shrinking		-1.47	-0.95	-3.19
Ghana	All years	0.77	0.70	0.10	1.27
	Growing	1.80	6.37	2.17	2.04
	Shrinking	-1.03	-5.67	-2.07	-0.77
Nigeria	All years	0.49		1.83	0.55
	Growing	3.04		3.69	2.02
	Shrinking	-2.55		-1.86	-1.46
Kenya	All years		0.64	1.60	0.16
	Growing		8.86	2.74	1.04
	Shrinking		-8.23	-1.14	-0.88
Uganda	All years		-0.53	-0.61	2.02
	Growing		2.99	1.44	2.73
	Shrinking		-3.52	-2.05	-0.70
Zambia	All years		3.84	1.07	-0.27
	Growing		4.19	3.04	1.76
	Shrinking		-0.35	-1.97	-2.03
Malawi	All years		3.98	2.22	0.59
	Growing		5.18	2.88	2.36
	Shrinking		-1.20	-0.66	-1.76
UK	All years	1.02	1.99	2.07	2.17
	Growing	1.63	2.56	2.22	2.29
	Shrinking	-0.61	-0.57	-0.15	-0.12

Sources: Derived from Appendix 1 and Maddison (2010).

Figure 1: Per capita GDP in Cape Colony, 1701-1910 and South Africa, 1910-2008 (1990 international dollars, log scale)

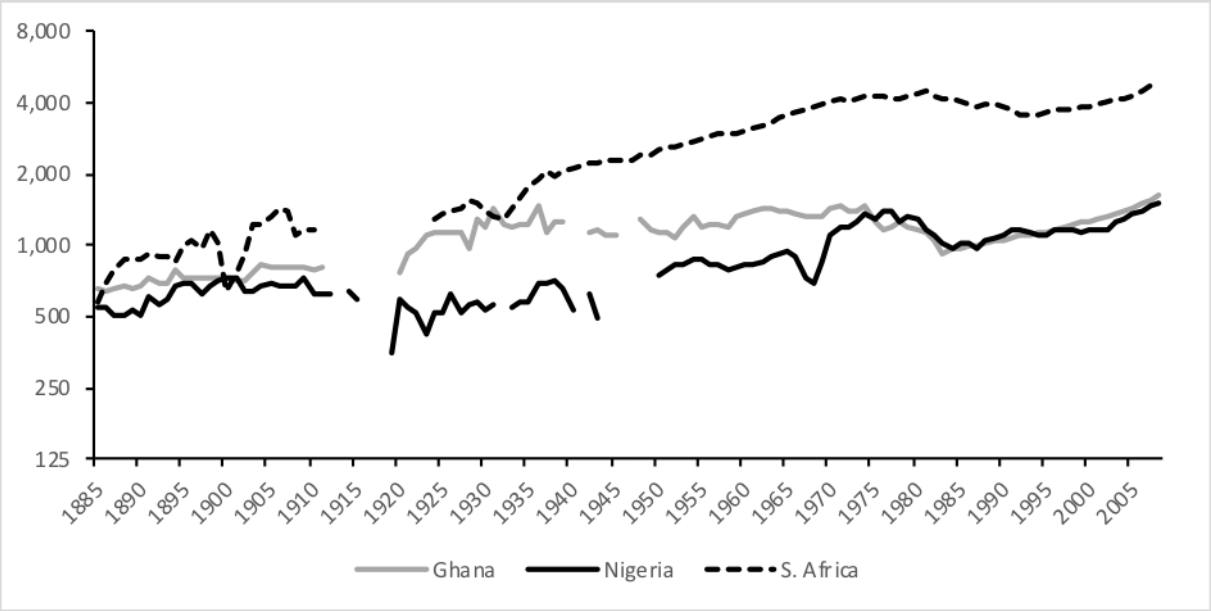


Source: Fourie and van Zanden (2013).

Figure 2: Per capita GDP in Southern Africa, 1885-2008 (1990 international dollars, log scale)

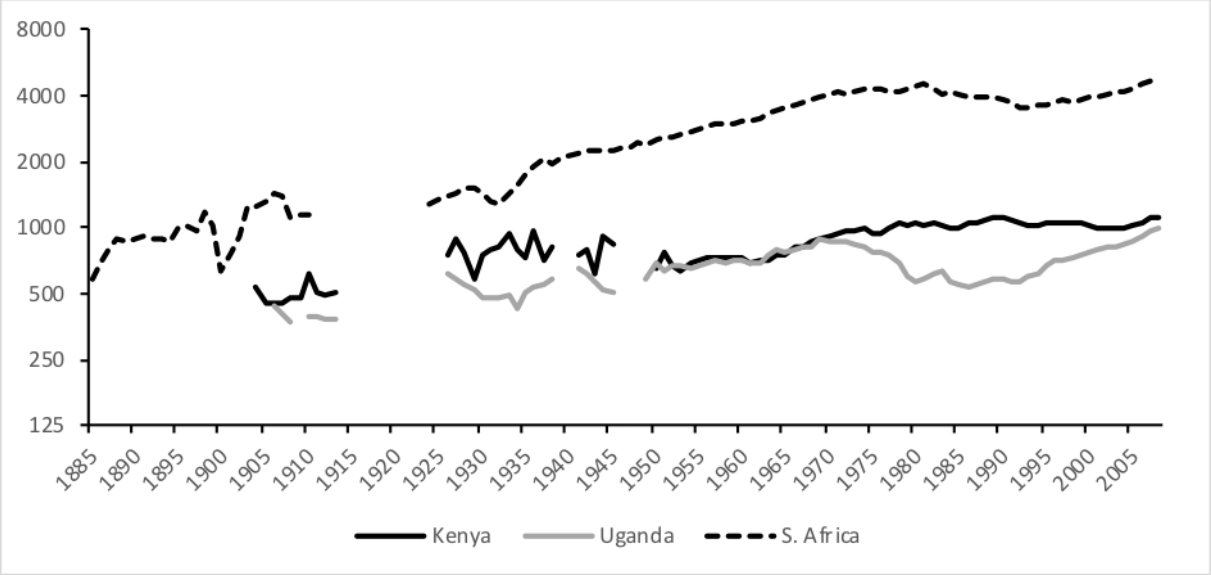
Sources: See Appendices 1 and 2.

Figure 3: Per capita GDP in West Africa compared with South Africa, 1885-2008 (1990 international dollars, log scale)



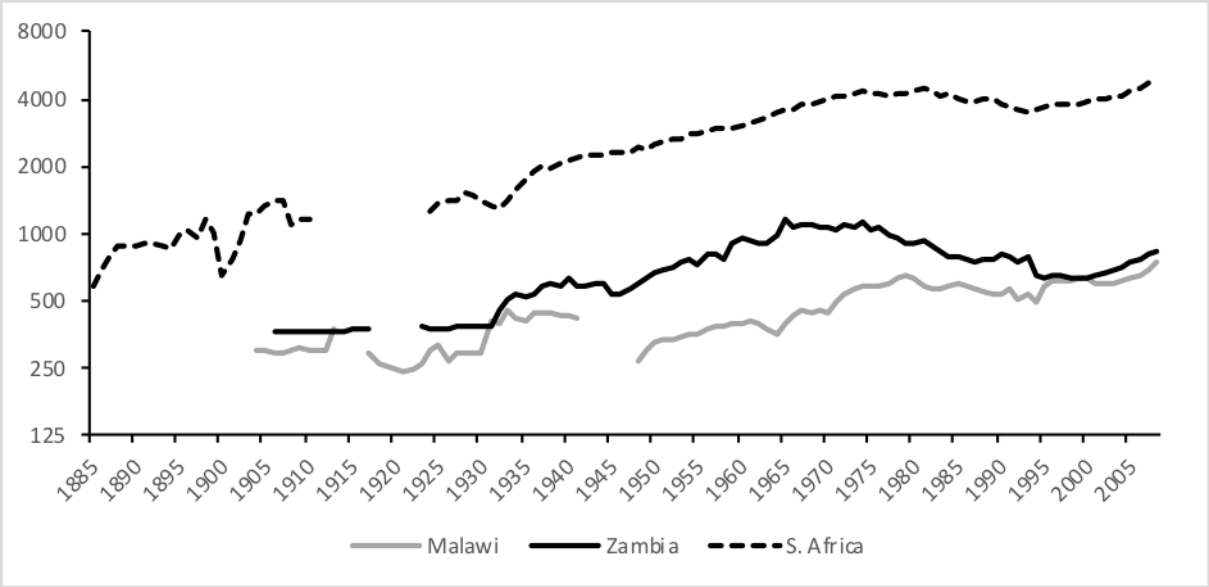
Sources: See Appendices 1 and 2.

Figure 4: Per capita GDP in East Africa compared with South Africa, 1885-2008 (1990 international dollars, log scale)



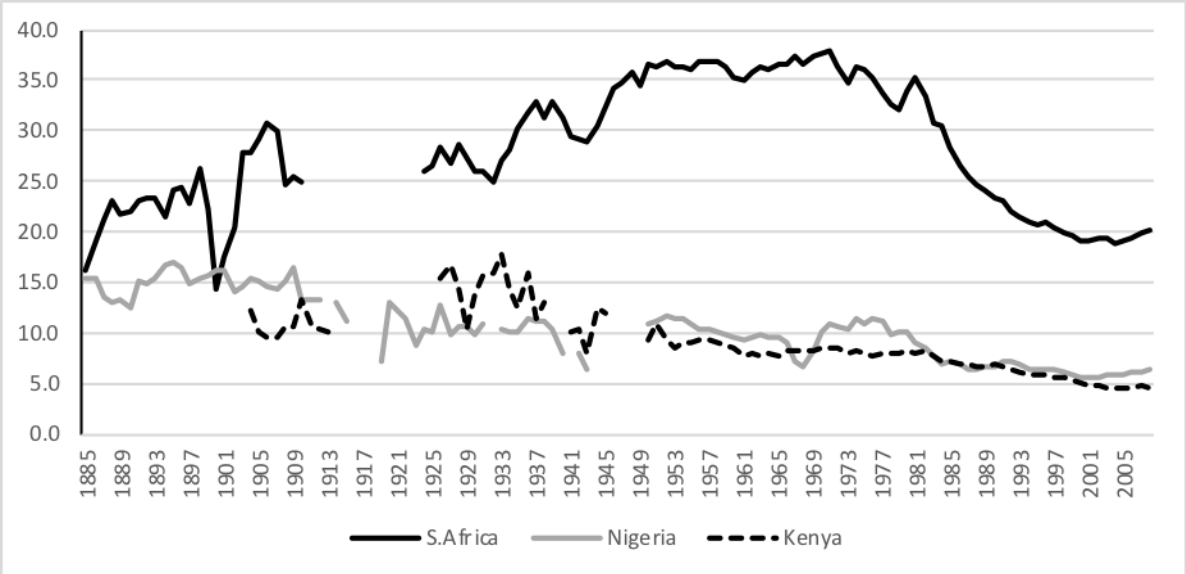
Sources: See Appendices 1 and 2.

Figure 5: Per capita GDP in Central Africa compared with South Africa, 1885-2008 (1990 international dollars, log scale)



Sources: See Appendices 1 and 2.

Figure 6: GDP per capita in leading African economies as a percentage of the UK level



Sources: See Appendices 1 and 2.

Appendix 3: Annual GDP per capita in sub-Saharan Africa, 1885-2008 (1990 international dollars)

	S Africa	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
1885	582		658	547				
1886	687		648	552				
1887	784		649	506				
1888	884		666	506				
1889	875		664	539				
1890	881		671	505				
1891	918		732	601				
1892	895		687	568				
1893	887		696	588				
1894	862		786	669				
1895	993		731	700				
1896	1,037		726	699				
1897	970		734	631				
1898	1,164		731	681				
1899	1,022		724	719				
1900	642		729	730				
1901	774		708	725				
1902	924		714	638				
1903	1,238		774	645				
1904	1,238		833	677	540			300
1905	1,321		809	684	452			298
1906	1,426		812	675	449	446	365	294
1907	1,400		817	676	453	406	366	296
1908	1,099		816	674	477	376	365	301
1909	1,151		814	736	480		365	313
1910	1,151		798	618	611	395	365	301
1911			811	629	501	393	366	302
1912				630	489	385	366	302
1913					502	379	367	374
1914		914		636			368	
1915				586			371	364
1916							374	
1917							372	291
1918	1,163							264
1919		609		353				256
1920		431	759	590				249
1921		419	913	548				244
1922		512	960	526				246
1923		588	1,093	418			381	266
1924	1,278	513	1,138	515			373	298
1925	1,362	507	1,127	525			374	320
1926	1,398	567	1,147	625	754	622	377	271
1927	1,425	640	1,140	524	886	580	389	297

Appendix 3: Annual GDP per capita in sub-Saharan Africa, 1885-2008 (1990 international dollars)

	S Africa	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
1928	1,533	683	970	566	773	555	391	295
1929	1,497	645	1,279	582	577	526	387	294
1930	1,413	623	1,204	536	752	477	390	296
1931	1,335	638	1,427	559	802	480	388	408
1932	1,284	704	1,233		822	473	461	401
1933	1,423	686	1,201	552	940	498	507	457
1934	1,577	666	1,222	570	797	433	538	414
1935	1,747	665	1,217	579	731	508	524	410
1936	1,912	696	1,484	684	959	543	532	440
1937	2,038	677	1,127	697	706	556	582	442
1938	1,956	713	1,248	703	814	584	597	437
1939	2,053	806	1,269	655			584	429
1940	2,145			538			638	428
1941	2,202				758	657	576	423
1942	2,226		1,137	616	789	620	580	
1943	2,232		1,150	498	625	573	600	
1944	2,265	659	1,113		916	515	593	
1945	2,278	672	1,105		848	505	542	
1946	2,311	599					543	
1947	2,288	594					564	
1948	2,414	615	1,279				592	271
1949	2,396	629	1,172			579	628	303
1950	2,535	701	1,122	753	651	687	661	324
1951	2,591	722	1,134	792	771	642	688	332
1952	2,619	724	1,084	830	667	664	715	339
1953	2,675	760	1,202	831	633	675	743	347
1954	2,763	772	1,317	867	687	648	772	355
1955	2,830	808	1,200	865	718	672	736	354
1956	2,914	892	1,236	821	736	690	803	376
1957	2,951	924	1,241	830	738	700	817	383
1958	2,939	906	1,187	797	725	685	776	388
1959	2,995	925	1,321	808	720	700	915	393
1960	3,042	938	1,378	820	726	713	960	394
1961	3,092	956	1,388	824	686	686	938	404
1962	3,179	939	1,416	846	701	694	905	393
1963	3,321	901	1,424	899	714	751	902	376
1964	3,450	953	1,414	910	758	785	996	359
1965	3,559	984	1,393	944	743	779	1,147	397
1966	3,615	967	1,354	887	812	803	1,056	426
1967	3,760	1,015	1,339	728	826	822	1,107	455
1968	3,819	999	1,318	699	857	818	1,092	437
1969	3,946	1,086	1,325	861	881	881	1,056	453
1970	4,045	1,282	1,424	1,094	915	867	1,073	447

Appendix 3: Annual GDP per capita in sub-Saharan Africa, 1885-2008 (1990 international dollars)

	S Africa	Zimbabwe	Ghana	Nigeria	Kenya	Uganda	Zambia	Malawi
1971	4,135	1,353	1,491	1,188	941	869	1,042	498
1972	4,109	1,423	1,402	1,197	956	856	1,105	534
1973	4,175	1,432	1,397	1,262	970	835	1,062	562
1974	4,299	1,427	1,455	1,367	981	817	1,114	582
1975	4,271	1,402	1,247	1,287	942	780	1,041	586
1976	4,267	1,357	1,178	1,385	943	765	1,071	591
1977	4,155	1,221	1,181	1,393	991	757	990	603
1978	4,174	1,232	1,260	1,272	1,039	697	967	637
1979	4,232	1,211	1,210	1,320	1,036	606	910	646
1980	4,390	1,295	1,157	1,305	1,051	572	911	630
1981	4,481	1,407	1,142	1,164	1,033	579	936	580
1982	4,323	1,405	1,042	1,119	1,054	610	877	567
1983	4,112	1,374	933	1,023	1,021	636	828	573
1984	4,186	1,297	960	958	1,000	563	796	580
1985	4,007	1,335	978	1,017	1,006	556	784	606
1986	3,912	1,322	988	1,010	1,040	538	762	587
1987	3,897	1,257	1,007	976	1,065	550	755	568
1988	3,964	1,326	1,034	1,046	1,092	566	777	547
1989	3,956	1,368	1,057	1,085	1,105	583	762	542
1990	3,834	1,355	1,062	1,112	1,117	585	806	540
1991	3,716	1,391	1,087	1,149	1,097	570	783	564
1992	3,566	1,233	1,099	1,150	1,049	567	749	504
1993	3,534	1,220	1,119	1,146	1,021	593	779	543
1994	3,584	1,278	1,122	1,111	1,023	609	658	496
1995	3,646	1,272	1,141	1,113	1,042	663	627	582
1996	3,752	1,385	1,168	1,156	1,059	701	653	611
1997	3,801	1,403	1,192	1,161	1,056	716	660	618
1998	3,777	1,427	1,221	1,154	1,049	728	633	622
1999	3,808	1,401	1,247	1,139	1,038	759	632	631
2000	3,890	1,320	1,265	1,161	1,013	773	640	639
2001	3,950	1,279	1,289	1,170	998	787	656	599
2002	4,048	1,203	1,317	1,161	982	815	665	597
2003	4,130	1,082	1,354	1,258	983	823	689	607
2004	4,156	1,048	1,400	1,305	1,000	835	715	623
2005	4,316	1,015	1,452	1,346	1,030	856	742	628
2006	4,503	958	1,514	1,400	1,066	916	776	655
2007	4,689	900	1,568	1,468	1,110	958	812	694
2008	4,793	779	1,650	1,524	1,098	1,008	845	744

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