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Abstract: This paper reviews the 'long twentieth-century' development of 'modern' manufacturing in Sub-Saharan Africa from colonization to the present. We argue that classifying Africa generically as a 'late industrializer' is inaccurate. To understand the distinctively African pattern of manufacturing growth, we focus our discussion on the dynamic interplay between the region's specific endowment structures, global economic relationships and government policies. We conclude that the case of Sub-Saharan Africa is best characterized as interrupted industrial growth instead of sustained convergence on world industrial leaders. This is partly because, until very recently, the factor endowments made it very costly for states to pursue industrialization; and partly because successive rulers, colonial and post-colonial, have rarely had both the capacity to adopt and the dedication to sustain policies that modified the region's existing comparative advantage in primary production, by using their fiscal and regulatory powers effectively to promote industrialization.

Keywords: Manufacturing, Sub-Saharan Africa, Colonial institutions, Economic History.

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1. Introduction

Currently, Sub-Saharan Africa has the lowest manufacturing output per capita of any inhabited region on the planet. Most African economies, in contrast to the Asian NICs, have so far failed to supplement agricultural and extractive output by raising average productivity through the creation of a substantial number of jobs in higher value-added manufacturing industries. From the perspective of mainstream growth theory this appears to be an important *proximate* cause of comparative African poverty. This view has received new impetus from some recent studies documenting unconditional convergence between leaders and followers in manufacturing output growth since the 1870s (Bénétrix et al., 2014) and manufacturing labour productivity since the 1960s (Rodrik, 2012). The key message of these studies is that failure to catch up in aggregate economic terms is not because manufacturing industries in the 'periphery' are underperforming, but rather because the proportion of industrial workers in the total labour force has remained too small to offer a substantial push to aggregate growth.

If industrialization of the global economic periphery is crucial to a sustained decline of global economic inequality in the twenty-first century, the case of Sub-Saharan Africa deserves special attention. Assessments of African economic development have become more optimistic recently due to encouraging rates of aggregate economic growth since c.1995 (IMF, 2012; Young, 2012; UNECA, 2013). While initial studies of the boom were largely silent on manufacturing growth, the matter has now begun to receive more attention (de Vries et al., 2013; McMillan and Harttgren, 2014; Rodrik, 2014; Diao and McMillan, 2015, Jerven 2015).

There are few signs yet that African countries are copying the Asian success-formula of moving up the value chain by promoting export of labour-intensive manufacturing produce (Sugihara, 2007; Austin and Sugihara, 2013). Nor do the growth rates of manufacturing output in the past decades offer encouragement. As Bénétrix, O'Rourke and Williamson (2014) show, the more successful Asian and Latin American economies in the industrial convergence club have recorded annual average rates of manufacturing output growth surpassing 5 per cent for at least half a century and sometimes even over a full century (e.g. Japan, China, Chile, see Table A.6, pp. 35-9). The only Sub-Saharan African country that achieved a more extended period of accelerated manufacturing output growth is South Africa (1924-78) during the heyday of its segregation and apartheid regimes. When other African countries caught the manufacturing train, it was for considerably shorter journeys. Moreover, among all the countries in the sample that recorded a 10-year annual average growth rate of manufacturing output exceeding 5 per cent since 1980, not one has managed to sustain this acceleration to the present. Indeed, in Sub-Saharan Africa as a

whole, the share of manufacturing in aggregate output actually declined between 1980 and 2010 (UNECA, 2013, pp. 7, 74).[1]

This paper reviews the historical development of 'modern' manufacturing in Sub-Saharan Africa, including the transition from 'pre-modern' to 'modern' forms of manufacturing. We define 'modern' as production based on inanimate sources of energy, which began during colonial rule. Its promotion has been an object of government policy mainly since independence from overseas rule. It was adopted by South Africa and Southern Rhodesia (now Zimbabwe) under white minority regimes in 1924 and 1933 respectively, and in many of the other countries when they escaped from European rule around 1960. Modern manufacturing began later in sub-Saharan Africa than in some parts of Asia, Latin America, North Africa and the Middle East, and its diffusion was certainly slower during the long twentieth century. Yet, for a deeper understanding of African manufacturing growth it is not sufficient to state that Africa is simply 'later' than the rest; the crucial question is whether there are signs that the *nature* of African industrial growth was or is different from experiences elsewhere. Only by exploring the deeper characteristics of the process, apart from rates of growth, may we hope to offer some cautious predictions for its future trajectory.

Bénétrix, O'Rourke and Williamson (2012) have argued that Sub-Saharan Africa was no exception to their rule that, once 'peripheral' countries began to industrialize, their convergence on the industrial leaders was 'unconditional' (see also Rodrik, 2012). However, arguably their historical sample is biased in that for Sub-Saharan Africa it includes only the few countries in the sub-continent that achieved some notable scale of manufacturing before the 1950s (South Africa, Southern Rhodesia and the Belgian Congo). We maintain, rather, that the story to date is more accurately summarized as *interrupted industrial growth* rather than catch-up growth; certainly for the Congo and Zimbabwe, but even, arguably, for South Africa. Moreover, taking account of the broader African experience, we argue that while 'unconditional convergence' in manufacturing output growth remains a dream, the conditions for achieving it are better at present than in they had been the late nineteenth century, or even than the time when most African countries achieved independence from colonial rule (c. 1960).

We explore the determinants of manufacturing growth in Sub-Saharan Africa by focusing on the interaction between changing factor endowments, global economic relationships and government policies. Our argument is as follows. The sub-continent entered the

[1] The report of the UN Economic Commission for Africa gives two sets of figures on this, which agree on the fact of relative decline but differ on its magnitude, for reasons that seem unclear. The share of manufacturing value-added in GDP is reported to have fallen from 16.6% to 12.7% in SSA, while rising in North Africa from 12.6% to 13.6% (p. 74). Elsewhere in the document, the share of manufacturing in the aggregate output of the continent as a whole is given as slipping from over 12% in 1980 to about 11% in 2010 (p. 7).

colonial period with an emerging comparative advantage in land-extensive production, agricultural and mineral, which colonial governments and (in the 'peasant' colonies at least) African farmers and entrepreneurs proceeded to deepen. Colonial and post-colonial government policies contributed to the growth of population and human capital, which by the end of the twentieth century had greatly eroded the region's long-running characteristic of land abundance and labour scarcity. This historical transformation in the region's endowment structure facilitated the expansion (or in some areas, creation) of wage labour markets (Sender and Smith, 1986). Colonial governments and enterprises also enhanced capital formation and the development of consumer markets, including new financial institutions. Africa's known 'resource wealth' has been progressively augmented by a combination of the search for commercially valuable minerals and, more so, by technological innovations outside the continent which have created new markets for materials and fluids found in Africa, even as mining and pumping have reduced these reserves. In the setting of these changing endowment structures, the crucial issue for any prospective late-industrializing country is whether the ruling elite has had the *capacity* to adopt and the *dedication* to sustain policies that, in effect, defied – and, implicitly, sought to modify – the country's existing comparative advantage in primary production, by using its fiscal and regulatory powers to promote industrialization (Gerschenkron, 1962; Wade, 1990; Amsden, 1992).

We argue further that the changing dynamics of politics and international competition for resources and markets have played an important role in shaping the conditions for such commitments and policy agendas. The fact that white minority regimes were the first actively to encourage manufacturing development was because they had become independent (South Africa) or autonomous (Southern Rhodesia) first. The South African government started its program in 1924, followed within a decade by Southern Rhodesia. The start of commercial copper mining in the 1920s in Katanga, in the southeast of the Belgian Congo, also spurred investments in complementary manufacturing industries. Following the independence of most of Africa around 1960, a larger number of tropical African countries adopted industrialization as a policy objective, despite relatively high costs for unskilled and especially for skilled labour. Import-substituting industrialization (ISI) polices were adopted by regimes with 'socialist' as well as 'capitalist' sympathies. But ISI policies were renounced when the same countries participated in economic liberalization programs ('Structural Adjustment') in the 1980s and 1990s. Escalating government debts and conditional foreign aid reduced the opportunities to African governments to design independent economic policies.

Meanwhile, however, factor ratios within the sub-continent continued to move towards a relatively abundant and better educated labour force. This creates opportunities for labour-intensive industrialization (Austin and Sugihara, 2013), of which Mauritius has

become the regional pioneer (Teal, 1999), with Ethiopia now looking to follow on a larger scale. Part of the reason why African economies have not (yet) been able to turn changing relative factor prices to their benefit is because of the tough competition they face from emerging economies in a neo-liberal global economic order.

Any long-term analysis of African economic development suffers data-availability constraints. There are relatively long manufacturing output series only for three countries, which happen to be the ones with significant early manufacturing growth, South Africa, Southern Rhodesia and the Belgian Congo (Clarence-Smith, 1989; Mitchell, 2007). The scattered pre-war surveys of manufacturing published in the colonial blue books of British Africa are notoriously incomplete. For the post-colonial era there are many gaps in the data as well, and there is little or no quantitative data on the value of production in "informal" manufacturing, which includes small-scale brewing and tool-making workshops. Thus, substitution effects between the informal and formal sectors remain invisible in the official data sources (Jerven, 2013). In an earlier study of colonial patterns of industrialization, Kilby noted that there was 'incomplete coverage of agricultural processing, cottage craft production, artisan industries and smaller establishments' (Kilby, 1975, p. 471), which not only limits comparisons across time, but makes it particularly hazardous to compare the industrial share of GDP from country to country, because 'definitions of industrial vary' (Austen, 1987, p. 247; see also Vandewalle, 1966, p. 39). Riddell, editing a volume on manufacturing growth in Africa, noted that 'little can be done . . . except to state at the outset that it throws considerable doubt about all the aggregate data used subsequently' (1990, p. 10). This is no less true for our study.

Within the framework of interactions between factor endowments, global economic relations and government policy, the following sections focus on the reasons for the abrupt discontinuity between pre-colonial handicraft production and the modern manufacturing introduced under colonial rule (section 2); the spatially and temporally uneven spread of modern manufacturing during the colonial period (section 3); a case-study of interrupted manufacturing growth in the Belgian Congo (section 4); the widespread attempts to promote import-substituting industrialization in the 1960s and 1970s (section 5); and manufacturing performance during the subsequent era of economic liberalism, including recent trends (section 6). Section 7 concludes.

2. From pre-colonial handicrafts to modern manufacturing

On the eve of the European partition, c. 1880, the two most important manufacturing activities were textiles plus iron smelting and smithing. While sizeable parts of Africa, such as Namibia and much of South Africa, including the Zulu kingdom, had predominantly pastoral economies, the arable and mixed-farming regions invariably had artisanal

manufacturing of some sort. The biggest centre in absolute terms, and seemingly also as a share of output, was the central emirates of the Sokoto Caliphate, based in what is now northwest and north-central Nigeria. With some 6 million people c. 1900, the Sokoto Caliphate was probably the most populous state in tropical Africa (Lovejoy, 2005, p. 8). From Kano, which became its commercial and manufacturing hub, cotton cloth was exported all over West Africa, and even to North Africa, as the German explorer Heinrich Barth reported from his visit in 1851 (1857, reprinted 1967, p. 511).

Rodney (1972: 112-14) famously claimed that African handicraft industries such as textiles and iron smelting shrank even before colonial rule, because of growing competition from foreign imports. However, this view has been increasingly overtaken by new research. In West Africa the quality of African iron (Goucher, 1981), as well as of high-end weaving (such as Akan *kente* cloth from what is now Ghana), was such as to retain consumer loyalty even throughout the colonial period (for a fuller discussion, see Austin, 2008). In East-Central Africa, locally-woven *machila* cloth produced in the lower Shire valley of Malawicontinued to enjoy widespread popularity through the 1880s at least. More importantly, Frederick (2014) has estimated that the quantities imported (per capita yards of cotton cloth) before the twentieth century, were too limited to have a significantly destructive impact. This changed at the outset of colonial rule, when per capita imports increased about fivefold between 1896 and 1913.[2]

The question arises why there was no direct transition from the handloom to the power loom, under the same entrepreneurs in the same workshops. Why – especially in contrast to Japan, the first non-western industrializer – did the traditions of handicraft production apparently make little or no contribution to the origins of modern manufacturing, in the twentieth century, even in Nigeria?

At one level, it may have been because machines using inanimate energy were introduced by foreign firms who had already moved beyond human-powered tools. In other words, for African entrepreneurs the technology gap was simply too large to bridge. But this is an insufficient answer, when we note that African entrepreneurs were among the first importers and users of motor lorries in Ghana and Nigeria, and were therefore pioneers of the adoption of mechanization in transport (Heap, 1990; Drummond-Thompson, 1993). Why would they not copy or import power-looms as well?

A more fundamental answer emerges when we take a closer look at the endowment structure of African economies. Cultivable land was relatively abundant in most areas, but the natural environment imposed severe constraints on its productive uses. Just as

[2] The de-industrialization thesis should be distinguished from the much more plausible argument that imported Indian and English cottons hindered proto-industrialization of the cotton industry, at least in West Africa, c.1650-c.1850 (Inikori, 2009).

opportunities to substitute capital for labour in agriculture and transport were constrained by *trypanosomiasis*, which prevented the use of large animals in the tropical forests and extensive if shifting bands of savannah, the rarity of coal and shortages of the kind of tree suitable for charcoal limited the production possibility frontier for iron. Despite the quality of local iron, and the existence of specialized iron-smelting communities engaged in iron trade, iron was scarce, hence expensive, until the bottleneck was eased by imports.

Meanwhile, in West Africa especially, the narrow loom was preferred to the broad loom: at first glance a perverse choice, because it reduced the quantity of output per hour. The explanation owes much to a combination of taste and environmentally-conditioned constraints on the supply of yarn (Austin, 2008; 2013). Though cotton was very widely grown in the savannahs of tropical Africa, further expansion of output entailed a severe trade-off with food growing, as food crops and cotton had to be planted in the same short season (Tosh, 1980). In addition, the preference for the narrow loom was facilitated by the extreme seasonality of rainfall in much of tropical Africa, which meant that, despite the general scarcity of labour during the agricultural year, in the heart of the dry season the opportunity cost of labour was low (Austin, 2008; 2013; cf. Curtin, 1973).

The combination of inelastic supplies of raw cotton and high-quality weaving and dyeing explains the African practice of unpicking imported cloth to re-weave the threads with which it was made. As far as the finishing of cloth is concerned, it is notable that the initial exports of Manchester cloth to Kano, in the late nineteenth century, were of un-dyed cloth, which was then dyed in Kano for sale in local and regional markets (Johnson, 1976).

A demand-side explanation may be considered as well. African labour scarcity created incentives for the adoption of labour-saving production techniques, but the investments required for capital-embodied technologies (e.g. power looms) also correspond with higher minimum efficient scales, particularly if machines are suited for the production of lower quality (bulk) cloth. Consumer markets in West Africa were not only considerably smaller than in Europe in terms of number and purchasing power of consumers, their development was also hampered by higher transportation costs. The transport constraint was partly eased by the construction of railways under colonial rule, but the same railways also cleared the way for expanded European textile imports. The rail networks, soon followed by motor roads, served as a key instrument of the characteristic colonial division of labour, under which Africa exported primary products in return for imported manufactures.

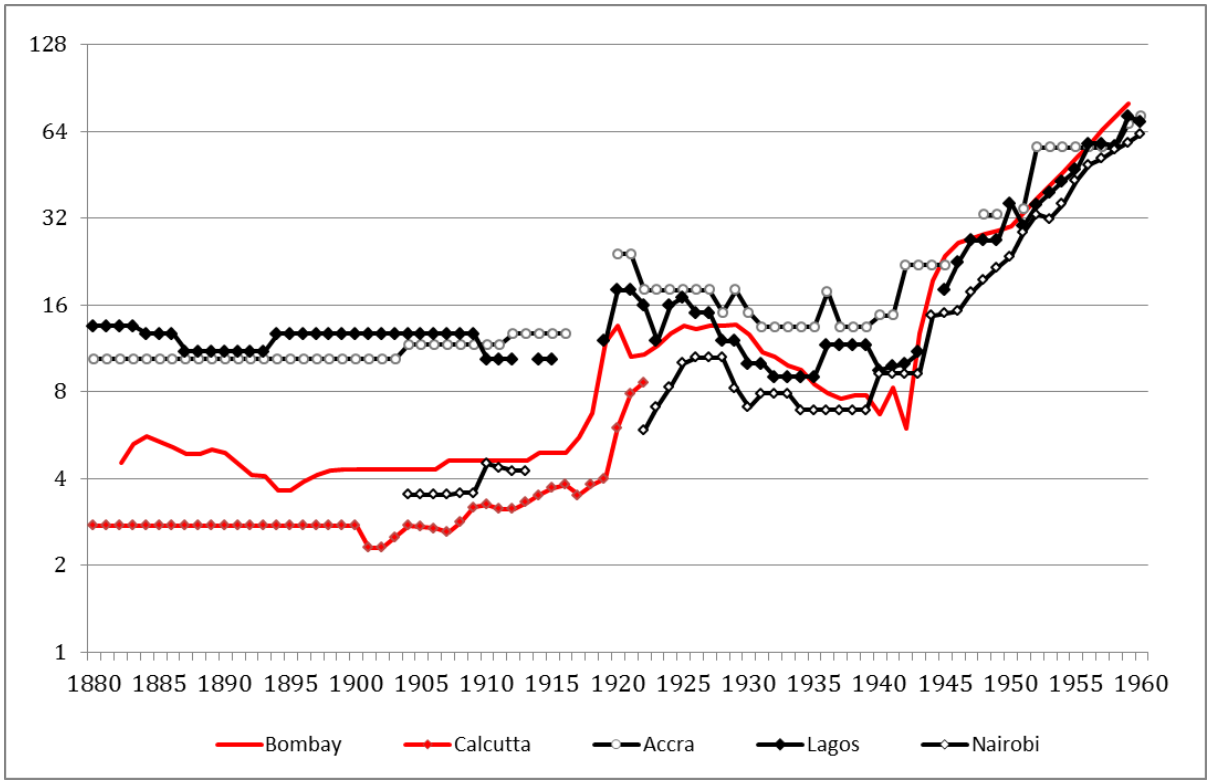
This division of labour has often been attributed to colonial policy (Rodney, 1972). However, while this division seemed natural as well as welcome to European politicians representing textile interests, it was not necessarily inevitable, if it had contradicted comparative advantage, especially in the 'free-trading' British empire of the early colonial years (in contrast to the more protectionist policies of Portugal and France). After all, the

interests of Manchester mill-owners did not stop Indians from developing a modern cotton textile industry under British rule in India. Moreover, as Kilby (1975, pp. 495-6) has shown for Nigeria, the market for manufactured goods in certain colonies was large enough to support local factories in several industries many years before such factories were established. On the other hand, Unilever established a soap factory in Nigeria in 1923, but it struggled in the face of competition from a British-based rival, as well as because of having to pay excessive prices for materials from a fellow Unilever subsidiary (Fieldhouse, 1978, pp. 345-79).

A fundamental obstacle to competitiveness for factories in Nigeria and other peasant colonies remained the high cost of labour. African comparative advantage was shaped by labour and capital scarcity and land abundance. The reservation wage of labour, hypothetical or actual, was relatively high, to the point that coercion (taking the form of slavery, pawning and corvée) was a prerequisite for the existence of a labour market in parts of nineteenth-century West Africa (e.g. Austin, 2005, pp. 155-70, 495-8). As shown in figure 1, especially before 1940, day wages of unskilled labour were considerably higher in British West Africa (Accra and Lagos) than in the major textile producing centers of British India (Bombay and Calcutta). However, colonial responses to labour scarcity differed and did not translate into high wages in major parts of East and Southern Africa, whdere labour coercion was more severe (Frankema and van Waijenburg, 2012).

In the mining regions of Southern Africa, labour coercion became particularly harsh. At the beginning of the South African gold mining industry, according to Harries, real earnings of black workers on the Rand and at Kimberley, who were often migrants from newly-conquered areas or from the (at the time, lightly-governed) Portuguese colony of Mozambique, 'compared favourably' to those of British agricultural workers (Harries, 1982, pp. 143, 161n). From the 1890s to the 1910s, however, black miners' wages were driven down by a combination of state policies designed to close the alternatives that Africans had enjoyed to supplying wage labour to white employers, and the creation of monopsonistic recruitment arrangements for mining companies (e.g. Lipton, 1985; Feinstein, 2005). Such reductions may already have occurred in the older British colonies of South Africa. According to de Zwart (2011, p. 65), nominal wages of black workers in Natal during the closing decades of the nineteenth century were lower than those paid in the capitals of at least some of the colonies that had been established further north, ranging between 5 to 9 pence per day, despite higher consumer price levels. In real terms, these wages were thus barely sufficient for subsistence. Wages paid in Nairobi were even lower and largely comparable with the rates observed in British India. By the 1950s the gap in nominal wages between British West Africa and India had largely been closed, owing much to the increasing political clout of the Indian independence movement.

Figure 1: Unskilled urban labourers' wages in pence per day, 1880-1960 (log scale)



Source: Wage and price data from Frankema and van Waijenburg (2012).

Austin has argued that, in a context of labour and capital scarcity, the logical next step in expanding African economies was specialization in land-extensive production in agriculture and mining. Indeed, African entrepreneurs in coastal West Africa had already revealed a comparative advantage in these areas (Austin, 2013; 2015), and it was further spurred by a favorable shift in the net barter terms of trade of African export commodities that followed the British industrial revolution (Hopkins, 1973; Law, 1995; Williamson, 2011; Frankema et al., 2015). As the Atlantic slave market shrank, from 1807, the demand for industrial inputs such as palm oil, gum and oilseeds such as groundnuts rose. African producers responded to rising prices by increasing supplies. A similar transition to "legitimate commerce" began in Angola and other areas when the external slave trade was eventually suppressed there as well. In the so-called "peasant" colonies, African entrepreneurs were relatively free to mobilize and invest sufficient capital and they themselves deepened the comparative advantage in agricultural exports, notably by the adoption of the exotic crop cocoa in Nigeria and Ghana, and by pioneering the adoption of the motor lorry there.

The result was not a wholesale handicraft de-industrialization. In southeast Nigeria, during 'legitimate commerce', female weavers in the town of Akwete, just outside the palm oil exporting zone, developed a new, more expensive style of cloth for the expanding market provided by the growth of exports (Kriger, 2006, pp. 45-7). During the early colonial decades, female dyers in Abeokuta, southwest Nigeria, sold their dyed cloth to the cocoa farmers of Nigeria and Ghana (Byfield, 2002). However, there was a widespread transfer of labour from low-productivity dry-season manufacturing, especially cotton spinning but also weaving, to what was now the more rewarding activity of export agriculture. Even so, in French Soudan (Mali), handicraft weavers (most of them seasonal) fought off the competition of factory-made cloth throughout the colonial period, outbidding French merchants for the most of the colony's cotton crop as late as 1948-9 (Roberts, 1996). In East African cotton growing regions such as Uganda and Nyasaland, local cloth production fared worse, as Indian and British firms bought up nearly all the cotton. Meanwhile, foreign imports of metal and metalware were largely unchecked by artisanal production; but this was not because African iron lacked quality, but rather because African producers increasingly ran out of the charcoal they needed for smelting (Goucher, 1981).

3. The uneven spread of modern manufacturing

Modern manufacturing emerged widely during the colonial period, but in most cases the process was slow, and it remained largely confined to the production of lighter consumer goods for domestic markets. As Table 1 shows, by the end of the colonial era, excluding South Africa, the largest manufacturer in Sub-Saharan Africa was Nigeria, reflecting the fact that it had much the largest GDP, which in turn was based on a combination of by far the largest population and considerable agricultural (and some mineral) exports. As of 1960, for the sample of the larger countries shown in Table 1, the shares of manufacturing in GDP varied from 3 per cent in Tanganyika to c. 9-10 per cent in Kenya and Senegal, 14 per cent in the Belgian Congo and 16 per cent in Southern Rhodesia. In South Africa, manufacturing was about 20 per cent of a much larger GDP (Lipton, 1986, p. 402).[3] The majority of the African countries absent in Table 1 must have had shares below 5 per cent, if only because of small market size, given that locational advantage could be important. According to the same source as used for Table 1, as late as 1965 Dahomey, with a population of 2.4 million, had a 2.6 per cent share of manufacturing in GDP (albeit, Gabon with 400,000 people had 6.1 per cent) (Kilby, 1975, p. 472).

[3] Note that this figure comes from a different series from that used in Table 1.

Table 1: Manufacturing output in context for selected African countries in 1960
(US 1964 dollars)

	Manufacturing /GDP (%)	Population (millions)	GDP (m. $)	Per capita income (S)	Manufacturing output (m. $)
Southern Rhodesia (Zimbabwe)	16.0	3.6	751	206	120.2
Belgian Congo	14.0	14.1	910	58	127.4
Senegal	9.5	3.1	678	218	64.4
Kenya	9.5	8.1	641	79	60.9
Uganda	6.5	6.7	583	87	37.9
Ghana	6.3	6.8	1,503	222	94.7
Cameroun	6.0	4.7	511	109	30.6
Ethiopia	6.0	20.7	1,021	49	61.3
Northern Rhodesia (Zambia)	5.5	3.2	511	155	28.1
Côte d'Ivoire	5.3	3.2	584	181	31.0
Sudan	4.8	11.8	909	77	43.6
Nigeria	4.5	40.0	3,500	88	157.5
Angola	4.3	4.8	726	151	31.2
Tanganyika	3.0	9.6	671	67	20.1

Source: Kilby (1975, p. 472, Table 112 - Population, income and manufacturing output in selected African countries, 1960)

Most of tropical Africa's progress in manufacturing occurred after the Second World War. In general, the world wars and the Great Depression, along with the associated slowdowns in world trade, gave some impetus to local industry in various colonies, notably in East and Southeast Asia. In particular, the French response to the Depression – of pursuing autarky on an imperial scale – provided protection for manufacturing investments, as was seen with textile mills in Indochina. In Senegal a groundnut-refining industry promptly emerged (producing shelled nuts and groundnut oil). However, its growth was soon curtailed by the French government, which limited exports to France to 5,900 tonnes a year, and effectively prohibited new entries to the industry (Boone, 1992, pp. 47-9).

By the end of the Second World War, the British Colonial Office was seeking to include the promotion of manufacturing in state-supported development programs, but this was rejected by a more powerful ministry, the treasury, partly because they saw African development as a means of assisting the recovery of the British economy, rather than increasing overseas competition for British firms, and partly because they thought that any infant industries in Africa were unlikely to grow up (Butler, 1997). On the last point, a

partly similar attitude was shown by the Watson Commission, which investigated the causes of riots in the Gold Coast in 1948. While recommending an accelerated timetable for political independence, they observed: 'At every turn we were pressed with the cry of industrialisation. We doubt very much if the authors of this cry really understood more than their vague desire for something that promised wealth and higher standards of life.' While accepting that 'there is clearly room for many secondary industries which would enrich the country,' they were 'unable to foresee, in any circumstances, the Gold Coast emerging as a unit of heavy industries in the world markets' (Great Britain, 1948, p. 54).

Still, from a very low base, the 1950s saw a spurt in the growth of manufacturing across British and French Africa. In part, this responded to the growth of consumer markets, underpinned by expanded earnings from export agriculture, and in some cases also from mining wages, facilitated by the Korean War boom. In part, too, European firms were responding to the accelerated process of decolonization. British trading companies sought to establish themselves in manufacturing before they were excluded from retailing by nationalist governments. French manufacturers, though still not expecting early independence, decided on direct investment to pre-empt competition from cheaper foreign producers. In both Senegal and Nigeria, the 1950s spurt in manufacturing mainly comprised French and British companies seeking to protect existing markets (Hopkins, 1973; Kilby, 1975; Boone, 1992).

The consumer industries that spread most widely across colonial Africa were food and beverages, cigarettes, cotton textiles, footwear, furniture, soap, and perfume. Export processing of cash crops (including cotton ginning and oil-seed crushing), ore smelting, sawmilling, and cement production could also be found. Viewing industrial development in a wider sense, there was also considerable investment and works associated with the construction of railways. However, outside South Africa, and to a lesser extent Southern Rhodesia, there were only very limited developments in the iron and steel, engineering, machinery, transport equipment and chemical sectors. Hence, most of the growth in manufacturing was based on the processing of food, cash crops and raw materials; there was little production of intermediate products and virtually none of capital equipment (Kilby, 1975).

To understand the temporal and geographic disparities in the spread of manufacturing growth it is useful to consider the differences between settler, concession and peasant colonies. In the peasant colonies, land remained overwhelmingly under African ownership and control, allowing space for African entrepreneurship, albeit with European oligopolies or monopolies in some sectors. In settler and concession economies, a large or even overwhelming proportion of land was alienated, respectively, for the use of European settlers or, mainly, for European companies. The presence of relatively large European

populations broadened and deepened the market for manufactured consumer goods. In Senegal, for instance, it stimulated the growth of small factories producing carbonated drinks, biscuits and bricks as early as the 1920s (Boone, 1992, p. 48). Substantial European populations also enhanced supplies of relevant manufacturing skills (Kilby, 1975). The latter applied obviously to settler economies, but also to the part-concession, part-settler economy of the Belgian Congo and to the capital of French West Africa, Dakar. The growth of modern manufacturing in the colonial era owed much to locational cost advantages. These evolved from proximity to raw materials or from natural protection for products with high transportation costs per unit value, such as beer and cement. Until oil became readily and cheaply available, access to coal to generate electricity was a major locational advantage as well, in South Africa, Southern Rhodesia and Nigeria.

But differences in government systems in settler and non-settler colonies made a decisive difference to the extent of political and financial investment in manufacturing, and made significant differences to the outcomes. The largest manufacturing industries were created in areas where a locally resident population, albeit a white minority, controlled the government: South Africa became effectively independent within the British empire in 1910, while Southern Rhodesia became autonomous in 1923 under a parliament largely elected by settlers. In contrast, following Salazar's establishment of a dictatorship in Portugal in 1926, the large Portuguese populations in the colonies were formally excluded from government, restricting – though not extinguishing -- their ability to lobby for manufacturing or anything else (Clarence-Smith, 1989, pp. 177-8). This does much to explain why, in 1960, manufacturing constituted only 4.3 per cent of Angola's GDP. Again, Ghana, which had been a "peasant colony", or more appropriately, an "indigenous rural capitalist" colony, had the highest per capita income in tropical Africa as of 1960, but the share of manufacturing in GDP was only 6.3 per cent (Table 1).

Along with Kenya, which was basically a settler colony until the 1950s but one in which the administration remained under metropolitan control, South Africa and Southern Rhodesia had seen a determined effort by the government to make unskilled labour artificially cheap. By a series of measures mostly unavailable to pre-colonial states (even had they wanted to adopt them), the above-mentioned alliance of governments and mining companies had driven down the cost of labour to well below the reservation wage of un-coerced labour. The most important measures were the reservation of land for European use, the imposition of native direct taxes, and bans or restrictions on African tenancy: obliging Africans to offer their labour for sale (Arrighi, 1973B; Mosley, 1984; Frankema and van Waijenburg, 2012).

In South Africa, the result of systematic labour coercion was that the real wages of black gold miners were less in 1911 than they had been in the late nineteenth century, yet higher in 1911 than they would be again until the early 1970s (Lipton, 1986, p. 410). Feinstein

(2005, p. 109-12) has provided a quantitative illustration of the importance of this policy. Without it, the mining industry in South Africa would have been a fraction of its actual (historical) size, at least until the 1930s. For governments, mining revenues provided the war chest necessary for subsidizing electricity production, and if necessary other industries, in pursuit of the interests of white settlers and workers. The latter, expressing themselves through the Labour Party in South Africa, wanted the guarantee of more, and more skillful, jobs. The former were willing to pay higher prices for consumer goods if it meant a more diversified economy, less dependent on the metropole. Once the Pact government in South Africa (Nationalist and Labour), elected in 1924, had implemented protectionist measures as part of its comprehensive program of promoting manufacturing, the South Rhodesia parliament felt obliged to respond with a similar program of import-substituting industrialization, launched in 1933 (Phimister, 2000). The South African case, in particular, fits the paradigm of a "developmental state" with regard to manufacturing, though certainly not in terms of the welfare of most of the population. Afrikaner nationalism and white labour made for a highly-motivated industrial lobby. Both in South Africa and, from 1944, in Southern Rhodesia, the state subsidized the creation of iron and steel plants (cf. Fine and Rustomjee, 1996).

Manufacturing growth in the Belgian Congo was also partly driven by the consumptive demands of a sizable white minority (about 90.000 people in 1960), but primarily by the needs of the mining industry (Buelens and Cassimon, 2013). Without the 'discovery' of vast copper reserves in the Katanga province and the acute demand for it during the First World War, sending world market copper prices through the roof, the area would have been one of the least attractive places to invest in manufacturing. Katanga was underpopulated, had no wage labour markets or consumer markets of any significance, and the area was tucked away in the vast Congolese interior, a thousand miles from the Atlantic coast. But with the development of the mines, the locational disadvantage turned into a high degree of natural protection for manufacturing industries that were needed to cater to the mines and the mine-workers. That said, also in the Congo labour and land policies were key to turn copper mining into a commercially feasible proposition. The powerful mining companies, especially the *Union Minière du Haute-Katanga* (UMHK), financed the colonial state and could exert great influence on labour-recruitment practices, as it did with labour stabilization, which we will now discuss. We will return to the Congo case below to illustrate how interrupted industrial growth has worked in practice.

While the settler regimes were effective in combating the problem of a physical scarcity of labour that in itself pointed to high labour costs, cheap migrant labour was not necessarily efficient for manufacturing. Hence factories, preceded by some of the mining companies, sought to stabilize their African workforces by offering 'family' wages rather than 'bachelor' wages. Pioneered by the South African Chamber of Mines, the implementation of

this policy in South Africa – which, to be profitable, required opening semi-skilled and even some skilled jobs to blacks – was long delayed by the resistance of organized white labour. Though the white union's violent protests (the Rand Revolt) were defeated in 1923, the white Labour Party got revenge in the elections of the following year, which put them into power in coalition with the National Party: forming the government that adopted ISI as policy. After that, black workers' real wages in manufacturing did creep up somewhat, despite the rigorous repression of miners' wages (Lipton, 1986), suggesting that some stabilized labour emerged even in South Africa. Meanwhile, from the late 1920s, in Katanga the Belgian mining companies, and soon Belgian manufacturers, implemented labour stabilization, in the interests of labour productivity. This example was followed in Southern Rhodesia, especially in the 1950s (Arrighi, 1973B, pp. 216-7). Meanwhile, as independence approached in most countries, African economies remained largely dependent on imports of manufactured goods financed by exports of unprocessed primary products.

4. Interrupted growth: the case of the Congo

The development of modern manufacturing in the Belgian Congo (later known as Zaïre and Democratic Republic of Congo) presents a particularly dramatic case of interrupted industrial growth in sub-Saharan Africa, but the mechanisms steering growth, stagnation and, eventually, a full collapse, were important aspects of a wider African pattern. Among those, specific attention is required for low investment in African human capital, the strong connections between mining and manufacturing sectors, and the great vulnerability of African manufacturing to world market shocks.

Compared to the disruptive kleptocratic style of economic governance that emerged under Leopold II (until he was deposed in 1908), the industrial and infrastructural investments after the First World War (when the Congo had become a Belgian colony instead of a private royal fiefdom) contained the promise of a more sustainable road towards economic growth. GDP per capita in the Congo was distinctly higher in 1960 than in neighbouring countries (Maddison, 2010), while the Congolese population had recovered from a serious collapse and enjoyed notably higher living standards than around 1900. Part of this long-term process of welfare growth (and recovery) resulted from structural economic change.

The growth of modern manufacturing in the Congo may be loosely divided in two periods (Lacroix, 1967). During the first phase from c. 1920 to c. 1940, copper mining gained momentum, railway infrastructure expanded and commercial centres emerged. Foreign firms (mostly Belgian and British) invested in plantation cultivation of tropical cash crops such as cotton, palm oil, coffee, cacao and tobacco. To feed, clothe and house a rapidly-expanding but now stabilized male wage labour force and their families, the mines and plantations needed processed foods from grain mills and slaughter houses, beer, soap,

cotton fabrics, cement, electricity, and specific chemicals to be used in mining operations (Buelens and Cassimon, 2013, p. 234). In addition, raw copper ore also had to undergo several stages of refinement to lower transport costs per unit value.

Manufacturing growth benefitted from the phenomenal profit margins generated by the copper industry. Buelens and Marysse (2010) have estimated that the equity shares of colonial companies yielded an average annual rate of return of 7.2 per cent between 1920 and 1955, which was about 2.5 times the return on Belgian stocks (2.8 per cent). The lure of big profit also spurred investments in large-scale infrastructural projects. The Congolese railway network covered over 5,000 kilometers by the end of the colonial era, twice as much as in Nigeria (Mitchell, 2007, pp. 721-2). The inauguration of the '*voie national*' by King Albert I in 1928, connecting the mines in Katanga to the Congo river in Ilebo (Port Francqui) over a distance of about a thousand miles through the tropical forest, symbolized the intertwined forces of colonial extraction and investment.

The second phase, from 1940 to 1960, differed from the first as it entailed a move towards ISI policies (motivated by the experiences of the Depression and the Second World War), increasing investments in energy infrastructure (hydro-electricity in particular) and a modest shift in manufacturing production from consumer goods to intermediate and capital goods (iron and steel, machinery). After a severe setback during the Great Depression, when copper prices collapsed, industrial growth picked up again during the war. The Congo was an important supplier of strategic raw materials (copper, uranium) to the Allied war effort, while on the other hand, the drastically reduced availability of manufacturing supplies from Europe enhanced investments in a wide range of local industries. The index of manufacturing production in the Belgian Congo in Table 2 demonstrates the impact of the war boom and the continued acceleration of manufacturing growth during the 1950s. From the 1940s to early 1970s international copper prices were high, especially compared to the 1930s, and the Congo was well on its way to become an African economic 'powerhouse.' The number of officially registered industrial enterprises rose to about 12,000 in the early 1950s (Buelens and Cassimon, 2013, p. 237). Table 3 shows that, in comparison to the metropole (with a comparable population size of c. 10 million), the volumes of industrial production in the Belgian Congo were indeed substantial.

Table 2: Volume index of manufacturing production in the Belgian Congo, 1939-1957 (1947–1949 = 100)

Year	Food	Textiles	Chemicals	Construction	Others	Total
1939	41	21	35	19	10	29
1948	100	102	76	105	95	99
1957	296	618	473	492	387	377

Source: Centrale Bank van Belgisch-Congo en Ruanda Urundi (1959, p. 4)

We lack the space to give a detailed reconstruction of the collapse of Congolese manufacturing and offer a brief summary instead: political instability occurred almost immediately after the official transfer of power. The Katanga secession war put investments on hold and turned the newly-independent country into turmoil. Only after Mobutu had fought his way to power in 1965 did the dust start to settle for about eight years. In these early years in office, Mobutu pursued the grand development schemes which had come to the drawing table in the final years of Belgian rule (1958-60). He introduced an open door policy to foreign investors by granting tax exemptions. Foreign investors (e.g. General Motors, Good Year, Fiat) came in and industrial output grew by about 50 per cent during 1966-72 (Chomé and Komitee, 1977, p. 120). But Mobutu's investments in various mega-projects lacked economic common sense. The Inga Falls project, a gigantic hydro-power dam in the lower Congo, turned into an outright failure and became a serious drain on the government budget. The economy hit reverse gear when international copper prices went into free fall in the wake of the 1973 oil crisis.

Table 3: Industrial production in Belgium and the Belgian Congo in 1957

Commodity	Units	Belgium	Belgian Congo	Congo as % share of Belgium
Electricity	Millions KWH	12,611	2,320	*18.4*
Sugar	Tons	369,335	19,332	*5.2*
Beer	1,000 hl	10,185	1,382	*13.6*
Water & Lemonade	1,000 hl	2,966	320	*10.8*
Margarine	Tons	95,253	669	*0.7*
Cigarettes	Millions	10,546	4,045	*38.4*
Cement	Tons	4,705,000	463,952	*9.9*
Lime	Tons	29,249,000	100,460	*0.3*
Bricks	1,000	2,242,933	293,876	*13.1*
Ceramics	1,000 m^2	1,625	137	*8.4*
Shoes	1,000 pair	12,117	2,851	*23.5*
Tissues	1,000 m^2	702,105	52,982	*7.5*
Blankets	1,000 pieces	11,768	1,976	*16.8*

Source: Buelens and Cassimon (2013, Table 11.2). Data obtained from Centrale Bank van Belgisch-Congo en Ruanda-Urundi (1959).

Until the end of the twentieth century copper prices did not recover to pre-1973 levels (Abbeloos, 2013, p. 264). The shock laid bare one of the fundamental weaknesses of the Belgian colonial state: the budget relied predominantly on the direct and indirect receipts from copper exports. Mobutu's response may perhaps be best summarized as denial. He

overloaded the state with foreign debt, increasingly allowed his personal clientele to strip state assets and plunged the country in an extended period of hyperinflation from 1988 to 1996, which eroded all macro-economic conditions for a recovery. During the 1990s and early 2000s the country was caught up in endemic warfare, creating the conditions for millions of excess deaths as a result of disease and undernourishment (Prunier, 2009). Primary school enrolment rates, which had approximated 100 per cent in 1970, plummeted to under 40 per cent in 2000 (Frankema, 2013, p. 161).

To be sure, even in the context of widespread post-colonial conflict across the continent, the Congolese economic and political collapse represented a worst case. But this does not mask one of the fundamental problems of industrial growth in Africa's former concession and settler colonies: the detrimental impact of racial discrimination on the socio-economic mobility and human capital accumulation of native Africans. Forced labour programs were focused on supplying the mines and plantations with manual labour power, while higher skilled jobs and management positions were exclusively reserved for whites. The color bar was also strictly applied in education. Primary education was almost entirely left to Catholic and Protestant missionary schools. The few public schools in the larger urban centers would offer lower-grade secondary education to Congolese children, but nothing more (Depaepe and van Rompaey, 1995; Dunkerly, 2009; Frankema, 2013).

The colonial government started to reform the education system in the late 1940s, by allowing tiny numbers of Congolese children to attend European secondary schools and reducing the education monopoly of the Christian missions. Yet, ironically, when the first university opened its doors in 1954 near Leopoldville (Kinshasa), the first cohorts of Congolese students had yet to complete secondary school. By 1960 only a few hundred Congolese were in university, of whom 13 were enrolled in natural sciences and 18 in engineering (Mantels, 2007). Frankema (2013) has argued that this legacy of racial discrimination in education had a detrimental effect on the quality of post-colonial governance. After dropping out of secondary school Mobutu received a two-year training in accounting and secretarial work in the army. He was among the best educated of his generation. Technical and engineering skills were thus hardly available after the Belgians had retreated and the few highly educated Congolese usually preferred salaried careers in the public sector.

5. From import-substitution to "structural adjustment"

On the eve of independence, many African politicians anticipated that industrialization would go hand in hand with the development of new independent nation-states (Mytelka, 1989). As in other developing regions in the 1950s to 1970s, the early post-colonial African

states adopted ISI-policies in an attempt to kick-start industrial development. The policies usually consisted of a combination of infant industry protection, increased investments in key infrastructures (transport, energy) and more or less ambitious output targets to secure a rapid replacement of manufacturing imports by domestically-produced manufactures (Killick, 1978). Indeed, the key objective of ISI was to achieve self-sufficiency in the production of domestic consumer goods, rather than obtaining stakes in export markets by developing internationally-competitive industries. This development agenda was not only embraced by 'socialist' governments, notably Ghana under Nkrumah (1951-66) and Tanzania under Nyerere (1961-85): it was also subscribed to by 'capitalist' governments, such as Côte d'Ivoire under Houphouët-Boigny (1960-93). Indeed, another staunchly capitalist regime, Kenyatta's in Kenya (1964-78), adopted five-year plans to promote industrialization and adopted protectionist policies to curb import competition.

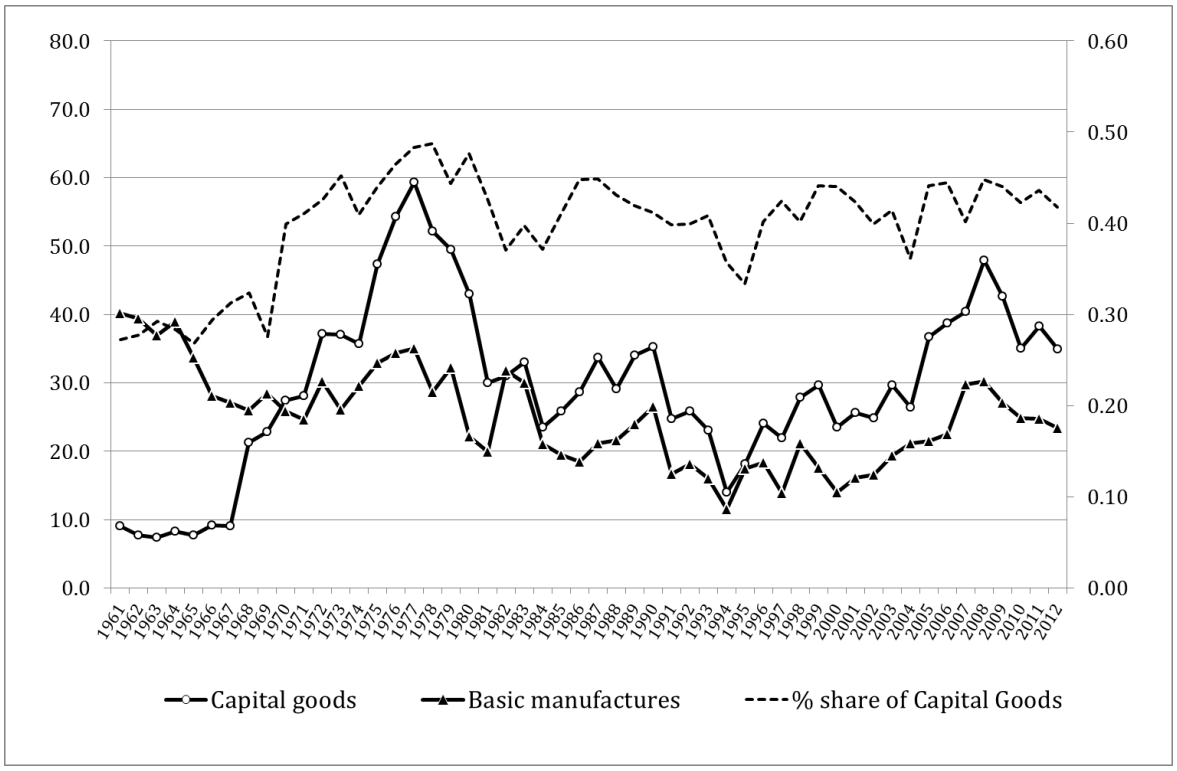
Yet there were important differences in the degree of state intervention across early post-colonial African economies. Most of the former French colonies, including Côte d'Ivoire and Cameroon, remained within the franc zone. Most of the former British colonies, together with Sekou Touré's Guinea and Congo-Zaïre, opted for monetary independence. In many cases (including Ghana, Guinea, Tanzania, Congo-Zaire, Zambia) the latter route became associated with increasingly over-valued, largely non-convertible currencies and a battery of quantity and price controls, not only on imports but also on internal markets. Structural macro-economic disequilibria eventually resulted in hyperinflation, by the 1980s. Kenya steered a middle path, with an independent currency but periodic devaluations, which largely prevented major price distortions.

In theory, currency over-valuation provided an indirect subsidy to domestic manufacturing enterprises, as it permitted them to acquire imported raw materials, intermediate goods and capital goods below world prices. This happened to some extent in Kenya, but in the likes of Ghana extreme currency over-valuation functioned as a punitive tax on exports, which not only reduced the incentive to reinvest in export agriculture, but also eroded foreign reserves and produced structural current account imbalances. This eventually resulted in acute shortages of strategic import products. Ironically, the government which made the strongest rhetorical commitment to industrialization, Ghana under Kwame Nkrumah and some of his successors, ultimately delivered less of it than those such as Côte d'Ivoire under Felix Houphouët-Boigny, whose policies merely aimed at the gradual growth of light consumer-goods industries around a continued growth of export agriculture (see Table 5, later).

In the former peasant colonies state intervention in the promotion of manufacturing represented a break with colonial economic policies. This policy reform may be called a partial success (in its defense, see Sender and Smith, 1986, pp. 67-109). Certainly it created

economic rents, facilitating the politicization of employment in public enterprises and allowing foreign as well as state enterprises to enjoy domestic markets without striving to improve their efficiency (e.g. Boone, 1992). But it also enhanced the availability of capital to local manufacturing industries and offered the latter protected access to growing (especially urban) consumer markets. To see the substitution effects of ISI policies and the associated process of capital accumulation, Figure 2 presents both the per capita value and the share of capital goods imports in total manufacturing imports in Senegal since 1961. It serves to illustrate a common pattern among ISI-adherents in Africa: after a rapid rise in capital goods imports, both in (nominal) per capita terms and as a share of manufactured imports, the economic downturn of the late 1970s to early 1990s interrupted this process of capital formation. Although the share of capital goods imports in total manufacturing imports remained higher than in the early 1960s, the declining per capita values were not replaced by increasing domestic output of capital goods.

Figure 2: Composition of Imports in Senegal, 1961-2012 (*left-hand vertical axis: per capita value of basic manufactures and capital goods in constant 1980 USD. Right-hand vertical axis: Percentage of capital goods in total imports*).



Source: United Nations, *Yearbook of International Trade Statistics* (several issues 1964-2013). Population data from UN, World Population Database, Accessed 1 October 2014. Notes: Capital goods imports corresponds to SITC 2 category 7: machinery and transport equipment. Basic manufactures corresponds to SITC 2 category 6, comprising a large range of intermediate and finished consumer manufactures such as textiles, leather, wood, cork, paper, metals and rubber products. Total manufacturing imports comprises SITS categories 5 to 8, including chemicals (5) and miscellaneous manufactures (8).

Table 4 indicates that aggregate rates of annual manufacturing growth in post-independence Sub-Saharan Africa stayed above population growth (2-3 per cent) until the start of the 1980s. Although we lack data for the colonial era, it is probably safe to say that the 1960s and 1970s saw the highest rates of growth of manufacturing during the twentieth century. At the same time it should be noted that African manufacturing industries failed to capture even a modest share of the international market for manufacturing merchandise. Exports remained largely confined to some cross-border trading among neighbours.

Table 4: Aggregate annual average growth rates of industry and manufacturing in Sub-Saharan Africa, 1961-2000

Sub-Saharan Africa	Industry (annual % growth)	Manufacturing (annual % growth)
1961–1970	7.7	8.8
1971–1980	4.0	5.1
1981–1990	1.3	1.9
1991–2000	1.3	1.1
2001-2010	4.3	3.4

Source: World Bank, *World Development Indicators* (2003). 2001-10 calculated with data from *World Development Indicators* (2013) . Jerven's calculations based on ten-year averages.

Even South Africa, where the manufacturing share in GDP surpassed agriculture and mining already by 1946, with a sizeable contribution from capital goods industries, failed to transform from a modest regional exporter of manufactures (mainly supplying its neighbors) into a global manufacturing exporter. For South African manufacturers the advantage of low-waged unskilled labour was increasingly outweighed by the disadvantages that the domestic market was restricted by the low purchasing-power of the vast majority of the population, and that skilled labour was artificially expensive: its supply being restricted by lack of investment in black education, as well as its use being curtailed by the colour bar (Lipton, 1986; Feinstein, 2005).

It is not only with reference to South Africa that it is important to take account of country-specific elements, and to emphasize the large inter-country differences in manufacturing growth, interacting with the diverging courses of African politics. Table 5 presents the growth rates of manufacturing output in 1965-88 in the most populous twelve countries in

Sub-Saharan Africa (all those with populations of ten million or more by 1988) besides South Africa. The first sub-period, 1965-73, covers ISI-policies before the first oil crisis, showing modest convergence in manufacturing on the world leaders in the majority of countries. The second sub-period, 1973-80, brought the exogenous shock of higher oil prices, offset a few years later in some countries by a boom in beverage crop prices. Much-increased oil prices enabled the governments of oil-exporting countries to increase their subsidies to manufacturing, direct or indirect, as happened in Nigeria. But in the oil-importing majority of African countries the net effects on manufacturing were negative, by reducing the capacity to import inputs, and depressing the domestic market. The third sub-period, 1980-88, captures the economic downturn in a number of African countries and includes the introduction of many of the Structural Adjustment programs.

Table 5: Average Annual Growth Rate of Manufacturing Output (%)

	1965-73	1973-80	1980-88
Sudan	..	6.7	5.0
Ethiopia	8.8	2.6	3.7
Kenya	12.4	6.9	4.6
Tanzania	8.7	2.6	-2.5
Uganda	4.0	-12.4	2.3
Nigeria	15.0	17.2	-2.9
Senegal	4.0	1.5	3.4
Ghana	6.5	-2.8	3.1
Côte d'Ivoire	10.9	8.3	8.2
Cameroon	7.4	9.0	6.2
Zaire (Congo DRC)	..	-5.7	1.7
Rhodesia/Zimbabwe	..	0.4	2.1

Source: 1965-80 from World Bank (1989, Table 2); 1980-88 from World Bank (1990, Table 2).

The third sub-period, 1980-88, shows the transition to the structural adjustment programs (SAPs): the schemes of economic liberalization promoted by the World Bank and International Monetary Fund that were voluntarily and involuntarily adopted by African governments for a range of reasons. The dates at which individual countries began 'adjustment' varied. For instance, Ghana made the move in 1983, Nigeria and Tanzania in 1986; Zambia vacillated.

The former settler economies did not escape the trend towards economic stagnation or decline that took hold in many countries at some stage in the 1970s and 1980s, albeit for different reasons. Rhodesian industry was initially stimulated by the reduced competition

it faced during the period of international sanctions imposed during the settler regime's unilateral declaration of independence from Britain in 1965, but stopped growing in the 1970s. Above all, South African manufacturing, after decades of expansion facilitated by repression of black labour (low wages, reinforced by the ban on black trade unions) and tariff protection, entered a productivity crisis primarily resulting from by the artificially high cost of skilled labour mentioned above. The marginal efficiency of investment shrank steadily during the last twenty years of apartheid (Lewis, 1990). The ingrained contradiction of the apartheid economy between the promotion of capital accumulation through artificially cheap unskilled labour, and the political incapacity to invest in the skills required to move manufacturing on to a path of rising total factor productivity, underlay the stagnation of the economy during the last fifteen years before the end of the apartheid regime in 1994 (Feinsten, 2005). This economic morass was reinforced, rather than caused, by international sanctions when they began to bite in the 1980s.

The first decade of economic liberalization was one of stagnation or net decline at the level of Sub-Saharan Africa as a whole, despite the dramatic reversal of economic shrinkage in the two most successful adjusters, Ghana and Uganda. In the majority of African countries macro-economic conditions continued to worsen, especially as a result of unmanageable debt accumulation. It took most countries until the late 1990s to reschedule their debts and implement all the liberalization and privatization programs prescribed by the Washington Consensus. Although aggregate regional GDP per capita growth picked up since the mid-1990s, the overall policy model remains the economic liberalism established in the 1980s. Within this, the region as a whole experienced at least a 'lost decade', in terms of growth of both manufacturing and GDP, to c.1995, followed by – to date – twenty years in which GDP has outpaced population, by about 2 per cent a year. The most plausible explanation for this contrast in performance under the same policy regime is that, as before, African economic growth rates primarily respond to external demand for African commodities (Jerven 2014, Jerven 2011).

While the current wave of economic expansion in Africa is more widespread and, in aggregate, apparently faster than any previous one, with the possible exception of 1890-1914, it would be unimaginable without the (this time Chinese-led) boom in the prices of primary commodities that started in the mid-1990s, after nearly two decades of price weakness (Jerven, 2010). It should be added that further technical advances in mining and oil drilling reinforced Africa's comparative advantage in extractive industries, for example by allowing re-filtering of iron ore slag in Sierra Leone and elsewhere, and permitting deep-water oil drilling off West Africa. The South African economy has also resumed growth since the advent of majority rule in 1994, but at a very modest rate, despite South African companies taking advantage of the opportunity to enter markets in the rest of Africa on a much larger scale than before. Manufacturing, overall, has expanded in absolute terms but

declined in relative terms (UNECA, 2013). This is not very surprising given that the problem of a lack of international competitiveness in manufacturing has not been resolved: how would these industries thrive without a shield?

6. Will manufacturing sustain Africa's growth revival?

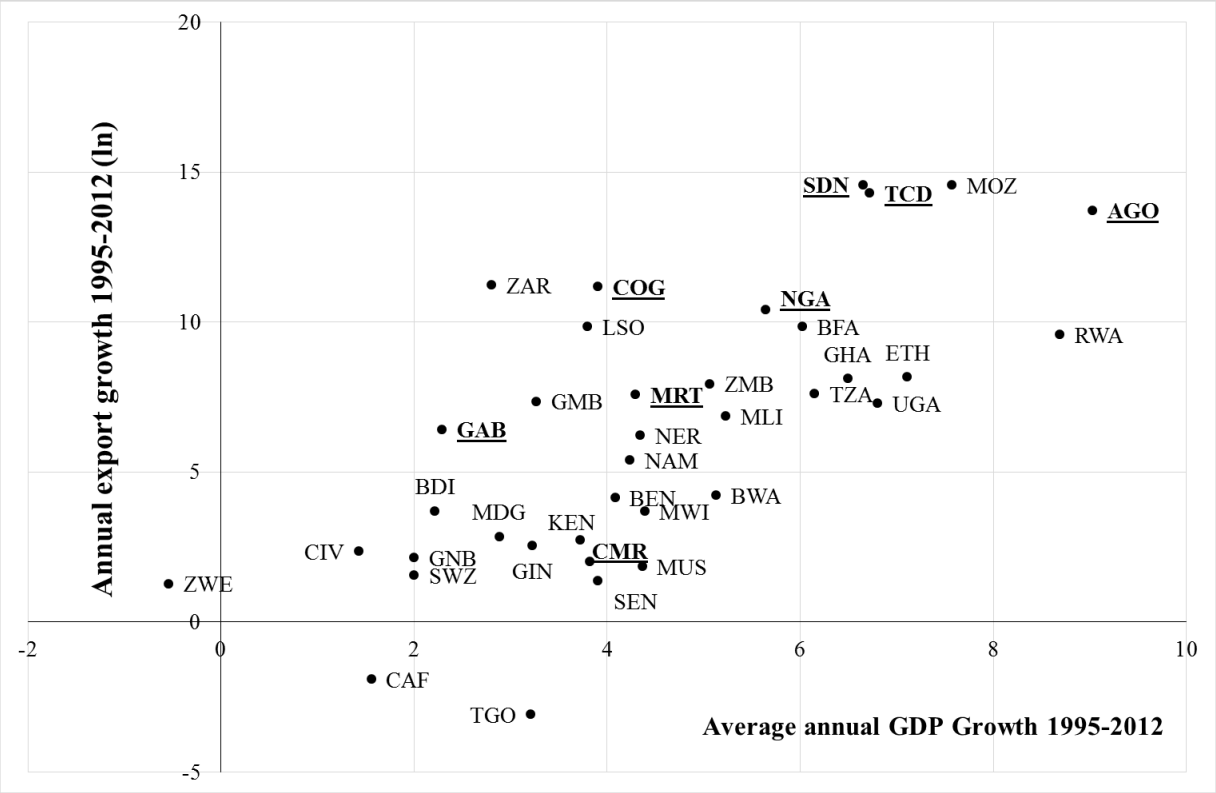
Despite Africa's long history of labour scarcity, factor endowments have been moving, and continue to move, in a direction that facilitates labour-intensive industrialization. Population rose six times over the twentieth century, and population growth rates accelerated especially after 1945. Moreover, increasing investment in education and public health counts as one of the biggest achievements of post-independence governments (Sender, 1999): poor though the African record still looks in cross-sectional terms, it was much better in 1980 than in 1960, and, despite retrogression in some countries during economic liberalization in the 1980s, on the whole there has been further progress since the mid-1990s. Yet, to date, Africa's growth revivial has not been led by labour-intensive manufacturing, but rather, as with earlier growth episodes, by commodity exports (Jerven 2010).

Figure 3 shows the correlation between average annual GDP per capita growth and the lognormal average of export growth for 38 African countries south of the Sahara between 1995 and 2012. The figure shows that the performance of the major oil-exporters (marked in bold in the figure), was not distinctively better than that of the net oil-importers, although the overall share of oil exports in total African exports has been increasing sharply since 1995 (Frankema and van Waijenburg, 2015). Even so, with the partial exception of Mauritius (see below), manufacturing exports have not played a significant role in this export boom.

Though there is fragmentary evidence that labour costs in Africa have fallen relative to other parts of the world, Teal's comparison of Ghana and Mauritius at the end of the last century (Teal 1999) illustrates a generalization that still largely applies today: without significant advances in labour productivity, continental African real wages remain too high to be internationally competitive in manufacturing. Teal estimated that the wages paid in Mauritius, the sugar plantation economy that did transform successfully into a manufacturing exporter (mainly of textiles) after 1970, were about six times higher than in Ghana, but that this gap was still insufficient to offset a labour productivity gap of over 600 per cent (1999, p. 991). It is not encouraging to note, however, that even the Mauritian textile industry has struggled since, in the face of intensified competition (Joomun, 2006). The industry's share of Mauritian exports declined from 55 per cent in 1995 to 16 per cent in 2010; a fall in the overall contribution of manufacturing to exports that was only partly

compensated by a rise in 'miscellaneous manufactured goods' from 0 to 20 per centu of exports during the same years (Sannassee et al., 2014).

Figure 3: Average annual GDP growth (%) and average annual export growth (ln), 1995-2012

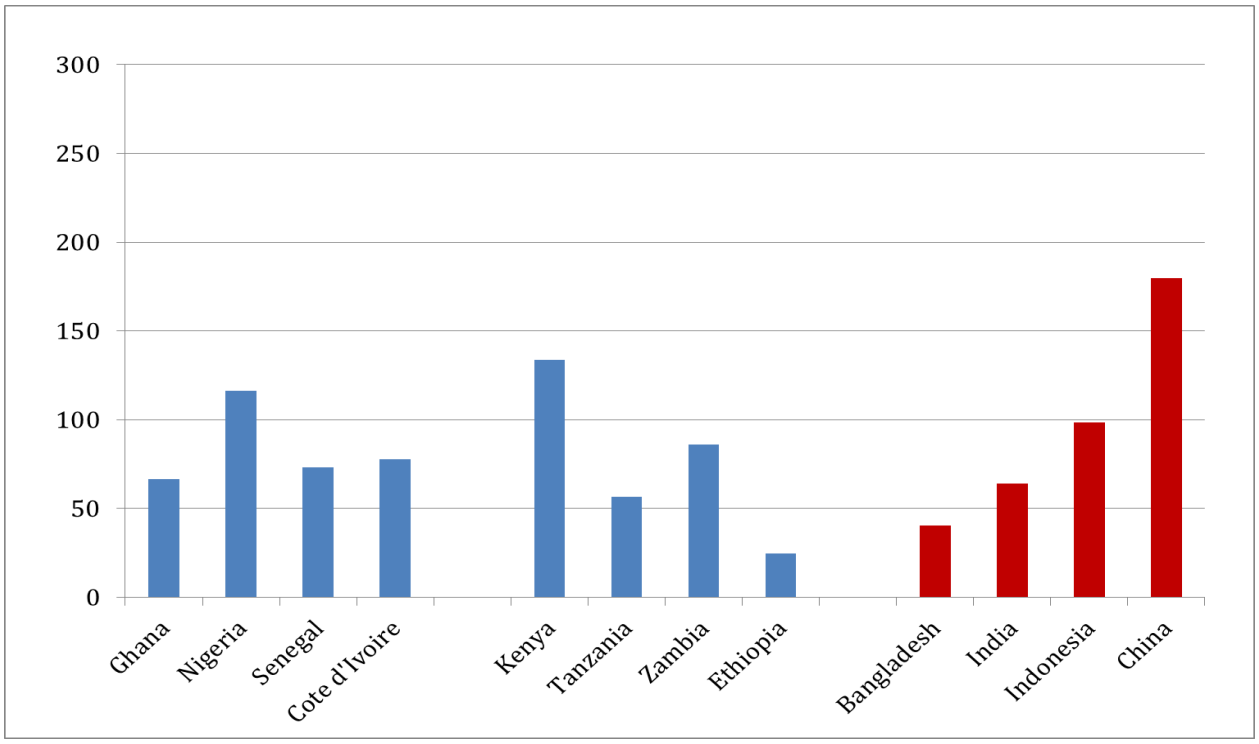


Sources: Scatterplot from Frankema and van Waijenburg (2015). Annual average uncompounded GDP growth 1995-2012 from African Development Indicators (2014). Data for the years 2011 and 2012 from IMF (2012). Annual average uncompounded export growth 1995-2012 from UNCTAD (2014). Bold indicates economies for whom oil is a major export. Countries included: **(AGO) Angola**; (BEN) Benin; (BWA) Botswana; (BFA) Burkina Faso; (BDI) Burundi; **(CMR) Cameroon**; (CAF) Central African Republic; **(TCD) Chad**; (ZAR) Congo, Dem. Rep.; **(COG) Congo, Rep.**; (CIV) Côte d'Ivoire; (ETH) Ethiopia; (GAB) Gabon; (GMB) The Gambia; (GHA) Ghana; (GIN) Guinea; (GNB) Guinea-Bissau; (KEN) Kenya; (LSO) Lesotho; (MDG) Madagascar; (MWI) Malawi; (MLI) Mali; **(MRT) Mauritania**; (MUS) Mauritius; (MOZ) Mozambique; (NAM) Namibia; (NER) Niger; **(NGA) Nigeria**; (RWA) Rwanda; (SEN) Senegal; **(SDN) Sudan**; (SWZ) Swaziland; (TZA) Tanzania; (TGO) Togo; (UGA); Uganda; (ZMB) Zambia; (ZWE) Zimbabwe.

Figure 4 shows the official minimum monthly wages in 2010-11 for a selection of African and Asian countries, expressed in US dollars using official exchange rates. While the enforcement of minimum wage legislation probably varies across the sample, the figure shows that there is no apparent clear-cut labour cost advantage in African economies

compared to emerging Asian economies such as India or Vietnam. In some cases (notably Kenya and Nigeria) the minimum wages are even distinctively higher. Chinese wages have only recently surpassed the upper levels in Sub-Saharan Africa. The reasons for this are unclear. Exchange rate overvaluation may explain part of this phenomenon, but it can hardly be the result of trade union power, which is generally weak in the neo-liberal era, and if 'efficiency wages' are being paid (wage premiums to encourage worker commitment in the absence of cheap and effective supervision), as has been suggested (Austin, 2013, p. 219), they have yet to have a discernible effect at the macro level.

Figure 4: Minimum wages in a selection of African and Asian countries, 2010-11 (US$ per month)



Source: Official minimum nominal monthly wages taken from ILOSTAT, converted into US Dollars using exchange rates from World Development Indicators (2014).

It remains extremely hard to pin down to what extent other sources than commodity exports are driving African growth. Having examined survey data on real material consumption per household for 1990-2006 – thus including several years before the start of the boom indicated by the GDP figures -- Young (2012) found that such consumption was growing fast enough (3.4-3.7 per cent per year) for him to proclaim an 'African growth

miracle'. But other studies take a more cautious approach. McMillan and Harttgen (2014) report that part of recent African growth stems from structural change, but also note that structural change in Africa does not follow the 'classic' historical pattern. The share of the labour force employed in agriculture in African countries declined on average by 10 per cent between 2000 and 2010, but only a fifth of this decline was absorbed by manufacturing. The rest went into services, formal and informal. As people move out of the lowest productivity sector, agriculture, structural change contributes to growth (see also Diao and McMillan, 2015). Yet, to what extent consumption growth and structural change operate independently from the commodity export boom remains difficult to assess.

Surely, the rising concentration of Africans in urban centres opens up new opportunities for scale economies and specialization, including a 'von Thunen' type of agricultural transformation in the vicinity of growing consumer markets, which may be further supported by the recent 'communication revolution' which releases spatial constraints that were innate to the historically dispersed settlement patterns in the region (Frankema, 2014, pp. 22-3). Rodrik's view is largely in line with the historical account we have provided:

> the African pattern of structural change is very different from the classic pattern that has produced high growth in Asia, and before that, the European industrializers. Labor is moving out of agriculture and rural areas. But formal manufacturing industries are not the main beneficiary. Urban migrants are being absorbed largely into services that are not particularly productive and into informal activities. The pace of industrialization is much too slow for the convergence dynamics to play out in full force (Rodrik 2014, p. 9).

If African real wages continue to fall relative to those in the current 'workshop of the world', China, there remains the question of whether entrepreneurs will convert this into manufacturing growth. Foreign direct investment (FDI) has been rising recently, some of it in the traditional form of Western-owned breweries for domestic markets, but also export-oriented shoe and cotton yarn factories in Ethiopia, owned by Chinese and Indian participants. The explanation for the apparent rise of Ethiopia as the first African country to attract considerable inflows of (Asian) FDI in modern labour-intensive manufacturing industries may be historical: Ethiopia represents the oldest peasant society south of the Sahara, has by far the longest record of state centralization, and was one of the two countries that remained independent from European colonial rule. Moreover, its relatively high population densities currently convert into relatively low minimum wages (Figure 4). It is not inconceivable that the exceptional historical path of Ethiopian 'development' has given rise to a favourable combination of labour costs, discipline and diligence, that is hard to find elsewhere in the continent (Frankema and van Waijenburg, 2015).

FDI in extractive industries in Africa has also increased, especially in oil. In the past, trans-national corporations investing in Africa had a capital-intensive bias, reflecting not local labour-market conditions, whatever they were, so much as their own habit of using the same techniques of production wherever they operated (Arrighi, 1973A, p. 113). This habit may be a liability in the context of falling costs of labour, including skilled labour, if that really comes about. As comparative experience shows, it is difficult to maximize productivity without congruence between the technologies employed and the resources and culture of the economies and societies in which the investment takes place (Abramowitz, 1986). African enterprise has the advantage of offering potentially greater linkages with the rest of the economy than foreign investment (even including investment by foreign minorities, such as Indians and Levantines in East and West Africa respectively, and now Chinese almost all over the sub-continent). But it is perhaps only in Nigeria that there is a history going back even thirty years of private (not privatized) factories employing several hundred people under African ownership (Forrest, 1994). African capitalists are mostly small-scale, whether in trade, agriculture or manufacturing.

On the latter, an important feature of the last century was the emergence of new forms of small-scale manufacturing, such as motor repairs and motor parts. These are part of growth stories in Nigerian and Ghanaian industrial enterprise that have not shown up clearly in the national income accounts (Dawson, 1991; Forrest, 1994). The Ghana population census of 2000 recorded just over one million people working in manufacturing, just over half of them women. Whatever their actual contribution to national output, small firms in Africa today, as in the colonial era, operate almost invariably in markets characterized by low entry costs and 'excess competition', making it hard to accumulate profits (Austin, 2013). So far, African firms may occasionally be created big, but they rarely start small and grow big; and, again with the partial exception of Nigeria, they rarely outlive their founders (Iliffe, 1983).

To judge both from African and East Asian history, if there is one thing that could assist both foreign and indigenous manufacturing enterprises in Africa, it would be the presence of states with the capacity and dedication to promote structural change in the cause of long-term growth. Mkandawire (2001) has argued plausibly that the absence of the 'developmental state' in Africa has been exaggerated. Several of the current governments in the sub-continent may be viewed as 'developmental'. The most populous country, Nigeria, is among those in which the state is still a long way from delivering certain basic public goods, such as security and, even for urban areas, reliable electricity. Clearly, there is much neglected business for many African governments to undertake if they want to facilitate the growth of manufacturing.

7. Conclusion

We have reviewed the progress of manufacturing in the colonial and post-colonial economies of Sub-Saharan Africa in the framework of the interactions between the region's specific endowment structures, global economic relationships and government policies. In a diverse sub-continent, it is possible to make the following nine generalizations about 'the' African case within the global spread of modern manufacturing. First, as of c.1900 resource endowments – both in terms of aggregate factor ratios (land abundance, labour scarcity), and on a disaggregated view (powerful environmental obstacles to the full utilization of the land and labour) – favoured neither a Western-style capital-intensive route of development, nor an East Asian-style labour-intensive one. This helps explain the second feature, a striking discontinuity between handicraft and machine-based production: artisanal manufacturing had been based primarily on a seasonal abundance of labour which was reduced or eliminated by the growth of primary-product exports, while factories were implanted from outside – where they were introduced at all. Handloom weaving, in particular, survived in some areas, but thrived mostly where its difference from factory-made cloth could be maximized, by artisans specializing in luxury handmade products. Third, in the decades before the European Scramble for Africa, African producers – especially but not exclusively in West Africa – were already responding to the export opportunities created by industrialization in the West in ways that revealed a deepening comparative advantage in land-extensive agriculture and mining. Fourth, colonial governments reinforced that specialization, notably through their infrastructural investments and regulations.

It is thus unsurprising that, fifth, only independent or self-governing regimes invested heavily in promoting manufacturing, whether calculating that it was possible to shift the comparative advantage of the country concerned to industry, or simply in the hope that defying the existing pattern of comparative advantage would not be costly. The first such regimes were the white-minority governments of South Africa and Southern Rhodesia, which adopted import-substitution industrialization having already taken drastically coercive measures to reduce the cost of African unskilled labour. They achieved considerable manufacturing growth, especially South Africa. But labour repression contained its own limitations: the early growth was replaced by stagnation, in the 1980s, by when productivity growth was stymied by the high cost of artificially-scarce skilled labour. Elsewhere in Africa, many of the majority-rule governments that followed the colonial regimes that departed around 1960 also embarked on import-substitution industrialization, in defiance of relatively high labour costs, and generally without the resources or commitment to carry it through.

Our sixth generalization is that the main achievement of these governments was better provision of education and health services, which greatly improved upon the modest

achievements of colonial governments in increasing the supply, and improving the preparation, of future workers. Seventh, colonial companies and governments, sooner or later, undertook policies of labour stabilization: paying higher wages to enable migrant male workers to become, with their families, permanent urban dwellers. This move in itself made sense from the perspective of both capital- and labour-intensive paths of development. The former path required skilled or semi-skilled workers which an itinerant, shifting workforce could not supply. The labour-intensive path entails cheap labour as a starting point, but goes on to require investments in labour quality (Austin and Sugihara, 2013). Eighth, so far large foreign companies have tended to use in Africa the capital-intensive technologies they apply elsewhere, without worrying about congruence with local conditions. It remains to be seen whether, helped by a relatively cheaper and better-educated workforce, this approach will contribute to more sustained industrial growth in future. Finally, while private African manufacturing enterprises are mostly small, occasionally (in Nigeria) medium-sized, they tend already to be labour-intensive, befitting the direction of change in factor ratios, towards labour-abundance. But they surely need government interventions to make it easier for them to accumulate profits, especially by the provision of public goods, if they are to be a leading force in a twenty-first century industrialization of Africa.

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