

STRUCTURAL CHANGE IN A POOR AFRICAN COUNTRY: NEW HISTORICAL EVIDENCE FROM GHANA

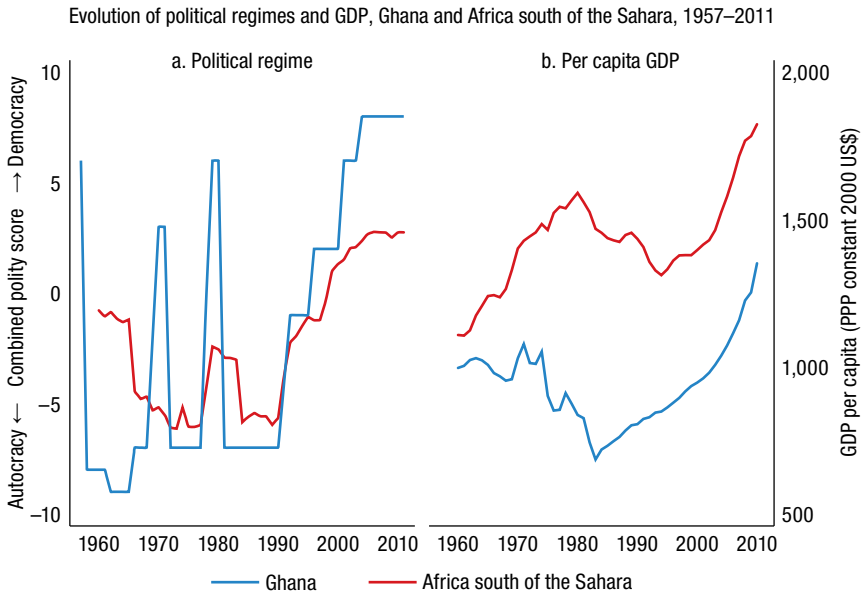
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Each country has its own story of how it developed, but at the regional level, some stark patterns stand out. For Asia, the development path was rather traditional, with the decline of agriculture and the rise of manufacturing (that is, industrialization) and services. In fact, it is the path that eight high-performing Asian economies followed between 1960 and 1990 to reach rapid, sustained, and inclusive growth rates—higher than those of all other regions—earning the title the “East Asian miracle.”

But for Africa, the development path has been quite different. It, too, saw a decline in agriculture, but it still lacks a vibrant manufacturing sector. There is reason to believe that a major culprit is insufficient growth in labor productivity, which is composed of a “within” component (changes in productivity within a sector) and a “structural change component” (changes in productivity resulting from labor movements across sectors).

To shed more light on the African story, a good case study is Ghana. It is one of a handful of countries in Africa that has sufficient data on sectoral productivity and employment over a long period. But it is also a fascinating case of structural change in a poor African country for a variety of reasons.

- Ghana’s political progression has often been a leading indicator of the rest of Africa’s political evolution (Figure 4.1). It was the first country in Africa south of the Sahara to gain independence (1957), quickly becoming a single-party autocracy. With the overthrow of Kwame Nkrumah in 1966, there were a series of military coups and fragile political regimes, followed by a transition to democracy in 1992. Ghana is now one of the most democratic African countries.
- Ghana’s economic progression has been a leading indicator of the rest of Africa’s economic evolution. It evolved from postindependence reliance on natural resource exports—like cocoa, mining (mostly gold), and timber—to

FIGURE 4.1 A harbinger of political and economic changes in Africa

Sources: Maddison (2008), World Bank (2010), and Polity IV (2013).

Notes: Panel (a) plots the combined polity score for Africa south of the Sahara (population-weighted average) and Ghana. Polity IV defines three regime categories: autocracies (–10 to –6), anocracies (–5 to +5), and democracies (+6 to +10). There were only four independent countries in the region before 1960. Panel (b) plots gross domestic product (GDP) per capita (purchasing power parity (PPP), constant 2000 US\$) for Africa south of the Sahara and Ghana.

import-substitution industrialization (ISI) and a bigger role for government in the 1960s. Then income declined in the 1970s and early 1980s (Figure 4.1), as a result of macroeconomic disequilibria and austerity measures adopted to reduce the mounting public deficits. This decline was followed by renewed growth after two structural adjustment programs (1983 and 1987–89), and accelerating growth after a post-2000 improvement in the business environment and a commodity price boom. Ghana is now an African transition economy, along with Senegal, Kenya, and Mozambique (McKinsey Global Institute 2011).

- Ghana is also very much a “work in progress.” Despite enormous progress in the past 20 years, the economy remains highly dependent upon natural resource exports, the manufacturing sector is still uncompetitive, and the socioeconomic indicators are not good—in 2013, Ghana ranked 138 out of 177 countries on the Human Development Index. With a still fast-growing population, jobs (especially for youth) are difficult to find,

and a large part of the population is underemployed. In addition, income inequality is rising.

- Plus, Sir Arthur Lewis, the intellectual father of structural transformation, not only wrote a report on Ghana's industrialization (Lewis 1954b) but also was the country's first chief economic advisor (1957–1958).

We already know from McMillan and Rodrik (2011) that, drawing on data for 38 countries (29 developing and 9 high-income) in 1990–2005, structural change was growth enhancing in Asia and growth reducing in Africa. That means that economic growth in Africa was driven by the within-sector component. We also know that in a later study of Africa, using data for 19 countries from 1990 to 2010, McMillan (2013) finds that while structural change was growth reducing in 1990–1999, it was growth enhancing in 2000–2010. As productivity also increased within sectors, the within-sector and structural change channels combined to dramatically increase productivity, which was the basis of what is now being termed the “African growth miracle” (Young 2012).

For developed countries, structural change has been a fundamental driver of long-term development (Duarte and Restuccia 2010; Herrendorf, Rogerson, and Valentinyi 2011). But we know now that the lack of it can lead to poverty traps. As Matusyama (2008) puts it: “Productivity growth can cause structural change, which in turn leads to further growth in productivity. The circular causality, however, is a double-edged sword, as the lack of productivity growth and the lack of structural change can reinforce each other, creating the vicious cycle of poverty.” However, if productivity increases sufficiently within sectors, the lack of structural change may not be a major constraint to economic development.

This chapter begins with a conceptual framework to analyze structural changes in poor countries. and then describes the broad patterns of economic and structural change in Ghana from 1957 to date, before focusing in on the agricultural, industrial, and service sectors. Next, we document the relationship between structural change and economic growth in Ghana, and then discuss the role of public policies in promoting structural change in Ghana and the future outlook.

Our findings—which draw on new sectoral employment and value-added data over 50 years (1960–2010)—suggest that until 1992, aggregate income changes were mostly driven by changes in the productivity of specific sectors, rather than structural change. While real GDP per capita growth ranged from about -4 to $+3$ percent per year during 1960–1992, the contribution

of structural change remained almost nil. But over time, structural change has become a significant factor of productivity growth, as many agricultural workers were absorbed by the (relatively more productive) industrial and service sectors. Labor productivity has grown at 3.0 percent per year post-1992, and about 50 percent of that growth—1.6 percent per year—came from structural change. This confirms that structural change has been growth enhancing in Ghana, too. However, our results also suggest that the “nature” of structural change in Ghana remains different from that in other successful developing countries, in that it has occurred without a green revolution, an industrial revolution, or a service revolution of the types seen, for example, in Asia. Moreover, going forward, there is still a lot of room for further structural change to help Ghana realize its full potential.

The Many Forms of Structural Change

So how can we interpret the types of structural changes that occur in poor countries, and how these changes feed into economic growth? Let us begin with the standard model and then explore some other possibilities.

Standard Model of Structural Change: Labor Push versus Labor Pull

Most countries follow a standard pattern: structural change is a by-product of either a push from agricultural productivity growth or a pull from industrial productivity growth.

Positive rural push (“labor push”): In poor countries, large fractions of land and labor are devoted to producing food for subsistence needs (Schultz 1953; Gollin, Parente, and Rogerson 2002). This “food problem” prevents the reallocation of productive resources to other sectors. The “labor push” approach shows how a rise in food productivity—a “green revolution”—reduces the food problem and releases labor to the modern sector (Matsuyama 1992; Caselli and Coleman II 2001; Gollin, Parente, and Rogerson 2002). Likewise, consistent with Engel’s Law, a rise in agricultural productivity and higher rural incomes lead to a greater demand for non-foodstuffs (that is, goods and services produced in the urban areas) (Jedwab 2013; Voigtländer and Voth 2013). This rural push is positive for growth when it leads to higher agricultural wages, lower food prices, and greater employment in the modern sector.

Positive urban pull (“labor pull”): In this case, a rise in manufacturing productivity—an “industrial revolution”—attracts underemployed labor from agriculture into the industrial sector (Lewis 1954a; Harris and Todaro 1970;

Hansen and Prescott 2002; Lucas 2004). In the long run, developed countries deindustrialize and specialize in tradable services (Herrendorf, Rogerson, and Valentinyi 2011; Buera and Kaboski 2012). However, developing countries can also specialize in, and export, tradable services (Gollin, Jedwab, and Vollrath 2015). The “service revolution” becomes another factor of the labor pull.¹

Other Labor Push and Labor Pull Factors

In the case of Africa, however, these models are not sufficient to explain the apparent nature of structural change that it has undergone—that is, low income growth, nonindustrialization, and the rise of services. Four theories have emerged to account for these facts (see Jedwab and Vollrath 2015, for a recent survey of these theories).

Less positive urban pull: It is possible for an economy to undergo structural change without any changes in agricultural, manufacturing, and service productivity if the country experiences a “natural resource revolution” (Jedwab 2013; Gollin, Jedwab, and Vollrath 2015). If resource windfalls are spent on manufactured goods and services, this creates opportunities in the modern sector. Resource-rich countries can use their trade surplus to import food. And if these countries also systematically import manufactured goods, structural change does not lead to industrialization, leaving the modern sector to consist of nontradable services.

Negative urban pull: If there is urbanization without economic growth, the excessive urbanization is often attributed to the urban-biased policies (agricultural taxation, public employment in the manufacturing and service sectors, and food price subsidies). These urban pull factors can lead to structural change in the form of “overurbanization” (Lipton 1977; Bates 1981), which some studies contend has occurred in Africa (Bairoch 1988; Fay and Opal 2000). This theory is consistent with the previous theory, except in this case the resource rents are captured by the government and used to generate public employment.

Negative rural push: Rural poverty (whether it is the result of agricultural taxation or not), land pressure (stemming from demographic growth), and man-made or natural disasters (like wars or climate change) constitute rural push

1 It is assumed that there is no food problem and labor can be reallocated to the modern sector. This could occur because (1) there could be surplus labor in the food sector, (2) the industrial revolution could be preceded by a green revolution, (3) an industrial revolution could facilitate the modernization of agriculture, or (4) a country could import food. This urban pull is positive for growth when it leads to greater employment in the modern sector and less underemployment or higher wages in the agriculture sector.

factors feeding rural exodus (Barrios, Bertinelli, and Strobl 2006; Poelhekke 2010). A relative decrease in the agricultural wage leads to structural change, as migrants flock to the cities and seek employment in the modern sector. If they are unskilled, they will work in the low-productivity service sectors.

Negative urban push: Structural change out of (rural) agriculture and into the (urban) modern sector implies that labor reallocation is associated with migration. But another source of urban growth can be a natural increase in population, stemming from a combination of high urban fertility and lower urban mortality because of the epidemiological transition. Indeed, two studies find that this natural increase causes the population of African cities to double every 15 years (Jedwab, Christiaensen, and Gindelsky 2015b; Jedwab and Vollrath 2015a). These labor supply shocks may have been absorbed by the low-productivity service sectors.

Type of Structural Change and Economic Growth

What is the tie-in with growth? Per capita GDP is a function of the employment-to-population ratio and overall productivity (the average productivity of each worker). If the employment ratio is stable, the evolution of per capita GDP is driven by changes in labor productivity. Overall productivity increases if either some sectors become more productive (the “within-sector” channel) or labor moves to higher-productivity sectors (the “structural change” channel). The latter implies that labor was somewhat misallocated before. This could be the result of institutional barriers to entry in the modern sector (for example, state ownership of plants in China and licensing in India, as in Hsieh and Klenow 2009). Or it could be the result of sectoral differences in the production function—for example, agricultural productivity could be low because of a lack of a green revolution. Farmworkers may not move into the more productive modern sector if that sector is skill intensive and cannot absorb the surplus labor.

The six push–pull theories described above lead to various predictions regarding the effects of structural change on growth. The standard labor push and labor pull are always growth enhancing.

- With *positive rural push*, as food productivity increases, the demand for nonfood goods also increases and the modern sector expands. If wages are relatively higher in the modern sector, structural change is growth enhancing.
- With *positive urban pull*, the rise in manufacturing productivity and wages leads to an enlargement of this sector, and structural change is growth enhancing.

However, the story is different for the nonstandard factors, which may be either growth enhancing or growth reducing, and may be only briefly growth enhancing:

- **Other pull factors (negative urban and less positive urban pull):** In the resource-rich or urban-biased economies, the consumption of resource and nonresource rents on nonagricultural goods increases wages and employment in the modern sector. Structural change is growth enhancing, but these effects may not last long. If the quality of institutions is low and manufactured goods are imported, structural change occurs through an expansion of low-productivity services (like a bloated government sector).
- **Other push factors (negative urban and negative rural push):** Rural poverty and the natural increase in the urban population lead to labor supply shocks that must be absorbed by the modern sector. Structural change is growth enhancing if the urban wage is relatively higher for the rural migrants. However, it is growth enhancing simply because the rural wage had previously decreased. Structural change is then clearly growth reducing if the urban natural increase is absorbed by low-productivity service sectors.

How Ghana's Economy Has Evolved since Independence

Focusing in now on Ghana, let us trace how the economy has developed and evolved at the aggregate and sectoral levels since independence. This section helps identify 1992 as the year when the nature of structural change was modified in Ghana.²

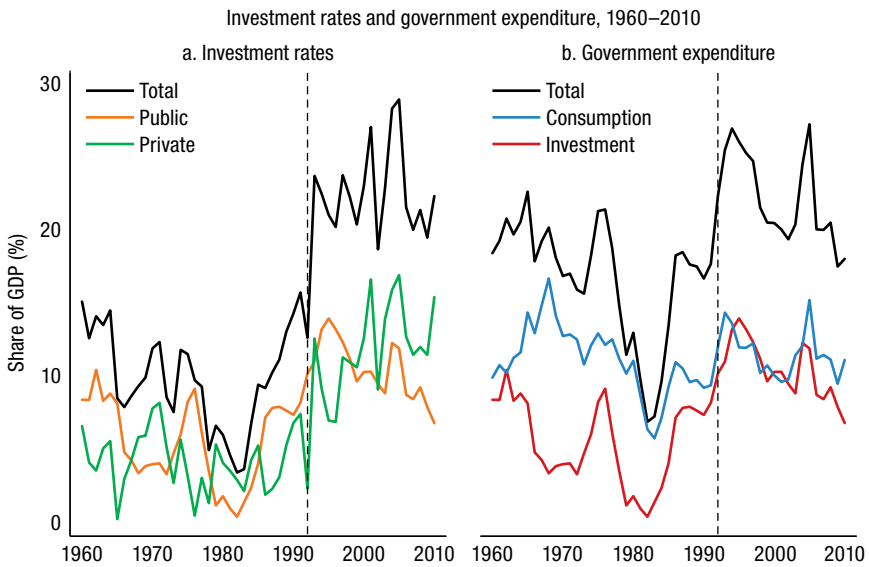
1957: At independence, Ghana was one of the most developed African countries, in part thanks to the boom in cocoa production, which made it one of the leaders of the “cash crop revolution” (Hill 1963; Teal 2002; Jedwab 2013). Sir Arthur Lewis (1954b) believed that Ghana could not develop without ISI, yet pursuing this strategy was not possible in the 1950s (Pickett and Shaeldin 1990; Agyeman-Duah 2008). First, wages were high because land was relatively abundant, there was no agricultural labor surplus, and developing labor-intensive manufacturing implied that the country primarily needed a “vigorous agricultural program.” Although Lewis is often described as

2 This section draws on Aryeetey, Harrigan, and Nissanke (2000); Agyeman-Duah (2008); and Breisinger et al. (2011).

supporting the labor pull hypothesis and industrialist policies, at that point he thought that labor push factors were more important. Second, there were not enough skilled people, so developing capital-intensive manufacturing was not a sound economic strategy. Instead, Lewis encouraged the government to increase agricultural productivity and lay the foundations for future industrialization. By providing infrastructure and investing in human capital, it would be possible to create a larger and more productive labor force.

1957–1966: When Kwame Nkrumah took power in 1957, his government adopted a capital-intensive ISI strategy. This strategy was in line with Lewis' model of development, but contradicted his recommendations to be more patient. The rationale behind Nkrumah's policy was that the surplus from the cocoa sector had to be used to expand the industrial sector. But faced with coordination failures, only an enlightened leader could implement this massive industrial policy. Another benefit of a strong state was that it promoted nation building in a context of marked ethnic fractionalization. As it turned out, investment rates increased but, as Figure 4.2 shows, this was driven by public investments (in 1966 there were 53 state enterprises and 12 public boards) (Agyeman-Duah 2008). Government consumption increased, as the number of public employees rose from 140,000 in 1957 to 280,000 in 1965. However, these investments had no impact on per capita GDP because of misguided investment decisions, mismanagement, and the inflationary effect of import restrictions. When cocoa prices collapsed in 1965, the government relied on printing money and public debt. Nkrumah was overthrown in 1966.

1966–1981: The Nkrumah presidency was followed by a succession of military coups and fragile political regimes, which were interrupted by short democratic episodes. The National Liberation Council (NLC) was composed of army officers and assumed executive power until 1969, when Kofi Busia was democratically elected. Busia was overthrown by another army coup in 1972, and Colonel Acheampong became the new head of state. Although Nkrumah was held responsible for the lack of economic growth before 1966, the following NLC, Busia, and Acheampong governments all adopted the same policies, with a more limited budget. Government consumption remained high (Figure 4.2). At the same time, the country accumulated debt, inflation was soaring, and private investment was collapsing. Population growth was high as mortality dropped, and urban natural increase became a major factor of urban growth (Jedwab, Christiaensen, and Gindelsky 2015). Between 1974 and 1983, per capita income declined by 34.9 percent (Figure 4.1), hitting both the (rural) agriculture sector and the (urban) modern sector.

FIGURE 4.2 Private investment starts to lead in the 2000s

Source: Statistical Yearbooks of Ghana 1961–1970, CBS (1970), Ewusi (1986), Aryeetey and Fosu (2002), and World Bank (2010).

Note: Panel (a) plots the investment rates for Ghana as a whole (defined as the share of gross fixed capital formation in gross domestic product (GDP)), and separately for the private and public sectors. Panel (b) plots the share of total government expenditure in GDP. Total government expenditure can be separated into government consumption (recurrent expenditure) and government investment (development expenditure, as already shown in Panel (a)). The vertical dashed line is for 1992, the year when the nature of structural change was modified in Ghana.

1981–2001: When Jerry Rawlings came to power after two coups in 1979 and 1981, he also thought that the bleak economic picture reflected mismanagement rather than poor policies (Agyeman-Duah 2008). Ghana was as poor as in 1939. Cocoa production had collapsed; the manufacturing sector was severely affected by cronyism, import restrictions, and price controls; and infrastructure was in a dire state. Moreover, Ghana had just been hit by the worst drought in 50 years, it was suffering from hyperinflation, and the state was bankrupt. The repatriation of about 1 million Ghanaians from Nigeria further heightened economic, political, and social pressures (Killick 2010). Rawlings had no choice but to implement the Economic Recovery Program in 1983, a structural adjustment program (SAP) under the guidance of international organizations. The government reduced expenditure while creating incentives for the development of the private sector (such as abolishing price controls and import restrictions). From 1987 to 1989, state enterprises were privatized and the currency was devalued. The urban sector was particularly

affected by the SAPs, as in most African countries (Potts 1995). The economy slowly recovered though (Figure 4.1), and Rawlings was democratically elected in 1992 and re-elected in 1996.

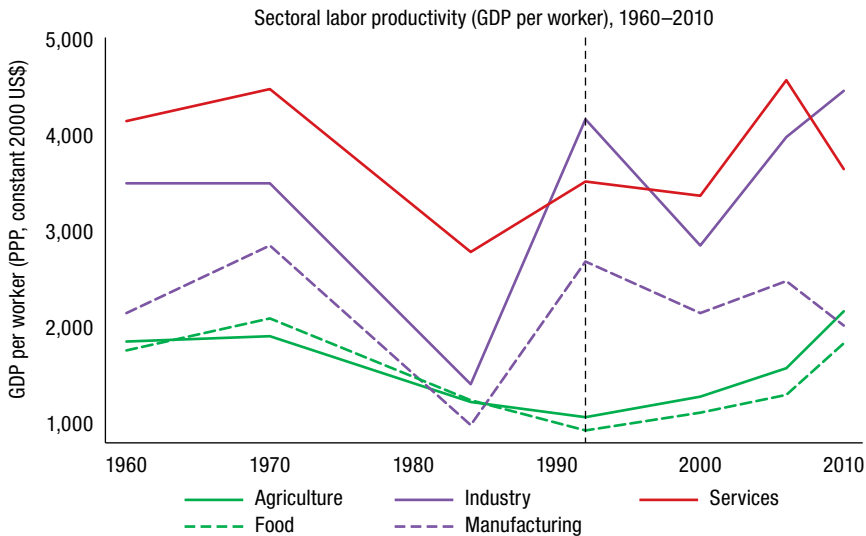
2001–2010: Rawlings peacefully handed over power to his main opponent John Kufuor in 2001. The macroeconomic situation was still unstable, but the economy rapidly took off, recording annual growth rates of 5 percent (Figure 4.1). This evolution was not coincidental, as there was an improvement across all dimensions. The business environment has become more favorable, captured by rising investment rates in the private sector (Figure 4.2), the value of cocoa and gold exports has boomed, and the service sector has become more competitive.

All in all, the economic history of Ghana suggests that the country has managed its economic development without experiencing a green revolution, an industrial revolution, or a service revolution—that is, the positive rural push and urban pull—as in Asia. Instead, it has relied heavily over the past 50 years on cocoa production and gold mining (the less positive urban pull), urban-biased policies (the negative urban pull), agricultural overtaxation and rural shocks (the negative rural push), and urban natural increase (the negative urban push).

The issue is whether the nature of structural change was modified post-1992, when the country became democratic.³ We know that in 1960, agriculture accounted for 43.3 percent of GDP and 61.8 percent of employment (Figure 4.3). While Ghana experienced some positive structural change until 1966—as evidenced by a decline in agricultural employment—the period from 1967 to 1984 saw a significant decline in economic activity and structural change in the wrong direction. The GDP share of agriculture increased to 52.8 percent in 1978, while the industrial and service sectors collapsed.⁴ The service sector resumed its expansion in the late 1970s and early 1980s, while industrial output returned to its pre-crisis level in 1986. Likewise, productivity remained stable or increased across all sectors in the 1960s, dropped

3 Turning points are the years 1957, 1966, 1974, 1983, 1992, 2001, and 2010. We have sectoral GDP data for all years between 1960 and 2010, but that is not the case for sectoral employment data. Although employment data are only available for 1960, 1970, 1984, 1992, 2000, 2006, and 2010, the periodicity of the dataset captures well the economic history of Ghana. The 1960–1970 period was characterized by ISI policies and income stagnation. The 1970–1984 period was marked by structural problems and economic decline. The Ghanaian economy slowly recovered in 1984–1992 and 1992–2000, after two SAPs were adopted in 1983 and 1987–1989; it later boomed in 2000–2006 and 2006–2010.

4 This result is consistent with Engel's Law. As people became poorer, they mechanically spent a higher share of their budget on food items, and many workers moved back to the agriculture sector, thus causing a "re-agriculturalization" of the economy in the aggregate.

FIGURE 4.3 Agricultural productivity remains far below that of industry and services

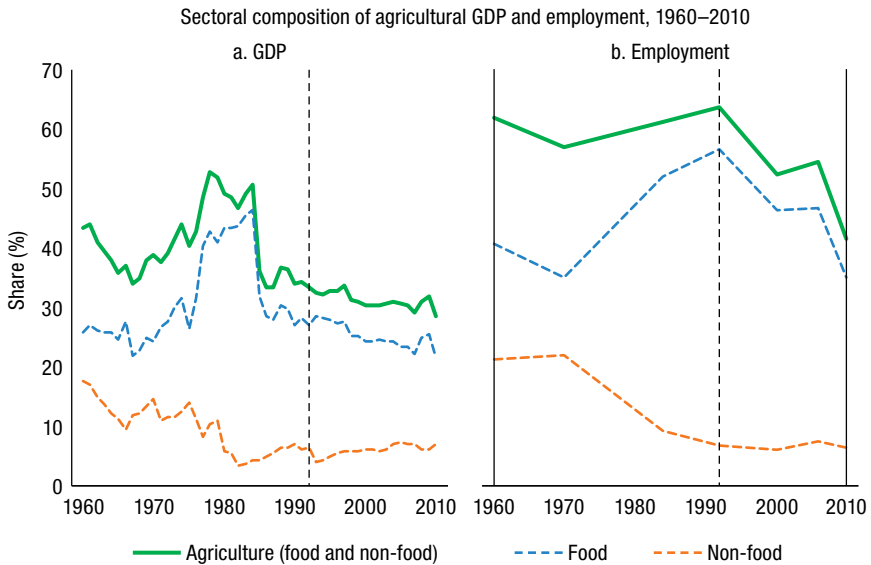
Source: Economic Survey of Ghana 1961–1982, Population and Housing Censuses 1960, 1970, 1984, 2000, and 2010, Ghana Living Standards Survey 1991–92 and 2005–2006, Singal and Nartey (1971), Androee (1981), Ewusi (1986), Maddison (2008), GSS (2010), and World Bank (2010).

Note: This figure plots sectoral labor productivity (PPP, constant 2000 US\$), using three aggregate sectors “agriculture,” “industry,” and “services.” Sectoral labor productivity is the ratio of sectoral GDP to the number of workers in that sector. Data is available for the following years: 1960, 1970, 1984, 1992, 2000, 2006, and 2010. The vertical dashed line is for the year 1992, the year in which the nature of structural change was modified in Ghana.

in the 1970s and early 1980s, and increased from then on (Figure 4.3). These patterns lead us to the following conclusions:

- **Economic development and structural change are intertwined.** Periods of economic growth were associated with decreasing agricultural shares of GDP and employment, whereas periods of economic stagnation or decline saw a rise in the same shares (Figure 4.4).
- **Structural change manifested itself in less agriculture and more services—not more industry.** The GDP and employment shares of industry are almost the same in the 2000s as in the 1960s. Ghana’s structural change occurred without industrialization, in contrast to Asia but in line with what we find for Africa as a whole in 2000.
- **Ghana has undergone major positive structural changes post-1992.** In the 1960s and the 1980s, agriculture’s employment share was still 60 percent, but by 2010, it fell to almost 40 percent.

FIGURE 4.5 Agriculture's employment share remained fairly steady for decades before falling sharply after 1992



Source: Economic Survey of Ghana (CBS 1961–1982; Population and Housing Censuses 1960, 1970, 1984, 2000, and 2010 (GSS various years); Ghana Living Standards Surveys 1991–1992 and 2005–2006 (GSS 1995, 2008); Singal and Narthey (1971); Androe (1981); Ewusi (1986); GSS (2010); and World Bank (2010).

Note: Panel (a) plots the sectoral composition of agricultural gross domestic product (GDP), when distinguishing the food subsectors (“agriculture, hunting, and livestock” and “fishing”) and the nonfood subsectors (“cocoa” and “forestry and logging”). Panel (b) plots the sectoral composition of agricultural employment, using the same subsectors. Employment data are available for the following years: 1960, 1970, 1984, 1992, 2000, 2006, and 2010. The vertical dashed line is for 1992, the year when the nature of structural change was modified in Ghana.

Low food productivity forces farmers to remain producers in the food sector (Breisinger et al. 2011), which is what appears to have happened in Ghana. Why was it so low? The reasons range from population pressure and a decrease in the land-to-labor ratio to insecure property rights, a low adoption rate of modern inputs, and a low level of mechanization. So why did employment decrease and productivity increase after 1992? It is true that the employment share decreased faster than the GDP share in 1992–2005—but not because of a positive rural push, as food productivity did not increase (cereals and starchy roots yields remained unchanged) during the period. Rather, surplus labor in agriculture was attracted to other sectors when urban wages increased, which in turn raised productivity. After 2006, higher yields—up 30 percent between 2005 and 2010 for cereals and starchy roots—kicked in, and labor was released for the modern sector (the positive rural push). Based on a few years of data, it is difficult to assert whether

this evolution indicates the beginning of a green revolution (see Nweke 2004, for a study on cassava), plus productivity is the same in 2010 as in 1960 (Figure 4.3). But even if Ghana has not experienced a green revolution, food productivity has increased in the rest of the world, and trade implies that Ghana has also benefited from these productivity gains—its share of imports in cereal consumption increased from around 10 percent in the mid-1980s to 30 percent before the food price spike of 2007–2008 (FAO 2010). In the absence of high international food prices, a green revolution is no longer necessary, as food can be imported.

As for cocoa, Ghana is the world's largest exporter, accounting for almost 50 percent of exports between 1960 and 2010 (Jedwab 2013). Yet the cocoa subsector collapsed in the 1960s–1980s (Jedwab 2013) because of low producer prices after 1958, restrictive migratory policies after 1969, and frequent droughts in the early 1980s. Producer prices were fixed by the government and its Cocoa Marketing Board, to protect farmers against fluctuant international prices. Given that the producer price was always below the international price, this actually served as a taxation mechanism (Bates 1981). As the average taxation rate was 46 percent on average in 1960–2010, cocoa really accounted for 10 percent of GDP (instead of 5 percent when not accounting for taxation). Growth has now resumed in the subsector. The producer price of cocoa rose in the 1990s and the subsector was liberalized, with production increasing from 200,000 tons to a record 1 million tons in 2010. However, cocoa's share of GDP remained low, as the rest of the economy was also growing.

As for the other nonfood subsector, forestry and logging took off after 1992 and saw a rising share of employment. But these recent improvements in the nonfood subsector are tempered by findings that the resource rents of the cocoa and forestry subsectors were spent either by farmers, logging companies, and the government or on (urban) manufactured goods and services (Jedwab 2013). Thus, as manufactured goods were imported from abroad, this urban pull produced “urbanization without industrialization”—that is, cities consisting of nontradable services (Gollin, Jedwab, and Vollrath 2015).⁵

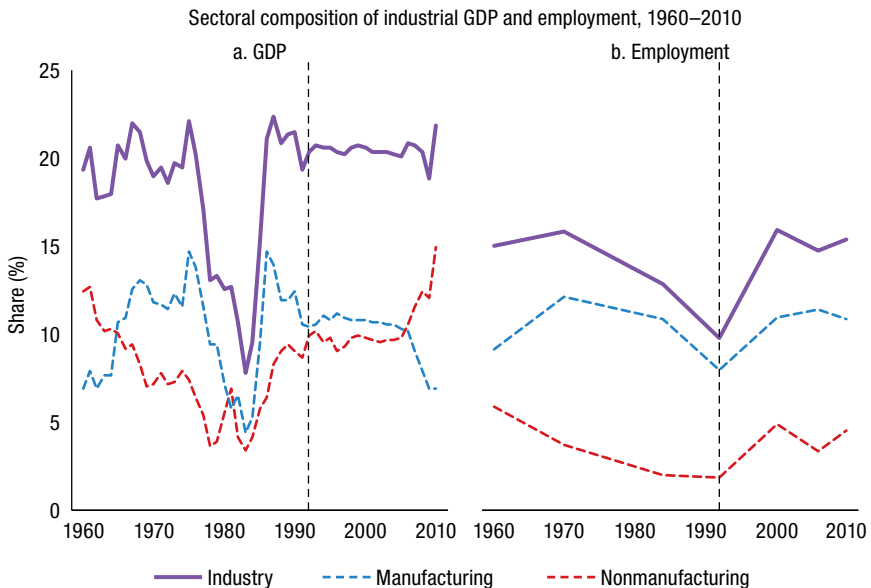
5 We classify the cocoa subsector as a “natural resource” subsector, in line with the literature on the Dutch disease (Bates 1981; Isham et al. 2005; Gollin, Jedwab, and Vollrath 2015). As explained by Isham et al. (2005), “countries can only export crops such as [...] cocoa if they have appropriate climates.” The agronomic literature (for example, Ruf 1995a, 1995b) has also shown that cocoa cultivation required very specific and exhaustible soils. As a result, very few countries are able to produce cocoa on a large scale, making cocoa supply highly inelastic, thus generating high profits in the subsector (Bates 1981; Ruf 1995a; Jedwab 2013). In particular, Ghana, Indonesia, and Côte d'Ivoire account for 75 percent of the world's cocoa exports. Other agriculture subsectors tend to be much less concentrated.

Structural Change without Industrialization

For industry—which include manufacturing, public utilities, mining, and construction—the GDP and employment shares have not changed much over the past 50 years, with the exception of the 1970s and early 1980s, when the sector shrank (Figure 4.6). In 2010, industry still only accounted for 21.8 percent of GDP and 15.4 percent of employment.

The key explanation for industry being largely bypassed is the lack of an industrial revolution. The Nkrumah government and the following governments all thought that industrialization was the only source of development, prompting massive public investments in the 1960s and 1970s. This led to a slight increase in the GDP and employment shares of manufacturing, and productivity increased. However, this rise was unsustainable, as it reflected biased public policies (negative urban pull), not positive structural change. When per capita income declined after 1976, the manufacturing sector contracted

FIGURE 4.6 No big move into manufacturing



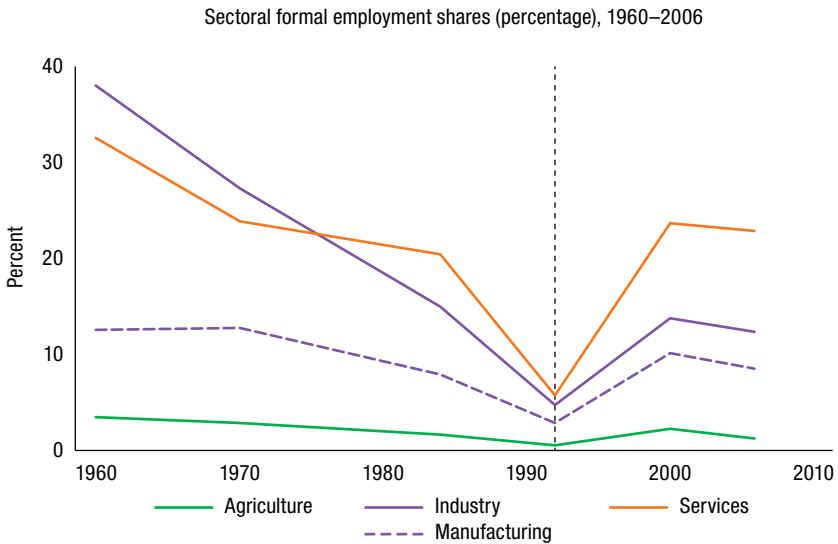
Source: Economic Survey of Ghana (CBS 1961–1982); Population and Housing Censuses 1960, 1970, 1984, 2000, and 2010 (GSS various years); Ghana Living Standards Surveys 1991–1992 and 2005–2006 (GSS 1995, 2008); Singal and Nartey (1971); Androe (1981); Ewusi (1986); GSS (2010); and World Bank (2010).

Note: Panel (a) plots the sectoral composition of industrial gross domestic product (GDP), when distinguishing manufacturing from other industrial subsectors (“mining,” “construction,” and “public utilities”). Panel (b) plots the sectoral composition of industrial employment, using the same subsectors. Employment data are available for the following years: 1960, 1970, 1984, 1992, 2000, 2006, and 2010. The vertical dashed line is for the year 1992, the year in which the nature of structural change was modified in Ghana.

and productivity dropped. The sector also became more informalized post-1970, and remained so until post-1992 (Figure 4.7). It was only after the SAP in 1983 that manufacturing production was resumed. Yet the fact that manufacturing productivity in 2010 was the same as in 1960 confirms the lack of an industrial revolution (positive urban pull) (Jedwab 2013). Manufacturing exports have also remained low as a result of high wages relative to productivity (Teal 1999) and the competition from China. The reality is that Ghana—like many African countries—has urbanized without industrialization (Gollin, Jedwab, and Vollrath 2015).

As for the other subsectors, construction follows economic activity, and two housing and infrastructure construction booms occurred in the 1960s and the 2000s. The mining subsector collapsed post-1961, as a result of low investments and poor maintenance, but its contribution to GDP recently increased (8.5 percent in 2011), thanks to rising gold prices and booming oil exports. Finally, the employment share and labor productivity in the public

FIGURE 4.7 Manufacturing’s level of formality is still quite low



Source: Statistical Yearbook of Ghana 1961–1970; CBS 1970; *Quarterly Digest of Statistics* (CBS 1981–1997); Population and Housing Census (GSS 2000); and Ghana Living Standards Survey 2005–2006 (GSS 2008).

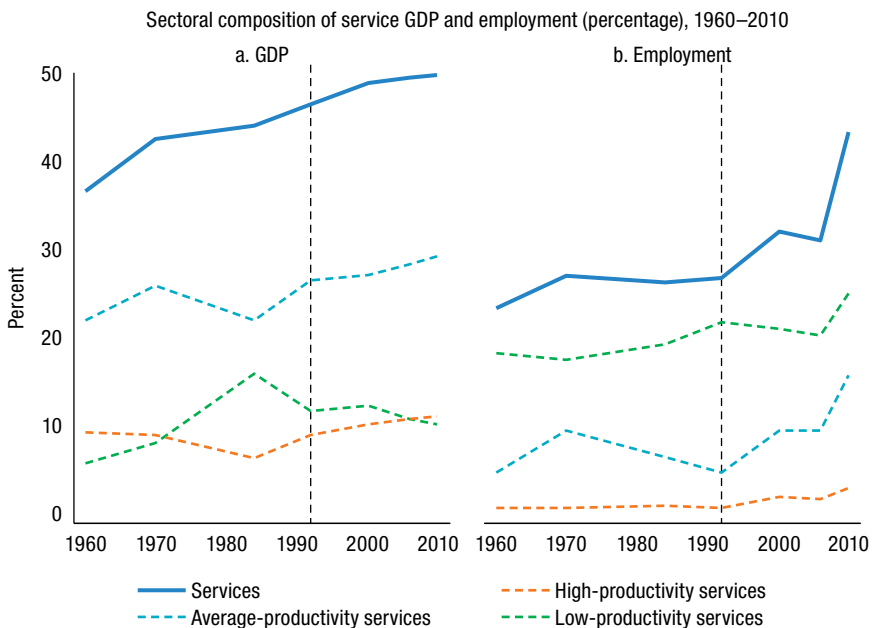
Note: This figure displays the shares of formal employment in sectoral employment, using the three aggregate sectors “agriculture,” “industry,” and “services” and the subsector “manufacturing.” Data are available for the following years: 1960, 1970, 1984, 1992, 2000, and 2006. Formal employment includes recorded employees of the formal establishments of the public and private sectors. The vertical dashed line is for 1992, the year when the nature of structural change was modified in Ghana.

utilities sector also followed economic activity. Productivity is now twice as high as at independence, thanks to the modernization of the energy sector that took place in the 1990s and the 2000s.

Structural Change with a Dramatic Expansion of Services

In services, the GDP share is at the time of this writing 49.8 percent, up from 37.4 percent in 1960, and the employment share is at 43.3 percent, sharply up from 23.2 percent in 1960—providing the strongest evidence for positive structural change in Ghana (Figure 4.8). While productivity is twice as high in services as in agriculture, it is still four times lower than in Asia and nearly the same in 2010 as it was in 1960. Moreover, the rise in service employment had only a

FIGURE 4.8 Not really a “service revolution”



Source: Economic Survey of Ghana (CBS 1961–1982); Population and Housing Censuses 1960, 1970, 1984, 2000, and 2010; Ghana Living Standards Surveys 1991–1992 and 2005–2006 (GSS 1995, 2008); Singal and Narthey (1971); Androë (1981); Ewusi (1986); GSS (2010); and World Bank (2010).

Note: Panel (a) plots the sectoral composition of service gross domestic product (GDP), when distinguishing the low-productivity service subsectors (wholesale and retail trade, and community, social, and personal services); the average productivity service subsectors (government services, transport and storage, and hotels and restaurants); and the high-productivity service subsectors (communications, and finance, insurance, real estate, and business services). Panel (b) plots the sectoral composition of service employment, using the same subsectors. GDP and employment data are available for the following years: 1960, 1970, 1984, 1992, 2000, 2006, and 2010.

limited effect on per capita income. Therefore, this evolution in Ghana does not suggest a service revolution of the type seen in Asia.

One way to view the evolution of the service sector between 1960 and 2010 is to divide the seven subsectors into three groups, depending on whether the subsector belongs to the top tier (communications; and finance, insurance, real estate, and business services), middle tier (government services; transport and storage; and hotels and restaurants), or lower tier (wholesale and retail trade; and community, social, and personal services) of all the subsectors in terms of labor productivity in 2010. High-productivity services are twice as productive as average-productivity services and tenfold more productive than low-productivity services.⁶ A few patterns stand out (Figure 4.8).

- **Service GDP.** The increase in service GDP was driven by average-productivity services, whose share increased from 21.8 percent in 1960 to 29.0 percent in 2010. Although employment increased in low-productivity services, it did not alter the GDP share of services, as productivity was too low. Nor did high-productivity services contribute much to structural change, which confirms that Ghana has not experienced a service revolution.
- **Service employment.** The rise in service employment was driven by average-productivity and low-productivity services, with their combined shares rising from 22.7 percent in 1960 to 40.6 percent in 2010.
- **Government.** In the pre-1992 period, service employment first increased, then decreased. In the 1960s, the expansion was the result of government consumption and a rising number of civil servants, which together also boosted productivity. But after 1970, the government sector contracted, also bringing down productivity. Post-1992, employment increased relatively more in the private service sector. However, the employment and GDP shares of the government sector also rose, as economic growth led to a higher budget.
- **Tourism.** Post-1992, the employment and GDP shares of hotels and restaurants increased, with the number of tourists jumping from 100,000 arrivals in 1985 to 1 million in 2010, and the share of service exports rising

⁶ This “economic dualism” within a same sector is not specific to the service sector. Within the agriculture sector, the cocoa and forestry subsectors are also much more productive than the more subsistence subsectors. Within the manufacturing sector, one can also note large productivity differences *across* but also *within* manufacturing subsectors, depending on how capital intensive each subsector and/or group of firms is.

from 0.6 percent of GDP in 1985 to 10.3 percent in 2005 (mostly resulting from tourism).

- The employment and GDP shares of low-productivity services—which are employers of last resort—increased with the economic crisis.
- The negative rural push, urban pull, and urban push probably all contributed to the expansion of services before 1992. After that, there is no evidence of a major positive urban pull in the case of tradable services—with the exception of tourism—but nontradable services managed to attract workers from the food sector.

Structural Change and Economic Growth in Ghana

Now that we have examined developments in the individual sectors, the big question is how much of the growth in overall labor productivity can be traced to within-sector versus structural change? To answer this, we use the methodology of McMillan and Rodrik (2011) and McMillan (2013) to estimate the respective contributions of the two channels (see the Overview in this book for details on the methodology).⁷

Our results (Table 4.1) show that for the overall period 1960–2010, labor productivity rose just 0.4 percent, with structural change accounting for a 0.3 percentage point and within-sector productivity accounting for the remaining 0.1 percentage point. However, the stories for before and after 1992 differ dramatically. Before 1992, no matter the decomposition used, the changes in overall productivity were essentially driven by the within-sector component. The structural change component was actually growth reducing in 1970–1992, as many workers returned to agriculture or were hired by retail trade or personal services—all unproductive sectors that acted as employers of last resort. Within-sector productivity was positive in 1960–1970, but then collapsed in 1970–1984, with some sectors—agriculture, cocoa, manufacturing (whose productivity dropped by a whopping

7 Algebraically, the decomposition is:

$$\Delta P_t = \sum_{i=1}^N \theta_{i,t-k} \Delta p_{i,t} + \sum_{i=1}^N p_{i,t} \Delta \theta_{i,t}$$

where ΔP_t is the change in aggregate labor productivity between period $t-k$ and t . The first term is the “within” component, which is a weighted average of the change in labor productivity in each of the N sectors, with the weight for sector i being the labor share of that sector in period $t-k$, measured by $\theta_{i,t-k}$. The second term is the “structural change” component, which is a weighted average of the change in labor shares in the N sectors, with the weights captured by the labor productivity of the sector in period t .

TABLE 4.1 Structural change kicks in after 1992

Period	Decomposition of overall productivity growth, 1960–2010					
	Labor productivity		Component of annual growth (percent) due to:			
	at starting year (2000 PPP US\$)	growth (annual, percent)	within (9 sectors)	structural (9 sectors)	within (15 sectors)	structural (15 sectors)
1960–1970	2,622	0.8	0.5	0.3	0.5	0.3
1970–1984	2,850	–3.8	–3.6	–0.2	–3.8	0
1984–1992	1,651	2.5	3.2	–0.7	4.2	–1.7
1992–2000	2,017	1.0	–0.9	2.0	–1.8	2.9
2000–2006	2,190	4.5	6.0	–1.5	6.1	–1.7
2006–2010	2,851	2.7	0.0	2.6	–0.5	3.2
1960–2010	2,622	0.4	0.2	0.2	0.1	0.3
1992–2010	2,017	3.0	1.9	1.1	1.4	1.6

Source: Jedwab and Osei (2012).

Note: This table displays labor productivity at starting year (2000 purchasing power parity (PPP) US\$) and the decomposition of annual productivity growth (percentage) into its within-sector and structural change components using two sectoral decompositions: 9 sectors, as in McMillan and Rodrik (2011), or 15 sectors. The advantage of using 15 sectors is that it allows us to isolate the effect for the food sector, instead of studying the whole agriculture sector (and likewise for the other subsectors).

65 percent), finance, and government services—more severely hit than others. The fact that the decline was widespread suggests the importance of national factors rather than sectoral factors. However, productivity then turned positive in most sectors in 1984–1992, although it was stronger in nonagriculture sectors than in agriculture, probably hampered by agricultural overtaxation (the negative rural push).

After 1992, productivity growth was driven by both within-sector productivity and structural change. For the 1992–2010 period, when labor productivity increased by an annual average 3 percent, structural change actually contributed slightly more than half of the total (1.6 percentage points versus 1.4 percentage points for the within component). During 1992–2000, many workers left the food sector and entered relatively more productive sectors (like construction, manufacturing, mining, tourism, transport, finance and business services, and government services). Surplus labor in agriculture was absorbed by other sectors, probably thanks to new opportunities in these sectors. The within-sector component was then negative because these sectors were characterized by declining marginal returns to labor—as employment increased, sectoral productivity decreased, even if the aggregate effect on overall productivity was positive.

However, during 2000–2006, the within-sector effect was very high—at around 6 percent of annual growth—with, interestingly, productivity up in all sectors. But the structural change component was negative, because the

economy was further rationalized after the economic reforms of the 1980s and 1990s. Each sector got rid of its less efficient workers, who had to enter a relatively less productive sector. During 2006–2010, we find exactly the same effects for exactly the same sectors as in 1992–2000, with urban pull factors probably explaining why these sectors hired more workers.

To what extent was growth driven by internal or foreign demand? This is difficult to decipher. When adding both the within-sector and the structural change components for each sector during the whole period 1992–2010, we find that growth was driven by mostly seven sectors (food production, cocoa, construction, mining, tourism, finance and business services, and government services). Construction and government services are procyclical, so their growth is tied to the rest of the economy. It is clear that the economy grew because of rising international demand for Ghana's natural resources (cocoa, gold, timber, and oil) and tourism services, with the combined GDP share of these sectors up from 9 percent to 18 percent in 1992–2010. In that case, the urban pull is driven by natural resources and tourism, rather than industrialization or high-productivity services, with the exception of finance and business services. But there was also a positive rural push, as higher food yields released labor for the modern sector, and stronger food imports post-1992 fed even more urban workers.

As for manufacturing, its total contribution was actually nil, which confirms that Ghana has experienced structural change without industrialization. Moreover, the manufacturing sector is relatively unproductive, with informality accounting for at least 90 percent of employment in 2000, and manufacturing productivity being 22.7 times lower in the informal sector than in the formal sector. In other words, Ghana has the “wrong” manufacturing sectors. For example, the informal clothing and furniture subsectors accounted for almost 40 percent of total manufacturing employment in 2000. Yet they serve the domestic market and are not that different from nontradable services.

Structural Change and Informal Employment

Most African countries implemented SAPs in the 1980s, paving the way for higher economic growth in the 1990s and 2000s. Yet these economies also witnessed a rise in informal or small-scale employment, while it would have been expected that a better business environment and fewer policy distortions would have led to formalization.⁸ In Ghana, the proportion of employment

⁸ See Kingdon, Sandefur, and Teal (2006) for a survey of recent trends in several countries in Africa south of the Sahara.

in small firms (fewer than 30 employees) increased from 33 percent in 1987 to 52 percent in 2003—a change driven by a massive new entry of small firms (Sandefur 2010). One study finds that this could be the result of distortionary taxes that disfavor large firms, although it also suggests that a uniform rate of taxation would not dramatically improve overall productivity, as large firms are not necessarily more productive than small firms (Gollin 1995).

Two criteria are used to distinguish formal and informal employment: the type of employment and the size of the employer. Using the first method, Ghanaian formal employment includes the recorded employees of the formal establishments of the public and private sectors, while informal employment consists of unrecorded employees, self-employed people, employers, and unpaid family workers (Gollin (1995) favors this approach). The other approach separates small-scale employment (in establishments with fewer than 30 employees) and large-scale employment (in establishments with more than 30 employees) (Sandefur (2010) favors this method). Given that it is much more difficult to “hide” large-scale establishments from government authorities, this threshold is likely to capture the difference between formal and informal employment. Yet many “formal” establishments have fewer than 30 people, and their employees are mistakenly defined as belonging to the informal sector.

For our analysis, we use the first method, because we have no panel data on employment in large-scale establishments at the sectoral level. Thus, formal employment includes all wage and salary earners in formally registered establishments. We also focus strictly on employment because we lack data on informal GDP.⁹ We find that the level of formal employment is extremely low—only 9.5 percent of total employment in 2006—even lower than the 13 percent in 1960, with more than half of workers in the public sector. Second, the share of formal employment fell to 2.9 percent between 1984 and 1992 (with only 0.2 percent in the private sector), as a result of the 1983 and 1988 SAPs. This result goes against the current belief that informality is rising in Ghana. The nonagriculture sectors were particularly affected by the SAPs. Third, by sector today, we find a large variation in the formalization rate, ranging from 52.6 percent in community, social, personal, and government services (followed by 45.6 percent in finance, insurance, real estate, and business services, and 32.4 percent in public utilities) to 10.1 percent in

⁹ We have panel data for 18 formal and informal sectors (2 times the 9 sectors of the main analysis) for the periods 1960–1970, 1970–1984, 1984–1992, 1992–2000, and 2000–2006. Data are missing for the year 2010.

manufacturing; 5.9 percent in wholesale and retail trade, hotels, and restaurants; and a mere 2.2 percent in agriculture, hunting, forestry, and fishing.

How much of this formalization stemmed from within-sector versus structural change? Our results show that the within-sector component is far more important than the structural component (Appendix 4B). This suggests that national factors—not sectoral factors—account for the evolution of the overall formalization rate. When the formalization rate collapsed after 1984, the contribution of the structural component was almost nil. This means that the formalization rate did not increase because people were moving to more informal sectors (that is, informal sectors are employers of last resort), but because each sector was becoming more informal. The within-sector component increased in 1992–2000 when the economy improved (the share of formal employment increased to about 11 percent). The formal firms rehired workers who ended up working for the informal firms of the same sector, or the formal firms that had to leave the formal sector during the economic crisis re-entered it. These results are somewhat in line with the results on structural change (Table 4.1). In addition, the structural change component was positive in the 1960s when nonagriculture sectors formalized as a result of public investments, and in the 1990s when the economy recovered and the more formal nonagriculture sectors hired more farmworkers.

Potential Gains from Structural Change

The main results are clearly ambiguous. On the optimistic side, our data for the post-1992 period indicate the following:

- Productivity increased continuously after 1992, and Ghana transitioned into a more efficient and formalized economy.
- The structural change component was mostly positive, which showed a reallocation of labor toward more productive sectors.
- This reallocation was permitted by an increase in the food supply (the positive rural push), whether it was the result of imports or rising food yields.
- This reallocation benefited other sectors as well, such as construction, and finance and business services. As urban wages increased, they attracted more workers from the food sector (the positive urban pulls).
- The economy diversified—while cocoa, timber, and mining accounted for almost all exports in 1960, Ghana now also exports tourism services and crude oil.

On the pessimistic side, these positive growth rates were not high, considering that the economy collapsed in the 1980s, which resulted in a catching-up effect in the next periods. The economy was so depressed that it could only get better. Moreover, Ghana is still two times as poor as India. Our data indicate the following:

- Income and sectoral productivities did not increase much between 1960 and 2010.
- Changes in labor productivity are volatile, and the overall economy can improve or deteriorate in a matter of years, as exemplified by the 1970s.
- The economy has not experienced a green revolution, which has limited its ability to release agricultural labor for the modern sector.
- Structural change occurred without industrialization, as shown by how little manufacturing and tradable services have contributed to productivity growth.
- Productivity growth was actually driven by the natural resource and tourism sectors, and the expansion of the construction and government sectors could just be the result of that economic growth.

How do these results compare with what we know from other studies? McMillan (2013, Figure 5) finds that structural change in Africa was growth reducing in 1990–1999 and growth enhancing in 2000–2005, with structural change’s contribution to growth almost nil during the whole period 1990–2005. In Ghana, the contribution of structural change was relatively low during the whole period. However, we also use data for the period 2006–2010, when the contribution of structural change clearly increased (Table 4.1). The structural change components are also stronger when using the decomposition of 15 sectors, instead of 9 sectors as in McMillan (2013), as we isolate the effect for the food sector, instead of studying the whole agriculture sector (and likewise for the other subsectors). In Ghana, structural change was actually growth enhancing in 1992–2000 and 2006–2010. Besides, the sample of McMillan (2013) includes many countries for which patterns could have been different. Our results are in line with Adeyinka, Salau, and Vollrath (2013, Table 4), who find that the contribution of structural change to growth was positive for Nigeria (at 2.3 percent per year) in 1996–2009. However, in Ghana as well as in Nigeria, it is not obvious to what extent these changes are ultimately stemming from resource exports or agricultural modernization and industrialization.

Promoting structural change can clearly enhance overall productivity, provided workers from the low-productivity sectors can be absorbed by

higher-productivity sectors. But workers are unlikely to move from the least productive sector (such as food production) to the most productive sectors (such as public utilities or finance). These are capital- or skill-intensive sectors, which limit their ability to absorb unskilled workers from other sectors. Besides, the demand for the goods and services produced by these sectors is limited by the size of the domestic economy or the growth of exports.

But workers could gradually climb the productivity ladder and move to the next more productive sector, as the constraints to sectoral mobility would then be less stringent. In the case of Nigeria, Adeyinka, Salau, and Vollrath (2013) show that value-added could be 54 percent higher if there were perfect sectoral mobility—an assumption not credible, given sectoral differences in the production function. They find that it would be just 25 percent higher when accounting for sectoral differences in skill intensity. In the case of Ghana in 2000, the mean number of years of schooling was 2.8 in the food sector, but 7.1 in the rest of the economy (6.2 in manufacturing, 10.5 in finance, and 13.4 in government services). Within the agriculture sector, only 25 percent of the workers had at least 7 years of schooling, which shows how limited sectoral mobility is in Ghana. These farmers could move to the least productive urban sectors, although wages are probably not much higher once we account for rural–urban differentials in housing and consumer prices.¹⁰

The Role of Government Policies in Structural Change in Ghana

The fact that all sectors were affected by the economic crisis in 1967–1984 and were then able to recover through economic growth in 1984–1992 confirms that poor economywide policies—not just poor sectoral policies—constrained economic development during the pre-1992 period. One major problem was the quality of institutions, with regulatory and nonregulatory constraints on the private sector hampering economic development. After the first phase of the Economic Recovery Program in 1983, which was aimed at halting the economic decline and reviving moribund sectors (like agriculture, manufacturing, and mining), growth resumed (at 2.5 percent per year in 1984–1992), private investment increased, and most sectors benefited from the better economic and institutional climate. However, in the agriculture sector, growth resumed more slowly, as the

10 Another possibility would be that farmers climb the productivity ladder *within* the agriculture sector, by specializing in riskier—but in typical years more rewarding—crops (Chapoto, Mabiso, and Bonsu 2013). Ghana potentially has a comparative advantage in horticulture and fruits (such as pineapples and fruit juices) in addition to cocoa (Wolter 2009).

urban-biased policies of the 1960s–1980s disproportionately hurt cocoa and non-cocoa farmers. It took some time before farmers were convinced to invest again.

So which government policies helped or hindered structural change between 1992 and 2010? Here we apply the growth diagnostics framework of Hausmann, Rodrik, and Velasco (2008) to identify the binding constraints to growth.¹¹ Two possibilities that we can probably rule out are poor geography and low human capital. On the former, although Ghana is in the tropics, it is close to international markets, with the population concentrated in the forested south, which has been exploited for cultivating cocoa (Hill 1963; Jedwab 2013). As such, physical geography does not seem to be a major constraint, relative to countries like Mauritius or Thailand. On the latter, Ghana's stock of human capital is relatively high for its income level (relative to other West Africa countries), and the returns to education are around 4 percent versus 8–12 percent on average in developing countries. Like most resource-rich economies, Ghana does not typically rely on human capital (Gollin, Jedwab, and Vollrath 2015), and even if the demand for labor were high and there were a skill shortage, the country could rely on its large, well-educated, and entrepreneurial emigrant population in the developed world.

The biggest constraints seem to be the cost of finance, poor infrastructure, and market failures, followed by macro and micro risks.

Cost of finance. The low level of investment in Ghana (20 percent of GDP versus almost 35 percent in India and 50 percent in China) could be owing to a high cost of finance. During the pre-SAP period, savings were captured by the government and “misallocated.” After the SAPs, the level of private investment rose, but firms still cite the inadequate availability of finance as a major constraint. For example, one recent study finds that capital is still highly misallocated in Ghana, as the marginal return to investment is higher in firms with less access to finance (Kalemli-Ozcan and Sorensen 2012). Firms also complain that the domestic demand for their products is too low.¹² Thus, the lack of credit is understandable, and the question becomes why firms seem to be unable to sell their nonresource goods and services to the rest of the

11 This section draws extensively on the analyses of Lejárraga (2010) and USG-GoG (2011).

12 For example, according to the Doing Business database of the World Bank, Ghana was ranked 120th in the world in terms of “Ease of Access to Credit” in 2010. Ghana is ranked lower than other African countries, such as South Africa (27th), Botswana (61th), Kenya (65th), Nigeria (90th), and Zambia (98th). Ghana is then ranked 84th in terms of “Overall Doing Business Score,” which suggests that the lack of access to credit is a relatively important constraint. One factor explaining this poor performance is the fact that less than 15 percent of individuals and firms are listed by a public or private credit bureau with information on their borrowing history, versus more than 50 percent in Botswana and South Africa.

world. Likewise, foreign firms may not be credit constrained, so why do we not see more FDI inflows to Ghana? If the cost of finance is not an issue, the private sector's poor performance must be explained by a low return to economic activity.

Poor infrastructure. Ghana has relatively better infrastructure than most countries with the same income level (Lejárraga 2010), but poor roads continue to be a key factor behind the lack of a green revolution. Transportation costs are high, which increases the price of agricultural inputs and decreases farmgate prices (Breisinger et al. 2011), and there is a lack of competition in the transport sector, with numerous roadblocks. In addition, the energy sector is facing significant challenges, with frequent disruptions to power. Firms are relying increasingly on their own power generation, and should this situation continue, it is unlikely that manufacturing firms can improve their competitiveness—in 2007, power outages cost 6.5 percent of annual sales for Ghanaian firms on average (Lejárraga 2010).

Market failures. The lack of self-discovery and coordination externalities (when the actions of economic agents need to be coordinated to improve efficiency) could account for the low level of private investment. To begin with, the economy has not diversified its exports much, although in the past 20 years, there seem to have been many “export discoveries” (products that are exported for the first time by a country) (Lejárraga 2010). However, these products failed to mature in larger export sectors, owing either to a lack of international demand or to constraints in the expansion of small firms (which predominate because of asymmetric taxes and regulations) (Gollin 1995). In addition, smaller exporting firms tend to rely on export intermediaries to sell their products, possibly the result of an imperfect knowledge of foreign markets or difficulties obtaining an export license (Lejárraga 2010). One example is in the agriculture sector. Ghana has an unexploited comparative advantage in horticulture and fruits (such as pineapples and fruit juices) (Wolter 2009). An agriculture-based industrial policy could be initially needed to support this nascent agribusiness industry.

Macro risks. The macro picture improved markedly after the democratization process started in 1992. Government consumption was rationalized, the fiscal deficit narrowed, and inflation fell. Ghana also achieved debt relief by participating in the Highly Indebted Poor Countries initiative, which required adopting the Poverty Reduction and Growth Facility. Further, there have been two peaceful political transitions from one party to another in 2000 and 2008, engendering more confidence in the institutions and the economy (Osei 2012). Yet, while a stable macroeconomic environment is a

necessary condition for long-run growth, it is not a sufficient condition for developing a strong (nonresource) tradable sector (Lejárraga 2010). Since the 2008 oil discovery, private investment has been concentrated in the resource sector (Barthel, Busse, and Osei 2011), and in recent years, the macroeconomic situation has deteriorated as a result of the oil boom. A big worry is that oil revenues may not be used to further transform the economy—in fact, the share of capital spending in government expenditure decreased from 50 percent in 2000 to 40 percent in 2011, as the choice was made to hire more civil servants and pay them better (Osei 2012).

Micro risks. Institutional change in the 1990s—including efforts by the government to rebalance the economy in favor of the private sector—has facilitated a better business environment (Asem et al. 2013). Evidence of this policy shift is seen in lower transaction costs associated with doing business in Ghana. Over the period 2006–2012, Ghana was one of the top-10 reformers according to the World Bank’s Doing Business database. It is now ranked 64th in the world (out of 185) and 5th in Africa south of the Sahara (out of 46). It is also ranked 64th in the world according to the Corruption Perceptions Index of Transparency International. And it outperforms other countries in registering property (45/185), enforcing contracts (48/185), and protecting investors (49/185).

Even so, Ghana underperforms other countries in paying taxes (89/185), starting a business (112/185), resolving insolvency (114/185), and dealing with construction permits (162/185). One problem seems to be high tax rates for firms. While taxes are necessary for funding public goods (like roads), they often include informal payments to tax inspectors (Lejárraga 2010). Taxes are also higher for large firms, which skews the firm distribution toward small firms (Gollin 1995). In addition, the regulatory framework is constraining, as it is complicated to start and shut down a business and to hire and fire workers in the formal sector (Lejárraga 2010). The current regulations favor large, politically connected firms, while smaller but successful firms cannot mature into larger ones. Thus, changes in the regulatory environment have not always benefited the majority of firms in Ghana (Asem et al. 2013). Another example of micro risks is the insecurity of property rights in the agriculture sector (USG-GoG 2011).

Tackling the Binding Constraints

In Africa, structural change was not synonymous with industrialization, but was defined by a dramatic expansion of services. One hypothesis is that structural change in Africa has not been as growth enhancing as in Asia. Our results for Ghana suggest the following:

- Structural change is both a factor and a consequence of development, as episodes of negative economic growth are associated with structural change in the wrong direction.
- The contribution of structural change to productivity growth was nil or negative until the 1980s, as the political and economic environment was not conducive to long-run growth.
- While structural change was thus growth reducing until the 1980s, it became growth enhancing after the country democratized in 1992. Therefore, structural change can also be a factor of economic development in Africa.
- The “nature” of structural change remains different in Ghana—it has occurred without a green revolution, an industrial revolution, or a service revolution of the types seen in Asia.

Although Ghana is hailed as one of Africa’s success stories, its economy remains highly dependent upon natural resource exports; the manufacturing sector is still uncompetitive; and there are still enormous hurdles on the socioeconomic front, with troubling levels of poverty, unemployment, and underemployment—especially for young people—and income inequality. The bottom line is that Ghana must cope with several binding constraints that contribute not only to the lack of a green, industrial, or service revolution but also to the causes and consequences of the other mechanisms of structural change (like the negative rural push, urban pull, and urban push).

While the contribution of structural change was positive in 1992–2010, it could increase further. In Asia, manufacturing and tradable services have absorbed the surplus labor from the food sector (Breisinger et al. 2011; Gollin, Jedwab, and Vollrath 2015). But in Ghana, these sectors are 19 and 6 times less productive than in the rest of the world, respectively. Labor costs are relatively high, because so much food is still imported. Nonlabor costs are also high because of a constraining regulatory framework, power outages, and poor roads. Although the business environment has improved considerably in the past 20 years, much remains to be done for Ghana to be as competitive as Mauritius or South Africa. Ghana is unlikely to develop a strong nonresource tradable sector in the near future. But anything is possible in the longer run, as exemplified by the development experience of the countries mentioned above. The reverse scenario is also true—the recent cocoa, gold, and oil booms could cause a new “resource curse” in Ghana.

Appendix 4A: Data Sources

This appendix describes in detail the data we use in our analysis. We consider the following 9 sectors for the decomposition analysis: agriculture, hunting, forestry, and fishing (agr); mining and quarrying (min); manufacturing (man); public utilities (pu); construction (con); wholesale and retail trade, hotels, and restaurants (wrt); transport, storage, and communications (tsc); finance, insurance, real estate, and business services (fire); and community, social, personal, and government services (cspg). To obtain 15 sectors, we decompose the agr sector into agriculture and hunting, cocoa, forestry and logging, and fishing; the wrt sector into wholesale and retail trade, and hotels and restaurants; the tsc sector into transport and storage, and communications; and the cspg sector into community, social, and personal services, and government services.

We use various sources to recreate total GDP (in constant 2000 US\$, PPP) for the 9 or 15 sectors annually from 1960 to 2010: Economic Surveys of Ghana (CBS 1961–1982), Singal and Nartey (1971), Androe (1981), Ewusi (1986), *Quarterly Digest of Statistics* (CBS 1981–1997), Maddison (2008), GSS (2010), and World Bank (2010). Employment data were reconstructed for the 9 or 15 sectors in 1960, 1970, 1984, 1992, 2000, 2006, and 2010 from various sources: Population and Housing Censuses (PHCs) (GSS 1960, 1970, 1984, 2000, and 2010); and Ghana Living Standards Surveys (GLSS) in 1991–1992 and 2005–2006 (GSS 1995, 2008). Sectoral labor productivity was then calculated as the ratio of sectoral GDP to sectoral employment. For the 9 sectors, formal and informal employment data were reconstructed in 1960, 1970, 1984, 1992, 2000, and 2006 from various sources: Statistical Yearbooks of Ghana 1961–1970, *Statistical Handbook of the Republic of Ghana 1970* (CBS 1970), *Quarterly Digest of Statistics* (CBS 1981–1997), the 2000 PHC (GSS 2000), and the 2005–2006 GLSS (GSS 2008).

Appendix 4B: Results of Informality

We decompose the aggregate evolution of the formalization rate between its within-sector component, when sectors become more informal, and its structural component, when labor moves from more formal to less formal sectors as follows:

$$\Delta F_t = F_t - F_{t-1} = \sum_j E_{j,t} \times (f_{j,t} - f_{j,t-1}) + \sum_j (E_{j,t} - E_{j,t-1}) \times f_{j,t-1}$$

where f_t and $f_{j,t}$ refer to economywide and sectoral formalization rates (for sector j), respectively, and $E_{j,t}$ is the share of employment in sector j . Results are reported in Table 4B.1, below. First, the within-sector component of

TABLE 4B.1 Decomposition of formal employment growth in Ghana, 1960–2006

Period	Share of formal employment		Component (percent) due to:	
	at starting year (percent)	growth (annual, percent)	within (9 sectors)	structural (9 sectors)
1960–1970	15.5	–2.2	–4.3	2.2
1970–1984	12.4	–2.8	–1.7	–1.1
1984–1992	8.3	–12.3	–12.4	0.1
1992–2000	2.9	18.0	15.1	2.9
2000–2006	10.9	–2.2	–0.6	–1.6

Source: Jedwab and Osei (2012).

Note: This table displays the share (percentage) of formal employment in total employment at the starting year of the period and the decomposition of the growth of this share into its “within-sector” and “structural change” components using nine sectors, as in McMillan and Rodrik (2011).

formalization is far more important than its structural component. This suggests that national factors, not sectoral factors, account for the evolution of the aggregate formalization rate. When the formalization rate collapsed after 1984, the contribution of the structural component was almost nil. This means that the formalization rate did not increase because people were moving to more informal sectors (that is, informal sectors are employers of last resort), but because each sector was becoming more informal. The within-sector component increased in 1992–2000 when the economy improved. The formal firms rehired workers who ended up working for the informal firms of the same sector, and/or the formal firms that had to leave the formal sector during the economic crisis re-entered it. These results are in line with the results on structural change (Table 4.1). Second, the structural change component was positive in the 1960s when non-agriculture sectors formalized as a result of public investments, and in the 1990s when the economy recovered and the more formal nonagriculture sectors hired more farmworkers.

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