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An African Growth Miracle?

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AN AFRICAN GROWTH MIRACLE?

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There is much to celebrate in Africa's recent economic performance. Gone are the traditional pessimism about the continent's growth prospects and the references to basket-case economies. They have been replaced by rosy scenarios replete with stories of African entrepreneurship, expanding Chinese investments, and a growing middle class. The turnaround is easy to see in the numbers. Having spent a long time in negative territory during the 1980s and 1990s, Sub-Saharan Africa's growth rate jumped up to close to 3 percent per annum in per capita terms after 2000. This wasn't as stellar as East and South Asia's performance, but decidedly better than what Latin America, undergoing its own renaissance of sorts, was able to achieve (Figure 1). And it isn't just a revival in investment. The region has been experiencing positive total factor productivity (TFP) growth for the first time since the early 1970s (Figure 2).

The slowing down of emerging market growth and China's rebalancing troubles have led many to take another look at Africa's future economic prospects. Concerns about inadequate structural change have been raised, among others, by the U.N. Economic Commission for Africa (UNECA 2014) and the African Center for Economic Transformation (ACET 2014). As welcome as recent growth has been, the depth of the economic decline prior to the last decade means that many African countries still have not caught up with post-independence income levels. If the World Banks's figures are to be believed, the Central African Republic, the Democratic Republic of Congo, Niger, Liberia, Cote d'Ivoire, Liberia, Zambia, Zimbabwe, and Senegal are all now poorer than they were in 1960.

It is clear that Africa has benefited from a particularly favorable external environment during the last two decades. Global commodity prices have been high and interest rates low. Private capital flows have supplemented increased official assistance. China's rapid growth has fueled demand for the region's natural resources and has stimulated direct investment in

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African economies. The global financial crisis, meanwhile, had little direct impact, given African countries' weak financial links with the rest of the world and low levels of financialization.

Now that China, the advanced economies, and most emerging markets are all slowing down, there is a genuine question about whether Africa's growth can be sustained, and if so, at what level. I will look at this question from the lens of modern growth theory, paying particular attention to structural issues that are crucial for low-income countries. I come down on the pessimistic side, due to what I think are poor prospects for industrialization. Even if my discussion does not yield decisive answers, I hope it clarifies the issues.

The economics of convergence

Neoclassical growth theory establishes a presumption that poor countries should grow faster than rich countries. After all, they have the advantages of economic backwardness: they have low capital-labor ratios, which should raise the return to investment, everything else being the same. Further, they can rely on global capital markets to supplement domestic saving, so the latter should not act as a constraint. Finally, they have access to global markets so that they can expand output quicker in those tradable goods in which they have comparative advantage.

The reality is that convergence has been the exception rather than the norm since the great divergence spawned by the Industrial Revolution and the division of the world into a rich core and a poor periphery (Figure 4). Except for the European periphery and East Asia, sustained rapid growth in the lagging regions has been rare.

Growth theory has accommodated this empirical reality by distinguishing between unconditional and conditional convergence. So growth in developing nations is held back by a variety of country-specific obstacles – ranging from weak institutions to poor geography, from lousy policies to poverty traps. Accordingly, developing nations converge to rich-country income levels only conditional on these disadvantages being overcome. Conditional convergence can be expressed formally as follows:

$$\hat{y}_j = \beta\left(\ln y^*(\Theta_j) - \ln y_j\right) + \varepsilon_j,$$

where $\hat{y}_j$ is the growth rate of per-capita (or per-worker) GDP, y_j, in country *j*, $\boldsymbol{\Theta}_j$ is a vector of country-specific circumstances determining the long-run income level, β is the rate of (conditional) convergence, and ε_j is a random shock term.

What goes into $\boldsymbol{\Theta}_j$ are what we might call the "growth fundamentals"—the set of factors that condition long-run income levels. While this set could be quite large in principle, many of the plausible members of the set are also endogenous in the long-run. Typical conditioning variables used in growth regressions such as levels of investment, human capital, and the quality of policies might be all viewed as being ultimately determined, for example, by a country's quality of institutions (as has been argued forcefully by Daron Acemoglu, James Robinson and assorted co-authors). Or they may be determined by geography and ecology (as has been argued by Jeff Sachs and co-authors). Institutions themselves may be endogenous to initial levels of human capital brought in by colonizers (as has been argued by Glaeser and Shleifer).

For the purposes of the present discussion, I do not need to take a strong stand among these contending perspectives on what the true growth fundamentals are. As long as we leave room for human capital and institutions, I am happy to accept that geography matters too.

African countries cannot do much about their geography, but there is little doubt that their growth fundamentals on all other dimensions have improved significantly. Agricultural markets have been liberalized, domestic markets have been opened up to international trade, parastatals have been rationalized or closed down, macroeconomic stability has been restored, and exchange-rate management is infinitely better than it used to be (Figure 5). Beyond economic governance, political institutions have improved significantly as well, with democracy and electoral competition becoming the norm rather than the exception throughout the continent (Figure 6). Finally, some of the worst military conflicts have ended, reducing the number of civil war casualties in recent years to historic lows for the region (Figure 7).

That is all good news for Africa's economic prospects, but how much growth should we expect out of them? The improvement in the policy and institutional environment can be expected to generate greater economic stability and prevent deep crises arising out of

mismanagement as in the past. But it is not clear that it provides a significant boost for economic growth, and nor that it acts, on its own, as the engine for a growth miracle. Work by Bill Easterly, myself, and others has shown that the relationship between standard measures of good policy (such as trade liberalization and low inflation) and economic growth is not particularly strong, leaving extreme cases aside. A huge black market premium for foreign currency and hyperinflation can drive an economy to ruin, but there is no predictable or large growth difference between an inflation rate of 5% and 15%, or an average tariff rate of 10% versus 25%. As economists, we have a pretty good idea of what can cause economic collapse, but not so much about what can produce a miracle. The upside potential of these policy reforms remain uncertain as a result.

What about institutions, which have received so much attention in the literature? Isn't it the case that high quality institutions make a huge difference to long-run income levels, and hence convergence patterns? Acemoglu, Gallego, and Robinson (2014) claim that differences in institutional quality account for as much as 75% of the variation in income levels around the world. This is a very big number. And it may well be right for the very long-run. The trouble is that even if it is correct, this long-run relationship tells us rather less about growth prospects over the next decade or two. The empirical relationship between institutions (or the change in the quality thereof) and growth rates tend not to be that strong, unlike what the long-run relationship in levels suggests. Few would deny that Latin America's political and economic institutions have improved significantly over the late 1980s and 1990s. Yet the growth payoff has been meager at best. Conversely, high-performing Asian economies such as South Korea (until the late 1990s) and China (presently) have been rife with institutional shortcomings such as cronyism and corruption and yet have done exceedingly well.

Consider democracy. Despite an extensive empirical literature, the growth effects of democracy still remain in question. The strongest recent statement about the growth-promoting effects of democracy comes from Acemoglu, Naidu, Restrepo, and Robinson (2014), who find that full democratization produces roughly a 20% increase in GDP per capita over 30 years. This translates to a growth effect of about 0.6 percent per year. This is not an insignificant effect, but it is temporary and phased out over time. And it cannot account for a

substantial part of income differences across the world – nothing like the 75% claimed for "institutions" in general.

To get large effects out of institutions, even for the long run, we need to use measures such as the "rule of law" or "expropriation risk." An important problem is that these are outcomes: they tell us something about investors' evaluation of the economic environment, but not so much about how to get there. It remains unclear which policy levers have to be pulled to get those outcomes. Surely what is required is more than passing the relevant laws or regulations. And perhaps those same outcomes can be obtained through institutional forms that look very different than those we associate with the "rule of law" in Western contexts. As I have argued elsewhere, the function that good institutions fulfil (about which we have a fairly good idea) do not map into unique forms (about which we know a lot less) (Rodrik 2008). The mapping depends on local context and opportunities, and figuring it out can be quite hard. One lesson for Africa is that we should not be overly confident about the growth payoffs when countries adopt the formal trappings of "good institutions."

A structural transformation perspective

So the standard growth equation $\hat{y}_j = \beta\left(\ln y^*(\boldsymbol{\Theta}_j) - \ln y_j\right) + \varepsilon_j$ does not do a very good job of describing growth miracles, at least with the usual fundamentals, $\boldsymbol{\Theta}$. A complementary perspective is provided by the tradition of dual-economy models that have long been the staple of development economics. The birth of modern growth economics has overshadowed this tradition aside, but it is clear that the heterogeneity in productive structures which dual-economy models capture continue to have great relevance to low income economies such as those in Sub-Saharan Africa. A hallmark of developing countries is the wide dispersion in productivity across economic activities – modern versus traditional, formal versus informal, traded versus non-traded, cash crops versus subsistence crops, etc. – and even within individual sectors, as recent studies have documented.

What was implicit in those old dual-economy models was the difference in the dynamic properties of productivity across the modern-traditional divide. Traditional sectors were

stagnant, while modern sectors had returns to scale, generated technological spillovers, and experienced rapid productivity growth. This picture has been refined over time, and we no longer think of traditional sectors – such as agriculture – as necessarily stagnant. But in one important respect, recent findings reinforce the dual-economy perspective. As I have shown (Rodrik 2013), modern, organized manufacturing industries are different: they do exhibit unconditional convergence, unlike the rest of the economy (Figure 8). The estimated beta-coefficient in these industries is close to 3 percent, suggesting a half-life of convergence of 40-50 years.

This is a rather remarkable result. It says that modern manufacturing industries converge to the global productivity frontier regardless of geographical disadvantages, lousy institutions, or bad policies. Under better conditions, convergence could be faster of course. But what is striking is the presence of convergence, in at least certain parts of the economy, even in the absence of good fundamentals.

In Rodrik (2013), I show that this result is fairly general, regardless of time period, region, or level of aggregation. In particular, the twenty or so African countries which are represented in the UNIDO data set follow the same pattern as the rest of the world (Figure 9). In this respect, Africa is no different. So can Africa generate a growth miracle based on the performance of these manufacturing industries?

Let us first integrate this sectoral convergence result with the conditional convergence framework for the entire economy. Divide the economy into two parts, the modern (or manufacturing) part, with the subscript *M*, and the rest (or traditional part) with subscript *T*. Suppose only the *M*-sector exhibits unconditional convergence, while the *T*-sector is subject to conditional convergence as before. Now the growth rate of the economy can be decomposed into three channels:

$$\begin{aligned}\hat{y} \quad &= \beta(\ln y^*(\boldsymbol{\Theta}) - \ln y) \\ &+ \alpha_M \pi_M \beta_M (\ln y_M^* - \ln y_M) \\ &+ (\pi_M - \pi_T) d\alpha_M\end{aligned}$$

The first of these is the conditional convergence channel we have looked at before. It depends on the cumulative accumulation of fundamental capabilities, vague as the contents of these may be, as I discussed before. The second channel is convergence within modern industries. Its magnitude depends on the distance from the productivity frontier, the convergence coefficient (β_M), the productivity premium in *M* relative to the economy (π_M), and the employment share of *M* (α_M). The third channel is the structural change term, and captures the growth effect of the reallocation of labor from low-productivity sectors (*T*) to high-productivity sectors (*M*).

The two new terms can boost growth significantly, and indeed have played a key role in Asian growth miracles. Their quantitative magnitudes depend crucially on the size of the modern/manufacturing sector and its rate of expansion ($\alpha_M, d\alpha_M$) – that is, the pace of industrialization. Rapid industrialization produces fast growth into middle-to-upper income status. In the later stages of growth, as industrial convergence runs out of steam, economic progress begins to rely disproportionately on the fundamentals and growth slows down.

This framework produces the following typology of growth patterns.

A typology of growth processes/outcomes

		Structural transformation, industrialization ($d\alpha$)	
		slow	*rapid*
Investment in fundamentals (human capital, institutions)	*slow*	(1) no growth	(1) episodic growth
	rapid	(1) slow growth	(1) rapid, sustained growth

As the 2X2 box makes clear, long-term convergence requires both structural change and fundamentals. Rapid industrialization without the accumulation of fundamental capabilities (institutions, human capital) produces spurts of growth that eventually run out of steam. But investment in fundamentals on its own produces moderate growth at best in the absence of rapid structural change.

Structural change and industrialization in Africa

So where does Africa stand in structural change? Here the picture is considerably less bright. While farmers have moved out of rural areas and the share of agriculture in employment and value added has dropped significantly since the 1960s, the primary beneficiary has been urban services rather than manufactures. In fact, industrialization has lost ground since the mid-1970s, and not much of a recovery seems to have taken place in recent decades. Manufacturing industries' share of employment stands well below 8 percent, and their share in GDP is around 10 percent, down from almost 15 percent in 1975 (Figure 10). Most countries of Africa are too poor to be experiencing de-industrialization, but that is precisely what seems to be taking place. Note that the data I am relying on here, from the Groningen Growth and Development Center, cover only eleven countries in the entire continent. But data from other sources (such as the World Bank's World Development Indicators) tell a broadly similar, and not very encouraging story.

Figure 11 provides a visual comparison with Asian countries. African countries are shown in blue, while Asian countries are red. Not surprisingly, African observations are mostly on the lower left-hand side of the chart, at low levels of income and industrialization compared to Asia. But more importantly, and less evidently, the industrialization-income relationship looks decidedly different in the two regions: African countries are under-industrialized at all levels of income, relative to Asia.

Figures 12 and 13 compare patterns of structural change for specific countries. Look first at Vietnam, which exhibits the classic, growth-promoting pattern of structural change. Labor has moved from agriculture into more productive urban occupations. Manufacturing has

expanded by 8 percentage of the labor force over 1990-2008, but so has many services which are comparatively of high productivity. McCaig and Pavcnik's (2013) work shows that these patterns of structural change account for around half of Vietnam's impressive growth over this period. The pattern in Africa, exemplified by Ethiopia and Kenya in Figure 13, is much more mixed. In both cases, there has been outmigration from agriculture, but the consequences have been less salutary. In Ethiopia, where there has been some growth-promoting structural change, its magnitude is much smaller than in Vietnam. Manufacturing industry, in particular, has expanded much less. In Kenya, meanwhile, structural change has contributed little to growth. That is because the large number of workers leaving agriculture have been absorbed mainly into services where productivity is apparently not much higher than in traditional agriculture.

The even worse news for African manufacturing is the degree to which it is dominated by small, informal firms that are not particularly productive. The share of formal employment in overall manufacturing employment appears to run as small as 6% in Ethiopia and Senegal (Figure 14). Remember that the finding on unconditional convergence applies to formal, organized firms. There is little reason or evidence to believe that informal firms are on the same escalator as modern firms with access to technology, markets, and finance. The evidence on informality suggests few small, informal firms eventually grow out of informality. So informality is a drag on overall productivity, and this plays a large part in explaining why not just services but also manufacturing in Africa has been falling behind the productivity frontier, even in recent years with high growth (Figure 15).

To sum up, 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.

High-growth scenarios for Africa

To generate sustained, rapid growth into the future, Africa has essentially four options. The first one is to revive manufacturing and put industrialization back on track, so as to replicate as much as possible the traditional route to convergence. The second is to generate agriculture-led growth, based on diversification into non-traditional agricultural products. The third is to generate rapid growth in productivity in services, where most of the people will end up in any case. The fourth is growth based on natural resources, in which many African countries are amply endowed. Let me say a few words about each of these scenarios.

What are the prospects for a renewed industrialization drive in Africa? While the bulk of Chinese investment has gone to natural resources, there have been some hopeful signs of greenfield investments in manufacturing as well in many countries of the region, most notably Ethiopia, Nigeria, Ghana, and Tanzania. Looking at some of these green shoots, one can perhaps convince oneself that Africa is well poised to take advantage of rising costs in Asia and turn itself into the world's next manufacturing hub. Yet, as we have seen, the aggregate data do not yet show something like this happening.

There is almost universal consensus on what holds manufacturing back in Africa. It is called "poor business climate," a term that is sufficiently broad and all-encompassing that there is room for virtually anything under its rubric. The very useful paper by Gelb, Meyer, and Ramachandran (2014), for example, cites costs of power, transport, corruption, regulations, security, contract enforcement, and policy uncertainty, among other impediments. There is little doubt that all of these raise the costs of doing business in Africa for an investor interested in starting or expanding a manufacturing operation.

But there is also a hopeful side to this account. If the problem is that such costs act as a tax on tradable industries, there is a relatively easy remedy that could compensate for them. It is the exchange rate. A real exchange rate depreciation of, say, 20%, is effectively a 20% subsidy on all tradable industries. It is a way of undoing the costs imposed by the business environment in a relatively quick and easy manner. Where the culprit for slow industrialization are market failures, an undervalued exchange rate also substitutes for industrial policy. At the right exchange rate, many African manufacturers can compete with Chinese and Vietnamese

exporters, both externally and in the home market. As I and others have noted, an undervalued real exchange rate may be the most effective tool for spurring industrialization and hence growth (Rodrik 2008, Johnson et al. 2010).

Of course, achieving and sustaining a competitive/undervalued real exchange rate requires an appropriate monetary/fiscal policy framework. In particular, it requires managing or discouraging capital and aid inflows and a tighter fiscal policy than otherwise. But these macroeconomic policy adjustments may be considerably easier to implement than the endless series of policy reforms needed to fix the individual problems associated with the "poor business climate." Once the economy is on a higher growth path, it may become easier to deal with those problems over time, reducing the reliance on the real exchange rate.

Yet I have the suspicion that the obstacles industrialization faces in Africa are more deep-seated, and go beyond specific African circumstances. For various reasons that we do not quite understand, industrialization has become really hard for all countries of the world. The advanced countries are of course de-industrializing, which is not a big surprise and can be ascribed both to shift in demand in services and imports. But middle income countries in Latin America are too. And industrialization in low income countries is running out of steam considerably earlier than has been traditionally case. This is the phenomenon that I have called "premature industrialization."

As Figure 16 shows, late developers have begun to deindustrialize at lower and lower levels of income. The first wave of industrializers such as Britain and Germany put more than 30 percent of their labor force in manufacturing before they began to deindustrialize. Among Asian exporters, the most successful such as Korea reached a peak well below 30 percent. Today, countries such as India, along with many Latin American countries, are deindustrializing from peaks that do not exceed the mid-teens. Even Vietnam, which is one of the most successful recent industrializers, shows signs of having peaked at 14 percent of employment. Yet Vietnam is still a poor country, and in an earlier period would have had many more years of further industrialization.

The reasons for this common pattern of premature deindustrialization are probably a combination of global demand shifts, global competition, and technological changes. Whatever

the reason, Africa finds itself in an environment where it is facing much stronger head winds. Countries with a head start in manufacturing, having developed a large manufacturing base behind protective walls as in both Europe and Asia, make it difficult for Africa to carve a space for itself, especially as global demand shifts from manufacturing to services. Having liberalized trade, African countries have to compete today with Asian and other exporters not only on world markets, but also in their domestic markets. Earlier industrializers were the product of not just export booms, but also considerable amount of import substitution. Africa is likely to find both processes very difficult, even under the best of circumstances.

What about the second scenario of agriculture-based growth? Since so much of Africa's workforce is still in agriculture, does it not make sense to prioritize agricultural development? Without question, there are many unexploited opportunities in African agriculture, whether in perishable non-traditional products such as fruits and vegetables or perishable cash crops such as coffee.

Agricultural diversification seems to be hindered by many of the same obstacles as manufacturing. The term "poor business climate" applies equally well here too (e.g., Golub and Hayat 2014). In addition, agriculture has special problems that governments need to fix, such as extension, land rights, standard setting, and input provision. Once again, the exchange rate can be an important compensatory tool.

The main argument against this scenario is that it is very difficult to identify historical examples of countries that have pulled such a strategy off. Agriculture-led growth implies that countries would sell their agricultural surplus on world markets, and that their export basket would remain heavily biased towards farm products. Yet one of the strongest correlates of economic development is export diversification away from agriculture. It is true that Asian countries such as China and Vietnam have benefited greatly from an early spurt in agricultural productivity – something that is particularly helpful for poverty reduction. But in all cases, the subsequent and more durable boost came from the development of urban industries. Moreover, even if modern, non-traditional agriculture succeeds on a large scale in Africa, it is unlikely that this will reverse the process of outmigration from the countryside. More capital and technology intensive farming may even accelerate this process. So one way or another

African countries will need to develop an array of high productivity sectors outside of agriculture.

The third scenario of growth in service productivity is one that perhaps raises the largest numbers of questions. When I lay out my pessimism on industrialization to audiences familiar with Africa, invariably I hear back a litany of success cases in services – mobile telephony and mobile banking are the most common – that seem to lead to a more optimistic prognosis.

With few exceptions, services traditionally have not acted as an escalator sector like manufacturing. The essential problem is that those services that have the capacity to act as productivity escalators tend to require relatively high skills. The classic case is information technology, which is a modern, tradable service. Long years of education and institution building are required before farm workers can be transformed into programmers or even call center operators. Contrast this with manufacturing where little more than manual dexterity is required to turn a farmer into a production worker in garments or shoes, raising his/her productivity by a factor of two or three.

So raising productivity in services has typically required steady and broad-based accumulation of capabilities in human capital, institutions, and governance. Unlike in manufacturing, technologies in most services seem less tradable and more context-specific (again with some exceptions such as cell phones). And achieving significant productivity gains seems to depend on complementarities across different policy domains. For example, productivity gains in a narrow segment of retailing can be accomplished relatively easily by letting foreign firms such as Walmart or Carrefour come in. But achieving productivity gains along the entire retail sector is extremely difficult in view of the heterogeneity of organizational forms and the range of prerequisites across different segments.

None of this is to say that the past will necessarily look like the future. Perhaps Africa will be the breeding ground of new technologies that will revolutionize services for broad masses, and do so in a way that creates high-wage jobs for all. Perhaps. But it is too early to be confident about the likelihood of this scenario.

Finally, what about natural resource based growth? Once again, the argument against this scenario has to be the paucity of relevant examples in history. Almost all of the countries that have grown rapidly (say at 4.5% per annum) over a period of three decades or more have done so by industrializing (Rodrik 2013). In the post-World War II period, there were two such waves of countries, one in the European periphery (Spain, Portugal, Italy, etc.) and one in Asia (Korea, Taiwan, China, etc.) Very few countries could achieve such a performance based on natural resources, and those that did were typically very small countries with unusual circumstances. Three of these countries were in Sub-Saharan Africa: Bostwana, Cape Verde, and Equatorial Guinea. What these countries demonstrate is that it is indeed possible to grow rapidly if you are exceptionally rich in minerals and fuels. But it would be a stretch of the imagination to think that these countries set a relevant or useful example for countries such as Nigeria and Zambia, let alone Ethiopia and Kenya.

The downsides of natural resource based growth patterns are well known. Resource sectors tend to be highly capital intensive and absorb little labor, creating enclaves within economies. This is one reason why small economies can generally do better with resource windfalls. Resource booms crowd out other tradables, preventing industries with escalator properties from getting off the ground. Resource rich economies experience substantial volatility in their terms of trade. And they have great difficulty in managing/sharing resource rents. Institutional underdevelopment is often the price paid for resource riches. All these factors help account for why resource based growth has not paid off for most countries.

Is an African growth miracle possible?

The balance of the evidence I have reviewed here suggests caution on the prospects for high growth in Africa. Much of the recent performance seems to be due to temporary boosts: an advantageous external context and making up of lost ground after a long period of economic decline. While the region's fundamentals have improved, the payoffs to macroeconomic stability and improved governance are mainly to foster resilience and lay the groundwork for growth, rather than to ignite and sustain rapid productivity growth. The traditional engines

behind rapid growth and convergence, structural change and industrialization, are operating at less than full power.

So my baseline would be that we should expect moderate and steady growth, perhaps as much as 2 percent per capita, as long as the external environment does not deteriorate significantly and China manages its own substantial challenges well. I hasten to point out that a growth rate of 2 percent on a sustained basis is not bad at all. In all likelihood, this will also produce some convergence with the more advanced economies, largely because the latter will not do very well in the decades ahead. My story is not one of Afro-pessimism, but one of curbing our enthusiasm, as Oliver Sabot aptly summarized at the dinner following my lecture.

I can make one other prediction, perhaps one that I feel even more confident about. If African countries do achieve growth rates substantially higher than what I have surmised, they will do so pursuing a growth model that is different from earlier miracles based on industrialization. Perhaps it will be agriculture-led growth. Perhaps it will be services. But it will look quite different than what we have seen before.

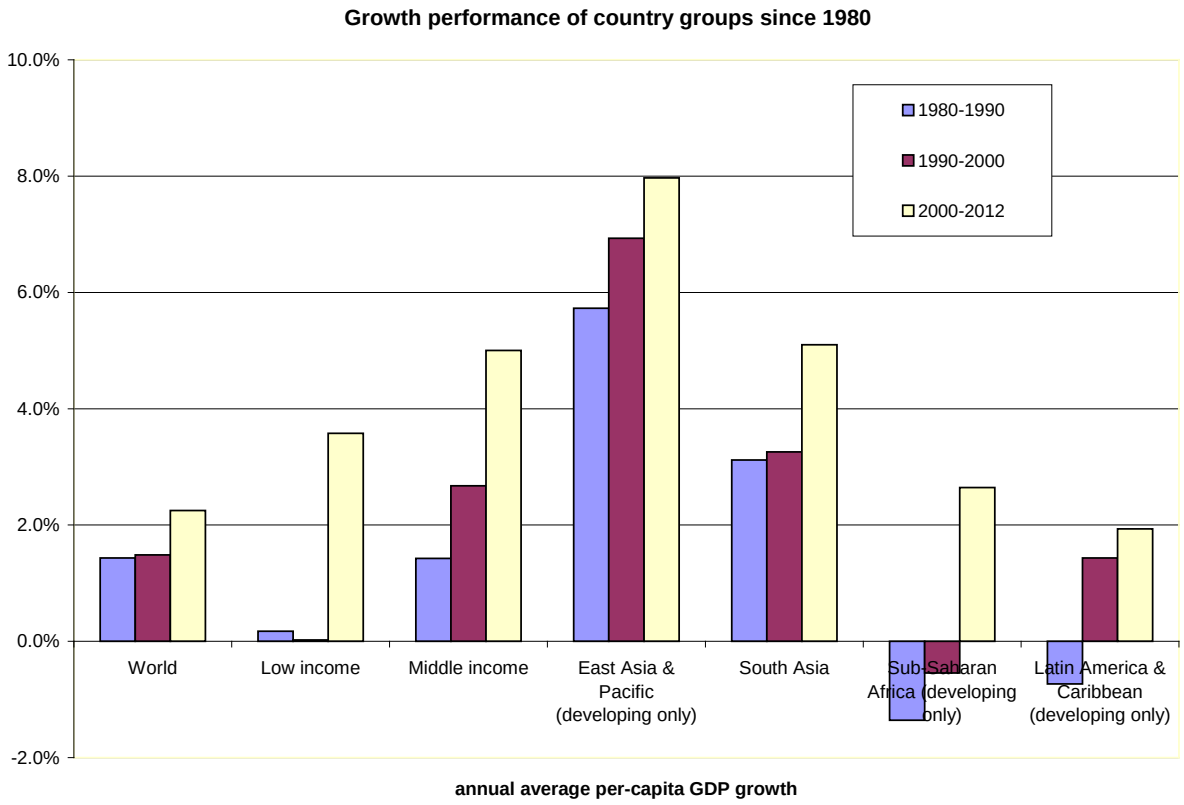


Figure 1

Source: World Development Indicators, World Bank

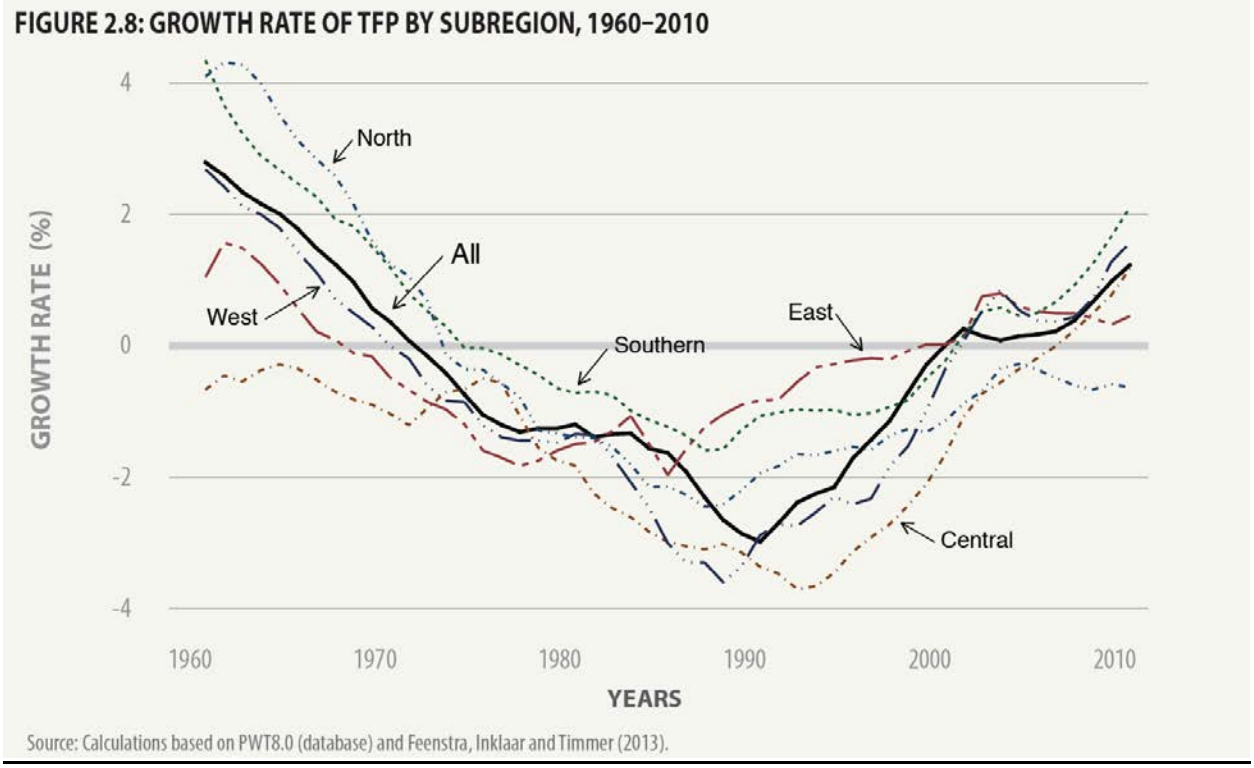


Figure 2

Source: UNECA (2014)

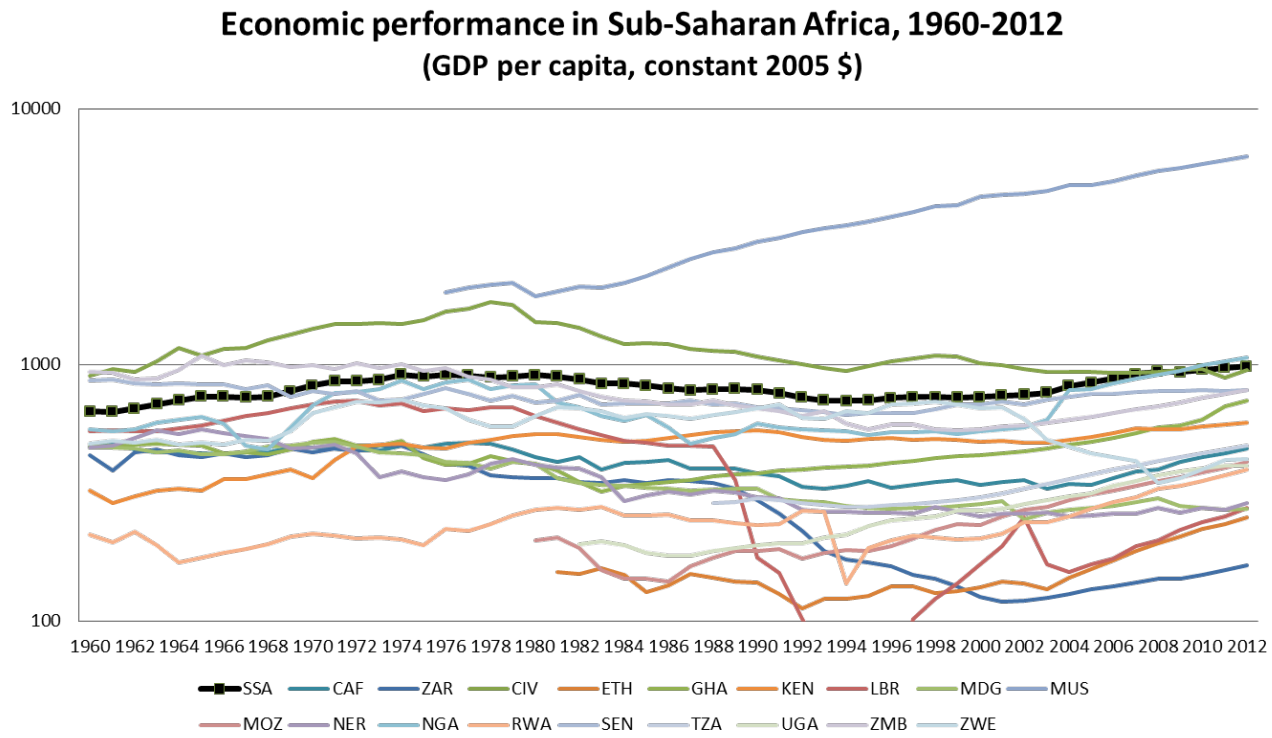
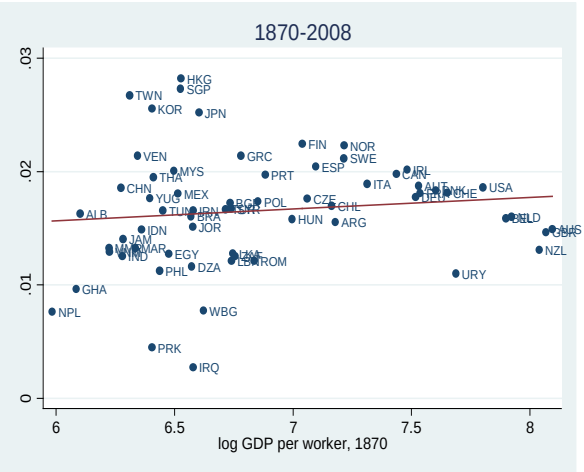
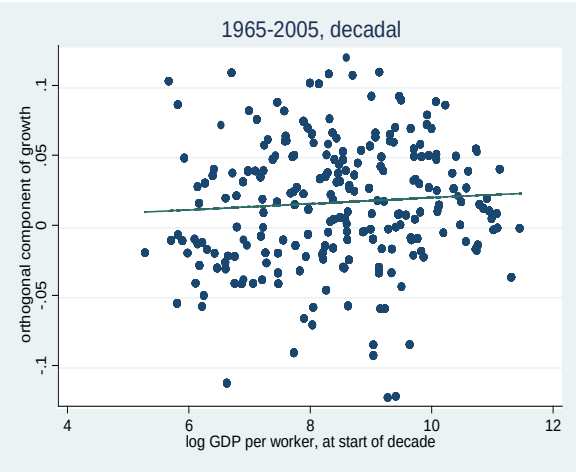


Figure 3

Source: World Development Indicators, World Bank

Convergence is historically the exception rather than the norm





Notes: For RHS chart, variable on the vertical axis is growth of GDP per worker over four separate decades (1965-1975, 1975-1985, 1985-1995, 1995-2005), controlling for decadal fixed effects.
Source: Rodrik (2013), using data from Maddison (2010) and PWT 7.0 (2011).

Figure 4

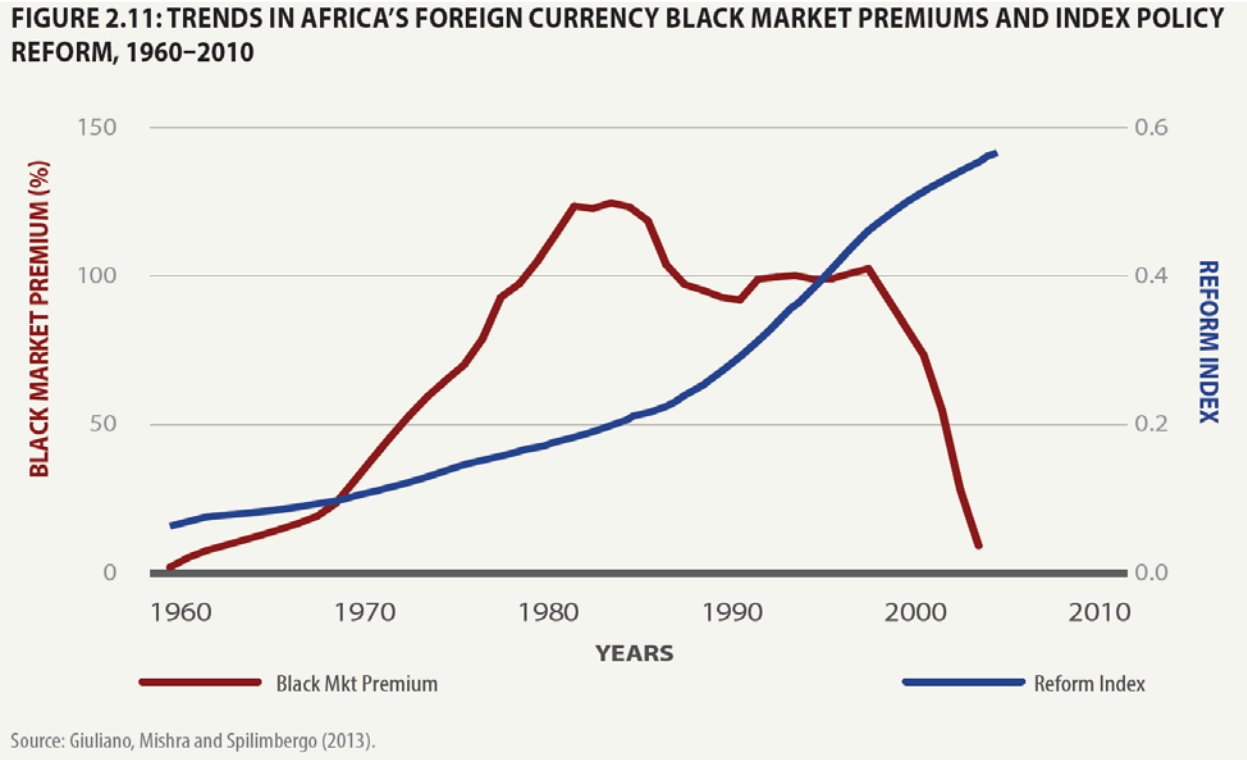


Figure 5

Source: UNECA (2014)

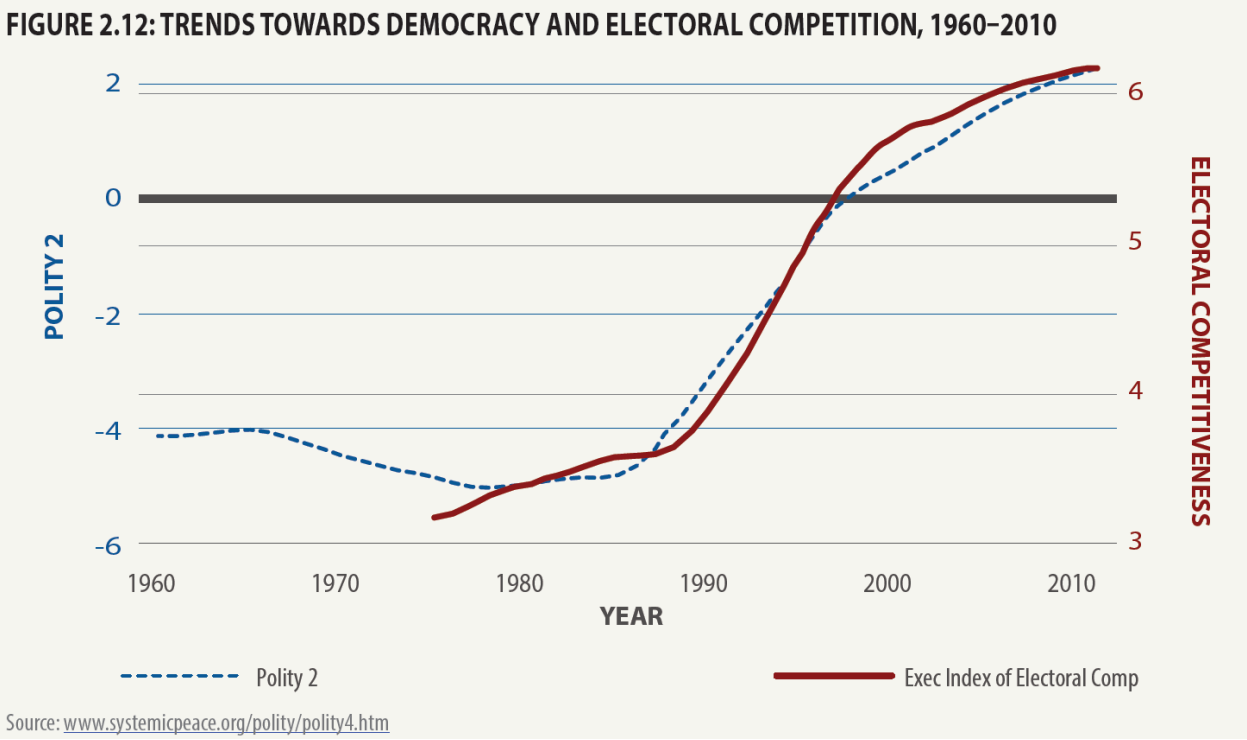


Figure 6

Source: UNECA (2014)

Africa's fundamentals: fewer civil wars

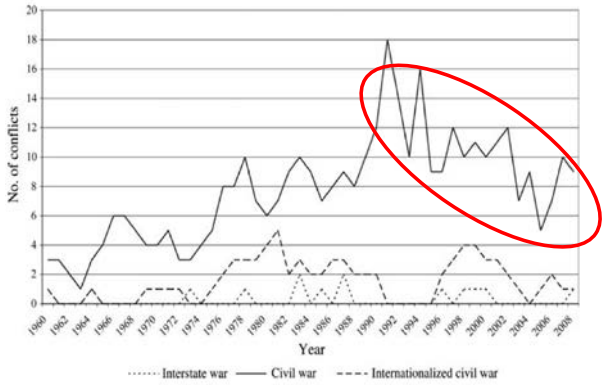


Figure 1. Armed conflicts in sub-Saharan Africa by type, 1960–2008.

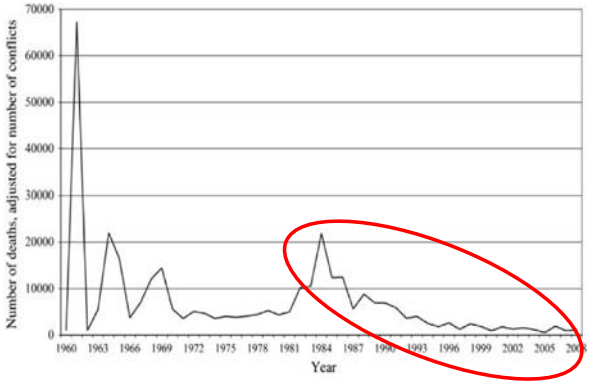
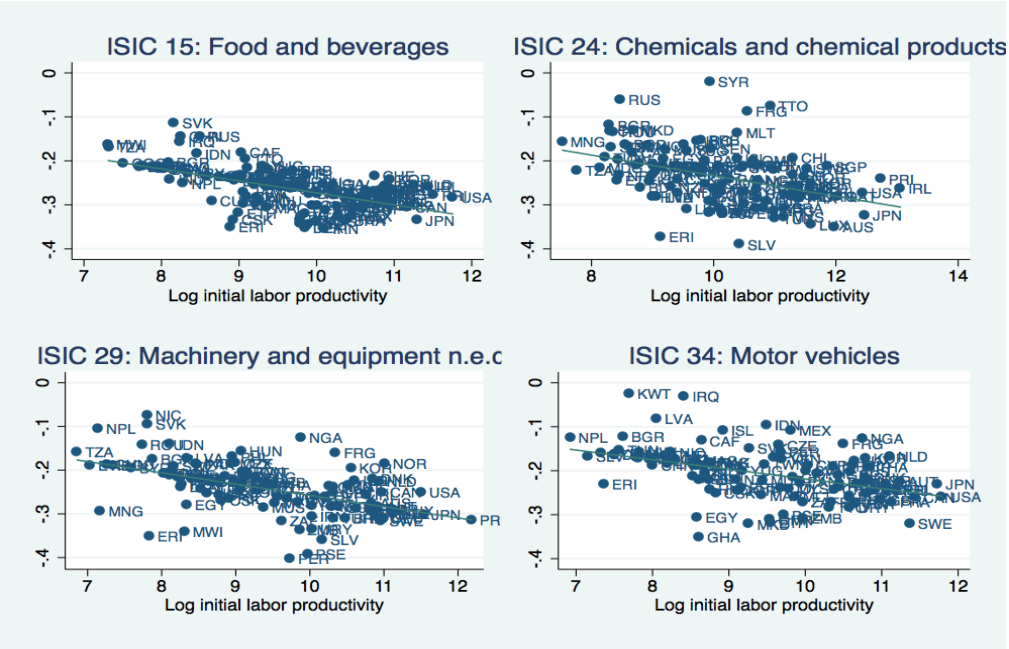


Figure 4. Battle deaths in civil wars in sub-Saharan Africa, 1960–2008.

Source: Straus (2012)

Figure 7

There *is* unconditional convergence -- in (formal) manufacturing industries

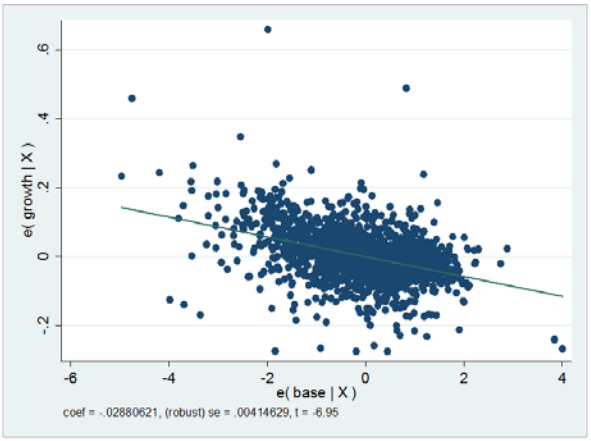


Notes: Vertical axis represents growth in labor productivity over subsequent decade (controlling for period fixed effects). Data are for the latest 10-year period available.
Source: Rodrik (2013)

Figure 8

African manufacturing seems no different

Full sample: 115 countries



Sub-Saharan Africa: 20 countries

Each observation represents a 2-digit manufacturing industry, for the latest 10 year period for which data are available. The horizontal axis is the log of VA per worker in base period, and the vertical axis is its growth rate over the subsequent decade. Period, industry, and period x industry controls are included.

Figure 9

Table 2. GDP, employment, and relative productivity levels across countries and sectors, 1960 -2010

	Value added				Employment				Relative productivity levels			
	1960	1975	1990	2010	1960	1975	1990	2010	1960	1975	1990	2010
Agriculture	**37.6**	**29.2**	**24.9**	**22.4**	**72.7**	**66.0**	**61.6**	**49.8**	**0.5**	**0.4**	**0.4**	**0.4**
Industry	**24.3**	**30.0**	**32.6**	**27.8**	**9.3**	**13.1**	**14.3**	**13.4**	**4.4**	**3.7**	**3.5**	**2.6**
Mining	8.1	6.2	11.2	8.9	1.7	1.5	1.5	0.9	15.7	22.4	23.3	19.5
Manufacturing	9.2	14.7	14.0	10.1	4.7	7.8	8.9	8.3	2.5	2.8	2.4	1.6
Other industry	7.1	9.2	7.3	8.9	3.0	3.8	3.9	4.2	8.5	5.8	5.3	2.9
Services	**38.1**	**40.7**	**42.6**	**49.8**	**18.0**	**20.9**	**24.1**	**36.8**	**2.7**	**2.5**	**2.4**	**1.6**
Market services	24.5	25.5	28.1	34.0	8.8	10.3	12.9	23.5	4.5	3.4	3.0	1.8
Distribution services	*21.5*	*20.8*	*22.7*	*25.4*	*8.2*	*9.5*	*11.4*	*20.1*	*4.6*	*3.2*	*2.7*	*1.5*
Fin. and bus. ser.	*3.0*	*4.7*	*5.4*	*8.6*	*0.6*	*0.8*	*1.5*	*3.4*	*6.1*	*8.9*	*10.4*	*8.1*
Non-market services	13.6	15.2	14.4	15.8	9.2	10.6	11.2	13.3	1.8	1.7	1.8	1.3
Government services	*10.5*	*11.7*	*11.5*	*12.2*	*4.2*	*5.0*	*6.4*	*8.7*	*2.8*	*2.5*	*2.5*	*1.7*
Other services	*3.1*	*3.5*	*2.9*	*3.5*	*5.4*	*6.1*	*5.3*	*5.4*	*0.9*	*0.9*	*1.0*	*1.0*
Total economy	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**1.0**	**1.0**	**1.0**	**1.0**

Figure 10

Source: de Vries, Timmer, and de Vries (2013)

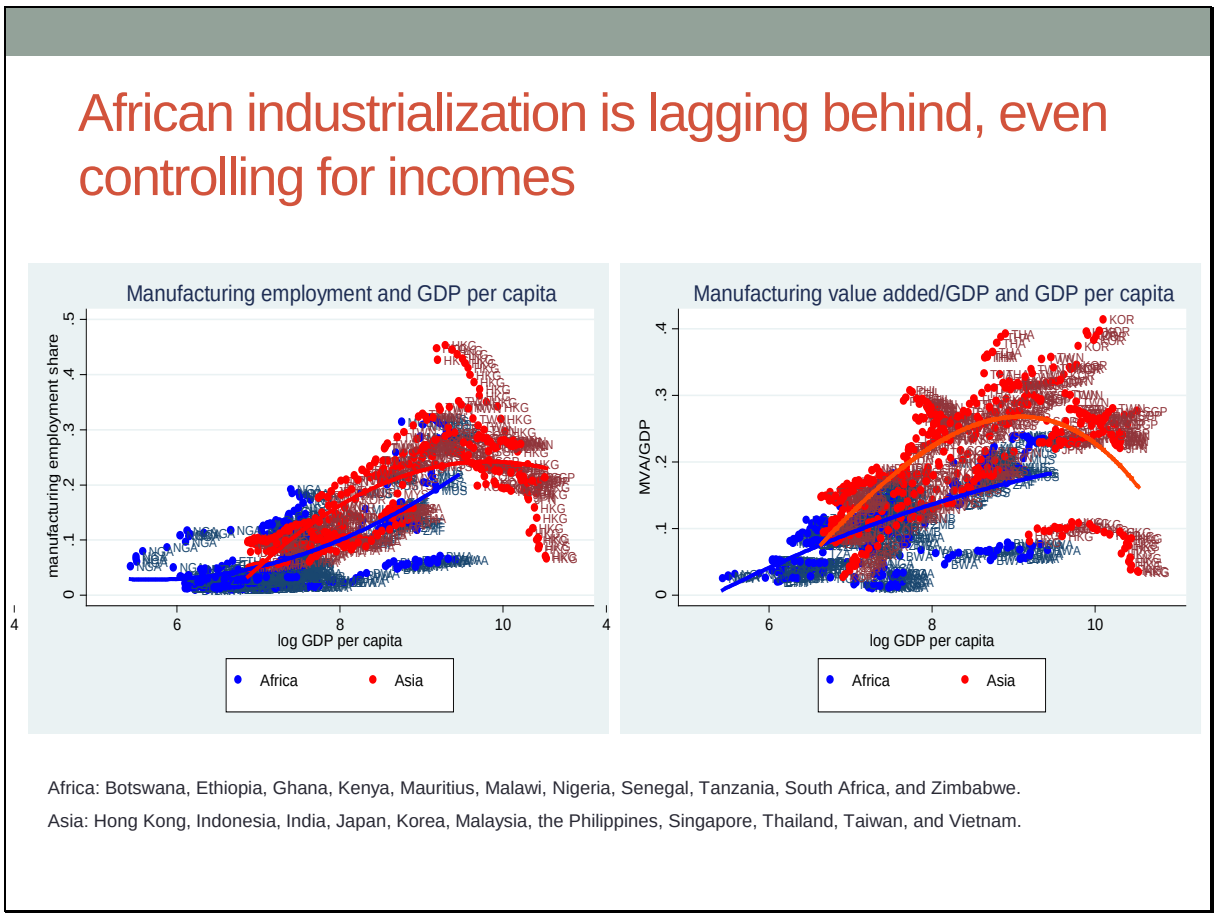
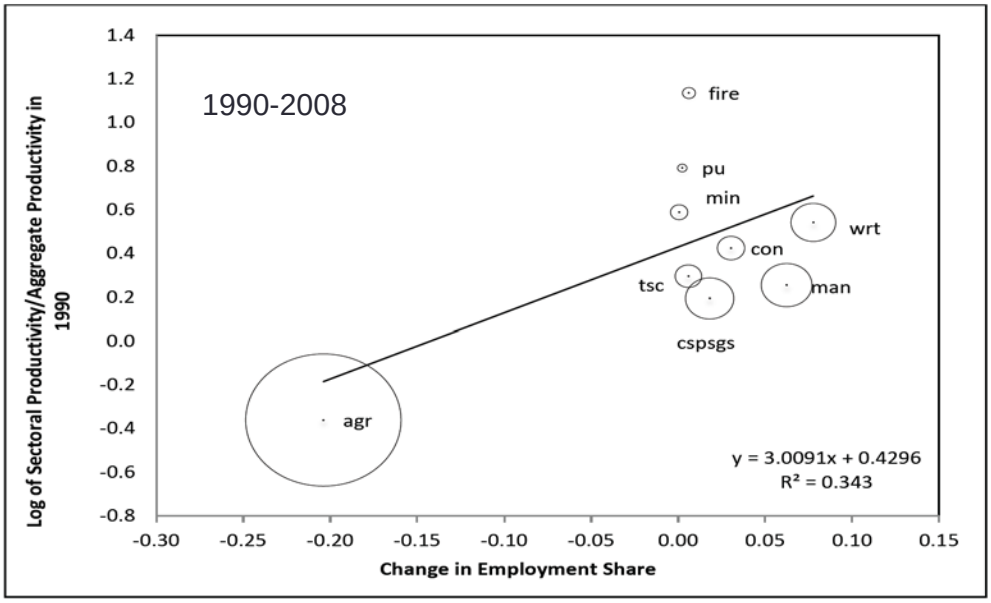


Figure 11

Source: Based on data from Groningen Growth and Development Center

Structural change in Vietnam versus…

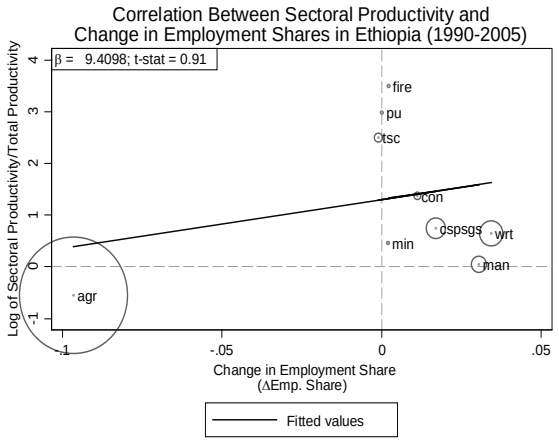


Notes: Authors' calculations based on data from the GSO. The bubble sizes indicate the share of total employment in 1990. For sector abbreviations refer to Table A.1.

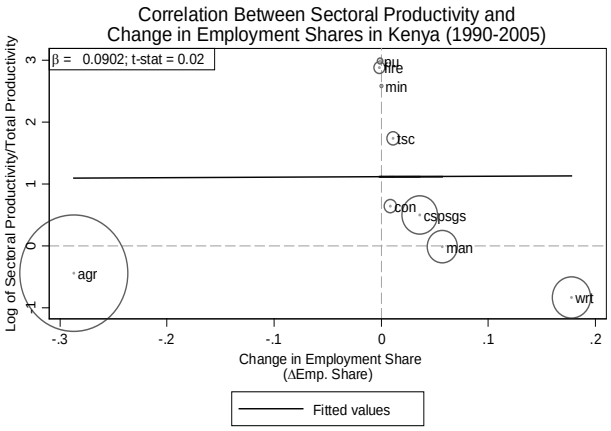
Source: McCaig and Pavcnik (2013)

Figure 12

… Africa



*Note: Size of circle represents employment share in 1990
**Note: β denotes coeff. of independent variable in regression equation:
ln(p/P) = α + βΔEmp. Share
Source: Authors' calculations with data from National Bank of Ethiopia and Ethiopia's Ministry of Finance



*Note: Size of circle represents employment share in 1990
**Note: β denotes coeff. of independent variable in regression equation:
ln(p/P) = α + βΔEmp. Share
Source: Authors' calculations with data from Kenya National Bureau of Statistics, Central Bureau of Statistics, UN National Accounts Statistics and ILO's KILM

Source: McMillan and Rodrik (2008)

Figure 13

Informality dominates in African manufacturing

Manufacturing employment shares, GGDC and UNIDO datasets, 1990

(percent)

	year	UNIDO	GGDC	ratio
BWA	2008	3.6	6.4	56%
ETH	2008	0.3	5.3	6%
GHA	2003	1.0	11.2	9%
KEN	2007	1.5	12.9	12%
MUS	2008	16.3	21.5	76%
MWI	2008	0.7	4.3	16%
NGA	1996	1.4	6.6	21%
SEN	2002	0.5	8.9	6%
TZA	2007	0.5	2.3	22%
ZAF	2008	7.0	13.1	53%
ZMB	1994	1.5	2.9	52%

Difference in coverage between two data sets: GGDC (which covers informal employment) and UNIDO (which is mostly formal, registered firms)

Figure 14

Figure 1. An international perspective on productivity (USA = 100)

A. manufacturing

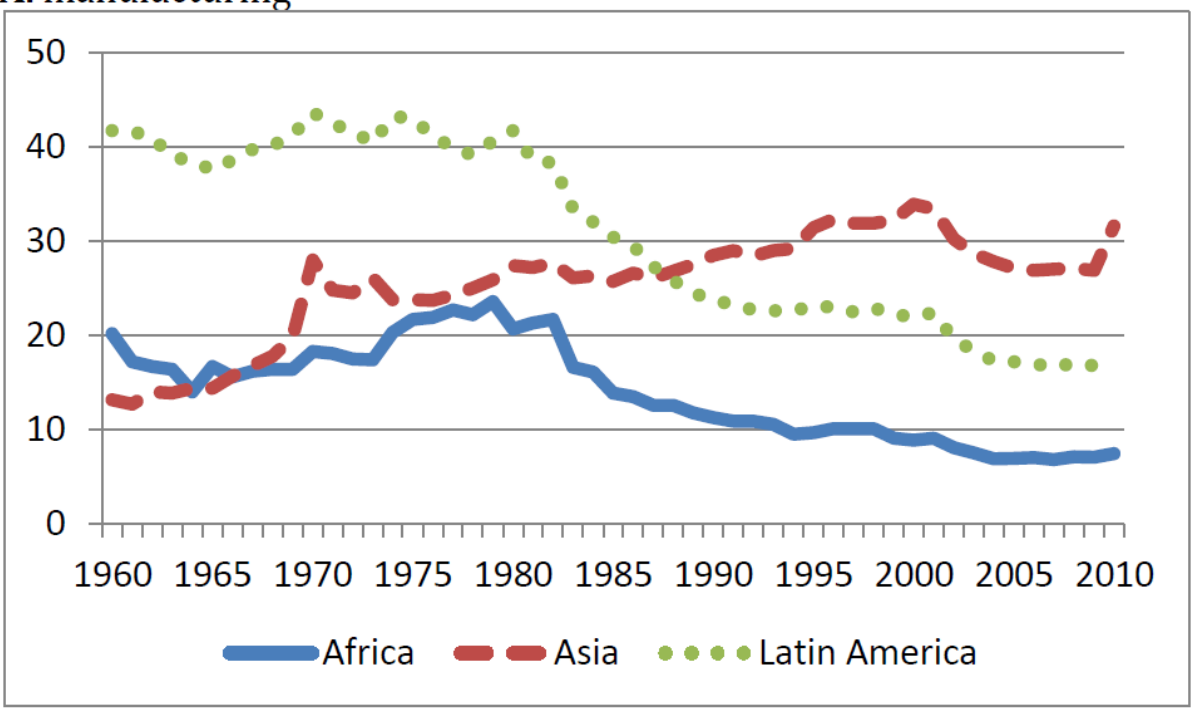


Figure 15

Source: de Vries, Timmer, and de Vries (2013)

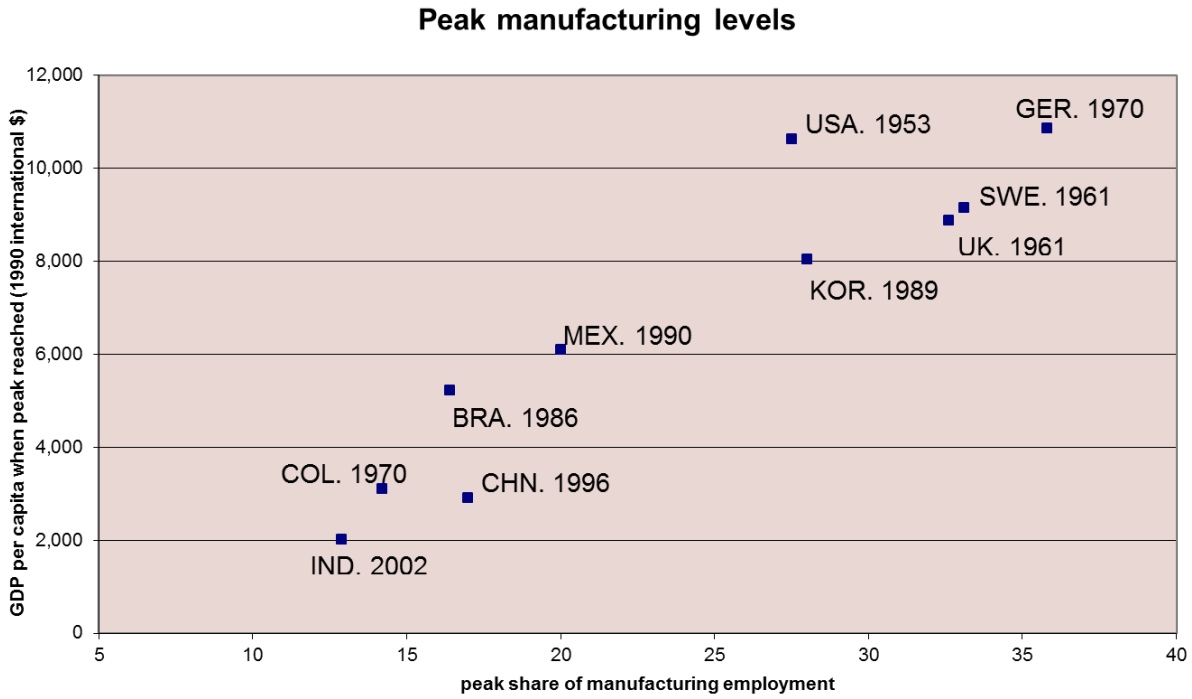

Peak manufacturing levels
GDP per capita when peak reached (1990 international $)
12,000
10,000
8,000
6,000
4,000
2,000
0
5
10
15
20
25
30
35
40
peak share of manufacturing employment
USA. 1953
GER. 1970
SWE. 1961
UK. 1961
KOR. 1989
MEX. 1990
BRA. 1986
COL. 1970
CHN. 1996
IND. 2002

Figure 16

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