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African Firms in the Global Economy

Arne Bigsten
Måns Söderbom

In this article we review the status of African manufacturing firms in the global economy. We discuss how the policies relevant for manufacturing performance have developed over four decades starting in the 1960s, and take stock of the actual performance of the sector. We examine the prospects for improved performance, using a historical benchmark and a comparative advantage framework, and document empirical evidence on the relationship between openness and firm performance drawing on African firm-level data. Finally we discuss what economic policies are required to support industrial growth.

Keywords: Export, investment, manufacturing performance, comparative advantage, Africa, industrial policy

I. Introduction

There is widespread agreement that growth in sub-Saharan Africa's private, non-farm sector is important for the continent's development. Growth in this sector will generate more jobs, reduce vulnerability to weather shocks, spur technological progress, and, ultimately, reduce poverty. Since domestic markets for non-farm products and services are typically small in sub-Saharan Africa

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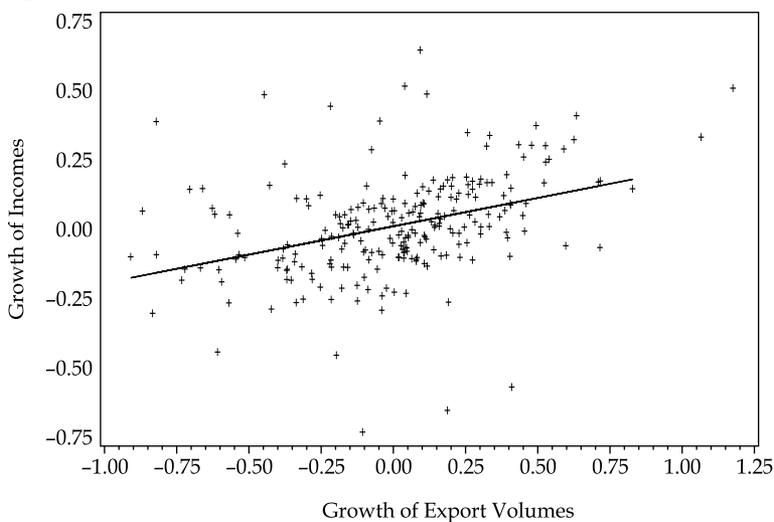
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(Africa from here on), growth in this sector requires participation of Africa's firms in the international market. In this article we review the status of African manufacturing firms in the global economy. Drawing on aggregate as well as plant-level data, we analyse long-run trends in the economic performance of the sector, identify the prospects for improved performance and discuss key areas in which policy changes can make a difference both in the short and long run.

There exists plenty of empirical evidence both at the macro and micro level showing that, for Africa, openness and growth are positively correlated. Figure 1, taken from Söderbom and Teal (2003), is one example. This graph plots the growth rate of per capita GDP (over five-year periods) on the lagged growth of per capita exports, based on macro data for nine countries observed over the period 1960–2000: Mauritius, South Africa, Botswana, Ghana, Kenya, Nigeria, Tanzania, Uganda, and Zambia. It is clear that the growth rates for income and exports are closely linked for these countries. Patillo et al. (2005) show that trade in Africa has been closely associated with growth accelerations. While the causal links between openness and growth are a matter of dispute amongst some economists (see Rodriguez and Rodrik 2001, for a critical assessment of the literature), one historical fact nevertheless remains undisputed: high per capita income growth rates tends to be accompanied by growth in exports. Moreover, there are many studies which show that the impact of exports on growth also depends on the export composition. Harrison and Rodriguez-Clare (2009: 40) note that 'exports are more likely to lead to growth if they are in non-traditional sectors such as manufacturing or skill-intensive goods rather than primary products or raw materials'. Evidence from micro data indicates that, for Africa at least, exporting causes productivity gains, supporting the idea that firms in Africa learn by exporting (see Bigsten et al. 2004; Bigsten and Gebreeyesus 2009; Van Biesebroeck 2005). The results in these studies also suggest that breaking into the export market is costly, however. This suggests that active policies encouraging exports, perhaps by lowering entry costs, may help African firms to become more competitive.

Figure 1: Growth of Incomes and Export Volumes in Nine African Countries*

Source: Söderbom and Teal (2003).

Note: *Incomes are GDP (PPP) per capita at 1995 prices. Export volumes are constant price volume figures. The growth rate of both incomes and exports are fifth period differences. The growth rate of exports is lagged one period.

The line shown is the predicted value of the regression

$$\text{Ln}(Y)_t - \text{Ln}(Y)_{t-5} = \beta [\text{Ln}(X)_{t-1} - \text{Ln}(X)_{t-6}],$$

where Y is per capita income and X is per capita exports.

Most of Africa's exports are not in the form of manufactures, and the manufacturing sector is quite small in terms of output and employment compared with other sectors. Table 1 shows that manufacturing value added is less than 15 per cent of total income in Africa, compared to more than 30 per cent in China. The table also shows that, for Africa, the share of manufacturing in total value added has declined since 1990. Nevertheless, the manufacturing sector has received a lot of attention from policy makers and academics for several decades. One reason is that manufacturing is often thought to be 'special', in the sense that it can create skilled jobs, and speed up the overall rate of technological progress in the economy. A second reason is that manufacturing

Table 1: Sectoral Value Added as Percentage of GDP 1965–2007 in SSA and China

	1965	1970	1975	1980	1985	1990	1995	2000	2005	2007
Sub-Saharan Africa										
Agriculture	21.85	19.65	20.02	18.50	18.01	18.83	17.95	16.53	17.00	15.27
Industry	31.02	30.86	32.68	36.84	34.49	32.14	29.15	29.38	31.19	31.98
– manufacturing	17.50	17.86	17.63	16.58	16.47	17.60	15.77	14.52	13.11	14.48
Services	47.14	49.48	47.31	44.64	47.49	49.24	52.91	54.10	51.81	52.88
China										
Agriculture	37.94	35.22	32.40	30.17	28.44	27.12	19.96	15.06	12.59	11.13
Industry	35.09	40.49	45.72	48.22	42.89	41.34	47.18	45.92	47.68	48.50
– manufacturing	29.23	33.75	38.13	40.23	34.73	33.66	33.65	32.12	32.18	–
Services	26.97	24.29	21.88	21.60	28.67	31.54	32.86	39.02	39.72	40.37

Source: World Development Indicators 2009.

growth is not constrained by land in the same way as agriculture. In countries with high population growth and strong pressure on land, diversification beyond agriculture is necessary to generate economic development.

The remaining sections of this article is organised as follows. Section 2 discusses how the policies relevant for manufacturing performance have developed over four decades starting in the 1960s, and takes stock of the actual performance of the sector. Section 3 discusses the prospects for improved performance, using a historical benchmark and a comparative advantage framework. Section 4 documents empirical evidence on the relationship between openness and firm performance drawing on African firm-level data. Section 5 reviews policy options, while Section 6 summarises and concludes.

2. Industrial Policies and Performance: A Bird's Eye View

Over the years, very different policies purporting to stimulate the development of the manufacturing sector in Africa can be identified. In the 1960s, after independence, a very common policy in Africa was one based on import substitution. The idea was that economic development required industrialisation, and the policy option chosen to achieve this was trade protection of manufacturing. This policy led to an expansion of manufacturing production for the domestic market, but few producers became competitive enough to break into the export market. Instead, manufacturing firms became increasingly uncompetitive and sold a shrinking share of their output internationally. The protection of the manufacturing sector resulted in a bias against agriculture and traditional export sectors, and eventually this resulted in current account deficits. Initially countries were unwilling to devalue their currencies, but instead chose to tighten protection even further and to institute various control measures such as licensing of imports and investment. Much needed adjustments could also be postponed because countries in the 1970s had the chance to borrow cheap petrodollars. Still, the second oil crisis in the late 1970s resulted

in large hikes in prices at the same time as countries in the north tightened their monetary policy to control inflation. This led to dramatic increases in interest costs on the accumulated debts at the same time as markets for African exports weakened. Thus, around 1980, many countries in Africa experienced severe macro-economic imbalances and faced unsustainable external deficits. Banks as well as donors were now unwilling or unable to finance these deficits further, which meant that adjustment no longer could be postponed.

Adjustment policies started to be implemented under the auspices of the international financial institutions, which provided funding through so-called Structural Adjustment Programmes. These programmes were the focal point for policy making in the 1980s and 1990s. They consisted of macroeconomic stabilisation measures and structural reforms. The former suffered many setbacks, but eventually most countries achieved a measure of economic stabilisation in terms of budget balance, monetary policy control, and a liberalisation of the foreign exchange market. Trade protection was rationalised and the level of protection was reduced, and most countries thus moved away from a situation with seriously overvalued currencies. The structural reforms included privatisation of state firms and the liberalisation of markets. As far as manufacturing was concerned this implied increased foreign competition at the same time as various forms of interventionist policies supporting manufacturing were phased out. Because of these reforms many non-viable manufacturing firms went out of business. So over four decades the policy towards manufacturing has moved full circle. It started out in a situation with (relatively) liberal economic policies, moved on to a policy set-up which was protectionist and which also included various forms of direct support to manufacturing, and then shifted back to a policy which again was more market oriented and where industrial policy played a limited role.

It is clear that the import-substitution policies did not lead to a good economic performance in Africa. It is equally clear that the structural adjustment phase was difficult, with falling per capita incomes. There was a reversal around 1995 when incomes were

starting to increase slowly. Around 2003 the commodity boom set in and African terms of trade improved very significantly, and this stimulated the whole economy. So Africa saw per capita income increase at a rate of about 3 per cent per year until the world was hit by the global financial crisis. This improvement was of course helped by the boom in commodities, but the fact that severe policy distortions had been reduced also helped pave the way for the recovery.

But had Africa really seen a sustainable economic take-off? Its overall economic growth was still far behind that of the successful Asian countries. The share of industry in 2007 was more or less the same as in the 1960s, and the share of manufacturing had actually fallen from 17.5 per cent to 14.5 per cent over the same period. The structural change that countries had been seeking had obviously not been achieved, in contrast to successful industrialisers in Asia. Africa had actually been marginalised in the international economy, with its share of world exports falling from 4.3 per cent in 1960 to 1.4 per cent in 2000. There was some recovery post 2000 to 1.8 per cent in 2007. Still, Africa exported a larger share of its GDP than East Asia until the 1990s. It is noteworthy, however, that while China increased the share of manufacturing in its export dramatically to 88 per cent in 2000, Africa only managed to increase it to 30 per cent.

Summing up, despite the introduction of more liberal trade policies, Africa has not been successful in the export market and remains a very small player in the international economy generally and even more so in manufacturing. There has been very limited diversification, and since 1995 export concentration has even increased, largely because of the resource boom. What are the prospects of improved performance in the future?

3. Prospects for Growth and the Role of Manufacturing Performance

In this section we discuss whether manufacturing can be a factor driving improved standards of living and poverty reduction,

drawing on two different analytical frameworks. The first is a historical benchmark. The second is the framework of comparative advantages.

3.1 A Historical Benchmark

Aggregate economic development in Africa has been poor, even if there recently has been some improvement. But in terms of manufacturing growth, the picture has remained bleak. There is an extensive literature analysing this 'African growth tragedy', and a range of factors have been identified. Why has growth in Africa been so poor? Answering this question is difficult. Because there have been very few cases where growth has been sustained for a longer period of time in Africa, it is hard to identify the determinants of sustained growth. Therefore Johnson et al. (2007) approach this issue from a different angle. They argue that it may be easier to approach the question from the opposite end and try to see what creates crises and derails growth. They argue that there are at least three plausible types of explanations, namely weak economic and political institutions, greater propensity to experience conflict and social strife, and bad macroeconomic policies.

Johnson et al. (2007) undertake a benchmarking exercise to see what the prospects for growth are in Africa. They identify a set of factors that have been found to be important for sustained growth, and then try to identify what the thresholds are at which these indicators signal a potential problem with sustained growth. To construct a benchmark they look at the recent experience of countries which started with weak institutions (and low income levels) like Africa, but which nevertheless were able to sustain high growth rates. They find 12 countries that did so in the post-1945 period. They all had rapid growth of exports, in most cases in the form of manufactures. They also avoided currency overvaluation.

The question they then ask is whether African countries are currently on their way to break away from the poverty path. They find from their analysis that African macro balances and institutions have improved over recent decades, and that Africa on these indicators in general does not score worse than the countries that were economic successes in the second half of the twentieth century.

However, in terms of some specific economic institutions (such as the World Bank's Doing Business indicators) there remains a wide gap relative to what the old countries experienced. There are still substantial regulatory costs of exporting in Africa, and many countries in Africa have experienced significant real exchange rate overvaluation. Still, the authors draw the rather optimistic conclusion that the deep determinants are not much worse for a group of promising African states today than they were in much of East Asia in the 1960s. There are of course inherent institutional weaknesses in Africa but they can be overcome as was in East Asia.

An interesting observation is that 'escapes from poverty in the face of weak institutions have generally involved exports and – in almost all cases – manufacturing exports' (Johnson et al. 2007: 37). How can we explain this? One possibility is that manufacturing exports help create a middle class that demands good institutions. Acemoglu et al. (2005) note that interaction between economic and political power produces (or changes) institutions. It is possible that trade may change the balance of power so that progressive groups get more influence. It was noted that economic and political institutions improved over time in the 12 countries that experienced sustained growth based on manufacturing expansion, while natural resource-based growth does not seem to have the same positive effect on institutions and growth. One might therefore fear that the recent growth acceleration in Africa may force less of progressive institutional change than Asian growth did.

Thus, there is some evidence supporting the notion that manufacturing growth may be particularly important for overall development, especially if it forces change in institutions that are important for economic growth. However, what if manufacturing is inherently unsuitable for Africa? This brings us to our second point of view for assessing the role of manufacturing for sustained growth, based on comparative advantages.

3.2 Comparative Advantage and African Manufacturing

As noted in the introduction, exports from Africa may not be in the form of manufactures. One of the oldest 'truths' in economics is that a country will always have a comparative advantage in some

type of production, and that production patterns in accordance with comparative advantages are economically efficient. The relevant question here is therefore whether Africa has or can have a comparative advantage in manufacturing. Could it be that manufacturing, the 'darling of policy makers', is actually not a suitable activity in Africa, given Africa's composition of resources?

There are different approaches about the basis for comparative advantage. The original theory derives from Ricardo (Krugman and Obstfeld 2009), who showed that differences across countries in productivity or technology created comparative advantages. According to the current standard theory, which is due to Heckscher and Ohlin (Ibid), comparative advantages can alternatively be created by differences across countries in relative factor abundance. But there may be other types of inter-country differences generating comparative advantages. One which is highly relevant for us relates them to differences in institutional quality or the business climate. The impact of these factors is mostly felt in tradables such as manufacturing, which rely most heavily on logistics, regulation, and infrastructure. A poor business environment may hinder a firm from supplying goods for export competitively even if it has a good control of factory-level costs.

Recent advances in trade theory have introduced models for imperfect markets and in particular models based on monopolistic competition. Krugman (1980, 1991) shows how comparative advantage in trade can arise between countries even if they have the same technology and factor abundance. In such a set-up, trade may be determined by economies of scale, clustering of production, learning, network effects, and spillovers. Changes in these determinants will drive structural change, and they may for example lead to comparative advantage for sectors that were previously uncompetitive.

A feature of manufacturing production today is that it is being increasingly fragmented with sourcing of components from different countries. This means that comparative advantage may now reside in a small and narrowly defined task. This may benefit for example African countries, since it should be easier to get

comparative advantage through learning and economies of scale in the production of a smaller item. To achieve this it is an advantage to have a dense network of firms, both within the same sector and in other input-output related sectors. Unfortunately African business is often segmented and firms are few, small, and far between.

Attempts at explaining Africa's pattern of trade (and the smallness of manufacturing exports) have so far been mainly based on versions of the Heckscher–Ohlin model. Bigsten and Durevall (2008) measure changes in relative factor endowments in Kenya 1964–2000. They assume that there are four types of goods, namely capital-intensive modern manufacturing and labour-intensive informal manufacturing, and capital-intensive agriculture and labour-intensive smallholder agriculture. With growing labour and slowly growing capital and fixed land there has been a shift out of land-using agriculture into the non-agricultural sectors, but since capital has become increasingly scarce since 1980 labour has had to shift into labour-intensive informal production instead of capital-intensive manufacturing. Their conclusion is that the factor accumulation process has failed to change the pattern of resource based comparative advantage towards manufacturing. At least there has not been a significant shift to the formal manufacturing sector that can produce for exports. The informal sector that has absorbed much of the labour that has left agriculture does not export. So the level of investment has not been enough to create comparative advantage for manufacturing in Kenya.

An alternative (and more pessimistic) analysis is due to Adrian Wood. He plus various co-authors also pursue a factor abundance explanation, but with the model set up in a different way. Wood (1994) argues that capital these days is highly mobile internationally, which means that it cannot be the basis of comparative advantages. Instead these are due to factors that are specific to the country such as labour or skills and natural resources. Since Africa is abundant in natural resources but short on skills, it is natural that it exports resource-intensive goods and imports skill-intensive ones. The essence of Wood's (1994) argument is that, since manufacturing is intensive in the use of skills but not natural resources, Africa does not have a comparative advantage in manufacturing.

3.3 Taking Stock: Comparative Advantages and Lessons from History

The structure of African trade can be said to 'reveal' its present comparative advantages, which are due to Africa's technology, factor abundance, business environment, and other institutional factors. At the same time we have argued that Africa has by now reached sufficient levels with regard to most of the factors that have previously held back economic growth. So is it at all possible for Africa to achieve rapid growth in manufacturing exports, which we argue is essential for an overall economic takeoff for Africa?

Africa is not inherently unsuitable for manufacturing production and manufacturing exports. Instead, we can think of Africa as having a latent comparative advantage, sometimes referred to as dynamic comparative advantage, in manufacturing. In the medium-term perspective, one would assume this will mainly be in segments of the manufacturing sector that are relatively low-tech or low-skill.

We can think of the situation in Africa as one with multiple equilibria (see the review in Harrison and Rodriguez-Clare 2009), where there exists an equilibrium different from the current one with latent comparative advantage. This may be due to various externalities of the types we have already discussed, such as learning, network effects, and inter-industry spillovers. There are also many examples of industrial clustering being associated with successful development in Africa, such as Kenya's horticulture industry and garments industry in Mauritius. But due to coordination failures it has not been possible for most African countries to exploit the latent advantage or to benefit from the externalities associated with manufacturing production. Manufacturing may be associated with significant external effects, and so there are likely to be significant latent comparative advantages in the sector for African countries as well. Clearly, there may be need for industrial policy to move the economy to the alternative equilibrium in such a situation.

Still, there is also a need for policies that can help change the realised comparative advantages of the economy in the direction of manufacturing. We have already noted that more rapid capital accumulation would tend to push the economy in the desired

direction, but investment levels particularly in sectors outside extractive industries have been hampered by both macroeconomic uncertainty and by high costs of doing business. So improvements in these areas also will change the pattern of comparative advantage.

4. Openness and Firm Performance: Firm-level Evidence

4.1 Exports and Productivity

As discussed in the introduction, while it is clear that the trade and productivity are positively correlated, the underlying causal mechanisms are unclear. From a policy point of view, it is important to establish what is causing what here. If, for example, an increase in exports causes higher productivity, then implementing a policy stimulating exports may be an efficient way of closing the competitiveness gap between firms in Africa and firms in other, more developed regions. However, such a policy would not achieve much if, in fact, causality runs from productivity to exporting.

These mechanisms have been formalised in the literature, distinguishing the 'learning-by-exporting' hypothesis (exporting causes productivity) and the 'selection-into-exporting' hypothesis (relatively productive firms choose to export, i.e., productivity causes exporting). The two hypotheses are not mutually exclusive. Influential papers are due to Bernard and Jensen (1999) and Clerides et al. (1998). Most studies for other regions than Africa have found evidence supporting the self-selection hypothesis but not the learning-by-exporting hypothesis. Clerides et al. (1998) develop an econometric framework for identifying the relative importance of learning effects and self-selection effects. Key features of this approach are that exports are determined by productivity and that there is a common unobserved time-invariant factor that affects both the propensity to export and firm-level efficiency. Modifying the econometric framework proposed by Clerides et al. (1998), Bigsten et al. (2004) estimate the effect of exporting on

productivity using a production function approach and data for Cameroon, Ghana, Kenya, and Zimbabwe. The production function is specified as Cobb–Douglas including a lagged dependent variable to capture dynamics. Table 2, adopted from Bigsten et al. (2004), shows the key regression results. The quantitative effect of exporting on productivity appears to be large. The estimates reported by Bigsten et al. imply that exporting is associated with a short-term productivity gain of 7–8 per cent in an output production function, which corresponds to productivity gains in terms of value added of 20–25 per cent in the short run and up to 50 per cent in

Table 2: Selected Maximum Likelihood Estimates: Cobb–Douglas Output Production Function and Export Probit

	[1]	[2]
The Production Function		
y_{t-1}	0.155 (8.398)**	0.118 (6.396)**
Export $_{t-1}$	0.069 (2.111)*	0.067 (2.147)*
k_t	0.023 (2.300)*	0.034 (3.474)**
n_t	0.103 (5.518)**	0.112 (6.013)**
m_t	0.632 (37.763)**	0.668 (40.631)**
e_t	0.093 (6.535)**	0.083 (6.100)**
Firm random effects?	No	Yes
Log likelihood value	-390.93	-332.37
Number of firms	289	289

Source: Bigsten et al. (2004).

Note: The dependent variable in the production function is the log of gross output. The dependent variable in the export equation is a dummy variable equal to one if the firm exports and zero otherwise. All regressions include dummy variables for country, industry, ownership, and time. The numbers in () are *t*-statistics based on asymptotic standard errors. Significance at the 1%, 5%, and 10% level is indicated by *, ** and + respectively. The estimates in column [2] were obtained using nonparametric maximum likelihood, see Bigsten et al. (2004) for details. Notation: y = output; $export$ = dummy equal to 1 if firm exports, zero otherwise; k = log physical capital; n = log employment; m = log raw materials; e = log cost of indirect inputs.

the long run. Van Biesebroeck (2005) reports similar results using a larger data set.

Against the backdrop of the structural adjustment programmes adopted by Ethiopia in the 1990s, Bigsten and Gebreyesus (2009) analyse the relationship between productivity and exports during this process using data for Ethiopian manufacturing firms. They rely on an annual plant-level census panel data set for the Ethiopian manufacturing covering 10 years (1996–2005). This is a much longer time period than what was analysed in the earlier papers by Bigsten et al. (2004) and Van Biesebroeck (2005). Bigsten and Gebreyesus (2009) document that exporters are not only more productive than non-exporters, but also on average three times bigger in terms of employment. They are also paying on average 1.6 times higher wages than non-exporters for both production and non-production workers. New entrants into the export market are also more productive than the never-export group even prior to their entry into the export market. They exhibit a surge of productivity in the period of entry and continue to increase their productivity after entry. This provides evidence of both self-selection and learning-by-exporting. When estimating productivity of previous export status using a Cobb–Douglas production function, controlling for unobserved firm heterogeneity and selection bias they find supporting evidence of learning-by-exporting in Ethiopian manufacturing. The estimates suggest that engaging increases productivity by at least 15 per cent. It is also shown that new export entrants exhibit increasing capital investments and sales both pre- and post-export entry with a remarkable jump at the period of entry. This implies that export participation is not random, but rather that entrants make a conscious move by upgrading their scale of operation. Capital investment is the significant export related pre-entry adjustment.

One conclusion from this and earlier analyses of African manufacturing is that export activity is productivity enhancing in the African environment. This suggests that it would be possible for African manufacturing firms to improve their competitiveness by getting involved in export production. The challenge is of course to be able to pass the entry threshold. The conclusion would thus be that if African manufacturing firms manage to climb over the

threshold they can gradually improve its cost competitiveness and grow. It also shows that being shut out from the export market is much more serious in the African context, than in a developed economy where there are no specific learning-by-exporting effects. African manufacturing can potentially enter a virtuous circle, where manufacturing becomes part of the solution of the African development problem.

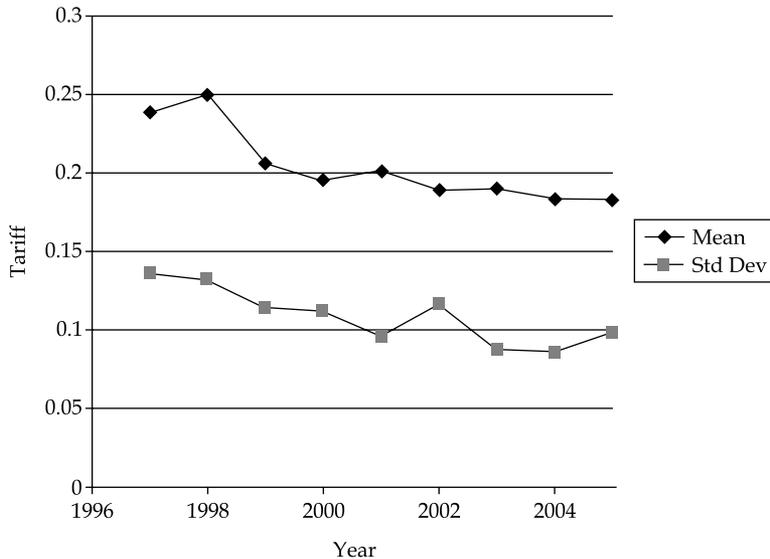
4.2 Imports and Productivity

As discussed above, most African countries liberalised their trade policies as part of structural adjustment, in response to the failure of the import-substitution strategy to generate satisfactory economic development. The rationale for the import-substitution policy was that firms needed to be protected during an initial period of learning. Protection was provided by high tariffs and various forms of quantitative restrictions on imports. During the first phase of this policy regime, domestic producers were able to replace imported goods with their products. Once this had been done, manufacturing growth was constrained by the growth of the local market since firms were not competitive enough to break into the export markets. The reason for the low level of productivity in the protected manufacturing sector was that they did not come under pressure to increase productivity since they had a virtually guaranteed domestic market. This may be contrasted with the type of policy interventions that were pursued by some countries in Asia, where firms could receive protection only as long as they also showed that they were able to sell part of their output in the international market. The unconditional support in African economies implied no incentive for firms to become internationally competitive.

The poor outcome in terms of productivity and competitiveness led to a change in a more liberal direction. The belief was now that openness would increase firm productivity. There have been several hypotheses about the connection between openness and productivity. The first is the import-discipline hypothesis, which says that trade liberalisation increases competition from imported goods, thereby forcing domestic producers to improve their

efficiency by reducing managerial slack and using inputs more efficiently (reducing X -inefficiency) (Holmes and Schmitz 2001; Nishimizu and Robinson 1984). Second, increased competitive pressure may lead to further exploitation of economies of scale, to the extent that the reduction in the market power of domestic firms forces them to expand output and move down the cost curve. Third, import competition also has reallocation effect. Reduced protection lowers domestic prices, forcing high-cost producers to exit the market while the efficient ones survive. This industry rationalisation may increase industry productivity through the reallocation of resources from less efficient to more efficient producers, even with unchanged within-plant productivity (see Roberts and Tybout 1991 and Rodrik 1992). Fourth, increasing integration into the world economy may have dynamic effects. Access to better technologies in the form of cheaper and better intermediate inputs and global capital, and the introduction of new goods and new methods of production due to increasing exposure to export markets can be a source of increased productivity (Dornbush 1992). Finally, endogenous growth-trade theorists have formulated models in which trade opening contributes to economic growth, by increasing diffusion of knowledge and technology, facilitating learning-by-doing, providing imported inputs, and increasing the size of the markets (Grossman and Helpman 1991; Young 1991; Romer 1994).

Unlike other regions, there exists very little empirical evidence on how trade reforms have impacted firm performance in Africa. Bigsten et al. (2009a), however, match firm-level panel data with commodity-level disaggregated data on imports and tariffs, and investigate how trade reforms have affected manufacturing firms in Ethiopia during the period 1997–2005. The trade reforms in Ethiopia gathered pace in 1993, so we observe a period over which adjustment to new policies have taken place. Figure 2, adopted from Bigsten et al. (2009b), shows how averages and standard deviations of nominal tariffs developed over the sampling period. The average tariff rate declined from about 24 per cent to about 18 per cent over the period investigated. The gradual and slow fall in average tariffs reflects the gradual reform of the tariff regime in

Figure 2: The Development of Tariff Levels for Manufactures in Ethiopia

Source: Bigsten et al. (2009).

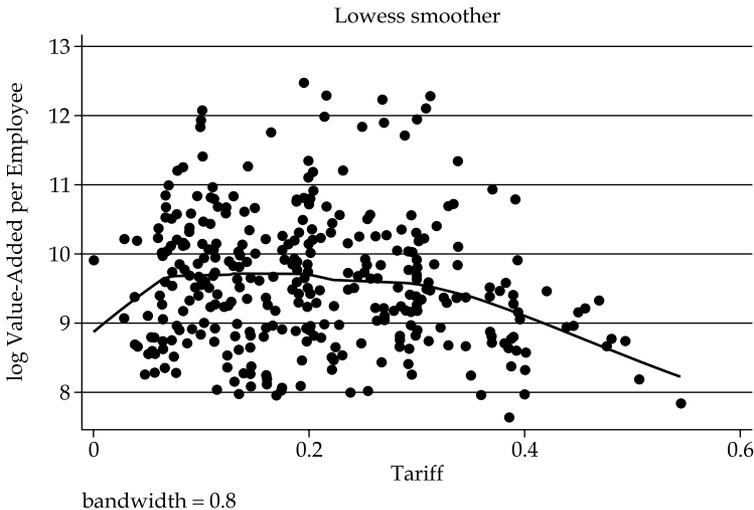
Ethiopia; see Bigsten et al. (2009) for details. The reduction in the standard deviation of tariffs (within years) indicates that tariffs became more uniform across sectors as a result of the reforms.

Have these changes in tariffs affected domestic firms in Ethiopia? Bigsten et al. (2009) report results indicating a strong negative association between tariffs and import-penetration ratios, and between tariffs and labour productivity. These results suggest that a reduction in the tariff rate is associated with an increase in imports and an increase in labour productivity. They also investigate the links between tariffs and sector-level entry and exit rates, investment rates, and employment growth rates, but find no statistically significant effects of tariffs on these variables. Taken together, the results thus suggest that reducing tariffs spurs imports as well as the productivity of domestic firms, but they lend no support to the idea that cutting tariffs results in enterprise expansion. One possible interpretation of these results is

that increased competition from imports forces domestic firms to become more efficient, while at the same time resulting in a reduction in the market shares of domestic firms, which would disincentivise enterprise expansion.¹

The relationship between tariffs and labour productivity is thus negative, on average. Bigsten et al. (2009) investigate whether the effect of reducing tariffs on productivity depends on the prevailing tariff regime. To do this, they add tariffs squared as an additional explanatory variable in the regression. The results indicate that the association between tariffs and labour productivity is non-linear: at high tariff levels, a (small) reduction in the tariff rate has a large positive effect on productivity, but at low tariff levels this is not the case. Figure 3 confirms this basic finding, showing the result of regressing log value added on tariffs using a nonparametric estimator. So the strong case for tariff reform is there when tariffs are high, but once they reach levels around 15 per cent the effect vanishes (in the case of Ethiopia). Given that tariffs are an important source of government revenue, it may therefore be rational to

Figure 3: Tariffs and Value-Added per Worker in Ethiopian Manufacturing



Source: Bigsten et al. (2009).

keep them for fiscal reasons, if distortions from other forms of tax collection are more serious.

Thus the result of this analysis is that high tariff protection has adverse effects on manufacturing firm productivity. So even if one believes that manufacturing is the route to economic take-off, high tariffs will not facilitate a take-off for the sector due to the negative effects on productivity. Tariffs at low levels, on the other hand, do not seem to cause negative productivity effects. Since most African economies have now reached reasonably low levels, it may well be time to shift the focus to other ways of enhancing productivity and production in manufacturing.

5. Economic Policy for Manufacturing Growth

As discussed above, Africa adopted drastic protectionist policies, as well as other market interventions, to support manufacturing in the 1960s and 1970s. This resulted in an initial expansion of manufacturing production. However, since manufactured goods were marketed primarily in the domestic market, manufacturing exports dwindled. Manufacturing in Africa did not become internationally competitive but rather became increasingly uncompetitive. Because of this disappointing result, and because of various macroeconomic imbalances and market distortions, African countries started a process of structural adjustment that gradually opened up these economies to international competition and moved them towards realistic exchange rates. The negative initial experiences meant that 'industrial policies' were viewed with scepticism, and the focus shifted to more general economic policies. The result so far is that there has not been any take-off in manufacturing production. To the extent that manufacturing has special characteristics that make it an essential ingredient in a future development strategy, this may be a cause for concern. So even if the experiences from the import-substitution industrialisation phase are bad, maybe we can find new forms industrial policy leading to more rapid manufacturing growth without distorting the economy.

So what is required is a policy that supports the development of manufacturing firms which are internationally competitive. This means that we need to support tradables' production. Here one can either support tradables sectors or only support exports. In the former case one supports tradables production also if it is sold domestically. Rodrik (2009: 18) finds that increases in the industry share are more significantly related to growth than increases in export shares overall, and therefore it is the structural change that matters and not the export orientation. He notes that 'once industry shares in GDP are controlled for, trade surpluses exert no additional positive effect on economic growth'. Still, this is not quite consistent with the results from firm-level analysis in Africa that we report above, which suggest that export has its own positive effects.

Some successful countries have instead tried to alleviate these constraints indirectly, by raising the relative profitability of modern activities through other means. African countries can possibly get away with undervaluing their currencies (which China has been doing so far, but which may be harder in the future). Still undervaluation of the currency is a subsidy of tradable exports, while there are other ways of supporting tradables production that affect both exports and domestic sales. Rodrik's strategy proposal is that government should seek to enhance the relative profitability of non-traditional products that face large information externalities and coordination failures, or which suffer particularly strongly from the poor institutional environment. Interventions such as tax exemptions, directed credit, payroll subsidies, investment subsidies, export processing zones are aimed at specific firms or sectors. One can think about ways of shifting the relative incentives in favour of tradables by reducing cost of inputs which are used intensively by modern economic activities. A typical area for intervention would be infrastructure for transport and logistic costs. Labour is the most important non-traded input, so what happens to wages is also very important for competitiveness.

On a general level all this sounds fine. But for Africa there are at least two concerns with regard to these types of interventions. The first is that the government does not have enough information, and the other is that, even if they did, there will be rent seeking and corruption. The second type of concern is probably the most

worrying one. Rodrik's response to the first concern is that mistakes are unavoidable but that governments generally recognise their mistakes and change. And on the second one he argues that industrial policy is not the only area that is open to corruption, but that policies still are pursued in a whole range of policy areas. So the relevant question on this second point then is whether one should be particularly concerned about industrial policies. And maybe there are reasons to be extra worried. Attempts in this direction during the import-substitution phase in Africa were largely a failure. So the question is whether the institutional environment in Africa is good enough for more ambitious forms of industrial policy. And, if so, how should it be designed. Or, alternatively, should industrial policy be designed in a special way so as to account for the fact that the policy environment is extra challenging in Africa?

6. Concluding Remarks

After independence the economies in sub-Saharan Africa sought to expand their manufacturing sector via import protection, which led to some expansion in the domestic market but little export growth. The policies then shifted back to a more market-oriented and open stance, but manufacturing growth has remained modest. Our review of the evidence suggests that African manufacturing may not have a comparative advantage in manufacturing. The factors behind the lack of comparative advantage in manufacturing are twofold. First, poor economic institutions tend to harm particularly transaction-intensive sectors like manufacturing. Second, even if Africa has a latent comparative advantage in manufacturing, the economies have not been able to shift factor proportions in favour of more capital-intensive manufacturing due to very low levels of investment. Empirical analyses of African manufacturing furthermore show that there is learning-by-exporting, but that there are large entry costs associated with entering the export market. There is also evidence indicating that high tariffs are detrimental to productivity in the sector.

Given the African experience, and the results of extensive microeconomic analysis, there may be good reasons to think about

industrial policy, whilst recognising that import protection is not the appropriate route to take. We need to devise a policy framework supporting production of the manufacturing sector due to the externalities associated with it. This means improving the parts of the economic institutional framework that is particularly important for tradables production such as transport infrastructure. One could also try to reduce costs of inputs and introduce tax exemptions, directed credit, payroll subsidies, investment subsidies, and improve the functioning of export processing zones. With good governance in place, there should be considerable scope for these types of interventions. Countries that can put competent and non-corrupt governments in place will have a good chance of achieving an economic takeoff based on manufacturing when the cost of labour is increasing among its Asian competitors. In the end it boils down to a question of whether African political systems can deliver such governments.

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Note

1. Research carried out while the present paper was in press suggests that it is primarily input tariffs, and not output tariffs, that affect firm performance. The new finding will be highlighted in a revised version of Bigsten et al. (2009).

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