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Is African Industry Competing?

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Africa's industrial performance has been poor and its ability to industrialize successfully is under increasing question. This paper argues that industrialization remains vital to African development. It describes the current global industrial setting and analyses the recent performance of African manufacturing relative to that of other developing regions. It finds that Africa is becoming increasingly marginal to the technological dynamics of global economy. It shows few signs of a responding to the competitive stimulus of liberalization or of attracting more mobile foreign productive factors. It analyses the reasons for this performance and argues that the basic problem of African industry lies not in the investment climate (which can certainly be improved) or in gaining market access to rich countries (which is already very good for manufactures, and has improved with initiatives like AGOA) but in the low level of its industrial capabilities. The paper concludes with the need to reconsider current African industrial strategy and to evolve a new strategy focused on building capabilities.

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1. INTRODUCTION

The economic travails of Sub-Saharan Africa continue to receive intense public attention. This paper focuses on its experience in the *manufacturing sector*. Manufacturing remains essential to African growth; with rapid technical change and globalization, it is becoming more important as the main engine for modernizing and diversifying the region's economic base. Today, however, manufacturing can only fulfil this role if it is competitive (not just in export markets but, with liberalization, also at home). This paper treats two aspects of industrialization that experience shows to be vital: the ability to master new technologies by mounting technological effort and to access new technologies by attracting foreign direct investment (FDI), particularly in export-oriented activity.

National competitiveness has many needs. Perhaps the most fundamental is a good investment climate: a stable social and political regime, sound macro management and legal framework, low business costs, a reasonable skill base and adequate infrastructure. However, industrial success requires more than a good investment climate – it needs the ability to respond vigorously in an increasingly competitive and technology-oriented environment. This ability does not arise automatically. It is based on cumulative effort to build a range of technological, managerial and institutional capabilities: just opening up to global markets, technology and capital flows, without a base of capabilities, means that economies cannot competitively handle new industrial technologies. If they cannot, they risk marginalisation in a globally integrated market.

The development of capabilities faces market and institutional failures. Overcoming such failures requires strategy, to tap foreign sources of knowledge, technology and skills, to absorb these locally and to build a base that can attract foreign resources. The countries that have developed the strongest capabilities in recent times, the East Asian Tigers, adopted a variety of strategies to overcome those failures (Lall, 1996, 2001, Lall and Urata, 2003). Africa has not adopted any of these different strategies successfully.

As a result, industrial capabilities are weak in Africa and its performance, particularly since liberalization, has been very disappointing. Africa's share of global manufacturing value added has fallen from a tiny 1 percent in 1980 to 0.8 percent by 2000 (excluding South Africa, these figures are 0.43 and 0.41 percent). Its share of world manufactured exports has gone from 0.7 to 0.6 percent over this period (0.3 and 0.2 percent without South Africa). It is practically 'off the map' in the most dynamic and technologically rewarding areas of manufacturing. Not only is Africa becoming marginal to the dynamics of the global economy, it shows little signs of a technological response to the new challenges. This is despite the fact that export markets are now more open (Africa has the best access to world markets for manufactures) and global resource (knowledge, capital, technology and skills) more mobile.

This persistent failure of African manufacturing to grow and compete is more than an economic loss – it is perverting future economic strategy because analysts are becoming very pessimistic about African industrial prospects. The pessimism is growing as the demands of competitive industrialization rise and other low wage regions and higher capabilities enter the arena. It is not uncommon to come across a belief, often left implicit, that 'Africa cannot industrialize'.

This pessimism is unwarranted, and its consequences are dangerous. Overcoming it, however, needs that the root causes of Africa's industrial weaknesses be addressed, that its deficiencies

in capabilities and governance be tackled directly rather than left to the mercies of liberalization and globalization. Africa's capability problems are not unique, of course; other developing regions have faced them, and some have overcome them with dramatic success. It is possible for Africa to do the same, entering into competitive manufacturing by strengthening local capabilities and attracting mobile capabilities from overseas. There are hopeful signs of a start in clothing and textile exports in some countries, stimulated by trade preferences offered by the US. Exports of processed natural resources are also growing. The investment climate in many countries in the region has improved greatly. These signs of industrial revival need to be nurtured and strengthened, and the structure of activity reoriented to take advantage of the dynamics of global industrial growth.

This will need a concerted effort by the countries themselves and by the international and donor community. In this paper, we review what the effort to build and attract competitive capabilities may comprise. Our focus is not competitiveness as a whole, but technological effort and FDI in particular; and our aim is to draw useful lessons from East Asia.

This paper starts with brief sections on the significance of industrialization to Africa (section 2), the current global setting (section 3) and the need for local technological activity (section 4). It then reviews African industrial performance, focusing on its competitive performance in different technological segments as compared to other regions (sections 5 and 6). It then considers its technological and skill base – the two are intimately correlated – and its FDI performance (sections 7 and 8). Section 9 draws the conclusions.

2. WHY INDUSTRIALIZATION IS IMPORTANT FOR AFRICA

Sustained economic development entails structural transformation. It involves a shift from traditional low-productivity, primary activities and low-value services to activities that use modern technologies, create new skills, generate exports and employment, and have beneficial spillover effects on other activities and institutions. Manufacturing has been, and remains, the main engine of structural transformation. While its contribution to GDP in most countries reaches a peak at 30-40 percent and then declines as modern services grow, its contribution to *development* is much more significant (Box 1). It is this contribution that Africa has failed to tap.

Manufacturing is critical to changing and modernizing Africa's economic structure. It is the main avenue for applying new technologies to production and for raising technical and managerial capabilities. It is crucial to raising and diversifying exports, moving the region from its continued dependence low value-added and unstable primary products. It is necessary to create new skills, work attitudes and institutions. And it can be the driver of growth and productivity in other activities: agriculture, information-based services, finance, construction, logistics and so on. The catalytic role of manufacturing is as relevant today to Africa as it has been to other regions in the past.

There has been much hyperbole about the information economy as means of leapfrogging to the economic frontier without going through the industrialization stage – so far this remains in the realms of hyperbole. Most of the relocation of IT-based services is going to developing countries with large industrial sectors and the only activities that may go to less industrialized countries are likely to be call centres: it is not clear that this will provide sufficient impetus to drive African growth. In our view, industrialization remains the main avenue for sustained development in Africa.

Box 1: The importance of manufacturing industry

(1) Manufacturing industry is the main vehicle for the **application of technological progress to production**. While agriculture also enjoys technical progress, the pace of technical change has historically been low – much lower than in manufacturing. Agriculture is constrained by the presence of one fixed factor, land, while manufacturing can apply a limitless variety of inputs and equipment. Moreover, many industrial technologies involve increasing returns to scale, enormous potential for further learning and for incremental improvement. Thus, the shift from low- to high-productivity activities has always involved a shift from agriculture and traditional services to industry. In recent years, modern information- and communication-based services have also attracted innovative activity; however, this has been possible only because of technological advances in the hardware of information processing and telecommunications.

(2) Manufacturing is itself the major **source of innovation**. Research and development (R&D) by private industrial enterprises has grown in importance since the nineteenth century, and now accounts for the bulk of innovation in advanced countries (industrial enterprises also finance significant R&D in other laboratories and universities). Moreover, formal R&D is only part of the technology development process. A significant part takes place in the engineering, production, procurement, quality management and other departments of enterprises. The scope for such innovation is enormous in manufacturing, perhaps more so than in other activities.

(3) Manufacturing is the hub for **diffusing innovation** to other activities, providing capital goods and transmitting new technical and organisational knowledge. Historically, the capital goods sector has been such a hub; today the electronics industry is at the centre of technical diffusion. In particular, the use of information technology related equipment by all activities involves considerable spread of new technology, accompanied by close interaction between suppliers and users.

(4) Manufacturing is a vital source of new **skills** and **attitudes**, particularly in transforming traditional economic structures. There are several elements to this contribution:

- The creation of an industrial work ethic, with the spreading of discipline and organisation required in modern societies;
- The fostering of entrepreneurial capabilities, with small enterprises providing the seedbed;
- The development of new managerial and technological capabilities, the core of modernisation and competitiveness.
- The creation of skills by enterprises. Enterprises invest increasingly in enhancing employee skills, by in-house and external training. In countries like Japan, investments in enterprise training are larger than spending by the higher-education sector;
- The interaction between industrial enterprises and educational institutions. As skill needs change more rapidly, and become more specialised, there is closer interaction between the users and providers of formal education, creating beneficial synergies for the economy;
- Larger inflows of foreign skills, a growing feature of globalised production (also very important in modern services). Manufacturing enterprises with international operations move highly skilled manpower around the globe as needed, filling gaps and providing beneficial training and spillover effects.

(5) Manufacturing led the development of **modern institutions and legal structures** (like joint stock companies, accounting standards, and corporate governance norms) that the modern economy requires.

(6) Innovation and skill creation by manufacturing have large beneficial **externalities** for other activities: agriculture gains by having better equipment and inputs, improved storage, transport, distribution and processing facilities and richer consumers. Services gain from better equipment and skills.

(7) Manufacturing also provides the **direct demand stimulus** for the growth of many modern services. It is often the largest customer for banking, transport, insurance, communications, advertising, utilities and other activities. It creates markets for new services and skills, particularly important for finance, education and logistics. It is also directly the source of new service enterprises: many services were originally part of manufacturing firms and were hived off to provide design, logistics, maintenance, training and other services.

(8) Manufacturing is the main source of **dynamic comparative advantage**, the shift from primary to more advanced (and generally more dynamic and high value) manufactured exports. Manufacturing now accounts for around 90 per cent of global visible trade and its share has grown steadily over time. Terms of trade for manufactures have also improved steadily over time. While modern service exports are also growing, much of this growth comes from relatively advanced countries that have built modern skills and capabilities by manufacturing. It is difficult to find countries selling high-value services (excluding tourism) that have not first undergone industrial development: the institutions and skills now involved in service exports were developed in conjunction with manufacturing.

(9) The **internationalization of the economy** often follows the spread of manufacturing TNCs. Banks, transport-providers,

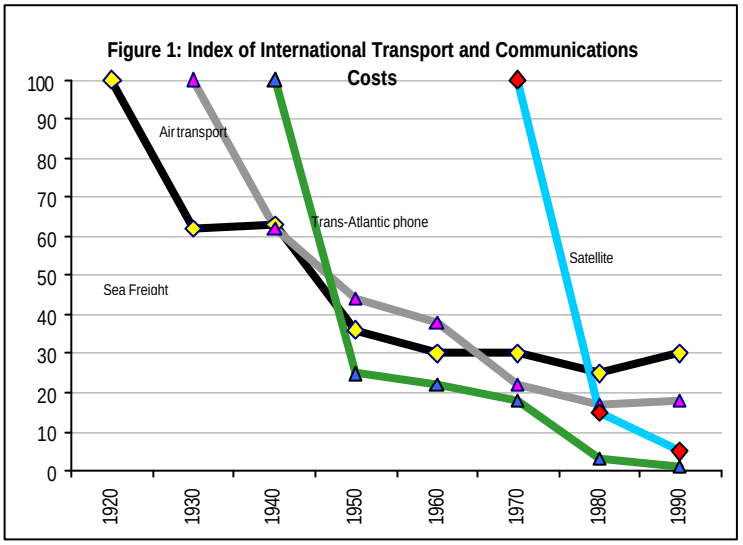
advertisers and so on are setting up across the world to serve customers with whom they have relations. The current phase of globalisation, with integrated production and other facilities across countries, has been led by manufacturing firms (resource-extraction TNCs never 'globalised' in terms of integrating operations at all levels across countries).

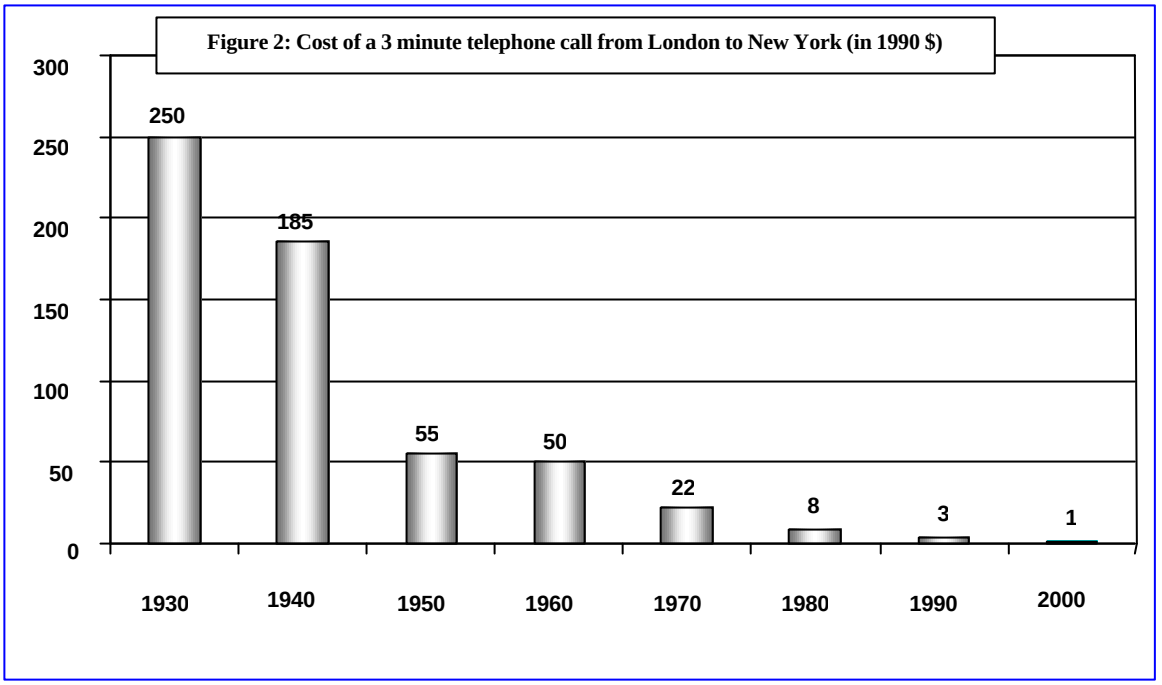
(10) The exposure to foreign markets, enterprises, skills and practices that manufacturing brings can be the catalyst for **modernization of national industrial enterprises**, as seen in East Asia. Such modernisation would not have been possible without industrial development.

In sum, industry has been the main source, user and diffuser of technical progress and associated skills and attitudes. No other productive activity comes near it. Its special role can only be understood in a world of dynamic learning and technical change, where large firms strive to increase their size and capabilities and realise economies of scale, and societies constantly transform their structures and habits. In this world, manufacturing industry is not only important for development – it is the essential ingredient.

3. THE CHANGING SETTING FOR INDUSTRIALIZATION

Industrialization today requires competitiveness. This simple statement has many implications. Industrial enterprises have always competed with each other, but competition in the past was confined mainly to local or national markets. There were two reasons for this. One was technological: high transport costs, lack of information on foreign markets and difficulties in communicating over long distances or across national boundaries. The other was policy-induced: governments in most developing countries (and developed countries in their early days of industrialization) restricted international competition by tariffs, quotas, standards and other trade and investment barriers.

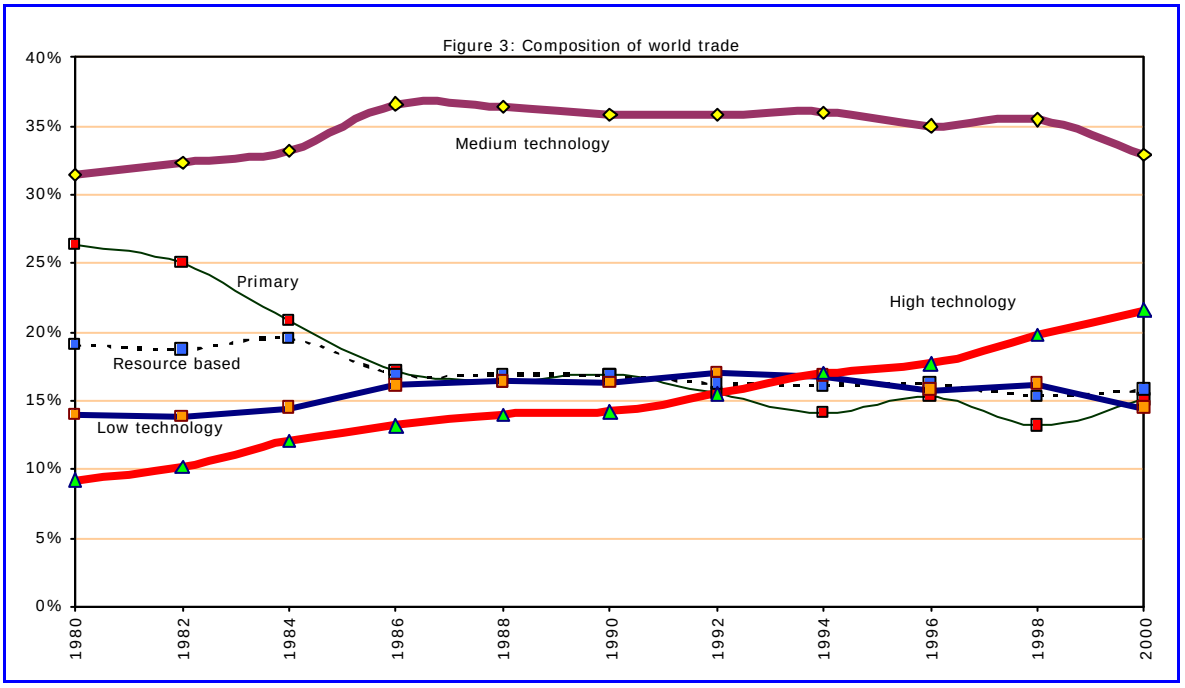




Both barriers are falling rapidly. New technologies are shrinking economic distance dramatically (Figure 1); the falling costs of communication, in particular, are leading to the 'death of distance' in information transmission (Figure 2). The shrinking of economic distance opens up new opportunities for competitive activity for developing countries, but it also threatens them with new competition. In Africa, the real competitive threat does not come so much from industrialized countries as from other low wage economies with stronger industrial bases: these countries may establish strong first mover advantages in the industries that Africa may compete in and so stifle its entry and growth.

The setting for industrialization today is also changing in other ways. *Rapid, pervasive and continuous technical progress* in manufacturing technologies is raising the threshold level of skills and capabilities needed for competitive production. This is true of all activities, from the simplest labour-intensive ones like apparel and textiles and resource-based ones like food or mineral processing – obvious entry points for African countries – to the most sophisticated technology-based ones like electronics, pharmaceuticals or advance equipment. The days in which developing countries could enter global value chains (say, for electronics) and launch export-oriented industrialization on the basis of semi-skilled cheap labour alone are gone: Africa has to provide much more advanced capabilities to get in on the first rung, and upgrade them rapidly to match the advantages provided by earlier entrants.

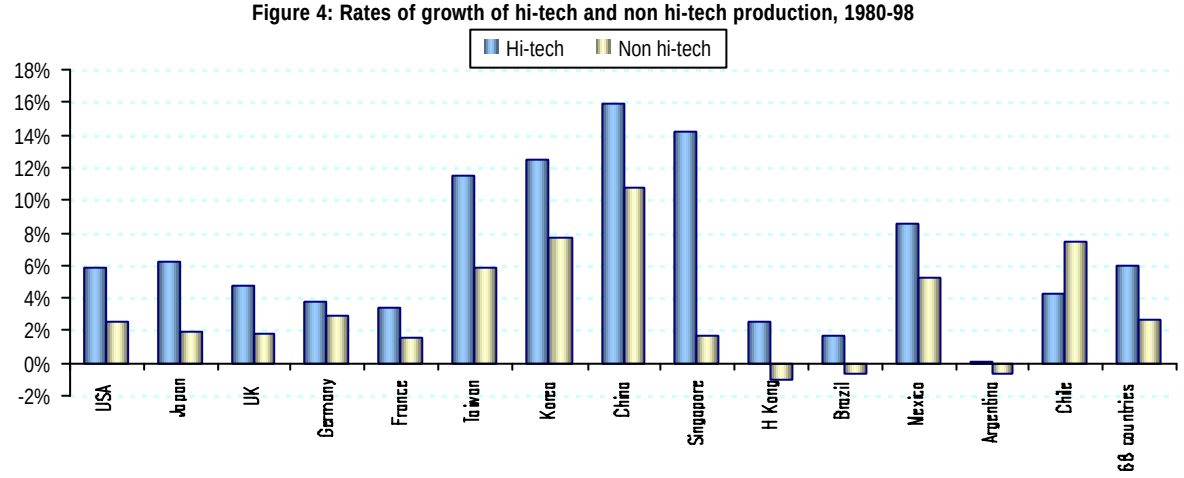
Technical progress is changing the way in which trade and production are organized. Enterprises are increasingly searching for low cost sites, moving resources like capital, technology and skills to places that can provide the right complementary factors. Many such moves are under the aegis of multinational companies (MNCs). Around two-thirds of world trade is now handled by MNCs and of this about one-third, the most dynamic segment, is within the companies and not on open markets. Export success depends increasingly on entering these fast-growing internal production systems. Shrinking economic distance makes it feasible for MNCs to relocate processes and functions in far-flung sites. The resulting 'fragmentation' of production has led to new forms of competitive advantage, based on a narrower range of assets. Tapping fragmentation can rapidly transform the production and export structure of developing countries (Lall, Albaladejo and Zhang, 2004).



As important for competitiveness as new production technologies and trade organization is *structural change in trade*. Put simply, innovative products (with high R&D spending) are growing faster than those with slow-changing technologies (Figure 3). High technology products have raised their share of trade from the lowest to the second highest – they are now the main engines of growth in world trade. Primary and resource-based products have lost ground and low technology products have stagnated since the mid-1990s. Good 'positioning' requires countries move into more innovative products; the Asian Tigers,[2] including China, have done just this; their recent export growth comes largely from technology-intensive products. However, only a few have built domestic capabilities in such advanced industrial products – most have simply 'plugged into' the global production networks of MNCs.

In an innovation-driven world, there are other reasons (apart from rapid export growth) to favour a structural shift to technology-based activities. HT products grow more rapidly than incomes (they are highly income elastic), they cut costs more rapidly and they offer greater benefits in terms of skill and capability creation, spillovers to other activities and flexibility in responding to changing conditions. Even plugging into the low end of HT activity, say by assembling electronics, allows quicker moves up the technology ladder as costs rise (in Malaysia, higher wages led electronics MNCs to deepen local technology and grow while clothing stagnated and moved offshore). By doing so, they allow countries to combine rising wages with production and export growth – no economy can develop by staying in low-value processes and simple products.

Figure 4: Rates of growth of hi-tech and non hi-tech production, 1980-98



Structural changes in trade to some extent reflect similar changes in production.[3] *The production of technology-intensive products is growing much faster that that of other manufactures* (Figure 4). According to data from the US National Science Board (2002) on the 68 countries accounting for over 95% of global economic activity, hi-tech production grew at 6.0% per annum over 1980-98, over twice as rapidly as other products (2.7%). More interestingly, hi-tech production also grew more rapidly in all developing countries, with the

[2] The Asian Tigers refer to Hong Kong, Singapore, Korea and Taiwan (the mature Tigers), Indonesia, Malaysia, the Philippines and Thailand (the new Tigers) and China (a new Tiger but in a class of its own).

[3] The correspondence is not exact, since trade is driven by other factors apart from growth in production and demand. In particular, the relocation of products like textiles and clothing, which tend to grow relatively slowly in production, has led to relatively healthy rates of growth in trade.

lead taken by the East Asian Tigers (the only exception was Hong Kong, which has de-industrialized rapidly). Even China, with its vast labour reserves, enjoyed rapid hi-tech production growth (in fact, the world's fastest): a simple two-factor model clearly cannot capture the complexities of industrial development. The NSB data do not, unfortunately, show African countries separately, but we provide other data below.

Box 2: Drivers of competitive advantage today

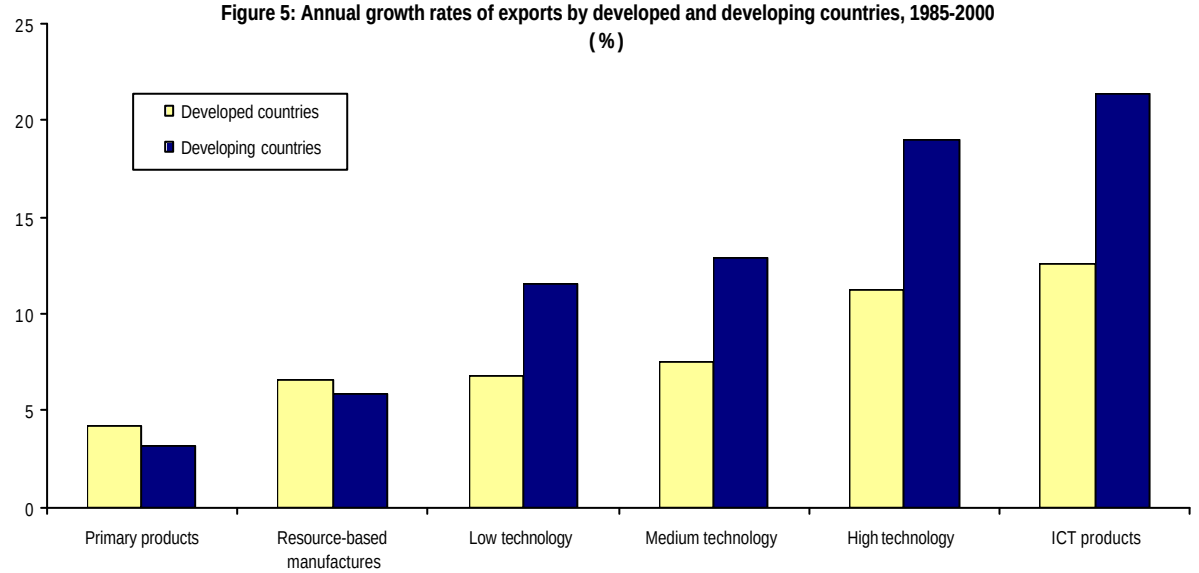
Patterns of competitive advantage are changing as exports grow in response to two forces: *innovation* and the *relocation* of activities, processes or functions to lower cost areas. Both play a role in most industries, but their importance differs by technology and physical characteristics.

- Some products (e.g. pharmaceuticals) grow rapidly mainly because of rapid innovation; there is little relocation to take advantage of low wages because of the continuous processes involved in production and the extremely stringent technical demands on the intermediate inputs.
- Some products (e.g. electronics) benefit from *both* innovation and relocation – they enjoy rapid demand growth, substitute for older products and also have low-technology assembly processes that can be placed in poor countries.
- Some products (like apparel) are driven primarily by relocation. The overall growth of production and technical change are relatively slow.
- Some products (like automobiles) have discrete, 'separable' processes that can undergo relocation. However, their technological complexity and 'weight' (critical components are, unlike electronics, heavy in relation to their value) means that distances across which processes are fragmented are fairly small (Lall, Albaladejo and Zhang, 2004).

Products for which neither innovation nor relocation are relevant tend to grow slowly in trade. One of the secrets of rapid export growth is therefore to enter product segments where the process of relocation is very active and demand is growing rapidly. This was just what the East Asian Tigers managed to do.

Fragmentation and relocation are dynamic processes, and, with new technologies, new forms are appearing constantly. The service area, for example, is experiencing a veritable explosion of relocation. Functions like call centres, back-office services and even R&D are being relocated in low wage countries, though most of these are concentrating in India and China (UNCTAD, 2004).

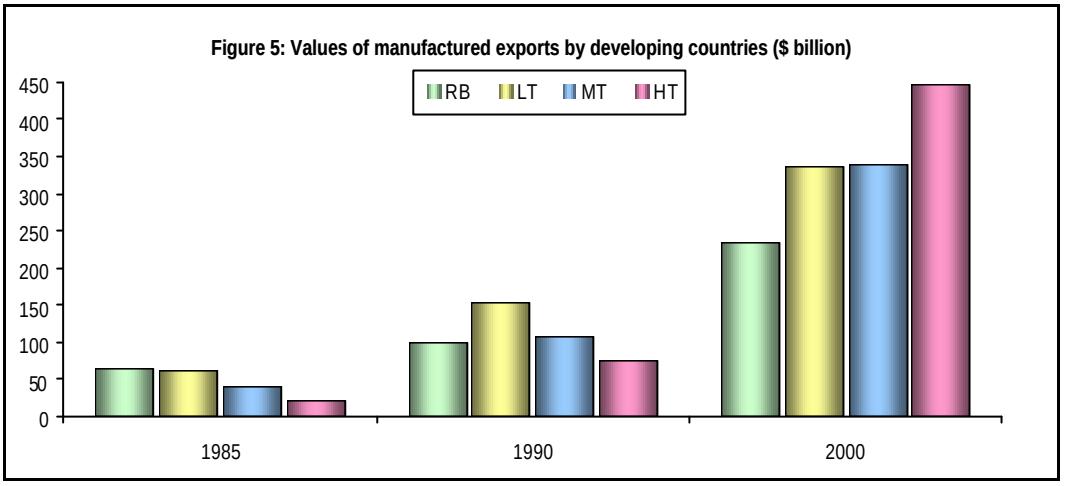
Figure 5: Annual growth rates of exports by developed and developing countries, 1985-2000 (%)



Returning to trade, high technology exports are not the preserve of industrialized countries. Contrary to conventional trade theory, the lead of developing countries over developed ones

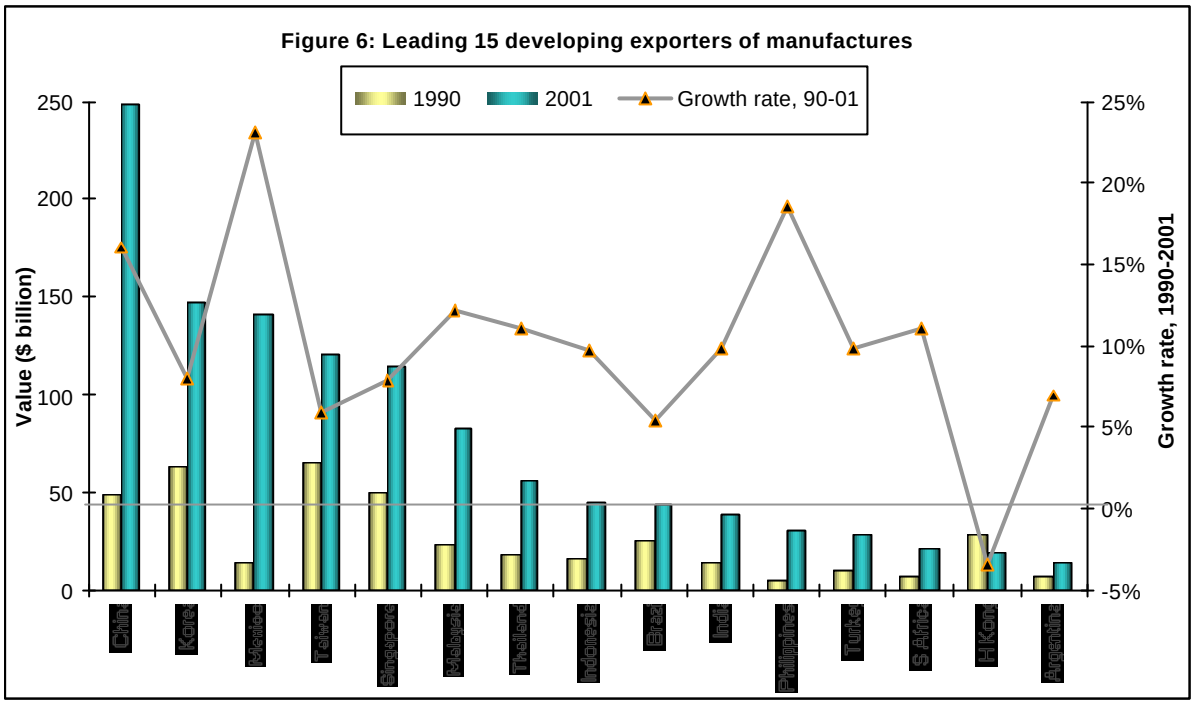
rises with technological complexity, and is highest in high technology products, led by ICT products (Figure 5). This surprising statistic is not due to the small starting base of complex exports: HT products are also the largest category of developing country exports today (Figure 5). By 2002, developing countries accounted for over 35% of global hi-tech exports.

HT products raised their share of developing world manufactured exports from 11% in 1985 to 33% in 2000. By contrast, the largest category in 1985, resource based products, saw its share halve from 34% to 17% in this period. The share of low technology products also fell from 33% to 24% (UNIDO, 2004).



Export success, however, has been *highly concentrated* in the developing world. East Asia accounts for over 70% of its total manufactured exports and over 90% of its HT exports (we return to African performance below). Within East Asia, electronics account for over one-third of total exports (up from 18% in 1990). At the country level, the leading 15 exporters accounted for 94% of its manufactured exports in 2001, up from 91% in 1990 (UNIDO, 2004). Figure 6 shows the values of exports and growth rates over 1990-2001 for the 15 developing world leaders.

The most dynamic large exporters hail mainly from East Asia, with Mexico a recent entrant because of the formation of NAFTA. All these exporters used high technology products to drive their success, and all *participated in global production networks, with all but Korea and Taiwan relying on developed country MNCs for this insertion.* Even China, with its many state-owned enterprises, relied heavily on MNCs to lead HT exports. UNCTAD estimates that over 80% of such exports came from foreign affiliates by 2001 (UNCTAD 2002). Korea and Taiwan tapped global production at arm's length, but only by building up very strong domestic capabilities (skills, R&D, institutions and infrastructure) (Lall and Urata, 2003).



To sum up on the global setting, the industrial environment has changed significantly since the early days of development. Rapid technical change, liberalization, shrinking economic distance and spreading global production networks are altering the way enterprises and countries compete. The outcome is an enormously expanded range of opportunities of production, exports and specialization offset by intense competition, rising minimum capability needs and the need to enter global value chains. Developing countries *can* succeed in this new setting, but only if they are able to meet these needs, compete in export markets and tap fast-growing segments of trade. Two crucial needs are therefore to build the necessary technological capabilities to compete and to attract FDI. Technological effort and FDI promotion are now vital to industrial success.

The rationale for attracting FDI is fairly obvious and does not need further discussion. That for undertaking technological effort (or building technological capabilities) needs a brief discussion.

4. DOES AFRICA NEED TECHNOLOGICAL EFFORT TO INDUSTRIALIZE?

There is a widespread belief that 'technology' is an activity reserved for developed countries. Developing countries only need to import existing knowledge from them in the form of machinery, equipment, designs, patents and blueprints. In simplified models with efficient markets, all they need to do to tap new technologies efficiently is to liberalize and wait for the right technologies to flow in to suit their factor endowments. No further technological effort is needed (they do not need to 'reinvent the wheel'); static comparative advantage is the same as dynamic comparative advantage, and as their factor price-ratios change their trade structure will adjust automatically and instantaneously. In sum, technology does not raise significant policy issues in developing countries.

This depiction is misleading. Developing countries do not generally 'innovate' in the sense of creating new products or processes. They do, however, have to invest in technological effort:

to acquire, master, adapt and improve upon existing technologies. This effort is often quite significant. In fact, developing countries often have to undertake greater effort than their counterparts in advanced economies because their absorptive capacities are much lower. Absorbing technologies is not a trivial or costless task, and industrial success depends on how well the process is managed. Since all countries have access to the same international technical knowledge, a critical determinant of industrial performance is technological 'learning' by different countries. It is critical to the argument of this chapter to understand this phenomenon.

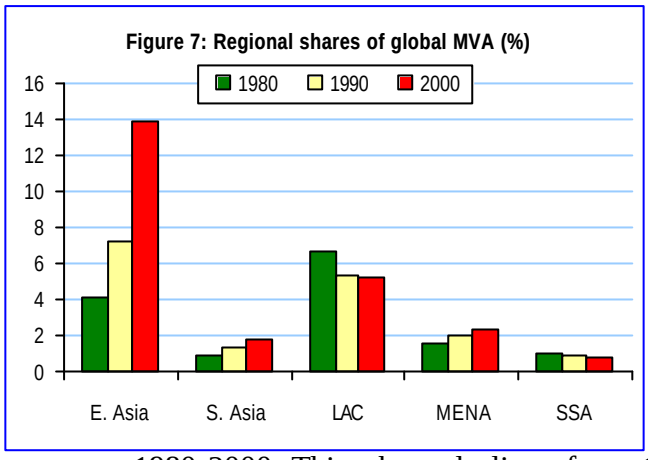
While technological hardware (equipment, designs, patents and so on) *is* available to all countries, just importing the hardware does not ensure that it is used efficiently. This is because the disembodied elements of technology ('tacit' knowledge) cannot be transferred like physical products. Technical knowledge is difficult to locate, price and evaluate. Its transfer cannot be embodied in equipment or instructions, designs or blueprints. Unlike the sale of a good, where the transaction is complete when physical delivery has taken place, the successful transfer of technology is a prolonged process, involving local learning to complete the transaction. The embodied elements can be used at best practice levels only if they are complemented by a number of *tacit* elements that must be developed locally. The need for learning exists in all cases, even when the seller of the technology provides assistance, though the costs vary by technology, firm and country (Lall, 2001). Learning calls for conscious, purposive efforts — to collect new information, 'try things out', create new skills and routines and strike new external relationships. This process is located in the production facility and embodied in the institutional setting of the enterprise. This process is strikingly different from textbook depictions of technology transfer.

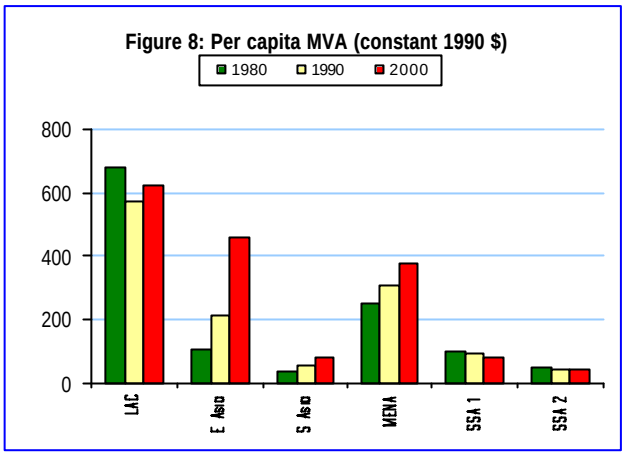
Enterprise technological learning does not take place in isolation: it is rife with *externalities* and *inter-linkages*. The most important interactions are those with suppliers of inputs or capital goods, competitors, customers, consultants and technology suppliers. Linkages also occur with firms in unrelated industries, technology institutes, extension services and universities, industry associations and training institutions. Many linkages are informal and not mediated by markets. Not all are deliberate or cooperative: some involve imitating and stealing knowledge. Where information and skill flows cohere around a set of related activities, 'clusters' of industries emerge, with collective learning in the group. These externalities raise clear issues for policy, since free markets cannot deal satisfactorily with them.

The ability of a country to undertake effective technological effort depends on a complex interaction between *its incentive system, factor markets and institutions*. The interaction is context specific. It reflects national policies, resources, support institutions, infrastructure, skills, business practices and history. Policies on trade, competition and labour, for instance, affect learning by each firm by influencing the signals it receives from the market. The resource base affects the relative cost and benefit of different learning trajectories. Support institutions affect how firms meet the information, skill, finance and other needs that are difficult to satisfy in open markets. Infrastructure determines the cost of operation and interacting with the outside world. The skill base that firms draw upon determines what and how they learn. The social and business setting, the product of past experience and tradition, is also very important; it affects how firms relate to each other and cooperate.

5. AFRICAN INDUSTRIAL PERFORMANCE

Figure 7 shows the share of Sub-Saharan Africa (including South Africa) in global MVA





over 1980-2000. This share declines from 1.0% to 0.82% over the two decades; without South Africa, it declines from 0.43% to 0.41% (UNIDO database). Figure 8 shows the values of per capita MVA in the developing regions, again with a declining value for SSA (SSA1 includes South Africa and SSA2 excludes it).[4]

The weak performance of African manufacturing in terms of values and world shares is reinforced by data on its technology composition. MVA in SSA2, excluding South Africa[5], is heavily biased towards resource-based activities (Figure 9). The share of medium and high technology (MHT) activities is very low and declines over time. In contrast, most other developing regions raise the MHT share. East Asia without China (EA 2) and China both have a preponderance of MHT activities. The lack of upgrading in African industry is particularly worrying in light of global trends in industrial development.

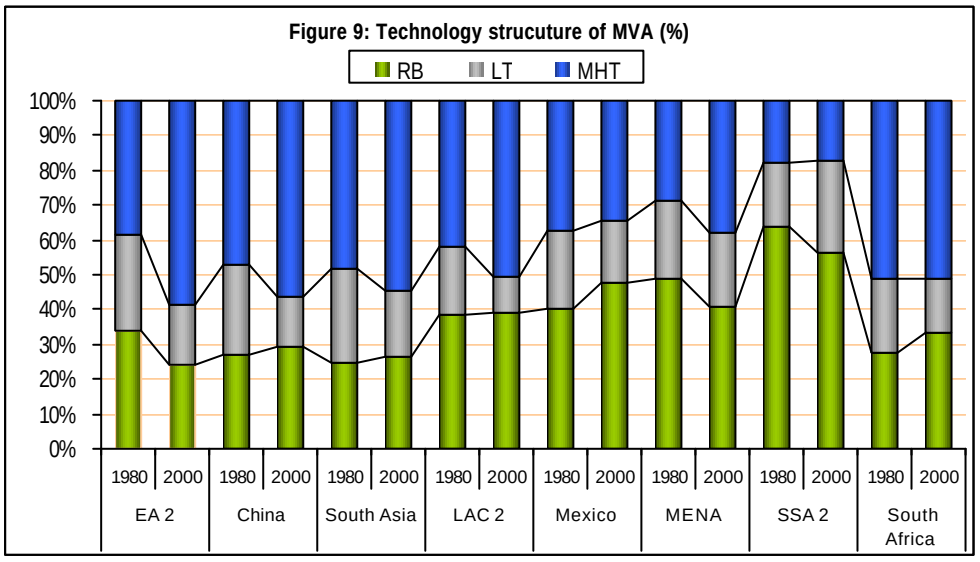
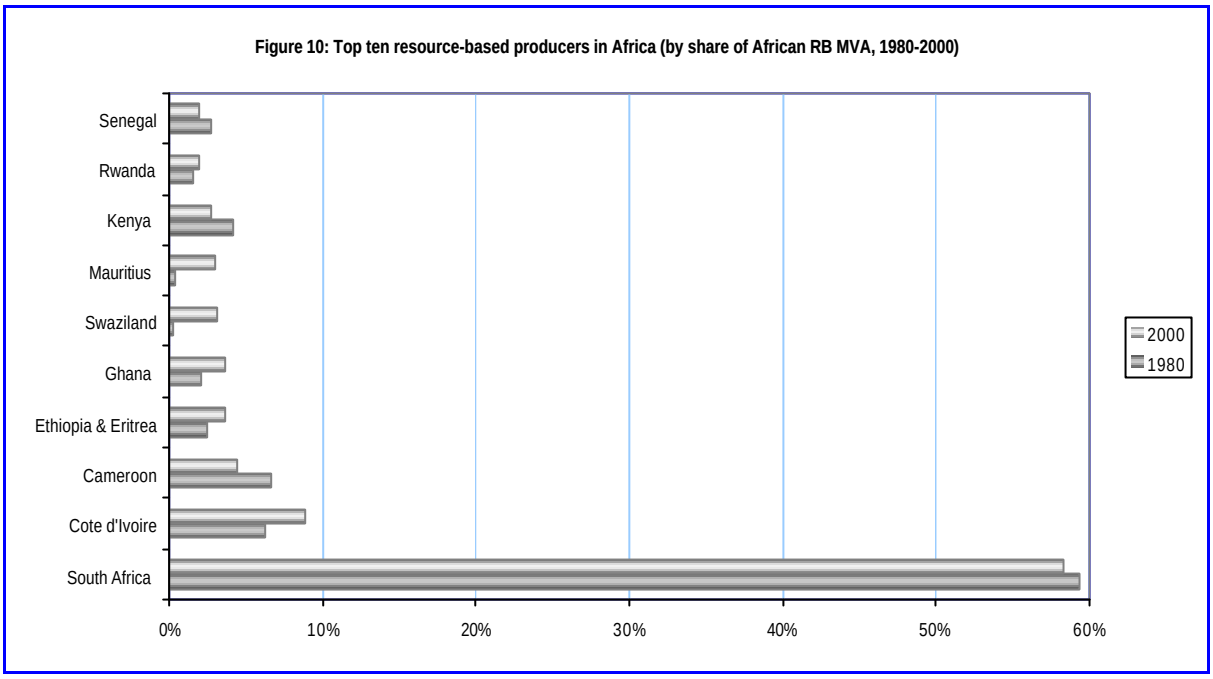


Figure 10 shows the leading countries in terms of shares of RB manufacturing in Africa; the share of South Africa is slightly higher here (58%) than for total MVA. Other countries are much smaller producers.

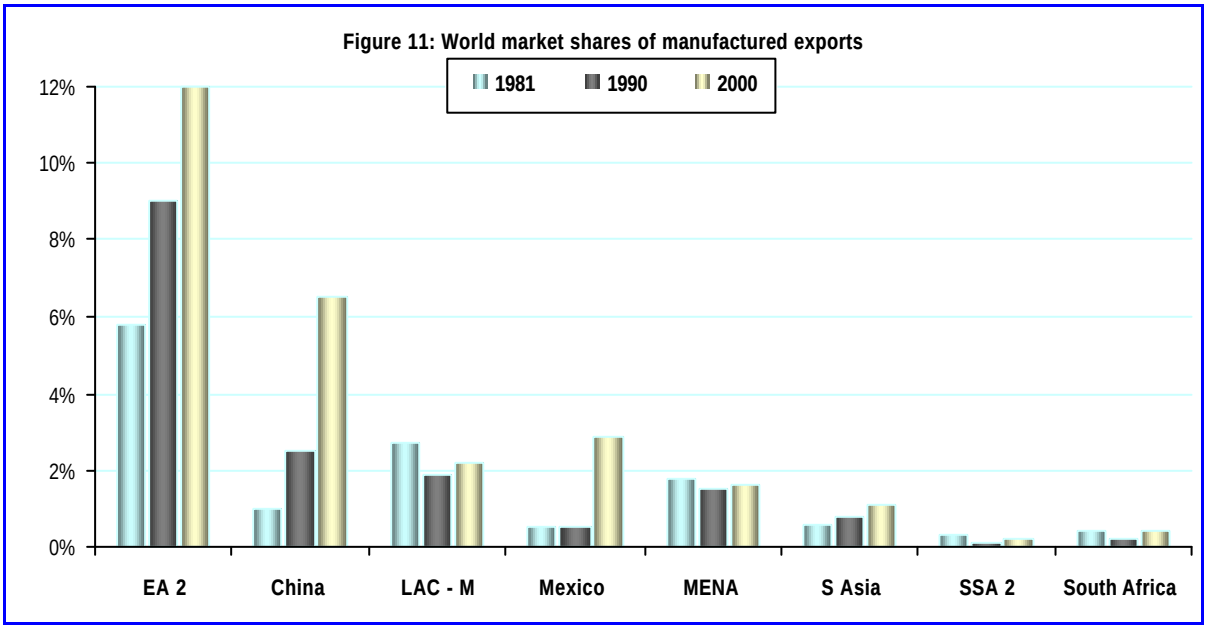
[4] The acronyms are: EA is East Asia, LAC is Latin America & the Caribbean, MENA is the Middle East and North Africa, SSA is Sub-Saharan Africa.

[5] South Africa accounted for 44% of SSA MVA in 2000, down from 53.7% in 1990 and 57% in 1980.



6. AFRICAN EXPORT PERFORMANCE

Figure 11 shows export market shares for Africa and other regions. SSA does not perform well: with South Africa included, it only accounts for 0.6% of world manufactured exports in 2000, marginally down from 0.7% in 1981 but slightly up from 0.4% in 1990. Without South Africa, the share declines from 0.3% in 1981 to 0.1% in 1990, then recovers slightly to 0.2% in 2000. Most of the recovery is in the early half of the 1990s – the later half is stagnant.



These two decades see massive rises in exports by East Asia as a whole, its world market shares going from 6.8% in 1981 to 18.4% in 2000. Within this total, China's WMS has risen from 1.0% to 6.5%. South Asia has also had a steady rise, if at much more modest levels. Latin America without Mexico has seen a fall in WMS over the 1980s and a rise in the 1990s but not to the levels reached in 1981; MENA had performed the same way. Mexico's export

prospects have altered dramatically in the 1990s with the formation of NAFTA and the boom in its *maquiladoras* (assembly operations) on the US border.

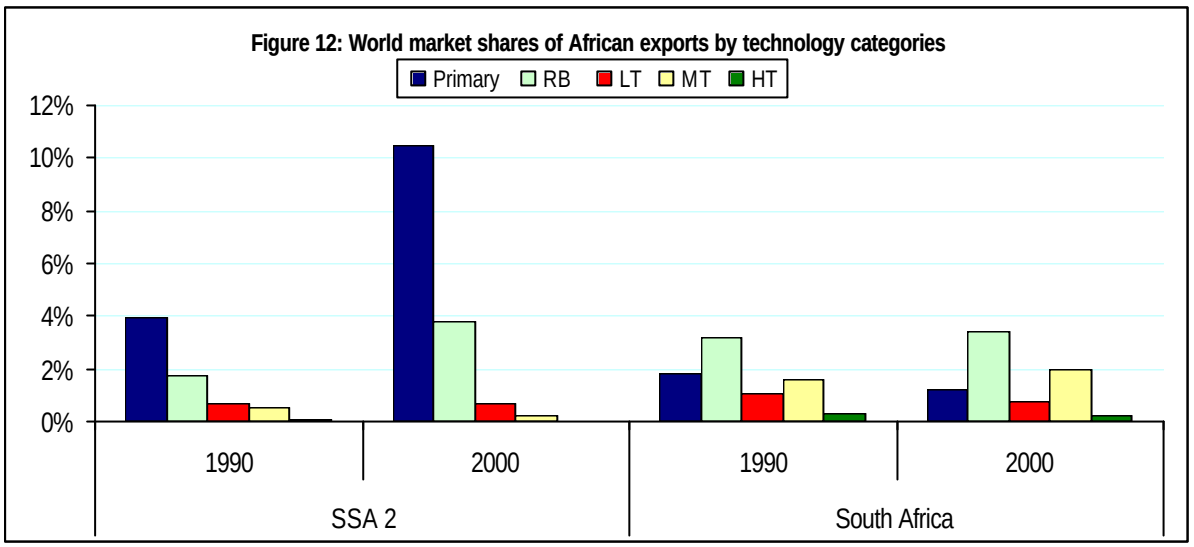


Figure 12 shows the WMS of African exports by technology categories in the 1990s. SSA2 (excluding South Africa) raises its total market share (including primary products), with large gains in primary products and resource-based manufactures Within the latter category, the main gains are in petroleum and other mineral-based products; its WMS for agro-based RB products remains stagnant. However, it loses shares in complex (medium and hi-tech) manufactured products. South Africa loses shares in primary products as well as low technology and high technology manufactures, while gaining in resource-based and medium technology manufactures. Its overall market share declines slightly.

Table 1: Shares of South Africa and Mauritius in African exports

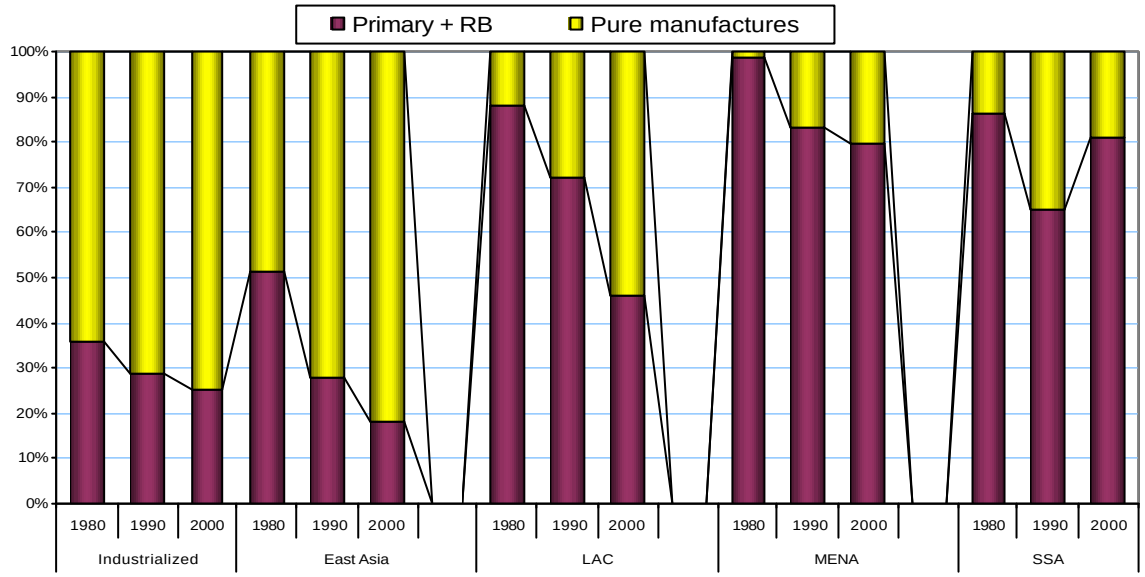
	South Africa			Mauritius		
	1980	**1990**	**2000**	**1980**	**1990**	**2000**
Total Exports	49.2%	70.8%	29.7%	2.0%	5.8%	1.9%
Primary products	33.2%	58.8%	9.7%	0.1%	0.3%	0.0%
Total manufactures	68.4%	76.5%	57.6%	4.4%	8.4%	4.6%
Resource based	60.9%	78.9%	45.6%	4.6%	6.0%	1.7%
Agricultural Based	53.7%	61.8%	43.0%	13.9%	15.7%	4.8%
Mineral Based	64.3%	87.9%	46.7%	0.1%	1.0%	0.4%
Low Technology	82.8%	58.0%	48.1%	6.8%	20.5%	20.3%
Fashion Cluster	58.3%	35.5%	25.1%	20.4%	45.3%	37.6%
Other LT	93.6%	74.7%	72.5%	0.8%	2.0%	2.1%
Medium Technology	91.0%	88.2%	86.1%	1.3%	1.9%	0.7%
Automotive	92.6%	96.6%	92.0%	0.0%	0.4%	0.1%
Process	92.1%	86.0%	84.0%	0.2%	0.6%	0.3%
Engineering	87.6%	88.2%	84.7%	4.3%	6.6%	1.6%
High Technology	69.8%	91.4%	87.1%	0.8%	1.4%	1.3%
Electronic	80.1%	94.9%	92.5%	2.7%	1.6%	0.4%
Other HT	66.0%	89.9%	83.8%	0.0%	1.3%	1.8%

South Africa and Mauritius the two main 'outliers' in Africa in terms of manufactured export performance. Table 1 shows the shares of these two countries in total African exports. Mauritius is particularly notable because, despite its small size (population of 1 million) and

lack of an industrial base, it has performed rather like an Asian Tiger, with spectacular growth in apparel exports (Lall and Wignaraja, 1998). However, this growth is coming to an end because of high wages; as a result, Mauritian exporters are relocating in low wages neighbours like Madagascar. The ending of the MFA will erode competitiveness further, unless Mauritian firms upgrade their quality significantly ahead of China and South Asia.

Within manufacturing, the structure of African exports reflects the overwhelming role of resource-based products (primary products and resource-based manufactures) as compared to 'pure' manufactures (low, medium and high technology) (Figure 13). East Asia has raised the share of pure manufactures to levels even higher than industrialized countries, based on its stellar performance in low as well as high technology products. LAC remains more dependent on resources but raises the share of manufactures rapidly. MENA, like SSA, remains primarily resource based.

Figure 13: Technology structure of exports by main regions



It is useful to distinguish the export structure of the main sub-regions within Africa (Figure 14): we exclude South Africa and then South Africa and Mauritius (the latter is an outlier because of its success in apparel exports). We also divide Africa into coastal countries (non-resource based economies including South Africa and Mauritius), land-locked countries and resource-based countries. The groups are taken from UNIDO (2004).

Figure 14: Complexity of Exports for SSA regions 1980-2000

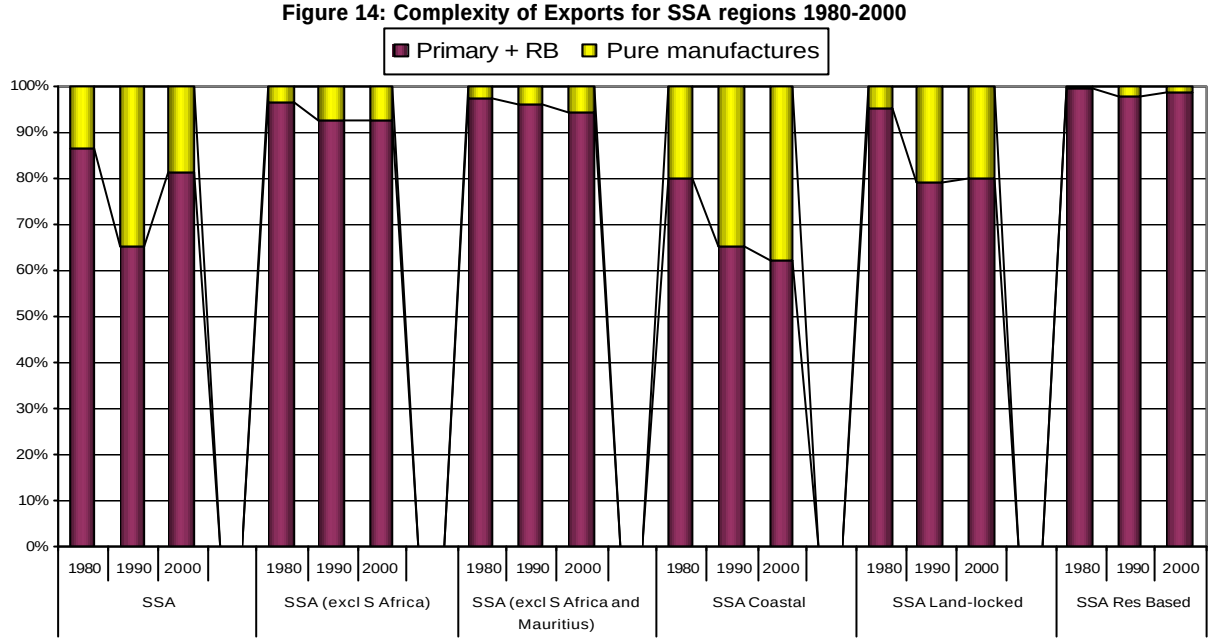
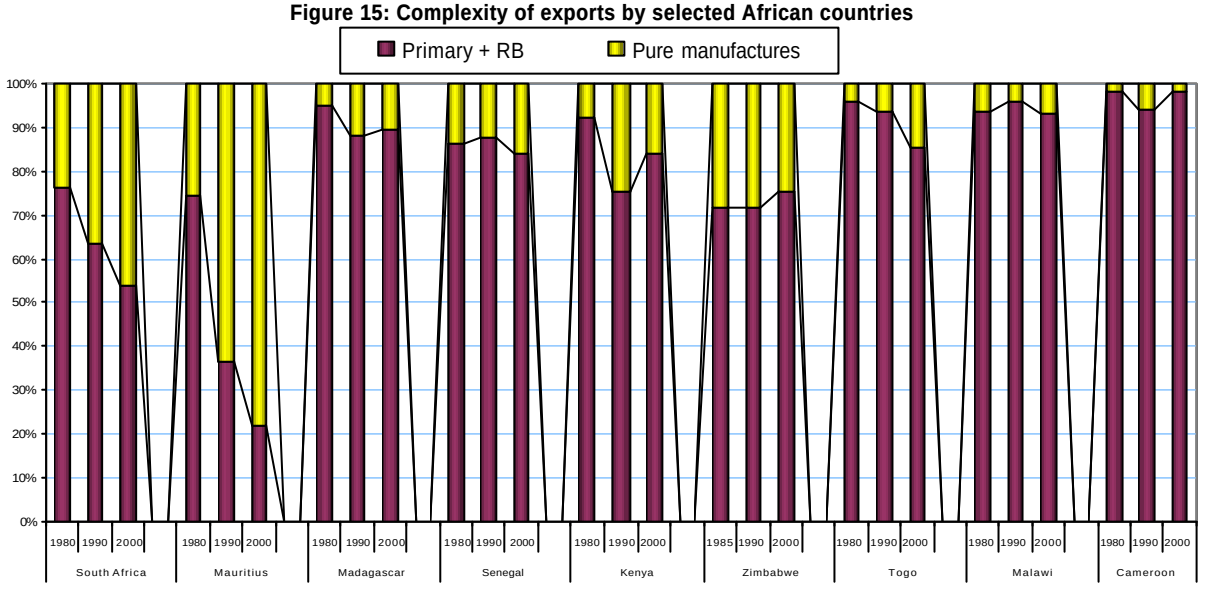


Figure 15: Complexity of exports by selected African countries



The coastal (non resource-based) countries have more reliance on pure manufactures than other countries, but the export structure is still highly reliant on natural resources. The predominantly resource-based countries are, expectedly, almost wholly dependent on such exports, with hardly any 'pure' manufactured exports. Figure 15 shows the structure of exports by selected African countries (Nigeria is excluded because of the absence of recent trade data), reinforcing the impression that the region is concentrated in resource-based products that offer relatively limited prospects of growth and technology development, and that often suffer from volatile and declining prices

Table 2 shows *upgrading in the export structure* of Africa relative to other regions, as measured by the change in the share of medium and high technology products in total or

manufactured exports over 1980-2000. This is a better indicator of the responsiveness of African countries to world trade and technology, the depth of their industrial capabilities and their ability to tap the dynamics of evolving comparative advantage. East Asia and LAC lead the world in terms of structural upgrading of exports over these two decades; however, the Latin American result is strongly biased by Mexican performance, and the rest of LAC has a relatively stagnant structure (Lall, Albaladejo and Moreira, 2004).

Table 2: Upgrading of export structure by region, and in Africa and East Asia

	In total exports		In manufactured exports	
	1980-1990	**1990-2000**	**1980-1990**	**1990-2000**
World	14.0%	4.9%	9.4%	4.8%
Industrialized	12.7%	5.1%	9.9%	4.6%
Developing	34.4%	16.4%	31.1%	16.0%
EA8	**42.3%**	**21.2%**	**37.6%**	**20.0%**
EA9	**36.6%**	**18.4%**	**31.6%**	**16.5%**
LAC	36.8%	23.9%	46.8%	21.6%
MENA	7.7%	1.6%	13.0%	3.3%
SSA (total)	**4.7%**	**-6.7%**	**12.8%**	**1.2%**
SSA excl South Africa	0.8%	0.3%	3.9%	-5.1%
SSA excl South Africa & Mauritius	0.9%	0.5%	4.4%	-9.7%
South Africa & Mauritius	20.1%	10.8%	20.3%	10.7%
SSA Coastal	14.4%	6.6%	18.2%	8.9%
SSA Landlocked	6.6%	-4.7%	10.9%	-27.1%
SSA Resource-based	0.5%	-0.6%	3.3%	-12.4%
Mauritius	0.1%	-1.6%	0.1%	-1.7%
South Africa	21.6%	11.4%	22.1%	11.0%
Togo	3.0%	3.7%	7.9%	5.6%
Kenya	2.5%	-8.5%	9.4%	-12.0%
Madagascar	-1.0%	-1.1%	-7.9%	-4.3%
Senegal	0.3%	3.4%	1.0%	8.8%
Malawi	1.2%	0.3%	7.4%	-1.8%
Cameroon	0.0%	-2.9%	-2.1%	-16.5%
Zimbabwe	-5.8%	-6.0%	-16.2%	-15.7%
Hong Kong	3.9%	-4.4%	4.5%	-3.7%
Indonesia	23.0%	17.8%	30.2%	21.7%
Korea	34.2%	17.9%	34.2%	18.3%
Malaysia	55.4%	29.3%	48.7%	23.9%
Philippines	73.4%	55.5%	75.5%	52.8%
Singapore	41.7%	17.5%	37.0%	15.9%
Taiwan	37.8%	20.6%	37.8%	20.0%
Thailand	42.8%	25.4%	33.3%	24.4%

Notes: 'Upgrading' is defined as the rise in the share of medium and high technology products in total or manufactured exports. EA 8 includes Hong Kong, Singapore, Korea and Taiwan; EA 9 also includes China.

Africa as a whole lags other developing regions in terms of export upgrading, though its performance in the 1980s is quite respectable. However, the breakdown of Africa shows that this is due largely to South Africa. Without South Africa, there is relatively little upgrading; the landlocked and resource-rich countries perform particularly poorly. At the country level, several retrogress technologically, particularly in the 1990s when liberalization starts to take hold. By contrast, all countries in East Asia, with the exception of Hong Kong, show vigorous upgrading in their export structures.

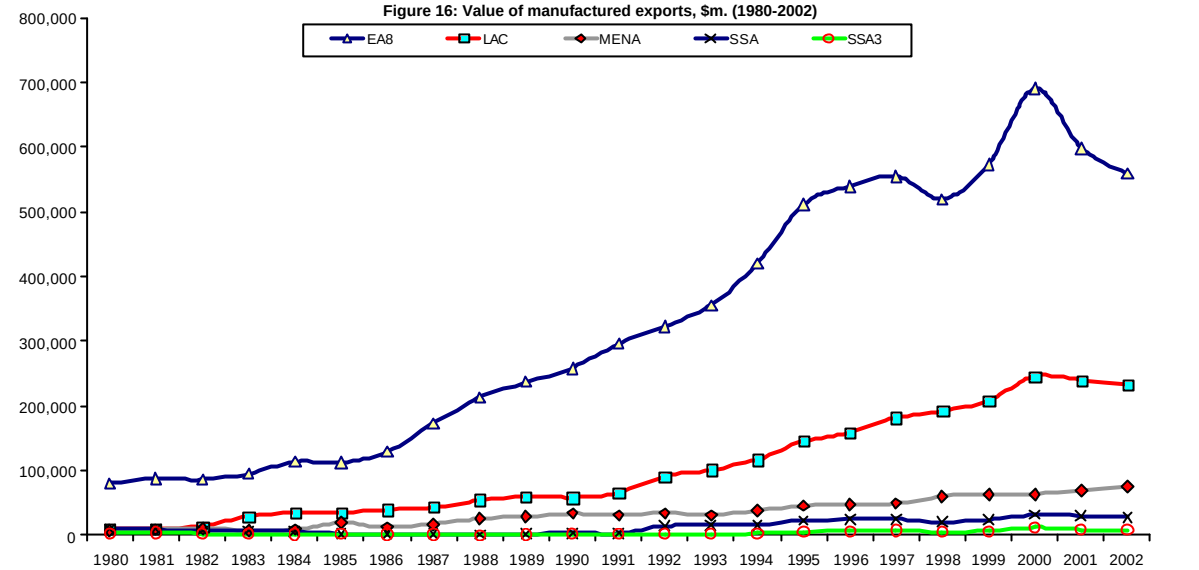
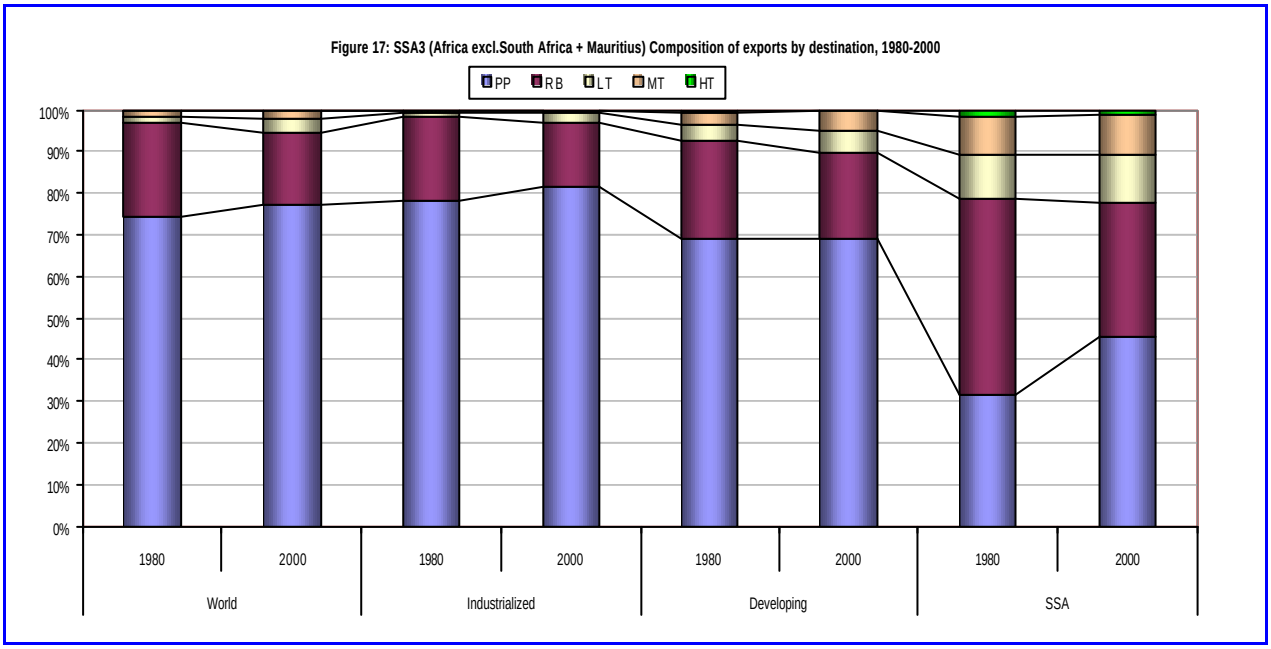


Figure 16 shows the trends in values of manufactured exports by the regions, and Figure 17 the technology composition of exports by SSA3 (i.e. excluding South Africa and Mauritius). The stagnation of African exports is strikingly obvious in the former. The latter shows interesting differences in export composition by destination. Exports to industrialized countries are more primary-product intensive than those to developing countries as a whole, and even more than exports to other African countries. However, over time the share of primary products rises in exports to the rest of Africa rises, while that of RB manufactures falls. African exports have higher shares of 'pure' manufactures than to other regions, with LT and MT products taking about equal shares. This is line with expectations that exports by African countries to countries at similar levels of development would be more complex than exports to industrialized countries; however, manufactures play a very small role in intra-African exports and even less in exports to other developing countries.



In sum, therefore, these data suggest very low levels of industrial and export capabilities in

much of Africa. While intra-regional trade seems to offer better prospects of upgrading, two factors have to be borne in mind. First, the regional market is relatively small and slow-growing, poorly linked by infrastructure, and volatile. It will not be sufficient to drive sustained export growth within Africa, though some industries may well benefit. Second, while local exporters have a transport cost and information advantage compared to other exporters to Africa, unless local firms can match others in terms of price, quality and technology, they will lose market share. After all, no African country will willingly buy more expensive or poorer quality products from other African countries if they have a choice – which they will increasingly as the region opens up.

Table 3: Correlation coefficients of export structures of Africa (all exports)

	1980	1990	2000	Change 1980-2000
Developing	0.953	0.768	0.612	(0.341)
EA8	0.819	0.015	(0.174)	(0.992)
EA9	0.819	0.108	(0.194)	(1.013)
SSA1 (ex South Africa)	0.983	0.864	0.994	0.011
SSA3 (ex South Africa +M)	0.982	0.891	0.995	0.013
South Africa + Mauritius	0.939	0.965	0.616	(0.323)
SSA Coastal	0.952	0.998	0.901	(0.051)
SSA Landlocked	0.948	0.808	0.981	0.032
SSA Resource-based	0.955	0.793	0.990	0.034

Finally, we correlate the export structures of Africa as a whole with subgroups in Africa and other regions, including individual Asian countries (the exercise is at the 3-digit level of SITC revision 2). The higher the correlation coefficient, the more similar are the export structures; over time, a positive figure for the change in the coefficient indicates that structures are growing more similar. Table 3 shows the coefficients for 1980, 1990 and 2000. Interestingly, the export structures of East Asia and Africa were fairly similar in 1980. Over time, they diverged significantly and by 2000 there was a negative correlation between them.

Table 4: Changes in correlation of export structures of Africa with other regions and countries (1980-2000) (all exports)

EA9	(1.013)
EA8	(0.992)
Malaysia	(0.914)
Thailand	(0.875)
Singapore	(0.715)
Philippines	(0.658)
Industrialized	(0.589)
Developing	(0.341)
South Africa	(0.325)
Korea	(0.130)
Mauritius	(0.115)
Indonesia	(0.096)
Taiwan	(0.062)
SSA Coastal	(0.051)
Senegal	0.001
SSA1(ex South Africa)	0.011
SSA3(ex South Africa + M)	0.013
Togo	0.016
SSA Landlocked	0.032
SSA Resource Based	0.034
Madagascar	0.039
Cameroon	0.040
Kenya	0.047
Malawi	0.055
Zimbabwe	0.064
Hong Kong	0.067

Table 4 shows only the changes in correlation of African exports structure with other regions and countries. The structure for the region as a whole evolved differently from EA as a whole and from Asian countries (with the exception of Hong Kong), all developing countries, all industrialized countries, South Africa and coastal African countries.

These data reinforce earlier findings: not only is Africa performing poorly in competitive terms, its export structure is at variance with trends globally and in the most dynamic exporters in the world. The latter conclusion is as worrying as the former: if export structures were geared to fast growth, slow export growth could have been remedied by removing immediate constraints like poor business climate, weak infrastructure, lack of

financing, and so on. If, however, the structures are not conducive to growth, there is a more difficult problem of shifting into more dynamic activities, with far-reaching implications for building skills, industrial capabilities, attracting different forms of FDI and engaging in different forms of technological activity.

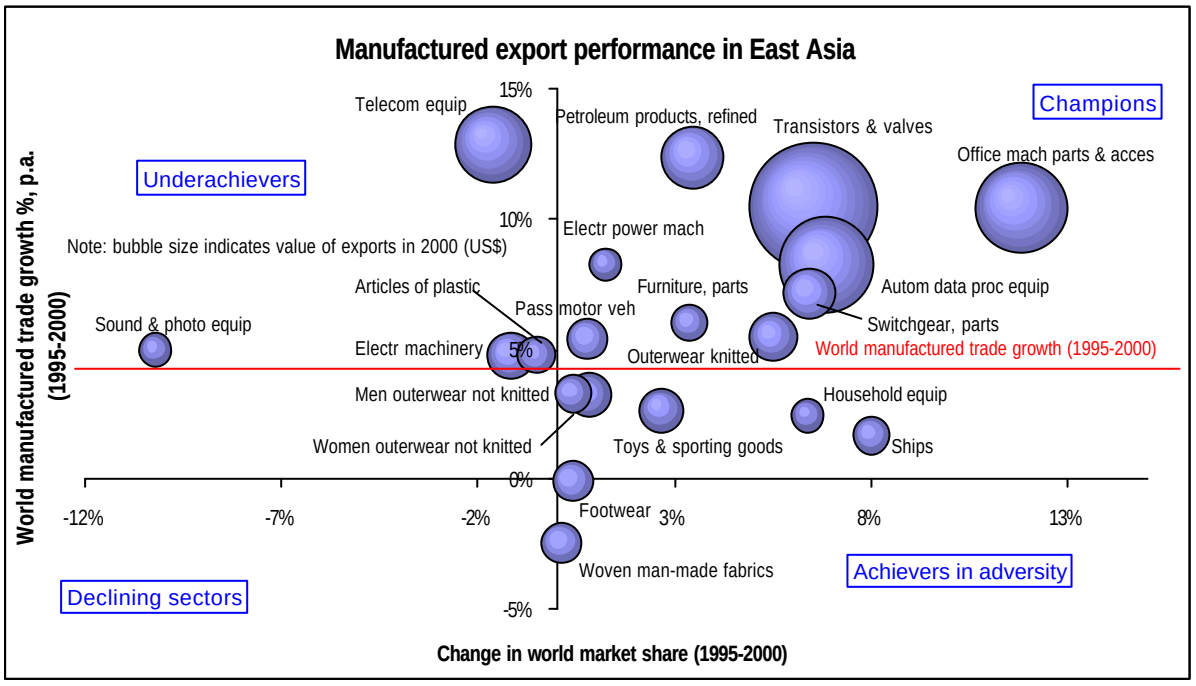
Finally, we consider the 'market positioning' of African manufactured exports as compared to East Asia, using a schema drawn from the business strategy literature (Box 3).

Box 3: Analysing market positioning

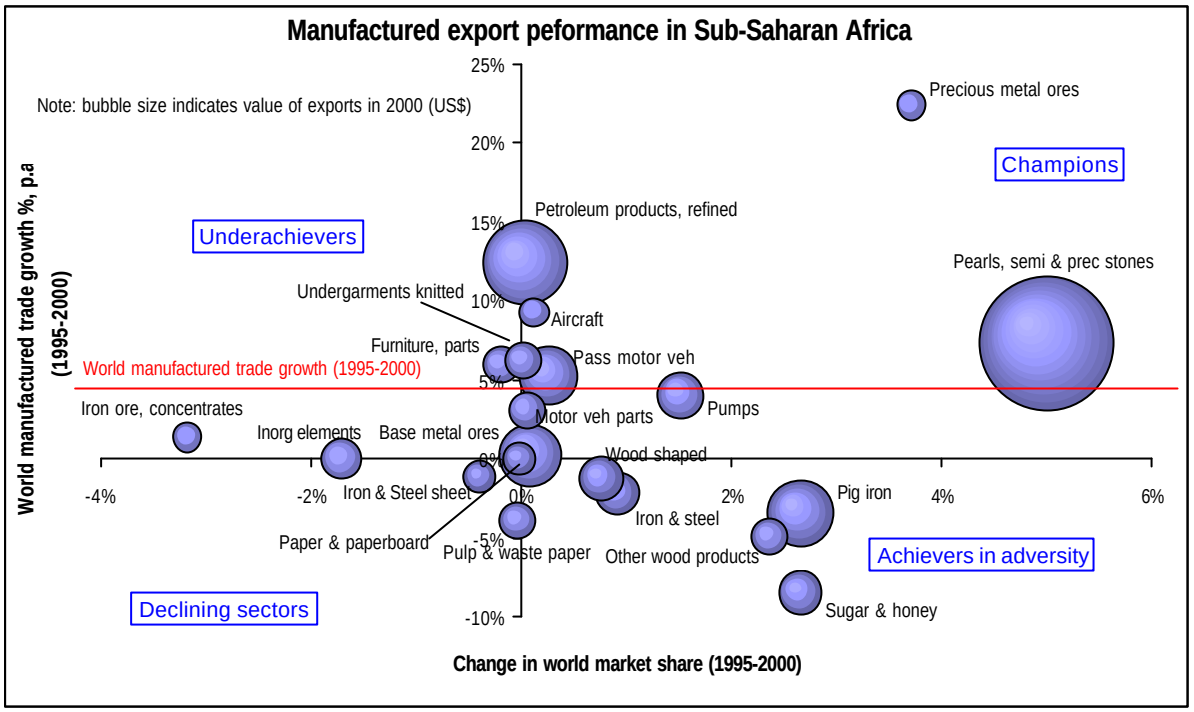
The analysis of market positioning is based on analyzing trends in the shares of a country's exports in dynamic or stagnant products in world trade and the country's overall competitive position in whether it is gaining or losing market share.

- **"Champions"**: exports with strong competitiveness (i.e. rising world market shares) in dynamic products that are growing faster than total trade. This is the most desirable, or 'optimal', export positioning.
- **"Underachievers"**: exports with rising market share in non-dynamic products. This signifies weak positioning, since competitive advantages are concentrated in areas where they may not yield high growth rates.
- **"Achievers in adversity"**: exports in decline (falling market shares) in dynamic products. This is the 'weakest' market position, as it shows the inability of the country to develop advantages in dynamic products.
- **"Declining sectors"**: exports that are losing market shares in non-dynamic products. This is a relatively desirable category, since it shows 'restructuring' away from a weak position and in fact amounts to a strategic retreat. However, if this category is very large, it could signify a weak overall export structure.

Market Positioning Classification		
	Share of product in world trade	
Share of country's export in world trade	Rising (Dynamic)	Falling (Stagnant)
Rising (Competitive)	Optimal "Champions"	Vulnerable "Achievers in adversity"
Falling (Non-competitive)	Weakness "Underachievers"	Restructuring "Declining sectors"



The two figures show the market positioning of the top 20 exports by East Asia and Africa. The size of the bubble shows the value of the export and the position in the quadrant its relative positioning. There is a horizontal line shows the average rate of growth of world exports. There are very few 'champions' in Africa as compared to East Asia and the dominant one, precious and semi-precious gems, is a primary product with a relatively modest growth rate and facing volatile markets. Other champions are based on oil or emanate from South Africa (passenger cars and pumps); one export, aircraft, is clearly a re-export as no African country makes aerospace equipment. There are quite a few achievers in adversity. In East Asia, by contrast, there are a large number of champions, and most of these are high technology products. The African market positioning, South Africa apart, is not very promising as far as manufactured products go.



7. AFRICAN COMPETITIVE LAGS: FRAMEWORK CONDITIONS

Africa is commonly perceived to have poor framework conditions for growth and competitiveness: social and political disturbance, ethnic conflict, weak governance and corruption, distance from major markets and fragmented markets within the region, poor macroeconomic management, deficient infrastructure, or simply being located in the tropics.[6] In addition, many African countries have high business costs that make entry and growth difficult for private investors, especially for the small and tiny ones that comprise the vast bulk of local entrepreneurs.[7]

It is indisputable that such framework and initial conditions matter for African industrial performance: political, social and economic instability, corruption and impediments to investment, high transport costs or poor infrastructure all affect the growth and full exploitation of capacities and capabilities. UNIDO (2004) compares conditions in Africa today with those in selected high performing developing economies (HPEs) in the recent past,[8] and finds that:

> "Initial conditions, including non-economic factors such as geography, ethnic diversity, civil unrest and educational capital have been found to have profound effects on economic performance and development of countries. Controlling for other factors such as initial levels of income, a comparison with the initial conditions prevalent in the HPEs at their point of take-off suggests that non-economic initial conditions in SSA represent a cost in terms of foregone growth of between 0.6 and 1.6 percentage points. Initial conditions in economic and factor markets result in a

[6] See, for instance, Collier and Gunning (1999), Devarajan *et al*. (2002), and Sachs and Bloom (1998).
[7] See country level scores for legal regulations on business in World Bank (2004).
[8] These economies are Chile, China, Korea, Indonesia, India, Malaysia, Sri Lanka, Thailand, Vietnam, Mauritius and Bangladesh.

further 0.4 to 1.1 percentage points in forgone growth.

> "Some of the most important sources of forgone growth are low life expectancy (between 0.2 and 0.6 percentage points), adverse geography (between 0.3 and 0.5 percentage points) and real exchange rate distortions, which can be taken as a proxy for institutional quality (between 0.4 and 0.7 percentage points). Because the six HPEs are located entirely within the tropics, the proportion of land between the tropics does not appear to have been a constraint on subsequent growth. However, an index of the coastline to land area shows that SSA is in a very disadvantageous position compared to the HPEs because the majority of SSA countries do not have access to natural ports or waterways… SSA is at a considerable disadvantage relative to HPEs in respect of income distribution… The analysis of the impact of initial educational attainment in HPEs shows that the majority of SSA countries are currently lagging, sometimes significantly, behind the initial enrolment rates of all HPEs, with the exception of Bangladesh and China… Finally, the main source of lost growth in SSA arises from the difference in life expectancy between SSA and the HPEs. Although life expectancy is used here as an overall proxy for comparing health conditions, there is no doubt that pandemics such as HIV/AIDS and tuberculosis pose major public health challenges with serious fiscal implications for SSA countries."[9]

Since these issues have been extensively discussed in the analytical and policy literature on Africa, there is little need here to analyse them further here. We accept their relevance and significance to industrial development, but believe that they do not account fully for the weak competitive and technological performance of African manufacturing. There are, in our view, structural factors – related to technology, skills and FDI – that also play a very important role.

However, in terms of the business environment (as measured by the World Bank), SSA does not fare badly relative to other developing regions. Table 5 shows recent data on selected measures of the business climate: Africa is clearly not the worst performer on any of the indices. In fact, on several it does better than East Asia. Its competitive lag is clearly not due to onerous regulations.

Table 5: Business environment in SSA and other developing regions (circa January 2003)

	No. of start-up procedures	Time to start a business (days)	Minimum capital requirement (% GNI)	Cost to enforce contract (% GNI)	Labour regulations (from 0, less rigid, to 100, most rigid)
SSA	**11**	**72**	**278**	**52**	**53**
EA and Pacific	10	80	819	77	49
LAC	12	78	90	39	62
MENA	12	56	1,286	14	50
S Asia	9	45	86	93	49

Source: World Bank. *World Development Indicators, 2004*, Table 5.3

By contrast, in terms of *investment risk* Africa does consistently worse than other regions (Table 6). This is important in that it deters inflows of foreign capital (including FDI, on which more below), an important input into competitive development.

[9] UNIDO (2004), pp. 57-58.

Table 6: Investment risk ratings (late 2003)			
	Composite ICRG risk rating	*Institutional Investor* credit rating	*Euromoney* country credit-worthiness rating
SSA	**58.0**	**17.5**	**28.7**
EA and Pacific	66.6	29.6	38.7
LAC	65.0	30.0	43.3
MENA	70.5	38.5	44.1
S Asia	63.5	27.4	37.8
Source: World Bank. *World Development Indicators, 2004*, Table 5.2 Note: Higher values indicate better risk performance.			

Sound framework conditions are necessary to healthy industrial development. However, they are not *sufficient* if there are structural lags, where, in other words, economies cannot respond to market stimuli because they lack the capabilities needed to become internationally competitive. Some capabilities are conditioned by framework conditions (as noted, FDI will not come if risks are very high), but their development faces an *independent set of market and institutional failures,* and policy must address these directly. The next section deals with these issues, drawing on the East Asian experience.

8. STRUCTURAL FACTORS IN COMPETITIVENESS: TECHNOLOGY, SKILLS AND FDI

8.1 ANALYTICAL BACKGROUND[10]

Domestic technological effort and FDI are both vital to competitiveness, and both need a strong base of skills. We explained above the role of technological effort in competitiveness; we now turn to the relationship between FDI and local effort. Technological effort is needed in all developing countries to implement new technologies efficiently, regardless of the ownership of the factory, and such effort has to build on technologies imported from advanced countries. What difference does FDI make to the transfer and absorption of new technology and to export competitiveness?

Access to new technologies takes two broad forms: *internalized* (from a multinational company to its affiliates) and *externalized* (between independent firms). While internalized modes necessarily involve MNCs, externalized ones may also involve MNCs selling technologies (they are in fact the largest sellers of technology on licence). However, there are other sources of technology: national enterprises without overseas investments, consultants, capital goods producers, research institutions or governments. The sale can take a variety of forms: minority joint ventures, franchising, turnkey projects, sale of equipment, licences, technical assistance, subcontracting or original equipment manufacturing arrangements. Internalized transfers bring a package of supporting inputs to ensure their efficient deployment. Externalized transfers may involve additional inputs by the technology seller, but generally tend to call for greater learning effort by the recipient.

The MNCs that dominate global FDI are also the main source of industrial innovation. In fact, innovation is often the main factor that allows them to become (and remain) multinational. Despite the growth of technology start-ups, concentration in R&D remains high. For instance, in 1997 the largest 2% (by employment) of manufacturing companies undertaking R&D in the USA accounted for nearly 80% of industrial R&D spending. As the major innovators, it is

[10] This section draws on Lall (2003).

not surprising MNCs are also the main sources of technology transfer in non-FDI forms – they choose the mode of transfer to maximize the value of their technological assets, internalizing the most valuable ones and selling older or less profitable ones at arm's length. Before considering transfers to developing countries, let us highlight features of recent FDI (Box 4).

Box 4: Salient features of recent FDI

- FDI flows are growing faster than other economic aggregates like national gross fixed capital formation, world trade and GDP. International production (by MNCs and affiliates) is steadily increasing its share in global production.
- MNCs increasingly dominate world trade: *around two-thirds of visible trade is handled by MNCs*, and the share is growing particularly in activities with significant scale economies in production, marketing or innovation.
- Of the visible trade handled by MNCs, between 30 and 40 percent is *within* MNC systems, between affiliates and parents or among affiliates. Such internalized trade contains the most dynamic exports today, moving within integrated international production systems, where MNCs locate different functions or stages of production to different countries. Affiliates participating in such systems produce at massive scales and use the latest technologies, skills and managerial techniques. Examples of complex integrated systems in which developing countries are important are automobiles (mainly in Mexico, Brazil and Argentina) and electronics (Malaysia, Singapore, Philippines and Mexico) (Lall, Albaladejo and Zhang, 2004). The globalisation of the value chain is likely to spread across many other industries, and linking local production chains to them will become a major source of growth, technology transfer and skill development.
- Some MNCs are locating non-production functions like accounting, engineering, R&D or marketing to affiliates – these are high value activities that feed into manufacturing competitiveness and local capabilities. However, the transfer of functions such as R&D lags that of production, particularly in developing countries. Over 90 percent of overseas R&D by US MNCs is in other industrial countries. MNCs from smaller countries are more international in terms of relocating R&D overseas, but MNCs from economies like the UK are also conducting very substantial amount of R&D overseas. However, much of such R&D remains confined to other industrial countries. For such deep integration to occur, host countries have to be able to provide not just cheap labour but the whole array of modern skills, infrastructure, institutions, efficient business practices and supplier networks that MNCs need to be fully competitive in world markets. Very few developing countries are able to meet these needs.
- Large companies with transnational operations increasingly dominate the process of *innovation*: the creation of new technologies and organizational methods that lies at the core of competitiveness in all but the simplest activities. About 90 per cent of world R&D expenditure is in the OECD. Within this group, seven countries (led by the USA) account for 90 per cent, the USA alone for 40 per cent. Access to new technologies thus involves getting knowledge from technological leaders in these countries. Many are increasingly unwilling to part with their most valuable technologies without a substantial equity stake. Thus, FDI becomes the most important – often the only – way of obtaining leading edge technologies.
- MNCs are often central to *exports by local firms*, particularly of technology-intensive products. Many such products are difficult to export independently because of the need for costly branding, distribution and after-sales servicing. Thus, 60-70 percent of consumer electronics made by Korea and Taiwan is sold to MNCs on an OEM (original equipment manufacture) basis. The significance of OEM for Korea is shown by the following statistics. In 1985, over 40% of Korean exports were in the form of OEM. In 1989, around 50-60% of VCR and TV, and about 80% of PC, exports by Korea were under OEM. In 1990, 70-80% of total Korean electronics exports were under OEM. MNCs are also active in *exports of low technology products* where factors like scale economies, branding, distribution and design are important.
- MNCs can help *restructure and upgrade competitive capabilities* in import-substituting activities. Where the facilities are already foreign owned, MNCs are often better able to respond to liberalization than local firms by investing in new technologies and skills. They can also help local suppliers to upgrade, or attract investment by their suppliers overseas. This has been commonly found in Latin America. Where local firms own the facilities, MNCs help them to upgrade through mergers and acquisitions (M&As). While cross-border M&As are often regarded with suspicion or resentment, they can salvage existing facilities that would not survive in a liberalised environment. In fact, with globalization and liberalization, international M&As now constitutes the bulk of FDI flows, accounting for over 80 percent of FDI in developed countries and around one-third in developing ones (UNCTAD 2000).
- FDI in services is rising rapidly as formerly homebound providers (as in utilities) globalise activities and take advantage of liberalization and privatization in their industries. The entry of service MNCs can provide rapid improvements in the productivity and efficiency to host economies, not only in their industries but also to their customers (many of which are important exporters.

In general, internalized technology flows are a very efficient means of transferring a package of capital, skills, information and brand names to developing countries. For many new technologies, internalized transfers are the *only possible mode* of transfer, since innovators are unwilling to part with them to unrelated parties. Even where technologies *are* available at arm's length, internalization may be the most efficient way of transferring the tacit

knowledge involved because of the commitment of the transferor and its capability to support learning. If the technology is changing rapidly, internalization provides the most direct access to improvements. If the activity is export-oriented, internalized transfers offer the additional advantages of international marketing skills and networks, established brand names or, of increasing relevance, access to integrated production structures spanning several countries.

However, internalized technology transfer may also have costs. Profits are realised by the MNC on the package as a whole rather than just the innovation component. If the host country already possesses other elements of the package, it is cheaper to buy the technology separately (countries like Korea and Taiwan did this because their enterprises had the necessary capabilities to master the technology). In general, the more standardised and diffused the technology and the more capable the buyer, the more economical will externalized modes be. However, there is a more subtle reason: the existence of learning benefits, deepening and externalities may tilt the choice in favour of externalisation even for relatively complex and difficult technologies. In such activities, reliance on foreign investment can shorten the learning period but reduce the other benefits of technology transfer and capability building.

A useful way to analyse this is to divide technological capabilities into four levels. At the bottom are the simplest (operational) ones, needed for running a technology efficiently: these involve basic manufacturing skills as well as some more demanding troubleshooting, quality control, maintenance and procurement skills. At the intermediate level are duplicative skills, which include the investment capabilities needed to expand capacity and to purchase and integrate foreign technologies. Next come adaptive skills, where imported technologies are adapted and improved, and design skills for more complex engineering learned. Finally come innovative skills, based on formal R&D, that are needed to keep pace with technological frontiers or to generate new technologies.

The advantage of internalised forms lies in the long-term commitment of the foreign partner to the project and its ability to provide the elements needed to operationalise new technologies. MNCs have important advantages over local firms in creating the capabilities to use new technologies. They have mastered and used the technologies elsewhere; they may have created the technology in the first place. They have large reserves of skill, technical support, experience and finance to design and implement learning. They invest in upgrading local skills, technological capabilities and supply chains, if only to the extent that it is profitable in commercial terms (to implement production technologies). They have access to major export markets, established marketing channels and well-known brand names. They can transfer particular components or processes from a production chain to a developing country and integrate it into an international system. This is much more difficult for local firms, not just because they may not have the experience or competence – they inevitably face higher transaction and coordination costs in integrating into MNC corporate systems.

As capability development progresses to the top level, where local innovative efforts become viable, there can be a conflict of interest between the host country and the foreign investor. Internalized technology transfer and local capability development can, in other words, become *competitive rather than complementary*. There are good reasons for international investors to keep innovative work centralized at home or in a few developed countries; these reasons include ease of coordination, skill availability, proximity to main markets, and more advanced science and technology infrastructures. At the same time, it is important for countries at a certain stage of industrial development to deepen their capabilities and move into innovation. MNCs tend to transfer the results of R&D rather than the process itself,

whereas the sustained technological growth of developing countries calls for increasing local innovation. There is clear scope of a clash between the social interests of the host economy and the private interests of MNCs. At this stage, there may be a case for restricting reliance on internalized forms to promote local R&D capabilities based on externalized forms or for intervening in the FDI process to induce MNCs to transfer more advanced technological functions. However, as MNCs start to globalize the process of R&D, and as the costs and risks of frontier innovation rise, it becomes increasingly feasible to develop innovative capabilities *within* the MNC framework. This is the strategy pursued by countries like Singapore, Ireland and Hungary, with the dominant share of industrial R&D carried out by foreign affiliates.

Using MNCs to develop local innovative capabilities is possible only if the host countries' skill base is growing, local suppliers are improving their capabilities, technology institutions can provide more advanced services, and so on. This needs active government policies. Moreover, a policy to induce MNCs to enter more advanced activities by offering such inducements as specialised infrastructure and skills can accelerate the upgrading process. With a completely passive policy, MNC exports can remain at low, technologically stagnant, levels. *Thus, an MNC dependent export strategy needs a proactive element for dynamic competitiveness.*

More important, *depending on FDI is not a substitute for strengthening domestic capabilities*. There are many activities that MNCs do not enter, including many locally oriented ones that tend to be populated by SMEs. They also need efficient local suppliers if they are to go beyond the assembly of imported components: capturing the spillover benefits of foreign presence needs capable local firms. More important, a strong base of national enterprises can lead to broader, deeper and more flexible capabilities, since the technology development process within foreign affiliates may be curtailed as compared to local firms. The very fact that an affiliate can draw upon its parent company for technical information, skills, technological advances and so on means that it needs to invest less in its own capabilities. This applies particularly to functions like advanced engineering, design or R&D, which MNCs tend to centralise in industrial countries. As they mature industrially, it is imperative for developing countries to undertake these functions locally to support their future comparative advantage. This is why some countries choose to promote technology development in indigenous firms.

8.2 SKILLS AND TECHNOLOGY EFFORT IN AFRICA

Let us start by benchmarking *skills*. Africa lags other developing regions in formal education and vocational training. Its overall enrolment rates are very low, particularly in the higher level managerial and technical skills needed to handle modern technologies efficiently. One illustration of this is its enrolments in tertiary level technical subjects (Table 7).

Table 7: Tertiary level enrolments and enrolments in technical subjects (1995)

	3 level enrolment		Technical enrolments: numbers & % of population							
	Total No. students	*% pop.*	*Natural Science*		*Math's, computing*		*Engineering*		*All Technical subjects*	
			Numbers	*%*	*Numbers*	*%*	*Numbers*	*%*	*Numbers*	*%*
Developing countries	*35,345,800*	*0.82%*	*2,046,566*	*0.05%*	*780,930*	*0.02%*	*4,194,433*	*0.10%*	*7,021,929*	*0.16%*
Sub-Saharan Africa	1,542,700	0.28%	111,500	0.02%	39,330	0.01%	69,830	0.01%	220,660	0.04%
MENA	4,571,900	1.26%	209,065	0.06%	114,200	0.03%	489,302	0.14%	812,567	0.22%
Latin America	7,677,800	1.64%	212,901	0.05%	188,800	0.04%	1,002,701	0.21%	1,404,402	0.30%
Asia	21,553,400	0.72%	1,513,100	0.05%	438,600	0.01%	2,632,600	0.09%	4,584,300	0.15%
4 mature Tigers	3,031,400	4.00%	195,200	0.26%	34,200	0.05%	786,100	1.04%	1,015,500	1.34%
4 new Tigers	5,547,900	1.61%	83,600	0.02%	280,700	0.08%	591,000	0.17%	955,300	0.28%
S Asia	6,545,800	0.54%	996,200	0.08%	7,800	0.00%	272,600	0.02%	1,276,600	0.10%
China	5,826,600	0.60%	167,700	0.02%	99,400	0.01%	971,000	0.10%	1,238,100	0.13%
Others	601,700	0.46%	70,400	0.05%	16,500	0.01%	11,900	0.01%	98,800	0.08%
Transition economies	*2,025,800*	*1.95%*	*55,500*	*0.05%*	*30,600*	*0.03%*	*354,700*	*0.34%*	*440,800*	*0.42%*
Developed economies	*33,774,800*	*4.06%*	*1,509,334*	*0.18%*	*1,053,913*	*0.13%*	*3,191,172*	*0.38%*	*5,754,419*	*0.69%*
Europe	12,297,400	3.17%	876,734	0.23%	448,113	0.12%	1,363,772	0.35%	2,688,619	0.69%
N America	16,430,800	5.54%	543,600	0.18%	577,900	0.19%	904,600	0.31%	2,026,100	0.68%
Japan	3,917,700	0.49%					805,800	0.10%	805,800	0.10%
Australia, N. Zealand	1,128,900	5.27%	89,000	0.42%	27,900	0.13%	117,000	0.55%	233,900	1.09%

Source: Lall (2003)

Enrolment data are not, as noted, the ideal measure of skills. They ignore on-the-job learning, other forms of training and quality differences in the education provided. Nevertheless, they are the only comparable data available and they do show the national base for skill acquisition. The Asian NIEs enrol over 33 times the percentage of their population in technical subjects than SSA (including South Africa). The leading 3 countries in terms of total numbers of technical enrolments – China (18%), India (16%) and Korea (11%) – account for 44 percent of the developing world's technical enrolments, the top ten for 76 percent and the top 20 for 93 percent.

In terms of the *intensity* of technical skill creation (enrolments as a percentage of the population), the picture is equally disturbing for Africa (Table 8). The world leader is Korea (1.65%), followed by Finland (1.33%). Taiwan, the next developing country, ranks fifth (1.07%). Most African countries come at the bottom of the table. The best is South Africa, at rank 52, followed by Zimbabwe at 60.

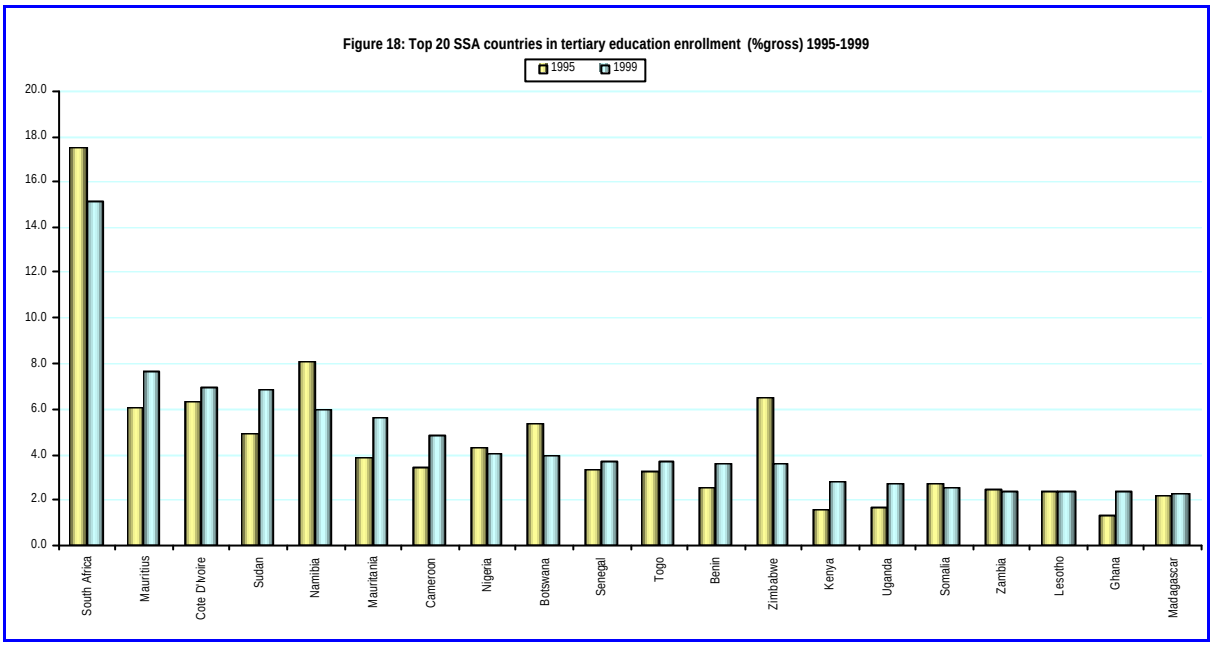
Table 8: Technical tertiary enrolments by country (% population) 1995

1	Korea	1.65	38	Bolivia	0.34
2	Finland	1.33	39	Costa Rica	0.34
3	Australia	1.17	40	Turkey	0.33
4	Taiwan	1.06	41	Ecuador	0.29
5	Spain	0.97	42	Uruguay	0.29
6	Ireland	0.90	43	Venezuela	0.29
7	Austria	0.78	44	El Salvador	0.26
8	Germany	0.77	45	Morocco	0.25
9	UK	0.75	46	Tunisia	0.24
10	Chile	0.73	47	Indonesia	0.23
11	Portugal	0.73	48	Nicaragua	0.22
12	Sweden	0.73	49	Honduras	0.20
13	Greece	0.72	50	Thailand	0.19
14	Canada	0.69	51	Brazil	0.18

15	Israel	0.68	52	S. Africa	0.17
16	N. Zealand	0.68	53	Hungary	0.16
17	USA	0.68	54	Malaysia	0.13
18	Norway	0.67	55	Egypt	0.12
19	Italy	0.64	56	India	0.12
20	Japan	0.64	57	Jamaica	0.11
21	France	0.61	58	Paraguay	0.11
22	Denmark	0.60	59	China	0.10
23	Panama	0.59	60	Zimbabwe	0.09
24	Netherlands	0.56	61	Bangladesh	0.08
25	Philippines	0.55	62	Nepal	0.08
26	Colombia	0.51	63	Sri Lanka	0.08
27	Switzerland	0.51	64	Cameroon	0.06
28	H. Kong	0.49	65	Madagascar	0.06
29	Romania	0.49	66	Pakistan	0.05
30	Argentina	0.47	67	Senegal	0.05
31	Singapore	0.47	68	Mauritius	0.04
32	Peru	0.46	69	Congo	0.03
33	Mexico	0.44	70	Kenya	0.02
34	Belgium	0.43	71	CAR	0.01
35	Jordan	0.42	72	Ethiopia	0.01
36	Algeria	0.41	73	Malawi	0.01
37	Poland	0.39			

Figure 18 shows tertiary enrolments as a percentage of the age group for the leading 20 African countries. Note that the average for high income countries is 61% and for upper middle income countries 33%. Most Asian Tigers have high rates: Korea 82%, Thailand 37%, Philippines 30%, Malaysia 26% and China 13% (World Bank, *World Development Indicators, 2004*). The highest in Africa is South Africa, with 15%, and this rate has declined over time.

It is difficult to see how Africa can build competitive capabilities in modern industry with such low skill levels. It is not just for hi-tech that advanced skills are needed – even 'simple' activities like apparel, footwear and basic engineering products now need a modicum of such skills to compete in global markets. If Africa is to grow by adding value to its natural resources, it will have to enter into much more complex, capital-intensive operations where technical skills are far more demanding.



Coming now to *technological effort*, the only available comparative data across regions are for formal R&D and patents taken out (the former is an R&D input and the latter R&D output). These indicators are partial, since a large part – in developing countries the dominant part – takes the form of informal effort on the shop floor and supporting quality, engineering, procurement and distribution operations. However, these indicators do provide insights into technological activity, bearing in mind that formal R&D becomes important in developing countries simply for absorbing complex new technologies. Table 9 shows regional R&D propensities.

Table 9: R&D Propensities and manpower in major country groups (latest year available)

Countries and regions (a)	Scientists/engineers in R&D		Total R&D	Sector of performance (%)		Source of Financing (% distribution)		R&D by financing (% of GNP)	
	Per mill. Pop.	Numbers	(% of GNP)	Productive sector	Higher education	Prod. enterprise	Govt	Productive enterprise	Prod. sector
Industrialised economies (b)	1,102	2,704,205	1.94	53.7	22.9	53.5	38.0	1.037	1.043
Developing economies (c)	514	1,034,333	0.39	13.7	22.2	10.5	55.0	0.041	0.054
Sub-Saharan Africa (exc. S Africa)	83	3,193	0.28	0.0	38.7	0.6	60.9	0.002	0.000
North Africa	423	29,675	0.40	N/A	N/A	N/A	N/A	N/A	N/A
Latin America & Caribbean	339	107,508	0.45	18.2	23.4	9.0	78.0	0.041	0.082
Asia (excluding Japan)	783	893,957	0.72	32.1	25.8	33.9	57.9	0.244	0.231
Mature NIEs (d)	2,121	189,212	1.50	50.1	36.6	51.2	45.8	0.768	0.751
New NIEs (e)	121	18,492	0.20	27.7	15.0	38.7	46.5	0.077	0.055
S Asia (f)	125	145,919	0.85	13.3	10.5	7.7	91.8	0.065	0.113
Middle East	296	50,528	0.47	9.7	45.9	11.0	51.0	0.051	0.045
China	350	422,700	0.50	31.9	13.7	N/A	N/A	N/A	0.160
European transition economies (g)	1,857	946,162	0.77	35.7	21.4	37.3	47.8	0.288	0.275
World (79-84 countries)	1,304	4,684,700	0.92	36.6	24.7	34.5	53.2	0.318	0.337

Source: Calculated from UNESCO Statistical Yearbook 1997. Regional propensities for R&D spending are simple averages.
Notes: (a) Only including countries with data, and with over 1 million inhabitants in 1995.
(b) USA, Canada, West Europe, Japan, Australia and N Zealand. (c) Including Middle East oil states, Turkey, Israel, South Africa, and formerly socialist economies in Asia. (d) Hong Kong, Korea, Singapore, Taiwan Province. (e) Indonesia, Malaysia, Thailand, Philippines. (f) India, Pakistan, Bangladesh, Nepal (g) Including Russian Federation.

Productive enterprise financed R&D as a share of GNP – in our view the best indicator of *technologically useful* R&D – is nearly 400 times higher in the mature NIEs than in Sub-

Saharan Africa. Asia as a whole accounts for 86 percent of R&D scientists and engineers in the developing world, Sub-Saharan Africa for 0.3 percent, and Latin America for 10 percent. The proportion of enterprise financed R&D in total R&D spending is highest in the mature NIEs, followed by the new NIEs, and lowest in Sub-Saharan Africa.

Another way to benchmark technology is to combine R&D with patents taken out internationally (in this case, in the US). Table 10 shows an indicator created by the present author ranking countries by 'technology intensity' (Lall, 2003.a). It ranks a large sample of countries according to a combination of enterprise financed R&D and patents (though countries at the bottom could not be ranked because they did not undertake meaningful technology effort by either measure).

Table 10: Technology Effort Index (1997-98)

	Productive enterprise financed R&D per capita (US$)		Patents in US (per 1,000 people)		Technology Effort Index (a)			Technology Group
1	Switzerland	859.9	USA	3.297	1	Japan	0.8649	
2	Japan	858.4	Japan	2.412	2	Switzerland	0.7858	
3	Sweden	653.9	Switzerland	1.884	3	USA	0.7709	
4	USA	465.9	Taiwan	1.622	4	Sweden	0.5957	
5	Germany	418.1	Sweden	1.421	5	Germany	0.4151	
6	Finland	413.4	Israel	1.275	6	Finland	0.4099	
7	Denmark	328.4	Germany	1.134	7	Denmark	0.3434	
8	France	297.6	Finland	1.118	8	Taiwan	0.3173	
9	Norway	275.5	Canada	1.090	9	Netherlands	0.2743	
10	Belgium	272.7	Denmark	1.005	10	France	0.2716	
11	Netherlands	258.8	Netherlands	0.817	11	Israel	0.2712	
12	Austria	214.4	Belgium	0.699	12	Belgium	0.2645	HIGH
13	S Korea	211.2	S Korea	0.657	13	Canada	0.2488	
14	Singapore	198.4	France	0.650	14	Norway	0.2344	
15	UK	174.5	UK	0.601	15	S Korea	0.2225	
16	Ireland	152.8	H Kong	0.540	16	Austria	0.2022	
17	Australia	148.0	Austria	0.511	17	UK	0.1926	
18	Canada	143.7	Norway	0.490	18	Singapore	0.1738	
19	Israel	134.0	Australia	0.402	19	Australia	0.1470	
20	Taiwan	122.5	Singapore	0.386	20	Ireland	0.1191	
21	Italy	90.1	N Zealand	0.356	21	Italy	0.0986	
22	Slovenia	73.3	Italy	0.305	22	N Zealand	0.0835	
23	Spain	55.2	Ireland	0.200	23	H Kong	0.0829	
24	N Zealand	50.7	Slovenia	0.076	24	Slovenia	0.0541	
25	Czech Rep	32.3	Spain	0.072	25	Spain	0.0431	
26	Portugal	14.1	Hungary	0.045	26	Czech Republic	0.0200	
27	Brazil	13.7	S Africa	0.030	27	Hungary	0.0135	
28	Greece	13.5	Malaysia	0.017	28	S Africa	0.0121	
29	S Africa	12.8	Greece	0.016	29	Greece	0.0103	
30	Hungary	11.3	Bahrain	0.016	30	Portugal	0.0096	
31	Argentina	8.5	Venezuela	0.013	31	Brazil	0.0087	
32	Poland	8.3	Russian Fed	0.012	32	Argentina	0.0067	
33	Russian Fed	7.5	Argentina	0.011	33	Malaysia	0.0065	
34	Malaysia	6.7	Chile	0.011	34	Russian Fed	0.0062	
35	C Rica	5.5	Uruguay	0.009	35	Poland	0.0055	
36	Chile	5.3	Portugal	0.009	36	Chile	0.0047	MODERATE
37	Turkey	4.8	Mexico	0.009	37	C Rica	0.0041	
38	Romania	2.5	Czech Rep	0.008	38	Venezuela	0.0033	
39	Venezuela	2.3	Saudi Arabia	0.006	39	Turkey	0.0029	
40	H Kong	1.8	Ecuador	0.006	40	Bahrain	0.0024	
41	Mexico	1.5	C Rica	0.006	41	Mexico	0.0022	
42	Panama	1.4	Brazil	0.005	42	Uruguay	0.0020	
43	Uruguay	1.1	Jordan	0.004	43	Romania	0.0015	
44	China	0.9	Poland	0.004	44	Saudi Arabia	0.0009	LOW
45	Indonesia	0.8	Jamaica	0.004	45	Ecuador	0.0009	
46	India	0.4	Philippines	0.003	46	Panama	0.0008	
47	Mauritius	0.3	Thailand	0.002	47	Jordan	0.0008	
48	Thailand	0.3	Guatemala	0.002	48	China	0.0006	

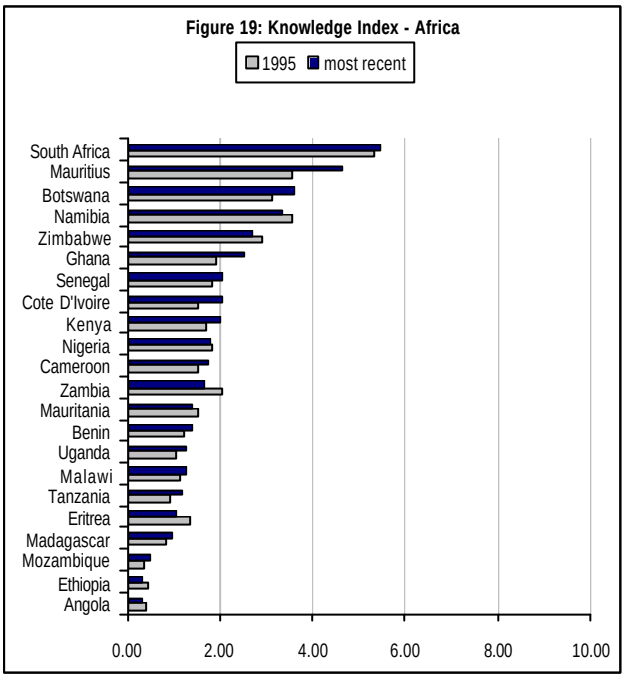
49	Egypt	0.2	Colombia	0.002	49	Jamaica	0.0006	
50	Colombia	0.2	Honduras	0.002	50	Philippines	0.0006	
51	Jordan	0.2	Bolivia	0.001	51	Indonesia	0.0005	
52	Guatemala	0.1	Tunisia	0.001	52	Thailand	0.0005	
53	Algeria	0.1	Sri Lanka	0.001	53	Colombia	0.0004	
54	Saudi Arabia	0.1	India	0.001	54	India	0.0004	
55	Peru	0.1	Morocco	0.001	55	Guatemala	0.0003	
56	Morocco	0.1	China	0.001	56	Honduras	0.0003	
57	Philippines	0.1	Turkey	0.000	57	Sri Lanka	0.0002	
58	Honduras	0.1	Indonesia	0.000	58	Bolivia	0.0002	
59	Nicaragua	0.1	Peru	0.000	59	Mauritius	0.0002	
60	Sri Lanka	0.1	Kenya	0.000	60	Morocco	0.0002	
-	Yemen	0	Egypt	0.000	61	Tunisia	0.0002	
-	Tunisia	0	Nigeria	0.000	62	Egypt, Arab Rep.	0.0001	
-	Malawi	0	Pakistan	0.000	63	Peru	0.0001	
-	Madagascar	0	Albania	0.000	64	Algeria	0.0001	
-	Kenya	0	Algeria	0.000	65	Nicaragua	0.0001	
-	Jamaica	0	Bangladesh	0.000	66	Kenya	0.0001	
-	Ecuador	0	Cameroon	0.000	-	Nigeria	0.0000	NEGLIGIBLE
-	Albania	0	CAR	0.000	-	Pakistan	0.0000	
-	Bahrain	0	El Salvador	0.000	-	Albania	0.0000	
-	Bangladesh	0	Ethiopia	0.000	-	Bangladesh	0.0000	
-	Bolivia	0	Ghana	0.000	-	Cameroon	0.0000	
-	Cameroon	0	Madagascar	0.000	-	CAR	0.0000	
-	CAR	0	Malawi	0.000	-	El Salvador	0.0000	
-	El Salvador	0	Mauritius	0.000	-	Ethiopia	0.0000	
-	Ethiopia	0	Mozambique	0.000	-	Ghana	0.0000	
-	Ghana	0	Nepal	0.000	-	Madagascar	0.0000	
-	Mozambique	0	Nicaragua	0.000	-	Malawi	0.0000	
-	Nepal	0	Oman	0.000	-	Mozambique	0.0000	
-	Nigeria	0	Panama	0.000	-	Nepal	0.0000	
-	Oman	0	Paraguay	0.000	-	Oman	0.0000	
-	Pakistan	0	Romania	0.000	-	Paraguay	0.0000	
-	Paraguay	0	Senegal	0.000	-	Senegal	0.0000	
-	Senegal	0	Tanzania	0.000	-	Tanzania	0.0000	
-	Tanzania	0	Uganda	0.000	-	Uganda	0.0000	
-	Uganda	0	Yemen	0.000	-	Yemen	0.0000	
-	Zambia	0	Zambia	0.000	-	Zambia	0.0000	
-	Zimbabwe	0	Zimbabwe	0.000	-	Zimbabwe	0.0000	

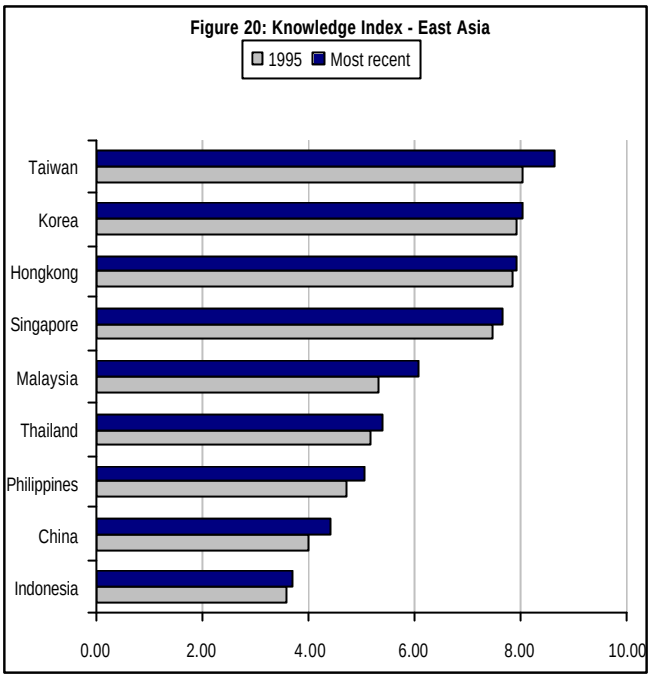
Source: Lall (2003.a)

All African countries in the table, with the exception of South Africa (rank 28 in the index) are at the bottom of the table, along with other less-industrialized countries. A final indicator technological capacity is the World Bank's new 'knowledge economy index' (available at http://info.worldbank.org/etools/kam2004), based on its Knowledge Assessment Methodology (KAM). KAM consists of 76 structural and qualitative variables that serve as proxies for the 'four pillars' of the development of a knowledge economy. The variables comprise measures of growth, governance, skills, technological effort and ICT infrastructure (described in http://info.worldbank.org/etools/kam2004/html/generic_technical.htm). The *Knowledge Index* is the average of the performance of a country in three 'pillars': Education, Innovation and Information Communications & Technology (it ignores the governance indicators). It thus serves as a useful combination of the factors reviewed earlier, with the addition of an ICT infrastructure variable.

Figures 19 and 20 show the Knowledge Index scores for Africa and East Asia in 1995 and the most recent available year, the scores ranging between 1 and 10. The four mature Asian Tigers are well in advance of other Asian countries, but even the least developed, Indonesia, ranks about the same as Botswana, which comes third in Africa after South Africa and Mauritius, the two outliers in the region. The rest of Africa scores very low in the index, even compared to other developing regions, not shown here.

These scores reiterate our findings that Africa is very poorly placed in terms of the *basic structural requirements* of building a modern knowledge-based economy. Thus, getting a healthy investment climate in place may be a desirable first step, but is unlikely to be sufficient to catalyse African industrial competitiveness.





8.3 FOREIGN DIRECT INVESTMENT

Foreign investors have recently taken an increasing interest in Africa since 2000. As Table 11 shows, the share of SSA in global FDI inflows has risen from 0.42% in 2000 to 1.65% in 2003 (data from UNCTAD, 2004). According to the UNCTAD Inward FDI Performance Index, which calculates the host region's share in global FDI as a ratio of its share in global GDP, Africa has raised its value from 0.89 in 2000-2002 to 1.28 in 2001-2003 (UNCTAD, 2004, p.12). Three countries dominate FDI in Africa because of their size and resources (South Africa, Nigeria and Angola), but their share in inflows to the region has declined from 58% in 1999 to 37% in 2003. Thus, FDI trends in other African countries are also encouraging.

Table 11: FDI inflows by region (current $ million and percentages)

Region	**1992-7** average	**1999**	**2000**	**2001**	**2002**	**2003**
			Values of FDI inflows			
SSA	4,010	8,558	5,810	14,126	8,149	9,250
South Africa	1,045	1,502	888	6,789	757	762
SSA 2 (ex. South Africa)	2,965	7,056	4,922	7,337	7,392	8,488
Nigeria	1,402	1,005	930	1,104	1,281	1,200
Angola	304	2,471	879	2,146	1,643	1,415
SSA2 excl. Nigeria/Angola	1,259	3,580	3,113	4,087	4,468	5,873
East Asia	67,120	106,020	139,591	98,246	81,791	90,849
South Asia	2,489	3,095	3,092	3,982	4,535	6,066
MENA	4,855	3,993	4,412	11,589	7,185	9,916
LAC	38,167	107,406	97,537	88,139	51,358	49,722
World	310,879	1,086,750	1,387,953	817,574	678,751	559,576

Developing world	118,596	231,880	252,459	219,721	157,612	172,033
FDI in SSA as % of global FDI						
SSA	1.29%	0.79%	0.42%	1.73%	1.20%	1.65%
SSA2 (ex. South Africa)	0.95%	0.65%	0.35%	0.90%	1.09%	1.52%
SSA2 ex. Nigeria & Angola	0.40%	0.33%	0.22%	0.50%	0.66%	1.05%
FDI in SSA as % of developing world FDI						
SSA	3.38%	3.69%	2.30%	6.43%	5.17%	5.38%
SSA2	2.50%	3.04%	1.95%	3.34%	4.69%	4.93%
SSA2 ex. Nigeria & Angola	1.06%	1.54%	1.23%	1.86%	2.83%	3.41%
FDI in other regions as % of global FDI						
East Asia	21.59%	9.76%	10.06%	12.02%	12.05%	16.24%
South Asia	0.80%	0.28%	0.22%	0.49%	0.67%	1.08%
MENA	1.56%	0.37%	0.32%	1.42%	1.06%	1.77%
LAC	12.28%	9.88%	7.03%	10.78%	7.57%	8.89%
Developing world % total	38.15%	21.34%	18.19%	26.87%	23.22%	30.74%

Source: UNCTAD (2004), Annex table B.1

FDI in East Asia has recovered from the financial crisis in 1997, and the rise of China as a host country has helped raise its global share sharply in 2003. There are, in fact, fears within East Asia that China will 'suck away' FDI from other recipients, though there is little evidence for this.[11] LAC continues to suffer a continuing decline in inflows since 1999, largely because of anaemic growth and the maturing of privatization. South Asia shows a steady if modest increase, largely due to liberalization and strong growth in India.

Table 12: Net FDI inflows per capita (current $)

1995		2000	
Singapore	2,492.3	Hong Kong	9,290.9
Hong Kong	2,256.3	Singapore	1,345.6
Malaysia	202.7	Mauritius	223.8
Lesotho	147.3	Korea	197.5
Botswana	47.1	Malaysia	162.8
Angola	41.7	Angola	66.9
Korea	39.4	Lesotho	57.9
Thailand	35.3	Thailand	55.4
South Africa	31.9	Botswana	34.1
China	29.8	China	30.4
Indonesia	22.5	South Africa	22.6
Philippines	21.6	Philippines	16.2
Mauritius	16.7	Cote d'Ivoire	14.7
Cote d'Ivoire	15.2	Sudan	12.6
Zambia	10.8	Zambia	12.1
Zimbabwe	10.3	Benin	10.3
Nigeria	9.7	Togo	9.3
Togo	6.7	Senegal	9.2
Uganda	6.3	Indonesia	-22.1

Table 12 shows inward FDI per capita in Africa and East Asia in 1995 and 2000. While Singapore and Hong Kong dominate in both years, Mauritius appears in third place, Angola in sixth place and Lesotho in seventh in 2000.[12] Botswana received more FDI per capita than China, while South Africa was ahead of the Philippines. The bottom of the list had Indonesia, which was still suffering the aftermath of the financial crisis and knock-on political effects.

One important reason for the rise in investment interest in Africa is *improved policies*: trade and FDI liberalization, better macro policies and greater socio-political stability. Assuming that these improvements continue, the rise in interest is likely to be sustained. Two other significant reasons for increased FDI in Africa are the growing *pressures for primary resources* and the *privatization of utilities* in several countries: the

[11] A statistical analysis of FDI inflows in East Asia using China as an independent variable along with other determinants of FDI (including the financial crisis) does not find that China reduces inflows to other countries. In fact, in some periods it raises FDI in other countries. See Lall and Zhou (forthcoming).

[12] However, the Lesotho figure is misleading in that it includes inflows of South African government investment in the Highlands Water Project and is not FDI in the normal sense of the term. See Lall (forthcoming).

former is likely to continue while the latter will taper off over time (UNCTAD, 2004, p. 45). Finally, there is some stimulus to foreign investors from AGOA (the African Growth and Opportunities Act of the US), which came into force in 2000 and offers quota and tariff-free access to the US market for a large range of manufactured and primary products from many African countries. The EBA (Everything but Arms) initiative of the EU, which gives similar privileges for the European market, reinforces the privileged market access that Africa enjoys in the world's largest markets.

In theory, these privileges should stimulate FDI in export-oriented manufacturing in Africa. Wages in Africa are now among the lowest in the developing world and FDI policies (at least on paper) are similar to those in other regions. There are, in addition, a large number of export processing zones, many of which are managed by private companies. While there remain infrastructure deficiencies in several countries and the landlocked ones face higher transport costs, there are many coastal countries that should be able to capitalize on these advantages. And some landlocked countries have reasonable access to ports through neighbouring countries, particularly those next to South Africa.

There are, however, few signs that Africa is using these advantages and investor interest to mount a sustained rise in *manufactured exports*. South Africa apart, there is still very little FDI in export-oriented manufacturing in Africa, and even in South Africa the range of interest is narrow, largely limited to automobiles and processed foods, with almost no FDI in labour-intensive activities that could help relieve its unemployment problem. In the rest of Africa, despite its relatively low wages, there is no surge of FDI in labour-intensive export-oriented activities of the type that drove East Asian growth. The region remains effectively marginal to the operations of global value chains in labour-intensive manufactures, particularly in the hi-tech activities that are the main cause of East Asian success.

AGOA has raised hopes in Africa of an export boom – in the US the intention was that it would draw American investors and use American materials, rather like the Mexican *maquiladoras*. Both hopes have not really been fulfilled. The bulk of increased exports under AGOA have been resource-based products, led by petroleum. In manufacturing, there *has* been some growth of apparel exports, but due mainly to quotas on apparel exports by (the more efficient) producers in East Asia.[13] There is no growth of other labour-intensive exports (like footwear, toys or sports goods) on which there are no quota restrictions. The largest and most dynamic exporter of apparel under AGOA has been Lesotho, and its experience offers very useful lessons for African industrialization and competitiveness (Box 5). And there has been little response from US companies in terms of investing in Africa in manufacturing or providing it with inputs (they are simply too expensive in the relevant activities, mainly textiles). Similarly, there is a low probability that the EU EBA initiative will stimulate manufactured exports by Africa, any more that the Lomé Convention did earlier.

Box 5: Lessons on export-oriented FDI in Africa from Lesotho

Lesotho, a small, resource poor and land-locked country inside South Africa, is behaving rather like an East Asian 'Tiger'. It is currently the largest and fastest growing exporter of clothing from Sub-Saharan Africa to the US. Some 70 percent of its exports are manufactures (compared to 25 percent for Africa as a whole), and they have grown at 30 percent per annum

[13] The value of African textile and apparel exports remains minuscule by world standards: Africa's world market share in this sector was only 0.78 percent in 2000, and had declined from 0.86 percent in 1990. Mauritius accounted for a large part of apparel exports, but it is something of an outlier in the African scene; without it, performance would be even more dismal.

during 1999-2002. Lesotho has relied on investors from East Asia to drive its industrial and export growth. The 38 clothing factories in the country now employ around 40 thousand people and exported $318 million worth of apparel to the US in 2002. These exports took place under AGOA (the African Growth and Opportunities Act), which gives African countries tariff and quota free access to the US market. In 2002, Lesotho's apparel exports were 2.6 larger than Kenya's, the next largest beneficiary from AGOA; they were also much larger than AGOA exports by better-established clothing exporters in Africa like Mauritius ($107 m.) and South Africa ($88 m.).

Foreign owned apparel exporters are not new to Lesotho. The first Asian plants moved there from South Africa in the late 1980s when sanctions were imposed on the apartheid regime. They took advantage of the Lomé Convention (giving quota and duty free access to the EU) to export to Europe. However, the Convention stipulated that after some time two stages of apparel processing (yarn and textile manufacture) had to be undertaken locally: this was economically unfeasible. Lesotho managed to get this requirement postponed for 8 years; after that – in the late 1990s – exports to Europe fell sharply. The launch of AGOA gave the industry a new lease of life. The long experience of Asian investors in the country, with the associated development of production capabilities, let them take a lead over other countries with AGOA privileges, including those with larger, longer-established industrial sectors and better location. The first lesson of Lesotho is then that the cumulative accumulation of capabilities, even of the simplest kind in clothing assembly, is vital to competitiveness.

AGOA has two stages. At the end of the first stage, due in 2008, one further stage of apparel manufacturing (i.e. fabric) has to be undertaken within Africa or the fabric has to be imported from the USA, a high cost source (East Asia is the cheapest). At the end of the second stage, in 2015, all AGOA privileges will end. An equally important, and more immediate, change is to be the abolition of the Multi-Fibre Arrangement (MFA) by end 2004. MFA drove Asian apparel exporters to Africa (and to several other countries, from Bangladesh and Sri Lanka to Latin America and the Caribbean) in the first instance, crippling growth by the most efficient producers (in East Asia) and forcing exporters to use low-wage but less efficient sites elsewhere. The MFA also explains why AGOA has not attracted any other labour-intensive assembly to Africa, even though trade concessions also apply to them. No footwear, toy, sports goods or similar assembly activities are relocating to Africa despite the tariff advantages they enjoy over competing producers. This suggests that tariff advantages do not offset Africa's productivity disadvantage. The second lesson of Lesotho then is that there is a huge productivity lag in the region.

This does not mean that Lesotho's exporters will leave when MFA expires. As noted, enterprises have built basic production capabilities and these may suffice with tariff advantages (currently about 17% over East Asian competitors) without quota protection However, the end of the first stage of AGOA in 2008 will mean that African exporters can no longer import fabrics from Asia. Procuring fabrics in Africa or the US will impose a cost handicap unless local production can be brought up to productivity levels of East Asia (wages are not too different from China). Fabric production is more capital and skill intensive than apparel assembly, and the extent of the cost handicap will depend on how much productivity differs from East Asia.

Apparel assembly in Lesotho, simple as it is, still suffers from low productivity. Scattered evidence suggests that the productivity of Lesotho workers is between 30 to 70 percent lower than in China. As wages are not very different from China, such a large productivity gap will be unsustainable once AGOA ends: the activity cannot compete in open markets, even if it reverts to importing cheap fabrics from Asia. The lack of local linkages exacerbates the cost disadvantages imposed by low productivity. Even after 15 years of operations, the industry has not catalysed the growth of local subcontractors or suppliers. This is very different from countries like Bangladesh where within a few years of East Asian investment hundreds of local garment exporters had started up – and Bangladesh had a relatively weak entrepreneurial tradition in South Asia.

The reasons for lower productivity within apparel manufacturing appear to lie in the wage system (time rather than piece wages), low levels of formal skills, the lack of training (apart from basic on-the-job training) and poor employer-worker relationships. Asian firms do not invest much in employee training, preferring to use Chinese supervisors and technicians. The government has done nothing to encourage skill formation by firms (say, by fiscal incentives), nor has it set up any training facilities for the industry. Its main efforts have been directed to getting AGOA extended rather than to using the remaining 'grace period' to raise capabilities to competitive levels. There is thus a real risk that the industry will evaporate once AGOA ends, unless the government launches targeted capability building measures and provides the basic public goods that the industry needs.

Lesotho has a good investment climate, with well-managed macro policy (run by South Africa), liberal trade regime, welcoming FDI policies, low business costs, reasonable infrastructure and low taxes (15%). This is not, however, the reason for its industrial and export success: the real reason (apart from sanctions on South Africa) lies in the trade 'distortions' (the MFA, the Lomé Convention and AGOA) that gave it a form of infant industry protection. While such protection has stimulated growth, it will yield lasting benefit only if the infant 'grows up' and is able to compete on open markets. This involves productivity raising measures that again have little to do with having a good investment climate.

Source: Lall (forthcoming)

The basic problem of African industrial competitiveness lies not in market access to rich countries or the investment climate but in the low level of industrial capabilities that hold

back a significant and sustained supply response. As the Lesotho case shows, its good 'framework conditions' account less for its surge in apparel exports than its past experience of apparel manufacture and its ties to East Asian full package suppliers. Its low wages will not be enough to offset low productivity and the lack of local linkages once trade privileges and constraints on Asian competitors are removed.

To the extent that this applies to other African industrializing countries apart from South Africa, there are important policy lessons for building African competitiveness. Put simply, Africa cannot compete and benefit from globalization at current levels of productivity, which is too low for its wages to offset in activities that face direct foreign competition. Productivity *remains low* even in entry-level manufacturing activities with relatively undemanding skill and organisational requirements, and after years of production experience. If Africa cannot compete here the prospects for the development of more complex activities are rather bleak.

Progress in resource-based manufacturing may be an industrialization option for countries that have resources, but having raw materials does not guarantee a competitive edge in processing it. The leading resource-based exporters in the developing world are countries like Singapore and the Republic of Korea that do not have their own resources but are able to efficiently process imported primary materials. In the industrial world, countries with large resource bases (Canada, Australia or Finland) do export processed resources, but their success rests on having strong technological capabilities in these activities. Many processing activities need advanced capital- and skill-intensive technologies to meet the rigorous standards of export markets; food products are particularly demanding because of sanitary requirements. Africa cannot industrialise using its ample resources unless it develops the capabilities to handle such complex technologies efficiently.

Africa thus needs to do much more than open up and improve the investment climate. Liberalization *can* spur efficiency, but where capabilities are too weak to cope with international competition, it can simply lead to the destruction of capacity and the dispersal of existing capabilities. In these conditions, local firms will not set up new facilities in areas where they face full international competition; nor will foreign investors enter. This is precisely the experience of much of Africa. A vigorous supply response is possible only if governments help new industrial capabilities to develop. Without this, the investment response of the private sector (local and foreign) is bound to be hesitant and inadequate.

9. CONCLUSIONS

There have been many grand initiatives on African development. Most have failed conspicuously. The reasons are complex, including bad luck (shocks like droughts, famines, political and social instability, or declining prices for primary exports), poor governance, wrong strategy design and weak implementation. The 'luck factor' is more propitious now: many African countries are over the worst of internal and external conflicts, macroeconomic management is improving and there are signs of better governance. It is the design and implementation of development initiatives that remains most problematic. Past initiatives have not integrated properly social and economic objectives. This should be corrected, integrating social, health, education and distribution issues into a seamless whole.

Africa must industrialize if it is to develop. A healthy and competitive manufacturing sector is necessary to drive income, export and employment growth. It is also necessary to move African economies out of their reliance on primary activities that promise little in terms of sustained development. Manufacturing remains the engine of modernisation and technical

upgrading, the seedbed of entrepreneurship and modern services, and the most productive way in which Africa can integrate into the international economy. Catalyzing industrial growth in Africa needs a new strategy.

The dominant mainstream solution to growth problems – a universal prescription to create a healthy investment climate and leave the rest to the market – is inadequate and misplaced. It neglects the capacity of African industry to respond to the challenges of competition, technical change, growing skill needs and shrinking economic distance. There is, unfortunately, no 'quick fix' to develop industry – the process is slow and cumulative, and differs by industry and country. At its heart lie industrial capabilities, the development of which call for more than better macro management, improved governance and a healthy investment climate. The first step in revitalizing African industry is to include detailed supply-side measures.

To create and develop industrial and technological capabilities African countries need to reconsider the strategies they are pursuing today. In particular, they must reconsider the role of government policy in supporting capability building, drawing upon the experience of East Asia (see Lall, 1996, 2001 and UNIDO, 2004). However, their freedom to mount the policies needed is often limited by the international system (multilateral development institutions, global financial institutions, trading partners, aid donors, investors and so on). No industrial strategy can hope to succeed unless it receives this community's approval and support. There are available policy spaces that Africa must fully exploit; however, there is also a strong case for relaxing some of the constraints on policy that the East Asian countries (and indeed the presently developed economies) did not face when building industrial capabilities.

Certainly, Africa will need investment – for additions to physical capacity in the form of factories, equipment and so on – but just building capacity is not the answer to African industrial problems. More important is to build *capabilities* to operate plants at competitive levels, raise quality, introduce new products and diversify into higher value-added activities and to *attract FDI* into such activities. This needs a more precious resource than money – skills, organisation, knowledge, effort and institutions. If the international community focuses on these it would make a more significant contribution to African development than it has in the recent past. Throwing money at the problem will not resolve the fundamental issues of competitiveness – it may make it worse.

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