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Competitiveness, productivity management and job creation in African enterprises: Evidence from Mauritius and Kenya

by

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Foreword

This working paper was prepared under the overall frame work of the Jobs for Africa (JfA) Programme. JfA aims to contribute to employment creation and poverty reduction in Africa through the identification of mutually reenforcing policies and programmes that will promote pro-poor and pro-employment intensive growth and development.

The JfA August 1997 Report emphasized that "Africa has no alternative but to embark on a process of sustained growth if the continent is to avoid continued marginalization. The process of globalization offers good opportunities through increased exports and foreign investments". The Report further stressed that " the process of reform has to be deepened by going beyond structural adjustment stabilization programmes, and by launching investment-led growth strategies that maximizes employment and reduce poverty".

Productive and competitive enterprises are key foundation for economic growth and national wealth creation. This is particularly so in increasingly interconnected economies brought about by globalization. Experiences of newly industrialized economies (NIE) suggest that efficient and effective productivity and competitiveness management at enterprise level was one of the most important influences on their impressive record of export competitiveness, employment generation as well as increasing incomes of workers. Research on these experiences has shown that conscious and well-managed investments of the enterprises in their own productivity and technology (both hard and soft) management systems and practices are essential for them to take good advantage of the improved access to information, markets, capital and technology brought about by globalization. In this respect, it is also important to recognize the critical contribution and influence of the national policy and institutional framework in building the productivity and competitiveness capabilities of enterprises. Indeed, a systemic view of enterprise productivity improvement is essential.

A key important element of an enterprise's productivity and competitiveness management is its investment in building its human and social capital. The economic realities brought about by globalization (liberalized and dynamic markets, constantly changing customer preferences, new structure of production and work, etc.) are leading to a rethinking of the concept of productivity and competitiveness. Whereas traditionally, productivity is viewed mainly as an efficiency concept (amount of outputs in relation to resources used, e.g. labour, capital, materials, energy, etc.), productivity is now viewed increasingly as an efficiency and effectiveness concept, effectiveness being how the enterprise meets the dynamic needs and expectations of customers (buyers of products and services), i.e. how the enterprise creates and offers customer value. Productivity is now seen to depend on the value of the products and services (utility, uniqueness, quality, convenience, availability, etc.) and the efficiency with which they are produced and delivered to the customers.

Productivity improvement and competitiveness must now focus on value creation rather than on minimization of inputs. Higher customer value is created when the products and services meet customer needs for utility, timeliness, esteem, service, etc. This is what customers buy and pay for. With the rapid advance of technology and greater access to information, customer expectations are constantly changing and getting more demanding. For long term productivity and competitiveness therefore, enterprises must constantly innovate (come-up with new and better products and develop better ways of doing things), be flexible and agile, respond rapidly to the increasingly sophisticated customer needs

which are constantly changing, and be able to anticipate and adjust to the very dynamic market conditions. In addition, customers are increasingly concerned with the social and labour conditions where the products and services are produced. Already, they are expressing their preferences for products and services that are produced and distributed in a social and ecologically sustainable process.

To be able to continuously innovate, be flexible and agile, an enterprise must have the competent, skilled, motivated and dedicated people who are working together in an atmosphere of mutual respect, trust and confidence, partnership and collaboration which facilitate cooperation and coordination. Sustained productivity improvement depends on the enterprise's human capital (the skills, knowledge, competencies and attitudes that reside in the employees of the enterprise) and its social capital (trust and confidence, communication, cooperative working dynamics and interaction, partnership, shared values, teamwork, etc. among these individuals as well as among the different parties the enterprise interacts within its supply-chain and value-chain). Thus, it is also increasingly being recognized that human and social capital of the enterprise are the sources of long term competitive advantage of enterprises. New product designs get easily imitated or copied and new technologies are easily accessed or bought. It is the unique human capital and work systems and relationships that are much more difficult to copy.

Social capital enables employees of the enterprise and its extended supply and value chain to act together, create synergies and build teamwork and partnerships. It also sets the context in which human capital can be developed through various learning processes: developing, sharing, transferring and utilizing knowledge. It is the foundation on which a learning organization's learning processes and good knowledge management are built. On the other hand, human capital helps to produce social capital through competencies and attitudes that enable individuals to participate and build the trust and relationships essential to be able to participate effectively as members of various teams work groups, and collaborate with other elements of the enterprise's network. In this connection, workplaces where employees have exercised their rights to organize tend to be better at innovation, adaptation and productivity.

This working paper looked at the experiences of Kenya and Mauritius using the concept of manufacturing capability index. It examined the importance of learning mechanisms that enterprises deliberately put in-place in the acquisition and assimilation of technology. The analysis showed that for enterprises to reap sustained productivity and competitiveness impacts, the human and social capital foundation must be built-up at the various phases of technology acquisition and assimilation. Critically important also is the development of the enterprises' linkages with key partners in its supply chain, sector, cluster and support institutional environment.

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1. Introduction

Nearly two decades ago, several economies in Africa adopted market-oriented policies in a bid to improve their industrial export competitiveness and job creation. At that time, there seemed to be an expectation in domestic policy circles and in the international financial institutions which provided structural adjustment loans and policy advice that market-oriented policies offered a panacea to Africa's industrial problems. Such problems included the limited industrial base, sluggish export growth based on a few primary products and labour-intensive goods, and a lack of employment. To date, however, these expectations remain largely unfulfilled. There is an emerging consensus in macro studies of industrial adjustment that African economies as a group have lagged behind other developing regions in terms of industrial export competitiveness, inward investment and job creation since the 1980s.[1] Their lacklustre performance is often attributed to fluctuating commodity prices, high levels of indebtedness, political instability, inadequate trade liberalization and weak macroeconomic management, poor physical infrastructure and institutional weaknesses. Macro aspects do contribute to Africa's dismal industrial and employment record but, even when these are taken into account, numerous elements remain unexplained.

In contrast to the attention given to macro aspects, micro aspects of industrial adjustment in African economies have been underplayed in the policy literature. In particular, insufficient emphasis has been given to the pivotal role of internal productivity and technological factors in improving competitiveness and job creation in African enterprises (and hence African performance). This may reflect the fact that most African economies do not publish information on productivity and technological factors at industry or firm levels because such data are hard to collect. Yet studies of the Republic of Korea, the Province of Taiwan, China and other newly industrializing economies (NIEs) in Asia suggest that efficient productivity and technological management at firm level was one of the most important influences on their impressive record of export competitiveness and employment generation (see Hobday, 1995; Kim and Nelson, 2000). The literature suggests that this is not a process that can be promoted easily and quickly by investing in new equipment or buying imported technology. It requires a conscious investment by firms in their own productivity and technological management. This aspect of management is defined here in broad terms as the manufacturing capabilities (e.g. skills, knowledge and experience) that enterprises need to operate imported technology efficiently. The research also suggests that government policies (technological support, education and training, SME development, foreign investment promotion, etc.) contributed to firm-level manufacturing capabilities and hence to the export and employment performance of Asian NIEs. The findings further suggest that it would be fruitful to undertake a study of competitiveness, manufacturing capabilities and employment at firm level in African economies.

This paper attempts to shed light on the relationship between competitiveness, manufacturing capabilities and employment in enterprises in Mauritius and Kenya and to suggest lessons for future competitiveness policies in other African economies. These two economies represent contrasting industrialization and employment creation experiences in the African region during the last two decades. Mauritius – a small island economy located off the south-eastern coast of Africa – is an outlier in the African region for its rapid entry into the production of manufactures for export and the creation of significant

[1] See World Bank, 1994a; Hussain and Faruqee, 1994; Mosley et al., 1995; UNIDO, 1999; and Helleiner, 2002.

manufacturing employment. This island economy is described as an economic miracle in paradise and regarded as a candidate for newly industrializing economy status in the twenty-first century (see, for instance, ILO, 1999). Kenya is a relatively large economy in East Africa and one of the continent's earliest industrializers but it has a weaker export growth and employment generation record than Mauritius. Blessed with a reasonable natural resource endowment, cheap labour and close proximity to the European market, Kenya has considerable potential for industrialization. The manufacturing capabilities of enterprises within these two economies are an important driver of the extent to which their industrial promise will be realized.

Little is known, however, about the influence of firm-level manufacturing capabilities on the industrial records of the two economies, the micro-level factors affecting the acquisition of such capabilities and what might be done to improve manufacturing capabilities and, hence, industrial performance. Using recent data from sample surveys of 40 manufacturing enterprises in Mauritius and 41 enterprises in Kenya as well as secondary sources, this paper attempts to address these critical issues. It begins by defining the concept of manufacturing capabilities and discussing how they can be measured through an index of manufacturing capabilities (IMC). Then it discusses the industrial experience of Mauritius and Kenya during the last two decades and looks at the nature of manufacturing capabilities in these economies by constructing IMCs for individual enterprises in Mauritius and Kenya and conducting statistical analysis on the firm-level determinants of IMCs. The paper concludes by comparing the two country case studies of industrial performance and capability building, and considering the policy implications for these and other African economies.

2. What are manufacturing capabilities?

2.1. Definition and characteristics

Although commonly mentioned by the business community and the media, the notion of manufacturing capability is somewhat elusive to development economists. A survey of the literature suggests a widespread belief that the successful accumulation of technology (and manufacturing capacity more generally) in developing countries can be achieved by providing conducive macroeconomic conditions, increasing expenditure on education, securing a smooth inflow of new information from abroad and investing in physical infrastructure. These factors are necessary but not sufficient to ensure continuous progress in domestic industrial technology in the developing world. The limited understanding of the notion of technological change and manufacturing capability can be attributed to the macro-level orientation of much contemporary development research. While valuable insights have been gained from macro-level research, important micro-level issues such as technological change and manufacturing capability are underplayed in the literature.

This point is increasingly being recognized and attention is being given to bridging the micro-macro divide. Studies of productivity have been at the forefront of efforts made by economists to investigate micro-level behaviour. Baily and Solow (2001) state:

> We have been extensively involved, along with a group of other academic advisers, in a series of international comparative performance studies carried out by the McKinsey Global Institute which took a micro-macro approach to productivity measurement and comparisons. These efforts have shown that it is possible – although it can be very difficult – to build up productivity measurements and comparisons from firm-level…In particular, we find that total factor productivity and labour productivity differences have their roots not in anything one would describe as *technology* but in patterns of organization, motivation of managers and the like (Baily and Solow, 2001, pp. 151-172).

A recent strand within the development economics literature has gone even further than the productivity literature into exploring the nature of manufacturing capability at the micro-level. This strand of the literature – termed the manufacturing capability literature in the present study – has begun to stress that industrial enterprises are the principal actors in the accumulation of technological and other manufacturing capabilities which are vital to industrial success. The literature suggests that industrial enterprises have to make conscious investments to put imported technologies into productive use.[2] This is because new technologies have a large tacit element (i.e., person-embodied information which is difficult to articulate in hardware or written instructions) that can only be acquired through experience and deliberate investments in training, information search, engineering activities and even research and development.

As already stated, manufacturing capabilities themselves can be defined here as the skills, knowledge and experience that enterprises need to operate imported technology efficiently. For the purpose of our study of Mauritian and Kenyan enterprises, the concept of productivity and technological management in industrial enterprises can be interpreted in rather broad terms as the process of acquiring manufacturing capabilities at firm level. This has two distinct advantages. One is that there is an emerging body of theoretical

[2] See Katz, 1987; Lall, 1992; Bell and Pavit, 1993; Hobday, 1995; Ernst et al., 1998; Kim and Nelson, 2000; and Metcalfe (forthcoming).

literature based on the micro-economics of technical change in developing countries, which provides a solid dynamic framework to underpin the concept of manufacturing capabilities. Another is that recent empirical developments have made it possible to measure manufacturing capability at firm level and to explore intra-firm determinants using statistical analysis. This permits analysts to link economic theory with empirical evidence and to formulate competitiveness policies to improve manufacturing capability in developing economies.

Several characteristics of the process of building firm-level manufacturing capabilities in developing countries are particularly relevant to this study of Mauritian and Kenyan enterprises:

- *Capability building is an incremental and cumulative process*. Enterprises rarely develop a diverse range of capabilities simultaneously. Nor do they make jumps into completely new areas of technology. Instead, they progress in an incremental manner by building on past investments in technological and other manufacturing capabilities; typically, they move from simple to more complex technological activities.

- *The process of acquiring technological and other manufacturing capabilities is unpredictable*. Investments in manufacturing capabilities, like financial investments, carry considerable risk and the outcome is uncertain. Firms face technical difficulties and financial uncertainties especially in research activities. Moreover, they can rarely insure against failure in capability building. The implications of fundamental uncertainty are clear: the reality cannot be fully modelled and the direction of change never achieves equilibrium.

- *Capability building involves close cooperation between organizations*. Firms rarely acquire capabilities in isolation. When attempting to absorb imported technologies, they interact and exchange technical inputs with other firms (e.g. competitors, suppliers and buyers of output) and support institutions (e.g. technology institutions, training bodies and SME service providers) in a national innovation system. Hence, interaction and interdependence between organizations (i.e. collective learning) in a national innovation system is a fundamental characteristic of capability building.

- *Capability building is affected by a host of national policy and institutional factors*. Firm level learning can be stimulated by the trade, industrial and macroeconomic regime as well as being supported by institutions of different kinds (including those providing industrial finance, training and information, and technological support). Prominent among the factors that have a positive influence on capability building are: macroeconomic stability, outward-oriented trade and investment policies, ample supplies of general and technical manpower, ready access to industrial finance, and comprehensive support from technology institutions.

- *Success in acquiring firm-level manufacturing capabilities can spill over into industrial success.* Differences in the efficiency with which firm-level capabilities are created are themselves a major source of differences in comparative advantage and export competitiveness between countries.

2.2. Evidence from developing countries

The present section reviews some of the detailed enterprise-level studies on manufacturing capability in developing countries. Case studies provide rich insights into the nature of technological change, effective human resource policies and other aspects of acquiring manufacturing capability at the enterprise level in developing countries. They also highlight the link between improving manufacturing capability and export competitiveness in the developing world. For reasons of space, the review is limited to some of the main studies of Asian and African developing countries.

Rapid export growth rates and sustained industrial upgrading following the adoption of export-oriented trade policies in the Republic of Korea in the early 1960s have attracted considerable academic interest. The country's manufactured exports were over US$ 125 billion by 1998 (up from US$ 91 million in 1965). The bulk of its manufactured exports consist of high-skill items such as machinery, electronics, motor vehicles and ships rather than low-skill items such as textiles and garments. Several studies have emphasized abundant technological capabilities as a crucial factor behind Korea's export success (Amsden, 1989; Yun, 1994; Kim and Nelson, 2000; Metcalfe, forthcoming). They argue that the creation of new technological capabilities to absorb and develop imported technology is a major reason why the Korean manufacturing sector has managed to move into the complex end of the technological scale and has responded well to the improved incentive structure. They also suggest that the creation of technological capabilities, while strongly influenced by competitive pressures generated by the incentive structure, also required public action to provide supportive technology institutions and ample supplies of skilled and technical manpower.

Some studies argue that the Republic of Korea has systematically increased its spending on education since 1945 to create a solid human capital endowment for its industrial take-off (Ernst et al. 1998; Kim and Nelson, 2000). As early as the mid-1960s, it had almost achieved universal primary enrolment and over two-thirds of the age group were enrolled in secondary education. Between 1965 and 1990, the country made great strides in secondary and tertiary enrolments. Today, the Republic of Korea is on the threshold of universal secondary enrolment and about a third of the relevant age group are enrolled in tertiary education. A high proportion of tertiary enrolment consists of engineers and technicians, the skill base most relevant for high-skill exports.

A remarkable feature of the Korean experience is the presence of a "crowding-in effect" whereby greater public expenditure in education and training seemed to attract private expenditure of similar magnitude. A study of small and medium light engineering firms, for example, estimates that the average share of engineers in total employment, 8.6 per cent in 1993, was nearly four times that of other developing countries (Yun, 1994). It also estimated that the same firms sent an average of 29 per cent of their employees on training courses in the same year. These findings are not exceptional by Korean standards: a study of large Korean heavy engineering firms estimated that the sample sent an average of 42 per cent of their employees on external training courses in 1984 (Amsden, 1989). The study went on to point out that the curriculum is of greater interest than the quantity of training. The aim is to instil in all workers a general knowledge of the firm's operations and operating principles, supplemented by in-depth specialized skills. Both studies suggest that the "crowding-in effect" was engineered through policy measures, including tax breaks for training, subsidized overseas travel for training, low-interest credit for training and the creation of specialized training institutions.

Other studies have examined the lacklustre export performance of South Asian and African countries that have adopted export-oriented trade policies in an effort to emulate the success of the Republic of Korea. A recent study shows that Sri Lanka, for example, was able to export manufactured goods, notably garments and jewellery, after the shift to an export-oriented trade policy in 1977 (Wignaraja, 1998). About 80 per cent of the country's US$ 3.5 billion worth of manufactured exports in 1998 consisted of garments and jewellery. Unlike the Republic of Korea, however, there has been little upgrading and diversification from this simple base. The study attributes Sri Lanka's successful entry into low skill exports to an improved environment for foreign investment combined with a ready supply of secondary educated labour (75 per cent of the relevant age group are enrolled in secondary education) and the establishment of a garment training institute. At the same time, it argues that the lack of technological capabilities prevented the Sri Lankan manufacturing sector from upgrading. It attributes the country's technological weaknesses to the lack of high-level technical manpower and in-firm training required to facilitate shifts in comparative advantage. The Sri Lankan survey of light engineering firms by Wignaraja (1998) showed that the average share of engineers (1.6 per cent in 1988) was well below Korean levels. It also estimated that these firms only sent an average 2 per cent of their employees on external training courses. The Sri Lankan experience highlights the importance of secondary education, tertiary technical education and enterprise training for sustained export growth and diversification.

African developing countries have recorded even weaker manufactured export performance than Sri Lanka following the adoption of export-oriented trade policies. A recent study showed that Ghana's manufactured exports only increased from US$ 3.5 million to $14.7 million between 1986 and 1991 (Lall et al., 1994). Ghana's leading performers, wood and aluminium products, are natural-resource items with a long presence in international markets. Unlike Sri Lanka, the country has been unable to enter the production of simple low skill manufactured exports like garments. In their firm-level survey, the authors found that (i) Ghana's technological capabilities are very low by world standards; and (ii) weaknesses in important operating capabilities (such as quality control, equipment maintenance, inventory control and productivity improvement) lie behind the manufacturing sector's lack of international competitiveness. The firm-level survey also revealed very low levels of technical manpower and enterprise training – the employment of engineers in Ghanaian engineering firms is under 1 per cent of total employment and the proportion of employees sent on external training was only 0.3 per cent.

In a study of Kenya, it was found that the country's manufactured exports reached US$ 179 million in 1993 after a decade of export-oriented policies (Teitel, 1993). The bulk of these exports consisted of processed primary products rather than garments. The Kenyan study reported very low levels of technological capabilities, technical manpower and training in its survey of Kenyan firms. Several firms claimed that they provided on-the-job training for workers, but most were vague on the exact nature and duration of such training. Another study of Kenyan enterprises shed more light on the content of in-firm training (Wignaraja and Ikiara, 1999). It found that the bulk of employee training in firms still occurs through the traditional apprenticeship scheme – it covered 16.9 per cent of garment employees in the sample and 16.9 per cent of engineering employees. In contrast, expenditure on formal training (0.13 per cent of sales in both industries) was very low in Kenyan firms compared to those in newly industrializing economies, which spend 1-2 per cent of their sales revenue on training. This study also pointed to intra-firm differences by ownership through a comparison of African and non-African owned firms. It was found that African-owned firms had entrepreneurs with less formal education than non-African firms, and that they devoted fewer resources to formal training than non-African firms.

A study on Tanzania revealed many similarities with Ghana and Kenya (Deraniyagala and Semboja, 1999). The study pointed to weak technological capabilities as well as low levels of secondary education and enterprise training as the major factors behind the poor

supply response of industry to export-oriented policies. Tanzania's secondary enrolment ratio (about 6 per cent of the relevant age group) is among the lowest in the developing world. In addition, training efforts in the garment industry were extremely limited, with no improvement after liberalization. None of the garment firms provided any external training to their workforce. Only one garment firm had a production manager with formal qualifications in clothing technology.

Research on Zimbabwe suggests that the country may be an exception to the general African experience (Latsch and Robinson, 1999). With liberalization, Zimbabwe's manufactured exports grew to reach US$ 678 million in 1998, with useful performances in garments and engineering products. The study found relatively good technological capabilities by African standards, high levels of secondary education of the labour force (46 per cent of the relevant age group are enrolled in secondary education) and reasonable emphasis on enterprise training (3.9 per cent of employees in engineering firms were sent on external training in 1994). Nevertheless, the study also reported that the bulk of human capital and skill formation was concentrated in the larger, non-African enterprises and that little such effort was taking place in African SMEs.

A similar finding was reported by a study on skill levels in black businesses in South Africa (Riley, 1993). The study noted that the owners of micro-enterprises tended to be young (over one-third were less than 35 years old) and had little formal education (30-40 per cent lacked basic literacy skills). Few had work experience in the formal sector and thus had virtually no supervisory or managerial experience. There was also little formal employee training taking place in their enterprises.

In sum, the strong export competitiveness of the Korean economy since the adoption of export-oriented policies can be attributed in part to investments in technological and other manufacturing capabilities, good human resource policies and emphasis on firm-level training. In contrast, the relatively weak export competitiveness in South Asian and African countries can be attributed to technological shortcomings and inadequate policies to develop human resources at the national and enterprise levels.

3. Measuring manufacturing capabilities

3.1. A taxonomy of manufacturing capabilities

As discussed above, much of the empirical literature on manufacturing capabilities in developing countries has been based on case studies of enterprises in particular industries.[3] These detailed analyses have shed valuable light on the nature of technological and other manufacturing activities in developing countries, the utility of different learning mechanisms and factors affecting firm-level capability building. A significant contribution by the case study research is to suggest ways of classifying the technical functions performed by manufacturing enterprises in the assimilation of imported technology.

One of the most elaborate taxonomies of enterprise capabilities has been put forward by Lall et al. (1994), who breaks them down into investment, production and linkages.

Investment is represented by project execution activities including feasibility studies, equipment search, assessment of equipment, employee training during start-up and involvement of the firm in detailed engineering.

Production is sub-divided into process technology and product technology. Process technology includes quality control, maintenance, plant layout, inventory control, and various improvements in equipment and processes. Product technology covers copying imports, improving existing products, introducing new products and licensing product technology.

Linkages are considered under supplier firm linkages, subcontracting linkages and linkages with institutions that provide trouble-shooting, testing, training and product design assistance.

The advantage of Lall's framework over other approaches is that it provides a clear continuum of technical functions from the time when new technology enters a given firm to the time when it exits to other firms and institutions. Furthermore, as this framework has been used successfully in past empirical work on manufacturing capabilities in developing countries, it will also be used here to examine the development of firm-level manufacturing capabilities in Mauritius and Kenya.[4]

3.2. The manufacturing capability index (MCI)

One major challenge facing researchers working on technological capabilities is to summarize inter-firm differences in capability. It is convenient to develop a simple summary measure to permit statistical analysis of the various influences on capability

[3] For additional literature, see Katz (1987) for a survey of early studies in Latin America and Bell and Pavitt (1993) for studies on other developing countries. Recent examples include: Hobday (1995) on the electronics industry in East Asia.

[4] See, for instance, Lall et al. (1994) on Ghana; Biggs et al. (1995) on Kenya, Zimbabwe and Ghana; Pietrobelli (1997) on Chile, and Wignaraja (1998) on Sri Lanka.

acquisition. Recently, some studies have begun to rank the technological capabilities of individual firms and attempt a statistical analysis of their determinants.[5] The ranking integrates objective and subjective information into measures of enterprise capacity to set up, operate and transfer technology. To create an enterprise score, the information in these indicators is converted into a summary measure of capabilities. The typical approach adopted by this literature is to highlight the various technical functions performed by enterprises in managing imported technology and to award a given firm a score for each technical activity, indicating its level of technical competence. An overall capability score is obtained for a given firm by averaging the scores for the different technical functions.

The manufacturing capability index (MCI) used for this study of Mauritian and Kenyan enterprises draws on earlier work by Wignaraja (1998) for Sri Lankan enterprises. It is based on the three-fold classification of firm-level capabilities into investment, production and linkage activities as described above. Information on the technical functions performed within a given industrial enterprise is used to compute an MCI (essentially score) for each of the 81 firms in the Mauritian and Kenyan samples. The basic MCI scoring systems for both the Mauritian and Kenyan firms are given in table 1. The production and linkage functions performed by industrial enterprises lie at the heart of the MCI scoring system.

The larger category, production, is represented by ten separate technical activities, which range from common process engineering tasks (e.g. measuring of internal reject rates and ISO 9000 quality management status) to product engineering tasks (e.g. copying existing products, improving existing products and introducing new products). Productivity improvement, a key industrial engineering activity, is also included under this heading.

The other category in the MCI scoring system, linkages, is represented by two technical activities. It highlights technology transfer via relationships with sub-contractors and with overseas buyers of output.

Each of the 12 technical activities can be graded at different levels (0, 1 and 2) to represent different levels of competence within that function. Thus, a given firm is ranked out of a total capability score of 24 and the result is normalized to give a value between 0 and 1.

Although both are based on a common core of production and linkage functions, the MCI scoring systems used for the Mauritian and Kenyan sample enterprises are slightly different. The Kenyan MCI is somewhat more elaborate than the Mauritian one and also covers a few investment activities (e.g. whether a feasibility study was conducted for setting up the plant, whether an extensive search was conducted for the plant and machinery and whether in-house technical staff participated in the detailed engineering of the plant). This difference – which reflects the greater availability of data on investment activities at firm-level in the Kenyan case – is not likely to be particularly significant in the context of this comparative study of manufacturing capability in the two African economies. The study by Wignaraja (1998) on Sri Lankan enterprises found a very close correlation between an MCI based on investment, production and linkages and an index based on production and linkages only. This suggests that an enterprise with a high level of manufacturing capability would be given a relatively high score using both a simple scoring system and a more elaborate one, and the same would apply to an enterprise with a low level of manufacturing capability. What a high level of manufacturing capability

[5] The pioneering work on this subject is Westphal et al. (1990) on Thailand. Subsequent work includes Gosen (1995) on Mexico, Deraniyagala (1995) and Wignaraja (1998) on Sri Lanka, Romijn (1999) on Pakistan.

means can be illustrated by a case study of an emerging exporting enterprise in Kenya (see box 1). It also suggests that it is possible to derive interesting insights into firm-level technological behaviour across countries when slightly different MCIs based on a common framework are employed in the analysis. Although more data do provide additional information on the pattern of firm-level investments in different manufacturing capabilities, less information is not a significant hindrance in this regard. Obviously, there is a critical minimum level of data – particularly on production activities – which is needed to facilitate firm-level analysis on manufacturing capabilities.

Box 1: A capable manufacturing enterprise in Kenya

The case of Bedi Investments Ltd. is unique in Kenya: a large local firm adopting the ISO 9000 quality management standards and moving into exports. Bedi was established in 1975 by a Kenyan entrepreneur of Indian origin as a small family-run garment firm, producing for the local market. Over the years, it integrated backward into making fabrics and yarns and emerged as one of the most modern integrated textile-garment plants in the country. The firm is presently managed by the founder's three sons, all graduates in engineering or business from the UK. It has a good base of technical manpower by local standards (two per cent of employees are engineers and technicians) and spent one per cent of sales on training in 1994. The firm moved into exports and was wholly export-oriented by 1994 with an export value of US$4.0 million.

Bedi's adoption of ISO 9000 in the early 1990s was stimulated by a long-term stable marketing arrangement with a foreign buyer who provided Bedi with information about the ISO programme and helped with implementation. Initially, the buyer arranged for an audit by a qualified consultant from abroad and subsidized its cost. It then helped Bedi implement the post-audit changes in the process, including the purchase of new equipment, metrological tests, training of workers and quality personnel, and a detailed monitoring system. Finally, it helped Bedi with the process of verification and certification by an independent accredited agency. In 1994, Bedi had a 26-strong quality control department (7.3 per cent of employment) and its internal reject rate was under one per cent. The implementation of the ISO 9000 system doubled Bedi's labour productivity growth to six per cent per year (between 1984–89 and 1989–94) and enabled it to attract two more foreign buyers.

Bedi's manufacturing capabilities have improved significantly. It has a good capacity to search and negotiate terms for imported technology; one of the best production capabilities in the Kenyan garment industry (a strong emphasis on quality control and low reject rates, well-maintained equipment and negligible equipment breakdown rates, and frequent changes in plant layout); and good technological linkages with foreign buyers and equipment suppliers. However, it lacks independent design capabilities and relies heavily on foreign buyers for product designs. This is a common characteristic of firms in the early stages of export development. The improvement in manufacturing capability is due to a strong base of human capital, investments in training, long experience in production and technology transfer from buyers. The case of Bedi contains useful lessons for enterprises in other African countries which are considering moving into export production.

Source: Author's fieldwork in Kenya in 1995-96

Table 1: Manufacturing capability scoring scales

Production capabilities:						Linkage capabilities:	
Process engineering:		Product engineering:		Industrial engineering:			
INTERNAL DEFECT RATES:		COPYING:		PROD.VITY IMPROVEMENT		SUBCONTRACTING LINKAGES:	
No measurement	0	none	0	none	0	none	0
high (>2%)	1	ad-hoc	1	some	1	ad-hoc technology transfer	1
low (<2%)	2	systematic	2	systematic	2	systematic technology transfer	2
ISO 9000 STATUS		IMPROVING EXISTING PRODUCTS:				SYSTEMATIC RECEIPT OF TECHNOLOGY	
no accreditation	0	none	0			FROM BUYERS	
ISO 9000 in-progress	1	some	1			none	0
ISO 9000 obtained	2	considerable	2			ad-hoc technology transfer	1
MAINTENANCE AWARENESS:		INTRODUCING NEW PRODUCTS IN-HOUSE				systematic technology transfer	2
None	0	none	0				
only repair when breakdown	1	some	1				
preventive system	2	considerable	2				
CALIBRATION of EQUIPMENT (b):							
None	0						
Little	1						
Frequently	2						
SUBSTITUTION OF LOCAL R.M.:							
None	0						
Little	1						
A lot	2						
BUY NEW EQUIPMENT:							
None	0						
Little	1						
A lot	2						

4. Mauritius

4.1. Policies, industrialization and employment

The prevailing orthodoxy of inward-oriented, state-dominated development strategies of the 1960s and 1970s emphasized stringent import substitution coupled with heavy state intervention in the economy. Mauritius did not subscribe to this approach. Instead, starting in 1970, the country followed a mixed trade policy of import substitution coupled with incentives for exports (e.g. duty-free access to raw materials for exports; low corporation tax rates; free repatriation of capital, profits and dividends; and permanent residence permits) through the export processing zone (EPZ). These two trade regimes co-existed, influencing enterprises producing for the small home market and those producing for export. Furthermore, Mauritius began trade liberalization in 1983 as part of its 1981 structural adjustment loan agreement with the World Bank.

One of the distinctive features of trade liberalization in Mauritius has been its gradual approach to reducing import protection and reforming other aspects of its industrial regime over the last 17 years. This was divided into three distinct periods, each with a different rate of reform and coverage.[6] The first two years (1983-1985) saw the rapid elimination of most quantitative restrictions on imports and their replacement by tariffs. The next decade (1983-1993) saw a gradual reduction in the effective protection of industry and more vigorous export promotion through preferential interest rates on development loans, tax concessions and the establishment of the Mauritius Export Development and Investment Authority to provide overseas marketing support. The third period (1994 to date) cut protection further by reducing import tariffs and the government began to develop skill-intensive exports by setting up new institutions such as the Mauritius Productivity and Competitiveness Council, created in 2000, and a separate Board of Investment established in 2001 to attract high-skill foreign investment.

By the mid-1990s, Mauritius had become considerably more open and market-friendly than in the past and is now one of the most liberal regimes in Africa. By the mid-1990s, substantial progress had been made in reducing tariffs and non-tariff barriers to imports. One indication of greater openness is the fact that the average tariff for manufacturing fell from 86.2 per cent in 1980 to 30.1 per cent in 1994.[7] The main changes are as follows: quantitative restrictions have mostly been eliminated and the few that remain are largely on health, sanitary and security grounds; there are few import prohibitions (with the exception of commodities such as second-hand motor vehicle spares and explosives); the level and distribution of nominal tariffs has fallen (the number of rate bands was cut from 60 to 8 and the maximum rates were reduced); there are no local content programmes to assist local suppliers; and public procurement policies are minimal.

To what extent did the adoption of market-oriented policies improve the industrial competitiveness of the Mauritian economy and generate industrial employment? Table 2 provides selected indicators of industrial competitiveness (MVA per capita, manufactured export growth and manufactured exports per head) and employment (numbers employed in manufacturing and manufacturing employment as a % of total employment) from 1980 to 1998. This information was computed from the online databases of UNIDO and ILO and the World Bank publication *World Development Indicators 2000*.

[6] See Woldekian, 1994; Milner and McKay, 1996; Lall and Wignaraja, 1998.

[7] WTO, 1996.

Table 2: Indicators of industrial competitiveness and employment in Mauritius, 1980-1998	
1. Manufacturing value added (MVA) per capita (US$)	
1980	210
1998	706
2. Manufactured export growth (% per year, current US$), 1980-1998	14.8
3. Manufactured exports per head, (US$), 1998	1,094
4. Manufacturing employment (numbers)	
1985	74,575
1999	99,421
5. Manufacturing employment as % of total employment	
1985	36.6
1999	33.4
Sources: Calculated from www.unido.org; www.laborsta.ilo.org; World Bank, *World Development Indicators 2000*.	

The data suggest that Mauritius is an outlier in Sub-Saharan Africa for its impressive industrial performance. During the last two decades or so, the economy has undergone a remarkable transformation from mono-crop sugar production, and the country has become one of the leading exporters of manufactures in Sub-Saharan Africa. Manufacturing value-added per head in Mauritius nearly quadrupled between 1980 and 1998 (from US$ 210 to US$ 706). This compares favourably with average MVA per capita for the whole of Sub-Saharan Africa, which increased modestly from US$ 76 to US$ 80 during the same period. The engine of industrial growth was manufactured exports, which grew at 14.8 per cent per year during 1980-1998. By 1998, the country's value of manufactured exports per head (US$ 1,094) was the highest in Sub-Saharan Africa. Much of this impressive performance can be attributed to a single export category – textiles and garments accounted for over 80 per cent of total manufactured exports in the late 1990s.

Another distinctive feature of the Mauritian experience is that sustained industrial competitiveness generated significant new employment opportunities. Nearly 75,000 manufacturing jobs had been created by the mid-1980s and this figure rose to nearly 100,000 within 15 years. As with manufactured exports, textiles and garments accounted for the majority of growth in manufacturing employment in the 1980s and 1990s – 50,440 jobs in 1985 and 67, 377 jobs in 1999. The share of manufacturing employment in total employment reached 36.6 per cent in 1985 and remained well above 30 per cent throughout the late 1980s and 1990s. In 1999, the proportion was 33.4 per cent.

4.2. Manufacturing capabilities of Mauritian industry

The impressive industrial competitiveness and employment record of Mauritius at macro-level since the 1980s raises two interesting questions about the nature of manufacturing capabilities at enterprise level: (a) to what extent did manufacturing enterprises of different kinds acquire the requisite capabilities to enter export markets? and (b) what micro-level factors influenced the pattern of firm-level capability acquisition? In spite of the country's reputation as one of the leading exporters of manufactures in Sub-Saharan Africa, surprisingly little is known about these critical aspects of the industrial transformation in Mauritius.

In an attempt to fill this gap, the present section explores these questions using data from an enterprise survey of 40 garment firms, which was undertaken by the author in the late 1990s. The focus on garments reflects the fact that this industry is the leading sector in terms of manufactured exports and manufacturing employment. There was a high propensity to export among the sample enterprises, suggesting that many of them were internationally competitive. Of the 40 enterprises, 27 were exporting some proportion of their sales at the time of the survey (10 enterprises were 100 per cent export-oriented). There was also a fairly even distribution between different sizes of firm – there are 19 SMEs (<100 employees) and 21 large firms (>100 employees). Thus, the sample contained a mix of some of the country's leading internationally competitive and employment-generating enterprises and some smaller, less dynamic exporters and employment generators.

Table 3 shows the frequency distribution of the overall manufacturing capability indices (MCI) for 40 garment firms in the Mauritian sample. The data suggest a wide variation in MCI scores between garment firms. Only one firm has a score above 0.81, another six have scores above 0.61 and the remainder have scores well below those of the best firms. This seems to suggest that some Mauritian garment firms have quite good manufacturing capabilities, which are probably on a par with international best practice in the garment industry, but there is also a long tail of underperformance in the sample. This manufacturing capability gap is linked to firm size.

Table 3: Frequency distribution of manufacturing capability indicies (MCI) for all garment firms in Mauritius

MCI class	No. of firms	% of total firms
0.0-0.20	14	35.0
0.21-0.40	10	25.0
0.41-0.60	9	22.5
0.61-0.80	6	15.0
0.81-1.00	1	2.5
Total	40	100

Table 4 shows the overall MCI scores for the 21 large garment firms (>100 employees) and the 19 SMEs (<100 employees) in the Mauritian sample. It also shows scores, by firm size, for the main sub-categories of the MCI (namely individual scores for process engineering, product engineering and linkages).[8] The overall MCI scores suggest that there is a striking difference in the level of manufacturing capability development between large garment firms and SMEs in Mauritius. Large firms record an average MCI score (0.51), which is three times higher than that for SMEs (0.17).

[8] Table 1 indicates that there are five categories of technical function under process engineering and a score for this is obtained by ranking firms out of 12. Similarly, a score for product engineering can be computed by ranking firms out of 6 and one for linkages by ranking out of 4. Size class scores are obtained by averaging the requisite enterprise scores.

Table 4: Average MCI scores for large firms and SMEs in Mauritius				
Size category (a)	MCI score	Process engineering score	Product engineering score	Linkages score
21 large firms	0.51	0.53	0.37	0.40
19 SMEs	0.17	0.20	0.23	0.04
(a) SMEs have <100 employees, large firms have >100 employees.				

Much of the manufacturing capability gap between size classes is due to differences in process engineering capabilities. Large firms have an average *process engineering score* (0.53), which is more than double that for SMEs (0.20). In part, this reflects the fact that large firms have much better quality management capabilities than SMEs. For instance, the available evidence from our sample shows that large firms typically record lower average internal reject rates for their main product (2.6 per cent) than SMEs (3.9 per cent). In addition, more large firms than SMEs had moved into comprehensive quality management by adopting ISO 9000 quality management standards to enhance their export competitiveness – four large firms had been certified to ISO 9000 standards and another four were in the certification process but none of the SMEs had received certification and only two small enterprises were in the certification process. Most SMEs rely on ad hoc checks on finished goods rather than a comprehensive quality management system.

Moreover, large firms seemed to have better maintenance capabilities than SMEs. Nearly all the large firms had a regular routine for maintaining and serving equipment, a maintenance shop and specialized maintenance staff. Some large firms also brought in foreign maintenance staff when required (e.g. for major repair work on computer-aided design systems). With some exceptions, SMEs did not seem to conduct routine maintenance of their equipment and tended to undertake repairs only when equipment broke down. In this type of emergency situation they resorted to contract specialists.

In the case of *product engineering scores*, a somewhat smaller gap between large firms (0.37) and SMEs (0.23) is indicated by the data. This is slightly deceptive as our firm-level interviews indicated considerable variation in the emphasis placed on product technology in the sample firms. At one end are large firms that typically receive new products and designs from foreign buyers and which make periodic visits to international trade fairs. On the whole, therefore, large firms are making garments in line with international trends and market demand. A core of large enterprises have also tried to create independent design capabilities by hiring trained designers, investing in computer-aided design (CAD) systems and formulating strategies for interaction with a range of foreign buyers. At the opposite end are SMEs which tend to copy imports or rely on local sources of information for product information and designs. A high proportion of products from SMEs cater to consumer tastes in the local/regional markets and are not in line with international trends. Relatively few SMEs were engaged in long-term marketing relationships with foreign buyers of output or had made the effort to develop independent design capabilities.

Finally, large firms (0.40) have better *linkage scores* than SMEs (0.04). There are limited contract-based intra-firm technological transfers in Mauritius either through subcontracting relationships or buyer-seller relationships with foreign buyers of output. To the extent that these occur, large firms (and, to a lesser extent, medium firms) are involved in exchanges of information, skills and technology. The lack of linkages involving small firms seems to be related to weaknesses in their price, quality and delivery performance.

4.3. Factors affecting the MCI

Building on the previous discussion of the pattern of manufacturing capability building at firms in Mauritius, it is possible to explore the influence of micro-level factors affecting this process by using econometric analysis. The present econometric investigation simultaneously tests for the influence of several factors on the manufacturing capability index (MCI)[9]. It focuses particularly on firm size, ownership, age in production, engineering and technical manpower, and employee training.

The full linear econometric model is:

$$MCI = b_0 + b_1 SIZE + b_2 FE + b_3 AGE + b_4 ET + b_5 TB \qquad (1)$$

The independent variables are as follows:

SIZE: total employment. This is expected to be positively correlated with MCI. The returns from capability acquisition are higher where a firm has a larger volume of sales to spread the fixed costs of capability acquisitions and larger firms can have more specialized manpower. Moreover, capital market imperfections confer an advantage on large firms in securing finance for technological activities, and size is correlated with the availability and stability of funds.

FE: the share of foreign equity. This is expected to have a positive relationship with MCI. There are two possible reasons for this. Foreign affiliates are better placed to acquire manufacturing capabilities because of their ready access to the "ownership advantages" (e.g. technologies, skills and marketing know-how) of their parent corporations. Moreover, foreign affiliates may have an extended learning experience if they have been in production for several decades; they may have accumulated manufacturing capabilities that are lacking in new local firms.

AGE: age in production. This is expected to have a positive sign because years of accumulated production experience can capture "learning by doing" amongst other things.

ET: the share of engineers and technicians in employment. We can expect this to have a positive relationship with MCI. Engineers and technicians can exert a significant influence on the process of building manufacturing capabilities even in simple industries like garments through new quality management methods, equipment maintenance and upgrading, productivity improvement, training and minor adaptations to process technologies (e.g. energy-saving measures).

TB: expenditure on employee training as a percentage of sales. This is expected to have a positive sign. During enterprise start-up it is essential to train the workforce to use new production technologies. As technologies evolve, a continuous process of training and re-training is needed to supply the technical and managerial skills needed by process and product innovations.

Using all these variables, we ran an econometric investigation which yielded the results below.

[9] For a fuller account of the econometric analysis of manufacturing capabilities in Mauritian enterprises and a related investigation of export performance see Wignaraja, 2002.

MCI = 0.178 + 0.00017 SIZE + 0.00051 FE + 0.001 AGE + 0.058 ET + 0.236 TB (2)

(2.99)* (3.50)*** (0.7) (0.3) (2.6)** (2.9)***

Adjusted $R^2 = 0.49$

* denotes statistical significance at the 10 per cent level, ** at 5 per cent level and *** at 1 per cent level.

The adjusted R^2 (0.49) in equation (2) is reasonable for a cross-section study based on a small sample. Of the five explanatory variables, three are significant (two at the 1 per cent level and one at the 5 per cent level) and have the expected sign. Firm size, engineering and technical manpower, and employee training have a positive and significant relationship with MCI. The positive sign on the firm size variable suggests that both explanations for the firm size effect are valid. The positive sign on the engineering and technical manpower variable indicates that technical manpower plays a fundamental role in the acquisition of firm-level capabilities. The positive sign on the employee-training variable suggests that formal in-house training programmes and on-the job training are important for both the acquisition of initial capabilities and for upgrading them as new technologies emerge.

Let us consider the other variables, which are not statistically significant. The lack of significance on foreign ownership might reflect the fact that there are too few majority foreign owned firms in the Mauritian sample for this effect to show up. The fact that age in production has no significance could imply that years in production are not a good proxy for learning by doing.

5. Kenya

5.1. Policies, industrialization and employment in Kenya

In the mid-1960s, Kenya launched an industrialization strategy of import substitution, with high levels of protection for manufacturing and a large role for the public sector in industry. Import substitution, however, did not result in significant industrialization of the Kenyan economy. After an initial spurt, manufacturing growth began to slow down, from 11.6 per cent per year in 1970-75 to 4.9 per cent in 1975-80; manufacturing value added per capita remained quite low and only reached US$ 32 in 1980; and the share of manufactured products in total exports stagnated at 16.0 per cent between 1975 and 1980. Most studies blamed this slowdown on the inward-oriented trade strategy, which was considered responsible for distorted resource allocation, constricted foreign competition and restricted technology inflows from abroad.[10] By the late 1970s, there was increasing recognition of the need for a change in strategy. Between 1980 and 1984 Kenya introduced import liberalization measures as part of a World Bank structural adjustment programme (SAP).[11] The new policies emphasized exports and the private sector, and sought to stimulate industrial competitiveness.

Prior to the SAPs, Kenya had a very restricted import regime, with high tariffs supplemented by a cumbersome and discretionary import licensing mechanism. Effective protection was high, leading to a strong anti-export bias. Import liberalization started in a modest way in mid-1980, when import bans were replaced by tariffs, and two broad categories of import were created to improve the classification system: Schedule I for unrestricted licensing items and Schedule II for quota-restricted ones.[12] There was a rise in the export-compensation rate from 10 to 20 per cent for a selected number of exports, and a simplification of export compensation procedures. However, due to the failure to devalue the shilling and reduce the budget deficit, the import liberalization process could not be sustained. By the end of 1982, some import restrictions were reinstated (World Bank, 1993, p. 37). A second episode of import liberalization took place in mid-1987, when more items were transferred from restricted to unrestricted schedules and tariffs were reduced. In addition, exporters were provided with duty-free access to imported inputs and export marketing support.

In both episodes, the implementation of liberalization was slow, halting and reluctant, leading donors to suspend aid to Kenya in late 1991. The Kenyan authorities accelerated the pace of reform and, in the third phase, 1992-to-date, made progress in trade and other economic reforms. All price and exchange rate controls were removed, import tariffs were slashed, domestic trade liberalized, privatization begun, parastatal enterprises restructured and the civil service trimmed. At the same time, political reforms were launched. Donors responded by restoring aid in 1993-94.[13] Thus, the third episode seemed to mark a break from the past as far as import liberalization was concerned. To judge by the available measures of the process of import liberalization, it seems that the Kenyan economy had become more open than in the past. Quantitative restrictions declined significantly between

[10] World Bank, 1987; Sharpley and Lewis, 1990.

[11] World Bank, 1994a.

[12] An account of the process of import liberalization in Kenya can be found in Swamy, 1994.

[13] At the Paris Club meetings in 1993 and 1994, donors pledged US$ 390 million to Kenya.

the mid-1980s and the mid-1990s, with the coverage of items falling from 71 per cent to 0.8 per cent and restricted imports as a share of domestic production declining from 79 per cent to 10 per cent.

Moreover, the unweighted average tariff on imports fell from 39.9 per cent to 20.9 per cent between 1987-88 and 1995-1996. In spite of these recent improvements, however, the liberalization process as a whole seemed to lack transparency and credibility. Thus, for most of the 1980s and 1990s, the incentive regime typically failed to provide the private sector with appropriate price signals to restructure and acquire new manufacturing capabilities.

How much did the change in the Kenyan trade and industrial regime contribute towards improving its industrial competitiveness record and creating industrial employment? Table 5 provides some measures of industrial competitiveness (MVA per capita, manufactured export growth and manufactured exports per head), and employment (numbers employed in manufacturing and manufacturing employment as a percentage of total employment) in Kenya since 1980. These data were calculated from the online databases of UNIDO and ILO and the World Bank publication *World Development Indicators 2000*.

Table 5: Indicators of industrial competitiveness and employment in Kenya, 1980-1998

1. Manufacturing value added (MVA) per capita (US$)	
1980	32
1998	36
2. Manufactured export growth (% per year, current US$), 1980-1998	6
3. Manufactured exports per head, (US$), 1998	16
4. Manufacturing employment (numbers)	
1985	162,751
1999	216,889
5. Manufacturing employment as a % of total employment	
1985	13.8
1999	13.2
Sources: Calculated from www.unido.org; www.laborsta.ilo.org; World Bank, World Development Indicators 2000.	

In contrast to Mauritius, the Kenyan economy has not undergone a significant structural change during the last 20 years and is not regarded as one of the major exporters of manufactures in Sub-Saharan Africa today. The potential of its industrial sector to compete on international markets and to generate industrial jobs seems to have been largely unfulfilled. Manufacturing value added per head in Kenya increased modestly from US$ 32 to US$ 36 between 1980 and 1998. Kenya's MVA per capita figure in 1998 is less than half the average for the whole of Sub-Saharan Africa (US$ 80). Manufactured exports were relatively sluggish and only grew at 6 per cent per year between 1980 and 1998, and the value of manufactured exports per head was relatively low by Sub-Saharan African standards (US$ 16 by 1998). The two industries (textiles/garments and engineering products) examined in the enterprise-level analysis of manufacturing capabilities in section 5.2 made up about a quarter of Kenya's value of manufactured exports (with textiles/garments accounting for about 14 per cent and engineering products for about 12 per cent).

The trends in industrial competitiveness performance were somewhat mirrored in Kenya's industrial employment record. The numbers employed in the manufacturing sector

increased from 162,751 to 216,889 between 1985 and 1999, which is a creditable achievement. However, the share of manufacturing employment in total employment remained relatively small (under 14 per cent) and fell slightly (from 13.8 per cent to 13.2 per cent between 1985 and 1999).

5.2. The manufacturing capabilities of Kenyan industry

5.2.1. Overall capabilities

The disappointing industrial competitiveness and employment record of Kenya at macro-level since the 1980s raises two important questions about the nature of manufacturing capabilities at enterprise-level: (a) to what extent did manufacturing enterprises of different kinds acquire the requisite capabilities to enter export markets? and (b) what micro-level factors influenced the pattern of firm-level capability acquisition? In the section below we attempt to explore these questions using data from an enterprise survey of 41 garment and engineering enterprises, which was undertaken by the author in the mid-1990s. The sample was evenly distributed between the two sectors, with 20 garment firms and 21 engineering firms. There was a relatively low propensity to export among the sample enterprises suggesting that most of them were not internationally competitive. Of the 41 enterprises, only 13 were exporting some proportion of their sales (one enterprise was 100 per cent export-oriented and three others were exporting >50 per cent of their sales). The garment firms were typically more export-oriented than the engineering ones – the average export-to-sales ratio for the garment firms was 24.1 per cent compared with 6.6 per cent for engineering.

Table 6 shows the frequency distribution of the overall manufacturing capability indices (MCI) for the Kenyan sample. There is a wide variation in MCI scores in both industries. There are no garment or engineering firms with scores in the range of 0.80 to 1.00. and only 10 per cent of garment firms and 9.5 per cent of engineering firms record scores in the range of 0.61 - 0.80. The remaining sample firms have scores well below those of the best companies in both Kenyan industries. This seems to suggest that only a handful of Kenyan garment and engineering firms have built reasonable manufacturing capabilities by African standards: the majority lack the capabilities to operate efficiently and compete on international markets. Some interesting aspects of the procedures involved in creating manufacturing capabilities – particularly those relating to process (e.g. quality management and equipment maintenance) and product technologies – in the sample enterprises can be highlighted below.

Table 6: Frequency distribution of manufacturing capability indicies (MCI) for garment and engineering enterprises in Kenya

MCI class	% of total garment firms	% of total eng. firms
0.0-0.20	45.0	28.6
0.21-0.40	25.0	38.1
0.41-0.60	20.0	23.8
0.61-0.80	10.0	9.5
0.80-1.00	0 .0	0 .0
Total	100.0	100.0

5.2.2. Process technology

Quality management

The attention paid to formal quality management varies considerably among the *garment* firms. At one end are firms with formal systems for quality control (based on final inspection), a full-time department and reject rate data. At the other end are firms where the entrepreneur does ad hoc checks on the finished products and reject rates are not recorded. Nine firms had a full-time quality control staff and eight kept track of reject rates. Table 7 shows the share of full-time quality control employees in employment and the average internal defect rates for the main product in 1989 and 1994.

The data suggest that import competition has a positive impact; quality control efforts have improved since 1989. The share of full-time employees in quality control increased from 1.5 to 1.7 per cent and average internal defect rates fell from 2.6 to 1.8 per cent. However, even the improved figures for quality control staff in the Kenyan garment industry are low by the standards of other developing country entrants into garment manufacturing.

Table 7: Quality control in Kenyan enterprises

	Full-time QC staff (% emp.)		No. of firms recording defects	Av. internal defect rates for main product (a)	
	1989	1994		1989	1994
Garments	1.5	1.7	8	2.6	1.8
Engineering	0.7	1.9	4	8.0	3.3

Notes: (a) Internal defect rates are the per cent of finished products which are rejected at final inspection.

Only one garment firm has received ISO 9000 quality certification. This experience was described in box 1. Another garment firm began to implement the ISO 9000 system in the late 1980s but soon abandoned it because the cost was too high. It seemed that the remaining 18 Kenyan garment firms were not even aware of the existence of the ISO 9000 quality management certificate and its growing significance in export activity.

Formal quality control has traditionally been a fairly low priority in *engineering* firms. By 1994, for instance, only seven firms had a full-time quality control department and only four kept track of reject rates. The majority of the engineering firms relied heavily on ad hoc visual inspection of the final products by the entrepreneur or the supervisor. Specialized tools and equipment for dimensional checking (i.e. the shape of the final product) were rare and only one firm (an MNC) had a laboratory to analyse the quality of raw materials and components. As with garments, liberalization has led to an intensification of quality control. Between 1989 and 1994 the proportion of full-time employees in quality control more than doubled, from 0.7 to 1.9 per cent, and average internal defect rates were reduced to less than half, from 8.0 to 3.3 per cent. This is in the context of fairly simple technological requirements. None of the engineering firms has obtained IS0 9000 certification, and most are unaware of its existence. Two (both MNCs) said they were familiar with the system but had no plans to introduce it in Kenya while the local firms had no awareness of it.

Maintenance

Maintenance efforts very considerably between *garment* firms, ranging from those with a regular routine for maintenance and servicing and a full-time maintenance department to those that only undertake repairs when equipment breaks down and rely on contract maintenance services. Only 10 garment firms have a full-time maintenance department with qualified employees and specialized equipment. Table 8 shows the share of full-time maintenance employees in 1989 and 1994 and the average number of equipment breakdowns per month per firm in 1994. These data also indicate some (albeit marginal) improvement in maintenance since liberalization started: the share of maintenance staff increased from 1.1 to 1.3 per cent. The average number of equipment breakdowns, however, remains quite high, at 5.5 per month.

Table 8: Maintenance and breakdowns

	Full-time maintenance staff (% emp.)		Av. number of equip. breakdowns (per month)
	1989	1994	1994
Garments	1.1	1.3	5.5
Engineering	1.8	4.0	1.9

Maintenance capabilities in the *engineering* firms have traditionally been quite good. In several firms, the equipment had operated trouble free for over a decade. The equipment was serviced regularly and parts were replaced according to manufacturers' schedules. About 10 firms had a full-time maintenance department and 13 had a maintenance shop with specialized equipment. There had been a significant improvement in maintenance efforts in the engineering firms since 1989, and the proportion of full-time employees in maintenance had more than doubled. In addition, the average number of equipment breakdowns was quite low, at only 1.9 per month.

Process improvement

There is evidence of improvements to equipment and processes in the sample firms. Three *garment* firms adjusted their layout every time they shifted product patterns. In addition, seven firms said they had implemented energy-saving measures which significantly reduced their energy bills. Both these types of process improvement occurred after 1989, but in the nature of the data we could not track similar efforts earlier.

None of the *engineering* firms carry out what is normally understood as formal process development. Even the large MNC affiliates did not conduct research and development. The improvements to equipment and processes in the sample firms take the form of minor adaptations to save energy and modify equipment. Three firms had adopted energy-saving measures which led to some reduction in total energy bills. Only one firm (an MNC) had conducted a comprehensive energy audit of its plant and improved its processes (for which it relied heavily on technical assistance from its parent company), resulting in a 15 per cent reduction in its energy bill. The other three firms undertook more modest projects, e.g. installing devises on lathes, milling machines etc. to correct for fluctuations in the power supply.

Modifications to equipment are more widespread. Five firms said they turned out jigs, fixtures and other mechanical attachments for their main tools. This permitted them to undertake heavier jobs or specialized tasks. These activities were only undertaken after

liberalization, suggesting that increased competition led to greater efforts to upgrade installed technologies.

5.2.3. Improvements in product technology

Product technology includes assimilating product designs from buyers and making adaptations to meet market needs, as well as the more demanding tasks of design improvement and new product introduction. There is little evidence of independent design capabilities in the *garment* firms. As in much of South and South East Asia (but unlike the better exporters in East Asia), the four exporting firms relied heavily on their foreign buyers for new products and designs. Specialist pattern makers employed by each exporter created copies of the product in accordance with the foreign buyer's "master pattern". The exporters felt they had the capacity to introduce standard, low-quality products for the African market but had yet to demonstrate this in practice (see below). The non-exporting firms relied on a variety of sources for products and designs, including local buyers, catalogues, imports and occasional visits to foreign trade fairs. Only two of the non-exporting firms employed specialist pattern makers. In most cases, design efforts were undertaken by the entrepreneur or the supervisor.

Table 9 shows the number of firms with product designers (i.e. pattern makers in garments), the number of firms with a computer-aided design (CAD) system and the number of new products introduced between 1989-94. The data suggest little improvement in product design capabilities since import liberalization. The garment firms introduced less than one new product each between 1989 and 1994 and only one firm adopted a CAD system to design logos for T-shirts. Probably the most important change has been the establishment of links by some local firms with foreign buyers. As box 1 showed, a stable long term buyer-seller relationship can transform technological capabilities. However, the benefits of buyer-seller relationships have yet to spill over to the firm's design capabilities. There was little attempt on the part of the local firms to ensure that this should happen.

Table 9: Designers, CAD and new products in the Kenyan enterprises

	No. of firms with full-time designers	No. of firms with CAD systems	Average number of new products introduced
	1994	1994	1989-94
Garments	7	1	0.8
Engineering	5	3	1.2

There is considerable variation in the design capabilities of *engineering* firms. The four foreign-owned firms obtained new products and designs from their parent companies. This enabled them to introduce more than twice the number of new products compared with large local firms but the foreign-owned firms have not invested in independent product design capabilities in Kenya.[14] Local firms copy imports or tailor their products to customer demand. Only four of the local firms have full-time design departments. The rest rely on the management to introduce new products. In contrast to garments, there is some evidence of improvement in product design capabilities in the engineering firms since import liberalization. The engineering firms introduced an average of 1.2 new products

[14]Only one of the foreign owned firms has set up a design department with trained designers (who account for 4.0 per cent of total employment).

each between 1989 and 1994. Four firms introduced three or more products during this period. In addition, three firms recently adopted CAD systems.

In general, design capabilities are rather weak in both industries: this is to be expected, because new product design tends to be technologically very demanding. The sample firms are nevertheless able to produce a range of simple products by copying imports (reverse engineering of complex products is also quite difficult). In view of the entry of second-hand items, this is not sufficient to compete in the local market and inadequate for export expansion. MNCs rely heavily on their parent companies for new products and local exporters, particularly in garments, rely on foreign buyers. While there is little evidence of independent design capabilities having emerged since liberalization, it seems that other types of product technology capabilities have improved slightly.

5.3. Factors affecting the MCI

The present analysis tests for the influence of firm size, ownership, technical manpower, entrepreneurial education, employee training and industry membership on MCI. Technology imports were excluded from the model because only a handful of Kenyan firms used formal technology contracts.

The linear model is as follows:

$$TI1 = b_0 + b_1\ SIZE + b_2\ FE + b_3\ ENTEDN + b_4\ ENG + b_5\ TRAIN \qquad (3)$$

The independent variables are:

(a) SIZE, (total sales in US$), is expected to have a positive relationship with MCI. The returns from capability acquisition are higher where a firm has a larger volume of sales to spread the fixed costs of capability acquisition and large firms can have more specialized technical manpower. Moreover, capital market imperfections confer an advantage on large firms in securing finance for risky technological activities; in addition size is correlated with the availability and stability of external funds.

(b) FE, the share of foreign and local non-African equity, is expected to be positively correlated to MCI. There are two *a priori* reasons for this: (1) The owner may have a longer period of industrial experience. Foreign affiliates and some of the Asian families had been in manufacturing for several generations and may have accumulated manufacturing capabilities that new African entrants lack. (2) The owner may have better international connections to access capital and technology or larger markets within the particular business community.

(c) ENTEDN, the number of years of schooling attained by the entrepreneur or CEO. We expect this to have a positive sign since educated entrepreneurs are thought to be more technologically dynamic in various ways, e.g. buying new equipment, forging links with foreign investors and hiring technical manpower.

(d) ENG, the share of engineers in employment is expected to have a positive sign. Engineers can play a major part in acquiring manufacturing capability through search, experimentation, training and formal R&D activities,

although it is mainly quite complex activities that need engineers for technology absorption.

(e) TRAIN, the number of employees sent on training courses outside the firm, as a percentage of employment, is expected to have a positive sign.

The results are as follows (T statistics in parentheses):

$$MCI = -0.106 + 0.001\ SIZE + 0.002\ FE + 0.022\ ENTEDN - 0.002\ ENG + 0.008\ TRAIN \quad (4)$$

(-0.8) (3.0)** (2.9)** (2.3)** (-0.3) (0.9)

Adjusted $R^2 = 0.53$

** denotes statistical significance at the 5 per cent level

The adjusted R^2 (0.53) is quite high for a cross-section study based on a small sample. Three of the five independent variables are significant at the 5 per cent level and have the expected sign. Firm size, non-African ownership and entrepreneurial education have a positive and significant relationship with MCI.

The positive sign on the firm size variable suggests that both explanations for the size effect are valid. The positive sign on the foreign/non-African ownership variable suggests that firms with overseas connections provide access to a variety of inputs for building manufacturing capability. The positive sign on the entrepreneurial education variable indicates that highly educated entrepreneurs perform the pivotal role of an "industrial catalyst" in managing capability acquisition.

Engineering manpower has no significance. One explanation may be that the engineers on the staff do not contribute to capability acquisition (i.e. they may be involved in marketing or administration rather than technological or training activities). Such a pattern is more widespread in large local firms than in MNC affiliates. Finally, employee training has no effect on MCI. This may be because the measure for employee training is fairly crude and excludes formal in-house training programmes and on-the-job training, which may be far more important.

The above econometric work has been based on the full sample of firms. The small size of the industrial groupings precluded estimating equation (2) separately for each industry. As an alternative, a dummy variable for industry was added to equation (2) but industry membership did not turn up as significant.[15] Somewhat surprisingly, perhaps because of the small sample, there are apparently no strong industry influences at work.

[15] To test the robustness of equation (2), we dropped some of the outliers and re-ran the model several times but the results were broadly similar to the above.

6. Summary of findings

6.1. Key issues

There is growing academic and policy interest in issues relating to competitiveness, productivity management and job creation in African enterprises. Market-oriented policies (with better macroeconomic management, freer trade and greater emphasis on the market to allocate resources) seem to have had a mixed impact on African economies and industrial enterprises within them since the 1980s. A few African economies have responded positively to the new incentive regime and attracted foreign investment, increased their manufactured exports and generated new industrial employment. However, many have yet to achieve significant success in this regard. There is thus a risk that large areas of Sub-Saharan Africa might be faced with uncompetitive industries and the prospect of industrial marginalization for the foreseeable future. This has negative implications for economic development and poverty reduction in these economies in the early decades of the twenty-first century.

Recent publications in the literature of economic development have highlighted the concept of manufacturing capabilities as a useful framework for analysing national competitiveness performance and employment generation. This literature suggests that industrial enterprises are the principal actors in the accumulation of technological and other manufacturing capabilities, which are vital to industrial competitiveness and employment generation in developing economies. Drawing on this framework, the present paper has attempted to analyse the links between competitiveness, manufacturing capabilities and employment in enterprises in two rather different African economies – Mauritius and Kenya.

The construction of a manufacturing capability index (MCI) has proved to be invaluable in the exploration of intra-firm manufacturing capabilities and their determinants in both economies. Amongst other advantages, this new tool permits the quantification of manufacturing capabilities as well as the econometric analysis of its determinants. The MCI can be used to highlight strengths and weaknesses in capability in particular kinds of firm and industry, and to assist in the development of policy responses.

6.2. Findings from the case studies

From 1970 onwards, Mauritius followed a mixed trade policy of import substitution coupled with incentives for exports via the export processing zone (EPZ). These two regimes co-existed, influencing enterprises producing for the small domestic market and those producing for export. In an attempt to reduce the anti-export bias of the trade regime, the country began liberalizing its imports in 1983, and the subsequent trade and industrial reforms can be divided into three separate episodes. The reform process was gradual but it has been largely credible and the momentum has been sustained. By the mid-1990s, Mauritius had become considerably more open and market-friendly than in the past and was reputed to be one of the most liberal regimes in Africa. There are virtually no quantitative restrictions on imports, no local content programmes or public procurement initiatives and the level and dispersion of nominal tariffs have fallen significantly. The reforms have been accompanied by impressive achievements in industrial competitiveness as well as job creation in Mauritius. Manufactured exports (primarily garments), the engine of industrial growth, grew at 14.8 per cent per year between 1980 and 1998, and by that

time manufactured exports per head were the highest in Sub-Saharan Africa. Rapid export growth translated into significant employment creation in the export sector. By 1999, the manufacturing sector had created 100,000 jobs (equivalent to over one-third of total employment).

Drawing on a survey of 40 garment enterprises, it was possible to explore the acquisition of manufacturing capabilities in the Mauritian export sector. The evidence suggests that the macro-level trends in industrial competitiveness and employment generation are related to the acquisition of manufacturing capabilities at the micro-level. Although overall Mauritian manufacturing capabilities in the garment sector are quite good by international standards, there is a strong element of firm size in the findings. Large firms seem to have acquired the capabilities required to produce to the high standards of price, quality and delivery demanded by major foreign buyers. However, manufacturing capabilities in SMEs lag behind the achievements of large firms. Quality control and quality management systems are insufficient. Few SMEs have preventive systems for equipment maintenance. Their capacity to copy, adapt and design new products is weak. They make little use of contractual technology imports and have few relations with foreign technical consultants. Using information from the Mauritian firms, we constructed a manufacturing capability index (MCI) in an attempt to capture inter-firm differences in manufacturing capabilities. We also conducted an econometric analysis, which produced interesting results. It showed that firm size, technical manpower and employee training had a significant and positive effect on the acquisition of manufacturing capabilities at firm level in Mauritius, whereas firm age and foreign equity were not significant. This suggests that firm size may not be the sole driver of the development of manufacturing capabilities and that hiring technical manpower and investments in training may be just as important.

The Kenyan experience contrasts in many ways with the Mauritius case. From the mid-1960s until about 1979, Kenya pursued an import substitution industrialization strategy, with high levels of protection for manufacturing and a large role for the public sector in industry. A disappointing industrial competitiveness and employment record fuelled increasing recognition of the need for a change in strategy by the late 1970s. Kenya introduced import liberalization measures between 1980 and 1984 as part of a World Bank structural adjustment programme (SAP). The new policies emphasized exports and the private sector, and sought to stimulate industrial competitiveness. There were several episodes of trade and industrial reform but the liberalization process remained halting, reluctant and intermittent. There was a strong tendency to backslide on policy implementation and the process as a whole lacked credibility. The net result was that the new policies typically failed to provide the private sector with appropriate incentives to restructure and acquire new manufacturing capabilities. Not surprisingly, the private sector response to the new policies has been weak (in terms of improving industrial competitiveness and generating employment). Manufactured exports grew at only 6 per cent per year from 1980 to 1998, and manufactured exports per head had reached no more than US$ 16 by 1998. Moreover, although 216, 889 people were employed in the manufacturing sector (1999), this was only equivalent to 13.2 per cent of total employment.

Data from a survey of 41 garment and engineering enterprises suggested that Kenya's disappointing record of macro-level competitiveness and employment is closely associated with weaknesses in enterprise-level manufacturing capabilities. The "initial conditions" for manufacturing development of the Kenyan garment and engineering firms are similar to the rest of Africa. There is a high propensity to start with used equipment and the average age of equipment is quite high. Some new investments have been made since import liberalization but few have involved significant equipment acquisition. One notable characteristic of enterprises is the high proportion of entrepreneurs with secondary school and higher qualifications. However, the employment of engineers is quite limited and

highly concentrated in the largest firms. Moreover, in-house and external training efforts are weak, being confined to a few large local firms and MNC affiliates.

While manufacturing capabilities are low by international standards, there has been some improvement in both industries since import liberalization. However, important gaps in competitive technological capabilities remain. In spite of the positive signs, it is not clear if there is sufficient dynamism to allow liberalization to proceed without severely disrupting industrial production and employment. The prospects for manufactured export growth are not good from the evidence of our sample (despite a few bright spots). There is little use of foreign technology contracts. Quality control systems and quality management standards are insufficient to attract major European and American buyers. Few firms have systems for continuous inventory control or productivity improvement. The capacity to develop new products is weak and none of the firms carry out formal R&D. Industrial engineering as a separate function is absent. There are few linkages with other firms or technology institutions. Econometric analysis suggests that the manufacturing capability index is positively related to ownership, entrepreneurial education and firm size. African-owned firms are generally smaller and younger, and use less capital-intensive techniques as well as less technical manpower than other firms. This shows up in lower levels of manufacturing competence.

6.3. Policy implications for other African economies

The Mauritian and Kenyan case studies suggest that MCI analysis offers valuable insights into the process of capability development. It also helps identify the factors affecting the process and the kinds of policy that might be needed to remedy gaps in capability development. Furthermore, these experiences highlight four key lessons for other African countries intent on improving their industrial competitiveness and employment creation.

1. Enterprises are the key actors in the process of capability development in African economies. Regardless of firm size and ownership, enterprises need to undertake conscious efforts (via search, engineering, research and development, recruitment of technical manpower, training and other relevant activities) to assimilate imported technologies and improve their manufacturing capabilities. In practice, however, they rarely undertake capability building in isolation. Enterprises interact and exchange technical inputs with industrial suppliers and competitors as well as support institutions of different kinds (particularly technology services, SME extension services, training bodies and providers of industrial finance). Collective learning is thus vital to future industrial success and employment in African economies. The challenge for business and government is to ensure that collective learning processes take root in African industry and are effective and sustainable. While this paper has emphasized technological and other manufacturing capabilities, it is recognized that other important aspects of enterprise level restructuring may also be needed (see box 2).

2. Market-oriented policies are an important aspect of the solution but they must be designed and implemented in a systematic manner. A clear and transparent liberalization process provides strong price signals for private enterprises to restructure and develop new manufacturing capabilities while slow, reluctant and intermittent reform can send mixed signals to firms. Ideally, this liberalization process should be pre-announced, the liberalization agenda should be widely disseminated through the media and meetings with business, reductions in protection should be phased (so that enterprises become increasingly aware of

progressive import competition) and the temptation to backslide on reform should be resisted. While liberalization is a necessary condition for the creation of an internationally viable industrial sector in African economies, it is clearly not a panacea. The post-liberalization African experience suggests that import liberalization and other industrial liberalization measures alone may be insufficient to enlist a private sector response (particularly, manufacturing export growth and industrial upgrading) to an improved incentive environment.

Box 2: Core elements of restructuring plans for African enterprises

Strategic issues
- Market focus (regional, national, international)
- Market niche
- Pricing policy (intra-brand and inter-brand competition)
- Technology strategy (e.g. joint venture with a multinational)

Marketing
- Product mix
- Market potential
- Competitors
- Marketing channels

Management
- Management structure
- Skills and experience
- Strategic perspective
- Internal controls
- Past performance

Finance
- Reporting structure
- Balance sheet and profitability ratios
- Skills of the finance team

Technology
- Complexity of technology
- Applicability of technology
- Vintage of technology
- New sources (e.g. technical assistance contracts, licensing, etc.)
- Maintenance and upgrading
- Quality management
- Process control

Skills
- Qualification and skill profile
- Labour productivity
- Training
- Recruitment
- Turnover

3. Supply-side measures (particularly education and training support, productivity improvement and quality assurance programmes, small and medium enterprise extension services and industrial finance) are essential to support industrial restructuring, the creation of new manufacturing capabilities in enterprises and improved competitiveness.[16] Unfortunately, most African economies are characterized by significant weaknesses in their institutional support system for industrial development and firms have to acquire capabilities in an institutional vacuum. Many critical institutions are missing and those that exist are often

[16] See Tolentino, 1995 and 1997; Metcalfe (forthcoming); Wignaraja, 1999 for some thoughts on how to combine market-oriented policies with supply-side support into coherent competitiveness strategies.

limited in their geographical coverage, and bureaucratic in their mode of service delivery. They also lack relevant specialist technical manpower and have no facilities to effectively support industrial learning. A difficult challenge for African governments is to reform industrial support systems effectively while putting in place coherent competitiveness policies that combine market-oriented policies with supply-side measures (see table 10 for examples of policies under the two headings). The sequencing of institutional development with policy reforms assumes great importance in this regard. As solutions need be tailored to individual national conditions and level of institutional development, little general policy guidance can be provided on this issue.

4. Many internal and external factors can affect the efficiency of collective learning and policy implementation in African economies and these factors should be kept in mind during the formulation of competitiveness strategies. External shocks (such as drought, wars, international recessions and HIV/AIDS) can have a devastating impact and disrupt even the best-made plans for improving competitiveness at national and firm-levels. Domestic political instability and poor macroeconomic management can suppress private sector supply responses and contribute to capital flight and brain drain. Weak government commitment and lack of policy management capabilities can hinder the design and implementation of competitiveness strategies. Table 10 summarizes the constraints which may operate and suggests possible solutions. The policy areas are grouped into incentive policies and supply-side policies.

Table 10: Policies for improving competitiveness in African economies		
POLICY AREA	**CONSTRAINT**	**SUGGESTION**
INCENTIVE POLICIES		
Macroeconomic policy	High inflation & large fiscal deficit	Develop a plan to reduce fiscal deficit within a specified period
	Appreciating real exchange rate	Adopt a more aggressive approach to exchange rate management
	Lack of policy credibility	Implement reforms and involve private sector in pre-budget consultations
Trade policy	High and variable effective protection	Persist with import liberalization to achieve low, uniform effective protection
	Weak export drive	Revamp trade promotion organization to become more proactive and allocate more funds for overseas marketing
	Long delays in refunds on imported inputs	Streamline bureaucratic procedures and introduce computerization at customs
	Ad hoc participation in the WTO and passive role in international trade negotiations	Develop trade negotiation capabilities within government, co-opt leading trade lawyers into trade delegations and set up an embassy at the WTO
Competition policy and privatization	Domination of key industries by inefficient state-owned enterprises	Conduct a study of SOEs and implement a privatization programme
	No framework for regulating anti-competitive practices	Pass a competition law and set up an enforcement agency (e.g. a monopolies and mergers commission)
SUPPLY-SIDE POLICIES		
Human resources	Skill gaps in potential areas of comparative advantage	Conduct a survey of future skill needs benchmarked against competitors and prioritize future skill needs
	Inefficient public sector training institutions	Introduce partial cost recovery of services for public institutions and assist industry associations to launch training centres
	Limited enterprise training	Introduce an information campaign to educate enterprises about skill gaps and offer tax deductions for training investments
Technology support	Weak quality standards in industry	Provide part-grants for SMEs to obtain ISO 9000 certification
	Low industrial productivity	Establish a productivity centre to improve industrial productivity to world standards
	Inadequate linkages between technology institutions and industry	Introduce partial cost recovery of service for public institutions and an aggressive marketing campaign
Foreign investment policy	Unfocused foreign investment promotion strategy	Develop a proactive foreign investment promotion strategy which targets a few realistic sectors and host countries
	Poor international image/lack of contact with potential investors	Establish overseas investment promotion offices as a joint venture with the private sector
	Uncompetitive EPZ package	Evaluate EPZ incentives against competitors and change offer to attract flagship multinationals
Industrial finance	High interest rates and an oligopolistic banking system	Manage prudent monetary policies and introduce competition into the banking sector
	Anti-SME bias in credit allocation by banks	Promote training for bank staff on assessing SME credit, specialist SME funding windows and micro-finance schemes
Source: Based on Wignaraja, 1999.		

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