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1

Globalization and SMEs: Introduction and Conclusion

1 Introduction

Industry is the engine of growth and one of the necessary conditions required to perform this role successfully include technological progress. For a long time several countries, particularly the developing ones, have struggled to determine appropriate technology and innovations, which promise high pay-offs. The advent of Information and Communication Technologies (ICTs) in this context has come as a technological revolution, which has enabled even some of the developing countries like India to make their presence felt in the world economy. It allows a reduction in co-ordination costs and leads to efficient electronic markets. Significant returns on ICT investments are found both in developing and developed countries. These benefits range from employment, to productivity gains, consumer surplus, and improvement in product quality.

Ample evidence exists to suggest substantive returns on IT systems, equipment and labour investments (Lichtenberg, 1995). Also, there is a strong relationship between IT and improvements in economic performance (Stiroh, 2001). Significant externalities emerge in the process of investment made in R&D due to complementary effects. In other words, as the level of 'general purpose technology' which is an outcome of adoption of ICTs, improves, it results in productivity growth across other sectors as well.

The other angle from which the contribution of ICTs to growth can be emphasized is infrastructure. Several studies have noted that infrastructure – social, financial and physical – contribute to total factor productivity growth across industries. This improves the level of technological efficiency as well the pace of technological progress (Mitra, 1999 and Mitra *et al.*, 2002). However, along with these components of infrastructure it is equally important to recognize the relevance of technological infrastructure, supplied by ICTs. Technological infrastructure, which may be broadly divided into three components, includes telecommunications, computing, and connectivity infrastructure (Oyelaran-Oyeyinka and Lal, 2006).

It may be noted that ICTs cut across types of activities. They can be applied in a wide variety of fields such as agriculture, health, education and training, manufacturing, services, transport, business, and environmental management (Lal, 2006). In the recent years in several developing countries much of the growth spur seems to have come from the services sector. And several economists have expressed concern in this regard as services growth is often viewed to be parasitic in nature. But a closer look at the composition of growth suggests that much of the services growth is taking place due to the growth of the dynamic components within services. And these dynamic components obviously include ICTs and tend to be the engine of growth. However, the developing countries cannot afford to ignore the importance of manufacturing or agriculture in the context of rapid economic growth. Hence, the application of ICTs in these sectors must be carried out aggressively which in return can contribute to productivity and faster economic growth. On the whole, industry is still the engine of growth and for industry to carry out its role successfully the ICTs have to undergo rapid expansion and progress.

2 Importance of SMEs

Within the industrial sector small and medium-sized enterprises (SMEs) are often regarded as the lifeblood of the economy in both developed and developing countries. The chapter on Malaysia argues that they help bring out innovation, increased productivity, competition and high value added activities. They are highly flexible and are able to explore and experiment new ideas and practices in the quest for efficiency and effectiveness. Lee (2003) argues that SMEs form an integral part of the value system as downstream suppliers or service providers to the large corporations in the overall production network. Realizing these crucial roles that SMEs play, governments are keen in designing appropriate industrial policies to further harness the potential of SMEs as a catalyst to economic growth of the countries.

Seow (1989) argues that SMEs contribute towards the national economy in five main areas. First, SMEs employ higher labour per capita investment. Although SMEs factories do not employ as much labour as the large manufacturing industries, in comparison to the capital invested in the business they employ more labour per dollar invested. So SMEs actually help resolve some of the labour problems. Second, SMEs assist tremendously towards increasing investment. The principle sources of finance for the SMEs are the owners own funds and those borrowed from other family members, friends and relatives and possibly some close business associates. Third, SMEs play a big role in generating entrepreneurship and creativity. The low cost of setting up a small manufacturing unit enables an enterprising worker not only to provide himself with a livelihood but also to offer employment to

others. Therefore, SMEs serve as a training ground for developing the skills of industrial workers and entrepreneurs. These entrepreneurs who have been trained in basic skills usually are creative in their own ways and may branch into other related fields and thus SMEs produce creativity, and this creativity of the entrepreneurs can generate new products.

Fourth, SMEs are also a good training ground for skill development. The establishment of SMEs actually enables the small entrepreneurs to use their skill and knowledge, as well as to improve their technological capabilities. Therefore, this eventually accelerates the process of technology absorption and dispersion of economic benefits. And finally, SMEs provide back-up service for the large industries. This is because it may not be cost effective for the large industries to go for manufacturing component parts. It would be more economical if they have their component parts manufactured either by their subsidiaries or sub-contract it to various SMEs which are able to supply them with these components at a cheaper price and sometimes more efficiently.

With the advent of ICTs and improved transportation people can travel easily and communicate effectively and efficiently. The direct result of this is that people can work together without having to be physically together. Organizations find that they can easily outsource some of their work to smaller companies, thus encouraging the establishment of more service industries. Besides SMEs are flexible in responding to demand changes, which Beaver (2002) describes as enterprise culture.

3 Evolution of SMEs

The evolution of manufacturing sector has taken several years and it varies from country to country. As the chapter on Costa Rica brings out, the evolution can be analysed in different time periods. The first period, before 1960, is characterized by the predominance of the agricultural sector in the overall economy and the poor development of the manufacturing structure. During that period, two crops, coffee and banana, represented most of the exports. Then, during the second period, between 1960 and 1985, the Industrialization Model (IM) was actively implemented and consequently the manufacturing sector emerged as the engine of growth of the Costa Rican economy (6 per cent average growth rate experienced between 1960 and 1970). These first two periods comprise the pre-Structural Adjustment era. Finally, in the third stage, 1986 onwards, government adopted structural adjustment programme, trade liberalization, and competitiveness policies. In this period, although policy orientation mainly focused on the transformation of SMEs into externally competitive industries, share of the manufacturing sector in GDP practically remained constant.

Under the agricultural-based model, few products, particularly coffee and bananas, comprised the core of the national GDP and their participation in

total exports was over 60 per cent. The dependence on two crops made the country highly vulnerable to fluctuations in prices and thus to external crisis in the balance of payments. Despite this fragility, practically no industrial policy was implemented during this period and the manufacturing sector was a series of small-dispersed firms with no intra and inter-sectoral links and poorly developed managerial capabilities.

Based on the ideas developed by the structuralist theory, spread in Latin America by the Economic Commission for Latin America and the Caribbean, the country adopted a new law, the well-known Act of Industrial Protection and Development (1959) that created a series of tax exemptions, subsidies, and tariffs to spur the development of the local industry. Later, with the incorporation of Costa Rica in the Central American Common Market, the adoption of the Central American Common Tariff provided the package of incentives by providing extra protection to the local infant industry and a bigger market for selling its products. The new legal and institutional framework provided positive results and thus the manufacturing sector became the most dynamic sector of the Costa Rican economy.

Data on the contribution of the manufacturing sector to national employment and wages also reflect a significant dynamism. Studies have confirmed that upward trend in employment was experienced by the manufacturing sector, although several concerns have been raised on the asymmetry between the dynamics of the manufacturing output and the pace of job creation in the manufacturing sector. Finally, in terms of remunerations, the sector contributed to 15 per cent of national remunerations.

Manufacturing sector exports and imports experienced a positive growth rate. Manufacturing exports almost quadrupled their participation in total exports while imports almost doubled their contribution. The Central American market became the most important destination by absorbing 70 per cent of the manufacturing exports. This market was so important that, if we take it off from the analysis, the results show that only 3 per cent of the small-scale production, 6 per cent of the medium-scale output and 8 per cent of the big firms' production was exported outside Central America.

Several structural problems and an obscure international context eroded the IM. So by the end of the 1970s the model experienced some problems. The 1981–82 crisis forced the adoption of a set of policy measures to stabilize the economy and to progressively implement a new development model. After 2 years of stabilization efforts, the country actively began the implementation of trade liberalization and pro-competitiveness policies as part of a broader package of structural adjustment measures.

The Structural Adjustment Program comprised a set of public policies aiming at reducing and eliminating those barriers that do not allow a full utilization of the economic resources. Part of the efforts was addressed to implementing a new trade model characterized by lower tariffs and export

promotion. By lowering tariffs, the industrial sector would face an increasing competition from international firms, improving its level of competitiveness. By promoting exports, the sector would have enough incentives for diversifying its products. The application of fiscal subsidies and the creation of a wide range of trade-related institutions were the two most important tools used by the different governments to promote the shift from one commercial regime to the other. The results of this model in the evolution of the manufacturing sector are discussed in Chapter 4.

4 Constraint and supports for SMEs

There are a number of constraints, as brought out by the chapter on Jamaica, which limit the growth of SMEs. They include inadequate credit facilities and infrastructural and technological problems, hampering the development of the sector and limiting the growth, global competitiveness and the formation of linkages in the global commodity chain by SMEs.

Governments in several developing countries have taken initiatives to retain/strengthen competitiveness of SMEs in the era of globalization. These measures range from technological up-gradation support to new opportunities for human resource development, and marketing support. Technological support is not only limited to make SMEs aware of advanced technological development which has taken place in the world market but also to help them in acquisition of new technologies. One possible way to encourage firms to adopt new technology is through cost-reduction in accessing such technologies. This can be achieved by providing soft loans for importing new technologies. For export-oriented SMEs a reduction in custom duties might encourage the adoption of new technologies.

Support to SMEs in the era of globalization has become imperative due to entry of Multi-National Corporations (MNCs) in developing countries. It is well known that MNCs are equipped with several tangible and intangible assets. These assets could vary from efficient production technologies to brand name advantages. In order to compete even in the domestic market SMEs need to upgrade their business processes, which is virtually impossible for SMEs without active support from the government. This is primarily because neither SMEs have enough resources at their disposal to invest in new technologies nor do they have enough risk absorbing capacity.

Governments in developing countries are aware of these problems and many initiatives have been taken to encounter the onslaught of globalization. However, only policy initiatives are not sufficient for success; there has to be willingness and eagerness to adopt new technologies in SMEs. The absence of such motivations might lead to misuse of policies and government resources as seen in several studies, which examined the effect of policy measures in India, Malaysia, and Jamaica on the performance of SMEs (Lal, 2004; Lee, 2003; McFarlane, 1997).

In Jamaica, for example, fiscal and credit support to SMEs are available in terms of lending institutions – some of which offer additional training and technology support. However, the extent of usage of these credit lines and technological support are not known since most SMEs remain outside the domain of the formal sector of the economy. The author evaluates the competitiveness of SMEs in Jamaica and their ability to use ICTs to enhance global competitiveness and add value in the global commodity chain.

5 New challenges for SMEs in the face of globalization

The process of globalization, as the chapter on Nigeria points out, is rapid, complex and full of uncertainties and expectations. It is obvious that only those countries that invest in science and technology (S&T) are able to integrate themselves better in the global system and to effectively respond to the challenges posed by globalization. Consequent upon this new era, the African continent in general and Nigeria in particular, are faced with new challenges in the process of socio-economic development. One dimension of this is how Nigeria can further integrate with the global economy through enhanced trade, and still cope with the prospect of unfettered economic growth and greater openness. This challenge is enormous especially given the current low level of penetration of processed and manufactured goods as well as services from Nigeria into the world trading system. Exports especially industrial goods from Nigeria and other developing nations are confronted with some competitive forces such as rivalry of competitors within its industry, threats of new entrants, threats of substitutes, the bargaining power of customers and the bargaining power of suppliers. The awesome capabilities of the various ICTs to confront some of these forces have been proved in a number of countries such as the United States, Brazil, Guatemala, and Tunisia (UNCTAD, 2003, 2004a).

The available data show that international trade in ICT goods and services has grown in recent years at a faster rate than total international trade (UNCTAD, 2004a). The impact of ICTs on the performance and competitiveness is achieved through increased information flows, which result in knowledge transfer as well as improved organization. The application of ICTs in business ranges from Computer-Aided Design (CAD), Computer-Aided Engineering (CAE) and Computer-Aided Manufacturing (CAM) to Intranet, Internet and Electronic Commerce (E-Commerce) among others. 'E-Commerce is one of the most visible examples of the way in which ICTs can contribute to economic growth. It helps to integrate economies with the global economy. It allows business and entrepreneurs to become more competitive. And it provided jobs, thereby creating wealth' (UNCTAD, 2004a).

International competitiveness in trade, as the chapter on Nigeria points out, continues unabated in spite of the growing number of supra-national

organizations such as the European Union (EU), North American Free Trade Zone, Southern Common Market or *Mercado Común del Sur* in Spanish (MERCOSUR), Economic Community of West African States (ECOWAS), and the Southern African Development Community (SADC). While African countries are widely regarded as being non-competitive, there are a few success stories. Some garment-producing firms in Mauritius have gained prominence as exporters even to the EU and United States markets since the early 1980s. UNCTAD (2004b) notes that since the USA's Africa Growth and Opportunity Act (AGOA) came into effect in 2000, many export-oriented garment factories have been set up in Namibia, Mozambique, Swaziland, Lesotho as well as Mauritius. The report went further to say that Lesotho became the largest African apparel exporter to the USA in 2003, with about 10,000 newly created jobs. Also, Nnewi industrial cluster in Nigeria is another success story, even though the manufactures especially automotive spare parts are exported to other West African countries.

Improving business competitiveness requires a variety of systemic transformation, including the availability of efficient infrastructure and services, technological changes, new organizational processes, adoption of good practices, training, mobilization of underutilized resources, creation and segmentation of markets, product and process certification and efficiency in inputs utilization. A study of small and medium enterprises in OECD (1997) on the challenges of globalization reveals that, internal dynamics of firms and environmental support are key factors which could either facilitate or inhibit export. SMEs that are active players in the global economy make special efforts to search for diversified growth by pursuing innovation-based production, and open-minded management capable of engaging the appropriate specialized resources e.g. ICTs.

The enabling environment includes effective consulting, funding and logistical resources to support exports. Some of the key internal factors inhibiting the globalization of SMEs are lack of experience on the part of the management, inadequate resources and an excessive risk perception. Poor national information networks with weak or inadequate international connection, poor regional resources and support programmes are also responsible for this (Julien *et al.*, 1993). Globalization and competitiveness of SMEs and Large-Scale Enterprises (LSEs) are driven by similar forces; the pre-eminence of ICTs in this regard is unassailable. A critical question for developing countries is whether the adoption of ICTs can be an authentic vehicle for solving the problems of economic development and low level participation in international trade.

6 The role of ICTs

Realizing the potential of ICTs in electronic business (e-business), as the chapter on India points out lucidly, the United Nations Commission on

International Trade Law (UNCITL) adopted a Model Law in 1996. The UN General Assembly recommended to its members in January 1997 that they give due consideration to this Model Law, when they enact their laws related to e-business. Despite several advantages, the growth of e-business has been dismal particularly in developing countries. The major impediments in the adoption of such technologies are the validity and authenticity of information. Lack of proper cyber laws could also be held responsible for the slow changeover to e-business.

There are many descriptions of e-business. In essence, e-business is about business innovation, about serving new and changing markets. E-business is meant to reshape the way companies go to markets, the way customers buy products and services. It can also be defined as a tool that forward-looking enterprises are racing to adopt. E-business technologies are meant to help adopters to reach new customers more efficiently and effectively. E-business transforms the exchange of goods, services, information, and knowledge through the use of ICTs. There are several models of e-business, namely, (i) business to business (B2B), (ii) business to consumer (B2C), (iii) consumer to consumer (C2C), (iv) business to government (B2G), and government to business (G2B).

Broadly speaking, there are three modes of e-business transactions. These are offline, online, and e-business using shared or individual portals. First and comparatively less effective than other forms of e-business tools, that is, offline e-business is enabled by electronic messaging systems. Offline e-business is normally done through email systems while online e-business transactions take place with Uniform Resource Locators (URLs) of companies. Having a URL does not necessarily mean that an enterprise is able to process online e-business transactions. URL must be dynamic and should have online transaction facilities such as Active Server Pages (ASPs) that allow online transactions. The third and most effective way of doing e-business is through portals. Portals are the essential additions in network technologies. They fulfil an important role of aggregating contents, services, and information on the net. Broadly speaking, their position on the net is between users (buyers) and web contents. This unique position enables portals to leverage marketing and referrals as they are intermediaries between web users and companies.

According to the information supplied by the International Data Corporation (IDC), the Compound Annual Growth Rate (CAGR) of e-business in the global market has been 105 per cent during 1995 and 2000. E-business has emerged as the fastest growing technology in recent times. Although there are several models of e-business, only two models, namely, B2B and B2C have experienced the highest growth. Within these two, B2B has grown from 3.5 billion US\$ in 1995 to 34.0 billion US\$ in 1998 while the growth of B2C has been 1.0 billion US\$ in 1995 to 4.0 billion US\$ in 1998. The share of B2B has increased from 77.78 per cent

in 1995 to 89.47 per cent in 1998. These data suggest that B2B has grown faster than B2C worldwide.

7 Finding from country studies

The study on India aims at identifying the factors that have significant impact on the diffusion of e-business, assessing the contributions of existing ICT industry in changeover to e-business, the role of institutional environment in growth of e-business and the impact of e-business on transaction and co-ordination costs.

The chapter analyses the determinants of the adoption of e-business technologies in the manufacturing sector in India. Based on the survey conducted during December 2000 and February 2001 the analysis refers to 51 firms located in New Okhla Industrial Development Area (NOIDA). Firms were revisited during January to March 2005 and found that technological profile of firms did not change much. Sample firms are dominated by SMEs as 73 per cent of these firms employ less than 150 persons. Entrepreneurial characteristics such as managing director's education and age, historical data of firms, and other firm-specific factors such as size of operation, export intensity, international orientation, wage rates, profit margins were included in the analysis. It also included a variable, i.e. bandwidth that represents the institutional environment created by central and local governments. The opinions of managing director (MDs) on potential benefits of the adoption of e-business technologies were also considered.

The analysis has been carried out by grouping the sample firms into three categories, namely, offline, online, and portal-using firms. Firms doing e-business using offline technologies such as messaging systems were grouped in the first category, whereas firms that were using messaging systems as well as online e-business tools such as ASPs in their URL were classified as online e-business doing firms. Portal and ERP using firms were considered as advanced users of e-business technologies and were treated in the third category. Firms were assigned ranks depending on the type of e-business technology used by them. As far as the model of e-business is concerned, 92 per cent of the sample firms adopted B2B e-business model.

The multivariate ordered PROBIT technique used to identify the determinants of the degree of the adoption of e-business tools reveals that the firms with more international orientation adopted more advanced e-business tools. Wage rates and scale of operations also emerged as significant determinants of the adoption of e-business technologies. The study captures the role of bandwidth in diffusion of e-business technologies. The findings tend to support several other studies pursued in the past (Doms *et al.*, 1997; Bedi, 1999; Siddharthan, 1992; Cohen, 1995; Pavitt *et al.*, 1987; Soete, 1997).

A positive association between type of e-business technology used by firms and the bandwidth is very much evident. Earlier a study by

NASSCOM (2000) suggested that availability of higher bandwidth is a prerequisite for the penetration of Internet and web-enabled services in India. The present study concludes that a very reliable and affordable telecommunication network has to be in place to harness the potentials of ICTs. The IT Law 2000 is a necessary but not sufficient condition for the success of diffusion of ICTs. The initiatives towards communication technology convergence are expected to result in faster growth of e-business. There is indeed a need to create proper local, national, and global information infrastructure to derive the maximum benefit from the ICT revolution.

The chapter on Malaysia showed that the majority of the respondents had advanced ICT adoption rate though generalization may not be justified because of the fact that majority of the sample were drawn from more advanced or technology driven industries such as hardware and machinery, chemical and pharmaceutical and electronics. One important finding is that educational attainment of companies' directors had a bearing on ICT adoption. There exists a strong link between technology driven firms and the qualification of their leaders. Collaboration with foreign partners was found to be a usual practice among SMEs in Malaysia. Language barrier was seen as the main problem, hindering training or collaborative efforts with foreign partners.

The findings suggest that other than providing financial support to SMEs, the Malaysian government need to focus on human resource development policies. Technological institutions that can provide job-oriented formal training and short-time training opportunities near the workplaces may be helpful for skill up-gradation of workers. A provision of such opportunities is expected to contribute to efficiency and productivity of workers. However, the study could not evaluate the impact of ICT on economic performance of sample SMEs due to the lack of data on performance indicators.

The study on Costa Rica can be summarized in three parts. First it evaluated economic performance of Costa Rican SMEs and their contributions to the national economy. Despite their substantial contributions, they were not given due importance until recently. The second part of the study delineates the policy initiatives that were taken since mid-1980s and were exclusively meant for SMEs. The third part of the study focuses on the innovativeness of SMEs in general and identification of factors that resulted in varying degree of ICT adoption based on a survey of 68 firms conducted during July 2004 and February 2005.

Although SMEs contribute significantly to the national economy in terms of jobs and exports, public efforts to improve their competitiveness have been erratic or weak. Hence, the progress towards that objective seems to be nominal. In terms of industrial policy, the experience of the last 20 years suggests that an overall industrial strategy should be developed with a long run perspective. SMEs are relatively young companies managed by middle aged, highly educated managers. Common strategies to compete are quality

and product differentiation in specific niches. Training is important but R&D has very few rooms in the SMEs agenda. ICTs play a highly significant role in the performance of SMEs. Although the country has been able to provide extensive coverage of basic technologies in the last 40 years (fix lines, for instance), it also lags behind in terms of modern technologies such as Internet coverage and speed.

Although the package of Internet services provided by National Institute of Electricity allows firms to use basic functions, lack of an adequate infrastructure is impeding SMEs in using the Internet for productive, marketing and sales purposes. In general, improved performance in productivity, time advantages, design flexibility, reorganization and management are associated with an extensive use of advanced ICTs, supporting the view that ICTs are essential for enhancing the competitive profile of the firm.

While analysing the data in multivariate analysis framework firms were categorized into three groups, namely: low level of ICT using firms, moderate users of ICT, and advanced ICT using firms. The ICTs¹ that were included in the analysis are email, Internet, portal, web enabled technologies, MIS, CAD/CAM, CAE, FMS, and CNC. Clustering of firms based on their intensity of ICT use was imperative as the sample had to be divided into reasonable number of distinctive groups. Subsequently, discriminant analysis was carried out to identify factors that discriminated different levels of ICT using firms.

Factors representing, entrepreneurship, international orientation, causes and consequences of ICT use, sources of competitiveness, and knowledge acquisition opportunities were used in the analysis. The results suggest that general managers (GMs) knowledge base and academic background emerged as an important discriminant. The study finds that skill intensity of advanced ICT using firm was higher than the rest. International orientation of firms also discriminated three groups of firms. GMs that attributed higher importance to ability of ICTs in providing better management control and useful market information adopted more advanced ICTs. On the whole, the adoption of ICTs results in productivity gains and efficiency in production processes. The government needs to encourage and provide institutional support for SMEs to participate in international markets so that they remain globally competitive. Lack of this could be attributed to the present state of low level of globalization of Costa Rican SMEs. Greater participation in global market might enable firms to increase their contribution to the national economy.

1 Management Information System (MIS), Computer-Aided-Design/Computer-Aided-Manufacturing (CAD/CAM), Computer-Aided-Engineering (CAE), Flexible Manufacturing System (FMS), and Computerised Numerically Controlled (CNC).

The study on Jamaica based on the primary data collected from 60 SMEs located in the Greater Kingston Metropolitan area focused on technology profile and international orientation of the units. ICT tools covered in the study include Internet, email, web enabled technologies, MIS, CAD/CAM, CAE, FMS, and CNC. Findings of the study suggest that most of the firms were using one or the other type of ICT. While Internet was preferred technology in the non-production processes CAD/CAM was popular in production processes.

Based on the factor analysis a composite score of ICT intensity used by sample firms was estimated. The production function approach was used to identify the role of ICTs in augmenting performance of firms. The findings suggest that the performance, represented by sales turnover was significantly influenced by intensity of ICTs used, skill intensity of workforce, foreign collaboration, age of owners/managing directors, size of firm, formal training as a mode of knowledge acquisition, and communication technology infrastructure represented by the speed of communication.

The study finds evidence in favour of the critical role played by the age of managing directors. Although, age and academic qualification have positive association, the age has been able to capture the type of education provided in recent times. For instance the type of training provided to an engineering graduate 20 years ago is very different from today. In recent times due emphasis has been given to the application and potential benefits of ICTs in all training and educational programmes. Consequently younger managing directors with the same qualifications as older ones tend to adopt more advanced ICTs. The study also finds evidence to support the argument that formal training of workers is preferred to learning by doing mode of knowledge acquisition. Managing directors' preference for formally trained workers in influencing size of operation is a case in point. The other findings lend support to several earlier studies (Lal, 2004; Earl, 1989; Doms *et al.*, 1997).

Policy implications of the study are twofold: one, Jamaican government needs to improve accessibility of telecommunication network at a globally competitive rate. That in turn is expected in higher adoption of ICTs, which might influence performance of firms in the domestic market. Government also needs to provide marketing support to enable SMEs to venture into international markets. Greater integration of SMEs with the foreign market might contribute to export growth. Another important implication of the study is related to the mode of knowledge acquisition. Government needs to strengthen the existing technical training institutions so that they can produce persons with appropriate skills needed by SMEs.

The study on Nigeria examines the following two questions: (a) what strategies have proved useful in terms of enabling Nigerian SMEs to become more competitive through the use of ICTs? And (b) how can ICTs be used

to facilitate the participation of Nigerian SMEs in national and international supply chains? The survey questionnaires retrieved from 67 SMEs in Aba, Ibadan, Lagos and Nnewi were analysed. Only 12 of the sample firms did not adopt any of the ICTs while 30 and 25 were classified as moderate and advanced adopters respectively based on the number of ICTs used. Overall 3,195 persons were employed by the 67 sample firms with the following classification: non-adopters 647 (20.25 per cent), moderate adopters 804 (28.26 per cent) and advanced adopters 1,645 (51.49 per cent). About 9 per cent of the entire work force had received one form of ICT training or the other, and the number of such trained workers increased with the level of adoption.

About half of the 67 sample firms had one form of collaboration or the other while roughly 12 per cent had to pursue their business without any foreign partnership. Among the non-adopters one firm was engaged in collaboration with foreign partners, whereas 68 per cent and 50 per cent of the advanced and moderate ICT adopters respectively had foreign partners. The two main preferred modes of technology transfer were importation of machinery and importation of technical design and drawings. Payments for the technologies acquired were usually in the form of royalties followed by technical fees and lump sum payment. Some of the major benefits emanating from foreign partnerships include access to foreign technology, goodwill, marketing, brand name and international linkage. Some of the SMEs depended on certain raw materials, machines, equipment and technical support from foreign countries especially the EU, and USA. On the other hand, some local firms exported raw materials, such as cocoa beans and timber, intermediate products (e.g. cocoa cake) and finished products like apparels, plastic products, biscuits, computer parts and software. This finding lends credence to the fact that successful firms under globalization need to develop and sustain domestic and international networks and partnerships.

In general, firms (44.77 per cent) rated the role of ICTs in foreign collaboration very high. Only 13.43 per cent of all the firms either rated ICT as being not important at all or unimportant while 41.79 per cent were indecisive. Changes in product mix through diversification and or acquisition of firm(s) producing different product lines represent progress and advances in technological capability and response to competition. Four out of every ten responding firms claimed to have made average changes in their product mix within the preceding 10 years. Nonetheless, the positive influence of ICT adoption on product mix changes is confirmed by the higher proportion of advanced adopters, which claimed to have made many changes in their product mix compared to moderate adopters and non-adopters. With respect to competitiveness, the firms intend to meet this challenge by improving the quality of their products, flexibility in design, protection of market share, and goodwill/brand name among others.

SMEs development, growth and competitiveness under rapid globalization are contingent upon unhindered access to information about the local and international operating environments and challenges. However, the absence of business development services has made it impossible for gathering and disseminating such information. There is, therefore, an urgent need for the establishment of business development service centres in different parts of the country within the framework of Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), and relevant private sector stakeholders. The centres should serve to educate SMEs on benefits of appropriate technologies and technical partners and facilitate access to them. Information about market demand and supply by sector and geographical location is also very critical to the competitiveness of firms. Availability of these types of information would most likely prompt them to look beyond central Africa and ECOWAS as potential export markets for their goods and services. In this regard, SMEDAN and the business development service centres, organized private sector associations and trade sections of Nigerian embassies have appropriate roles to play.

One of the major factors inhibiting ICT diffusion and intensive utilization is poor physical infrastructure such as adequate and uninterrupted electricity supply, and communication connectivity infrastructure. The resultant effect is high cost of ICT acquisition and maintenance. The government should urgently spur existing public-private partnerships (the private telephone operators) with a view to improving the state of these types of infrastructure. The Central Bank of Nigeria should in partnership with SMEDAN and relevant private sector stakeholders, organize seminars with a view to sensitizing SMEs on the benefits and modalities of accessing Small and Medium Enterprises Equity Investment Scheme (SMEEIS) fund for sustainable growth and ICTs acquisition and utilization. Since ICT is a major driver of the globalization process, for Nigerian SMEs to be competitive they must have reasonable level of competence in ICT applications. Consequently, trade and business associations with the active support of relevant government agencies should organize regular training workshops on the various facets of e-business.

Furthermore, the efficiency of business decisions is known to be contingent on the ability of managers to assess potential opportunities and risks, and to identify and select most appropriate actions to pursue business objectives subject to external and internal constraints. There should therefore be deliberate entrepreneur skills improvement programmes for SMEs. Under the current globalization, it is no longer only individual firms that are engaged in competition rather groups of firms organized in networks, whose dynamic development and competitiveness depend on the spatial location and proximity (real and virtual) with R&D facilities, technology formation and dissemination institutions, knowledge centres, financial and export information institutions. Consequently, the government should

provide an enabling environment for SMEs to operate in efficient ways and access to relevant research and development results and market information so as to make them competitive.

The global ICT revolution offers Nigeria the unique opportunity of actively participating in a globalized economy. The biggest beneficiaries are countries that are proactive and have identified the strategic relevance of ICTs in the rapid transformation of national economic development. A major policy challenge therefore is how the country could re-engineer and re-position its formal and informal educational and training systems in order to rapidly raise ICT literacy level. In specific reference to SMEs, ICT training sessions may be organized in or around the clusters they are located in.

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