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The industrial challenges for African countries in the era of globalization, information and communication technology

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The African economic development forums of the year 2009 marked opportunities for African leaders to unite in meeting the challenges of globalization and the emerging information economy. This advent coupled with the exponentially rapid spread of information and communication technology (ICT) is deeply affecting the social, political, economic and cultural spheres in most African countries. Furthermore, ICT had influenced the paths of national development and the international division of labor in some African countries which have embraced information economy as an essence of globalization fittedness which is aided by the use and application of electronic commerce. In this evaluation, we suggest that the appropriation of ICT by African countries is strongly determined by their ability to integrate into global production networks through a techno-economic paradigm shifting. A significant disparity in terms of international use of ICT is remarkable among African countries and developed countries given the inherent and unique challenges facing the African continent. However, industrial opportunities are opening for African countries following the rapid spread of these technologies, although there is need to strengthen the innovation-mediated production in the current global information economy.

Key words: African countries, ICT, globalization, industrial companies.

INTRODUCTION

Since 2009, African leaders have largely awoken to the need to shape the African agenda so that it can be able to meet the challenges of this period of globalization and for the rapidly emerging information economy. This has been due to the negative economic performance trend which, from 2000 to 2007, showed that the real Africa's GDP growth was averaged between 5 and 6%, but in 2009 it had dipped to only 1.1% and the per capita income had declined for the first time in a decade (Global Economic Prospects, 2010). However, the need to develop clear African conceptual frameworks of globalization for this information economy has been a

bumpy slow road in Africa (The African Development Bank, 1999). Furthermore, the understanding of globalization had previously been narrowed down to only financial integration, but now, it has seemingly started to dawn on the leaders that it influences wider spheres which encompass the social, political, economic and cultural systems. This process has been so rapid especially due to the application of electronic commerce in some countries, although there is need for some kind of techno-economic paradigm shift in others. This has been slow in Africa because of the need to first of all have an adjustment of the underlying political economy which could make the information economy to thrive faster. This diffusion of information and communication technology (ICT) in Africa countries is likely to encourage also industrial adjustments and improve their integration in the

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international division of labor (The Ghana, ICT for Accelerated Development Policy, 2003). The debate around the contribution of ICT to national development has been crystallized around the fundamental questions of use, whereby there should be an essential and consistent relationship between the international diffusion of ICT and the opportunities for developing countries to participate in global supply through the promotion of local manufacturing and services.

In general, the trend of globalization and the spread of ICT has taken an important place in the African development agenda; but, more than just a global demand, globalization has been seen as a form of an organization of the international economy through which national economies can be decomposed, then rearticulated in a transaction system and process, which ultimately operates directly on international levels (Boyer, 1997). Therefore, this appropriation of ICT in African countries is part of the complex coordination of public and private actors focusing on local and international forms of its organizational production (Bamogo et al., 1996). The purpose of this paper was to evaluate how the broad dissemination of ICT in African countries has impacted the continent integration into the international arena through several African based techno-economic paradigms shifting in business organization, nature of production, dynamics in e-commerce and information technology infusion for globalization articulation in all spheres. One of the key findings implied that inequality amongst countries in the information economy is being determined by exposure, continuous development and the acceptance of information technology and e-commerce in economic agenda. The goal of this paper was to review the African continent impact of globalization by examining its gains and loses with particular emphasis on the role of information economy. We focused and highlighted the reasons for embracing e-commerce and discussed the available options that can reduce inequalities, and maximized the potentials of the opportunities which globalization offers for Africa within the context of e-commerce.

METHODOLOGY

We used the analyses of several representative African government agenda and several economic and ICT papers on the situation in and about Africa. This was to enable us synthesize the current position, trends and challenges impacted by globalization and information economy in challenging the African development agenda.

THE E-COMMERCE INNOVATION-MEDIATED INDUSTRIAL PRODUCTION

While most parts of the world are and have been benefiting from globalization (ITT, 1997), there has been some marginalization in Africa, and even some negative

aspects have been observed as well. This could have been the reason for the increase in the dissatisfaction expressions in government workers and demonstrations by workers unions together with other civil societies. Also, it could have been due to perceived disparities in the distribution of the globalization benefits. This has been more so in some countries and areas which have not been integrated into the global economy and which have access into new technologies only, but mainly by their disability in the absorption and utilization of the phase of the electronic information technology. The emergence of the new technologies requires quick skill in innovation and integration which is influenced by a profound access to e-assessed economic valuable knowledge. All these have raised the possibility of leapfrogging or are being left in economically disadvantaged situations.

Most African countries, through the strategies adopted from the 1980s in tandem with structural adjustment programs, have tended to converge towards a model of development based on open trade, a withdrawal of the nation-state from the productive sphere and a deregulation of the factor markets production. Two mechanisms are basically central in this model. The exhibition of African firms to greater international competition is forcing them to streamline and modernize their production to be more innovative. The goal is to make the industry adjust to the standards of international competitiveness through the development of the private industry, changes in methods of organizing production and a rise in the qualification of the workforce on the one hand, while establishing an investment plan to ensure high mobility of capital and sufficient level of profitability to improve the support attractiveness of multinational firms on the other hand. This regime is based primarily on a tax policy encouraging production, a social policy legislation providing flexible labor and a monetary policy of using currency devaluations to reduce real wages and restore eroded cost competitiveness. The effect of this model of development on technology transfer has been proved to be limited altogether. Two mechanisms have certainly been responsible for massive transfers of mature technologies. The acquisition of an information technology in its phase of standardization has helped in generating productivity gains, even if it is relatively small, from the feedback of information enjoyed by business users. Also, the massive importation of capital equipment and acquisition of licenses or patents have generated learning effects by practice and or by imitation, to exploit the potential economies of scale. However, this development model also imposes some limitations on the potential acquisition and appropriation of technology. First, all the knowledge embodied in technologies can only be displaced by trade liberalization. When a country moves from a protectionist regime to an open liberal one, only some knowledge becomes available (Keller, 1996). For greater clarity, when codified and standardized, their acquisition is somewhat constrained to the extent that they are readily available on the market. However, when tacit

and specific, knowledge is more difficult to transfer outside the appropriate coordination among the involved actors, strategic alliances and industrial cooperation between firms or shared funding of research programs (Mouhoud and Moati, 1994). Additionally, outsourcing manufacturing in the peripheral economies has not necessarily resulted in a real technology transfer. Multinational companies have transferred manufacturing activities significantly using labor in workshops of subsidiary workshops (footloose firms). These workshops are moved according to local conditions of profitability and competitiveness in an increasingly uncertain international environment marked by financial savings. In this case, the learning effects are reduced, while the risk of locking in manufacturing activities that do little in enhancing local technical capacity is high. Finally, the conditions of a permanent structural adjustment that are integrated into the international economy requirements may cause adverse effects. Thus, fiscal austerity measurements maintained over a long period caused a sharp decrease in funding for basic infrastructure in African countries. Similarly, such conditions do not encourage private capital (domestic and international) to move towards productive activities and research for the benefit of speculative activities or immediate return.

In fact, various signs of technological catch-up have been observed in African countries. While these countries were able to renegotiate their integration into the international division of labor, becoming key players in order to develop new technologies, almost all developing countries have nonetheless continued to remain technologically backwards. The increasing integration of African countries into the international economy has not, in many cases, resulted in exceeding the specializations acquired in the processing of raw natural resources or manufacturing activities with low added values; instead, they seem to be locked into a path of slow economic growth because of their specialization in activities with low potential for technological learning (Amable, 1992). In other words, convergence towards a model of myopic development tends to enhance specialization in these activities; now those countries are in a trap of underdevelopment (Lucas, 1988). Consequently, the technological marginalization of African countries can only cumulatively strengthen them, even as the international division of labor is more likely to be organized according to the countries' capacity to master specific knowledge. The theoretical developments have stressed the interest of a country to specialize in sectors with increasing returns. In these sectors, the market growth is not limited by the availability or cost of factors of production, but by the ability to share in the accumulated knowledge. Some lessons have led to recognition of the role of government in developing strategies and policies in Africa, improving education and training or incentives for research and development; thereby reducing constraints on the dissemination of knowledge, and especially

support for dynamic industries. Basically, what is needed in most African countries is to remove key constraints on local capacity to absorb knowledge. The development of Information and Communication Technologies innovation capacities are at the heart of this problem because they are likely to contribute in easing these constraints.

STRATEGIES FOR A TECHNOLOGICAL LEAP IN ICT FOR AFRICA

The convergence of the computer industry, electronics and telecommunications into an integrated system, leading to the development of new industries and service activities was accentuated by the rapid diffusion of ICT during the 1990s. The industrial and technological changes, with their relentless rise, have contributed to a renewal of the terms of debating on ways out of the impasse of underdevelopment by increasing access opportunities to knowledge. According to international institutions, ICT should be put to serve its role in economic growth and thereby spur and maintain economic development. On the one hand, Perez and Soete (1998) pointed out that windows of opportunity could exist for developing countries during transition periods of economic systems, marked by the emergence of new technologies. The originality of their approach is to recommend the implementation of a strategy of technological leap on the advent of a technological paradigm.

African countries basically need to reduce the technological gap and short-circuit the existing technology by directly launching it into the new technology that could replace it. Indeed, during this phase, pioneer countries are in the early stages of learning process: barriers to entry are still low and new skills are more accessible. This is because of the relatively small amount of physical capital, human and financial commitment. The advance is aimed at economizing the learning impacts of previous technologies and the inherent costs of adaptation and exploitation of directly adopting new technologies. On the other hand, restructuring the production system, by the diffusion of information and communication technology, is likely to cause a substantial reduction in spatial and temporal constraints in developing countries, especially Africa.

However, an extensive use of ICT would allow Africa to reconstruct the failing interdependencies among actors in the production and dissemination of knowledge through companies, research centers, training centers and universities leading to new forms of organization of production and work with reduced detail and transaction costs. Conventional activities of international outsourcing can be bolstered by optimizing relationships with customers, suppliers or purchasers, facilitating the integration of African businesses into international production

production networks. It is important to note that new electronic interfaces significantly alter connections between consumers and businesses in the world market through access to a wide range of cheaper and better goods, quality information on the worldwide supply, market opportunities and additional reduction in barriers to market entry (Rallet, 2001). Companies in African countries can improve their penetration in markets with strong purchasing power, opening up their production and diversifying their export of goods and services. The opening of new industrial niches and deployment of the potential development of service activities supports the diversification of the national economy (La Rovere, 1996). Particularly, it can be remote services such as call centers, outsourcing of administrative services, data digitization centers and software production.

A third view shows that the integration of technology and communication leads to the development and optimization of basic infrastructure. Indeed, the expansion of processing capacity, storage and exchange of knowledge leads to significant gains in productivity and efficiency in the management of basic needs, while renewing the local base of knowledge. The applications are manifold especially on Information and Communication Technology education which promote training and qualification of individuals through the development of distance learning methods like virtual universities, virtual libraries and teleconferencing. On health, this can be done via telemedicine which can improve care management by ensuring better monitoring of diseases through a digital record of certain diseases as well as access for diagnostic support and expertise to distance. From this point of view, African countries should be interested in making a technological leap including significant adoption of information and communication technologies. However, this possibility is constrained for at least two basic reasons. First, it denies the non-public and non-free features of knowledge in the new industries at pre-paradigmatic stage and secondly, the near unavailability of a scientific infrastructure and technology in African countries and the oligopolistic nature of the international market for technology limit their distribution in respect of African countries. The strategies for technological leap require more profound changes in the system of education, training and production. Hence, in summary, the appropriation of ICT by African countries is strongly determined by their ability to integrate them in international production networks. However, it is important to note that the international diffusion of ICT, instead of being uniform and linear, is rather concentrated even globally in certain areas such as the United States, Europe and Japan, and is currently in China.

REDUCING THE LARGE INTERNATIONAL DISPARITY IN THE USE OF ICT IN E-COMMERCE

Although, imperfectly understood, the digital division

between the developed and developing countries has been quickly established and it tends to be increasing exponentially (Shapiro and Varian, 1999). The Human Development UNDP (2001) reported a strong disparity in the use of ICT. The OECD countries which represent less than one-sixth of the world population form about 80% of the internet users worldwide and 96% of the mainframe computers connection to the internet. For example, Finland has more computers than the entire central region of Latin America, while the city of New York is more technologically equipped than the entire African continent. Hence, the transition of countries in Africa to the information society definitely stumbles on a set of structural constraints such as inadequate tele-communications infrastructure, high cost of access and use, low computer penetration and lack of specific e-commerce skills (Hodge and Miller, 1996). Comparatively, leading countries like USA, Japan, Scandinavia and China have emerged as excellent leaders of innovation in information technology. Hence, their goods and services are electronically being processed, advertised and evaluated at economically viable speeds due to reliable technological networks and low costs of access, engineering and design.

This polarization of the world geography due to information and communication technologies is a dominant trend, although not exclusive. The reduction of the digital division between Africa and these countries seems unlikely for four basic reasons: first, because the production and use of Information and Communication Technology have been dominated for a long time by a few multinationals, who in order to preserve their competitiveness and leadership position, have ensured a comprehensive control of networks, equipment design and production content. For example, the MCI-World Com alone had 30% of the physical network of the 'internet' in 2000, while the top ten companies which provide services on the 'internet' are all Americans. However, the movement of industrial concentration and merging which is being manifested in many areas can form a capital strengthening which can set transparency in the global monitoring of electronic infrastructure. Secondly, the way Information and Communication Technologies are appropriated. Until the Second World War, the diffusion of technological innovations was made possible by the rapid nature of public learning or knowledge. Nonetheless, new barriers into the information highway entry have been recently built on top of the technologies which become rapidly more complex. This is especially evident if one considers possessing this new generation of technologies. This has made the degree of international mobility to be relatively low and the degree of appropriateness to be quite high. Thirdly, the Information and Communication Technology is intensive in both research and development, that is, the research expenditure incurred for their design and development are considerably high, while the return on

investment can be long, and even well below expectations. To maximize the profitability of these expenses, the leading countries have tended to limit the disclosure of their results, particularly in the early stages of the life cycle of technology to deprive followers, especially African countries, of both complementary and key knowledge. Lastly, the Information and Communication Technology, like all other properties, are subject to market constraints. In order to offset slowed growth in developed markets, showing some signs of saturation, the international mobile telecommunications operators have tried to find new outlets in most of the dynamic markets. Thus, their arbitrations have been based on a criterion of profitability in the emerging country and / or urban areas with high densities: a typical example is Egypt's Orascom group that tends to undermine its implementation in countries of the Middle East and Africa, especially in countries of North Africa. Hence, the phenomenon of disconnection of many developing countries from the international economy is expected to become more pointed with the continuation of the technological progress. In fact, Marchal, 2000 had predicted that the dominant discourse that the diffusion of information and communication technologies is accompanied by a decrease in user costs (which by feedback stimulates the diffusion of information and communication technologies) must be a key motivation for African countries as it is now observed in developed countries. The barriers and challenges which the consumer countries, especially African countries, are experiencing are that: they will always be charged higher user cost if they wish to acquire the latest technology or have access to sophisticated interactive services. Inadequate communications infrastructure already disallows national, regional or even international interconnection links at unbeatable prices. Furthermore, these same countries are moving away more from the technological frontier as the life cycle of technology shortens. In other words, the pace of technology innovation is accelerating exponentially and is now certainly more intense than at any other time. Yet, these technological innovations better meet the needs, uses and production agenda expressed in those countries in which they were developed primarily. The development gap is widening and the applicability of new technologies in African countries is expected to contract. In fact, the diffusion of information communication in African countries cannot be viewed solely from the standpoint of the question of use. From the study's point of view, reducing the digital division is closely related to the ability of these countries to participate more actively in the global supply of activities related to Information and Communication Technology. If African countries remain only as passive consumers of these technologies, failing to produce and exploit, their dependence on external supply could inevitably exacerbate their exclusion from the international division of labor. Therefore, taking into

account the strategy of international players in the design and operation of Information and Communication Technology becomes fundamental to understanding the process of recomposing global production networks and the possibilities for developing countries, in general and in particular African countries, to promote manufacturing and service activities.

STRATEGIES TO INTEGRATE AFRICA INTO GLOBAL E-PRODUCTION NETWORKS

The international division of labor, far from being stable, is characterized by both an ongoing challenge of acquired positions and the entry of new players. During the 1990s, emerging countries from Latin America such as Mexico and Brazil, Eastern Europe like Poland and Hungary and most of Asia (in this case mainly China and Thailand) have penetrated the integrated global networks of manufacturing and business development services related to Information and Communication Technology. Studies show that African countries have largely lagged behind and are risking further marginalization if, they do not have a defined conceptional framework in redefining their development agenda in this area. For example, Gayi (2010) showed that in the period of 2000 to 2008, the least developed countries (LDCs) in Africa had become even more commodity-dependent in which the concentration index from 2000-08, for the Africa's LDCs had surprisingly increased by 73% when compared to that of the Asian LDC's which had decreased by 39% (Gayi, 2010). Hence, there is need to almost doubly invest in these e-commerce fields and carry a thorough rapid implementation of schemes of the necessary e-training and encouragement of proper education to complete the knowledge of the workforce so as to fit in the information economy world. In this case, the youth which are the foundation of hope for developing countries, should take on this challenge and aggressively be electronically compliant in the e-commerce strategies of globalization. This is one of the key ways in which Africa can contribute to its vast resources at viable quantities in the world market. There are some African countries like South Africa, Namibia and Morocco which sought to integrate into these global production networks.

However, the reorganization of the world production fundamentally involves three major structural forces which act on the consubstantial redefining strategies of multinational firms. These structuring forces are as follows:

1) International competition: This means that the intensification of competitive pressures induced by globalization weighs increasingly on sources of profitable business and requires a significant reduction in margins of standard production functions. This constraint determines the competitive industrial restructuring in two

ways. One is that the multinational firms are gradually phasing out of hardware production and are transferring this production process to specialized subcontractors, and two, that the activities of services based on implementing trivialized tasks such as computer input and remote assistance are also increasingly being assigned to other companies or affiliated companies. These subcontractors are increasingly located in countries where they have an abundantly cheap labor and flexible models of production based on job insecurity. This outsourcing allows for a higher rate of capacity utilization to produce and therefore reduce capital costs.

2) The search for new production models: Here, the position of businesses or multinational companies on standardized activities, if weakened, is encouraged to focus on activities related to higher value addition. They can thus explore new know-how, which focus primarily on three strategic areas: software design, development of information systems and business services. These developments herald the advent of a new mode of production embodying the organizational model. Industrial activity is carried on a modular basis which results in a redistribution of roles, that is, specialist firms are responsible for the design and production of modules, while the manufacturer is focused on strategic activities and production coordination of actors involved in the production process. They aim in highlighting the complementary skills so as to make economies of scale and differentiation of goods compatible, while ensuring better consumption in the markets.

3. The spatial concentration of innovations technology: Industrial changes also occur in local forms of organization based on certain logic of spatial concentration of technological innovations. The proximity of the actors plays a key role in the territorial industrial and service base with innovations of high technological content. The technopoles host local businesses, research centers and training institutions operating in the fields of Information and Communication Technology, and related technologies in a favored businesses place or multinational corporations.

Thus, to boost the local African industry and strengthen the science – education - industry, self-reinforcing endogenous mechanisms are necessary. Although mostly located in industrialized countries, many emerging technology centers originate from peripheral economies. If these are connected to each other, they can form scientific and technologic poles which in turn can form new international networks and hubs for technological innovation. A recent study by (Zepeda et al., 2009) had shown that Kenya was likely to be specialized in agriculture and more so in processed food if the Doha Round was successful. The ODI (2008) supposes that the rules of origin by developed countries would assist many African countries to diversify their economies out of the so called low value-added products. This would be

maximized more by innovations in e-commerce.

The streamlining of production and the search for new sources of competitiveness require the development of specific skills. In this sense, multinational companies are redefining their strategies so as to maximize gains in terms of localization of production costs and/or in terms of technological innovation. It is still premature to assess all the effects of these organizational trends on industrial adjustment of African countries. The international diffusion of Information and Communication Technology will, without a doubt, lead to large movements of industrial restructuring in the near future. In recent years, the reconfiguration of the world already seems to be emerging, defining new industrial specializations. Some developing countries such as Mexico, Malaysia and Thailand have set important platforms for assembly and production of generic components in the semiconductor industry. The international assemblers such as Solectron and Flextronics have developed subsidiaries in these countries to concentrate part of their production and improve yields of scale. Similarly, telephone brands such as Nokia, Ericsson, Alcatel, Samsung and Siemens have attempted to withdraw from manufacturing to focus on research and development, pre-figuring a new wave of offshoring in the peripheral economies. India has emerged also as a global hub of IT outsourcing. Many multinational companies, in all sectors combined, have outsourced their services. The market and remote computer services like telemarketing, customer support, back office, managing payroll, managing databases, processing of credit cards, etc. could have represented nearly 500 billion U.S. dollars in the world by 2008 (UNDP, 2001). Moreover, with a large base of computer engineering skills at low cost, India has come to build competitive advantages in designing information systems and software. Other countries also seem to benefit from this movement of remote outsourcing services. Morocco (as an African country) and Turkey, taking advantage of geographical proximity and cultural cooperation with countries of the European Union, have the potential of becoming major suppliers of remote services in the Mediterranean area, especially for markets in French / Hispanic. Both countries are hosted on behalf of the European companies call centers and places of systematized capture. Surprisingly, the countries that are now seemingly taking a greater advantage of the diffusion of information and communication are the same ones benefiting from a diversified industrial base and an appropriate infrastructure. Reliable information technology in infrastructures such as communication, transport and education, have created location advantages in industrial activities by adding an e-technological content in commerce.

CONCLUSION

The developments of strategies to survive and thrive in

the globalization process have been closely linked to advances in information technology. Africa has largely stumbled over log jams in the process of internalizing the whole concept of globalization and in adjusting to the rapid phase of adopting information economy in development. The Information and Communication Technology undoubtedly have opened new opportunities for industrial upgrading and adjustment for African countries by introducing significant organizational changes. The proliferation of forms of communication and access to knowledge, with its potential applications are likely to optimize production processes, training and organization. However, globalization makes an uneven diffusion of information and communication technologies between countries, posing the risk of a digital divide. The access and control of Information and Communication Technology are inseparable from their integration into national production systems. Globalization and the exponential spread of Information and Communication Technology have hereby been discussed to have an impact on industrial growth. This advantage is remarkable in almost all developed countries and some emerging countries like China. African countries, however, have been unable to benefit greatly from globalization and the ICT due to specific problems which impede their development. This issue is at the interface of the strategic plans of multinational firms and political adjustments and adaptations.

The double movement of internalization of production and the spatial concentration of innovations determines the inclusion of certain African countries in international industrial networks. However, at the same time, the stress induced by globalization may reinforce a phenomenon of exclusion of other countries, especially African countries in the international economy. This could imply that there is need for:

1. The reorganization of production of multinationals on a global basis to bring heavy pressure on local suppliers. Although, the efforts of technological and organizational learning may be difficult to achieve, the requirements for quality, flexibility and control delays may result in an increased control of multinational firms on the industrial process, which may result in the ousting of less efficient companies.
2. A permanent tendering among countries which might create a risk of an excessive deregulation in order to match the lowest bidder. The economic liberalization programs in Africa have in many cases led to the demolition of government policies which have resulted into three main consequences: (a) A loss of social, scientific and industrial infrastructure. (b) Inconsistency of the institutional framework affecting the regulation of market mechanisms. This means an unclear reforms strategy, low transaction transparency, bureaucracy and imperfect application of the rules. (c) The loss of control by the local components of the industry, research and

training of the national system of innovation (Mezouaghi, 2002).

3. The deregulation of markets for factors of production which weakens the internal economic balance. On the one hand, volatility in international capital exposes countries to sudden reversals of market conditions, while on the other hand, the increasing demand in developed countries for specific skills increases the mobility of scientists and specialists such as engineers and technicians, by inducing a reversal of technology transfer ("brain drain") sponsored by the developing countries, especially by the affected African countries.

In this case, the integration of Information and Communication Technology into the local industry should lead to a redefinition of the role of government policies in assimilating the full concept of globalization. Indeed, we have evaluated that the globalization might reduce the flexibility of national governance in African countries in the long run. However, the role of government in knowledge production and acquisition of new information is critical (David and Foray, 1994) and more so, in countries where basic infrastructure is poorly developed. With globalization and spread of Information and Communication Technology, national governance tends to disappear in favor of indefinite and unbalanced international governance. However, international rules on trade, capital flows and protection of intellectual property rights are insufficient to preserve the interest of least developed countries, especially African countries. On the one hand, the apparent international consensus does not withstand the force of the legal arsenal deployed by multinational firms, while on the other hand, the failure of legal and institutional capacity of developing countries hinders their bargaining power considerably. Reducing the large disparity in terms of international use of ICT is compatible with the capacity of African countries to implement proactive strategies for development and to impose their own interests in international institutional arrangements. The world trade recovered much in 2010 after the recession; however, the question still lingers on how Africa will transform its structure and composition of trade in a bid to sustain economic growth and development. This question will find its full solution when Africa would have embraced the full concept of globalization and information economy in the phase which other nations are endeavoring to keep.

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REFERENCES

- Amable B (1992). Effects of national learning, international specialization and growth trajectory. In D. Foray, C. Freeman, Technology and the Wealth of Nations, Paris. Economica, pp. 213-232.
- Bamogo D, Ouedraogo A, Bako M, Tankoano J (1996). The Impact of new Communication and Information Technologies in Developing Countries: A Case study of Burkina Faso'. Paper presented at the International Workshop on Information Technology for Development UNU/INTECH, Maastricht, The Netherlands.
- Boyer R (1997). Globalization beyond the myths. Paris, La Découverte. European Commission, 1997, Information Society and Development. <http://www.europe.eu.int/comm/development/lexfr>.
- David P, Foray D (1994). Accessing and expanding the base of scientific and technological knowledge. *Sci. Technol. Ind.*, 16: 14-73.
- Hodge J, Miller J (1996). Information Technology in South Africa'. Paper presented at the International Workshop on Information Technology for Development, UNU/INTECH, Maastricht, The Netherlands.
- Information Industries Taskforce, ITT (1997). 'The Global Information Economy: The Way Ahead.' Report of the Australian Information Industries Taskforce (ITT), Canberra: Australia Government's Department of Industry, Science and Tourism.
- Keller W (1996). Absorptive Capacity: On the Creation and Acquisition of Technology in Development. *J. Dev. Econ.*, 49: 199-227.
- La Rovere R (1996). Information Technology Diffusion in Small and Medium sized Enterprises: Elements for Policy definition.' *Inf. Technol. Dev.*, 1(4): 169-181.
- Lucas RE (1988). On the Mechanics of Economic Development. *J. Monetary Econ.*, 22: 3-42.
- Marchal J (2000). New Deal, New Networks. In Chéneau-Loquay A (ed.): Issues of communication technologies in Africa, Paris, Karthala-Glance, pp. 67-89.
- Mezouaghi M (2002). Emergence of the national system of innovation and diffusion of knowledge. *Revue Tiers-Monde*, No.169 (forthcoming).
- Moati P, Mouhoud EM (1994). Information and organization of production: Towards a cognitive division of labor, *Appl. Econ.*, 46(1): 47-73.
- ODI (2008). 'The WTO Doha Round Impasse. "Briefing Paper, September. <http://www.odi.org.uk/resourcesdownload/2034.pdf>.
- Perez C, Soete I (1988). Catching up in Technology: Entry Barriers and Windows of opportunity. In Dosi G, Freeman C, Nelson R, Silverberg G, Soete L (dir.). *Tech. Change Econ. Theory*, Londres, Pinter, pp. 458-479.
- Rallet A (2001). Electronic commerce or trade electrification?" In Benghosi PJ, Licoppe C, Rallet A (ed.), *Internet Electron. Commerce*, Paris, Hermes Sci. Publ., 19: 17-72.
- Shapiro C, Varian HR (1999). *Information Rules: A Strategic Guide to the Network Economy*. New York: McGraw-Hill.
- The African Development Bank (1999). *African Development Report*, 1999. Abidjan: ADB.
- The Ghana ICT for Accelerated Development Policy (ICT4AD) (2003).
- UNDP (2001). *Human development report (2001). Making new technologies work for human development*, New York, Oxford University Press.
- Zepeda E, Chemingui M, Bchir H, Kiru J, Onyango C, Wanjala B (2009). The Impact of the Doha Round on Kenya. *Carnegie Endowment for International Peace*. http://www.carnegieendowment.org/files/impact_doha_kenya.pdf.