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A synthesis of the impact of the ever evolving information and communication technologies on the economic development of Togo

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The Information and Communication Technologies (ICT) can play an important role in accelerating the economic growth potential of a country. The exponentially rapid spread of ICT is deeply affecting the social, political, economic and cultural spheres in even in poor countries like Togo. We evaluated the appropriation of ICT in Togo to determine its potential to integrate its economy into global production networks through a techno-economic paradigm shift. In Togo, ITC has impacted education, health, rural development, economic and public management and other infrastructures. Many difficulties handicap the evaluation of changes in ICT and its consequences on economic growth. Therefore, the concept of ICTs has remained vague with regard to the ever changing diversity of its components and applications. Qualitative approach was used for theoretical foundations of the relationship between ICTs and economic growth while the quantitative approach focuses on the contribution of NICTs to economic development in Togo. Our analysis indicates that despite the exponential diffusion of NICTs and their admirable contribution in the economic development of developing countries, Togo remains marginalized. This is based on the synthesis that digital economy should not only be measured by the weight of ICT sector but also by the impact of ICTs on the whole national economic activity.

Key words: ICT, Economic development, shift, production, network, Togo.

INTRODUCTION

In the Report of the Commission on the Immaterial Economy, the economy has changed. In few years, a new component has emerged as a key engine of economic growth: ICTs, the new economy (Lévy and Jouyet, 2006). Since the 80s, the New Information and Communication Technologies (NICTs) have appeared as a development tool and a cross-cutting sector which has

a direct multiplying effect on all other sectors of economic activity. ICTs development has been accompanied, as a whole, by the transformation of production processes and economics of such extent that they are sometimes considered as a third industrial revolution.

ICTs, this information revolution which was considered by most economic communities as being the 'third

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industrial revolution', is qualified among the most dominant movements which participated in the disruption of economic history on the same line as the industrial revolution and the invention of electricity from which has inevitably caused profound changes in the structure and shape of the global economy. This phenomenon allows the transition from a traditional economy to a modern one relied on the resources of a new economy based on the knowledge which focuses on information and communication. Moreover ICTs occupying a crucial and even central role in our economies such as the transmission of knowledge and information which is usually done by interpersonal contacts has known a phenomenal change even spectacular for the concept of the new economy means the increase of the growth generated from the late 1990s by the new information and communication technologies. While this change was first seen as a new industrial revolution: it is the digital TV, it is the cable and telephone by optic fiber, satellites, etc. In addition, this new economy pierces all strata of our society; it seems lively and inspired today in all sectors of economic activity, of the productivity and innovation; they allow the discussion concerning the birth of the new economy that is characterized by a considerable presence of ICTs that have to be considered as technical and economic progress instruments of nations.

The main concern of this work is to capture the structural changes generated by the NICTs as an essential and decisive factor for the determination of the economic growth and an evaluation variable of their impact of the economic development « ICTs can appear as an opportunity as well as a challenge » (Besma, 2004). It is an opportunity for the economy and companies of the less advanced countries, and those of developing countries who are already able to exploit them, and a challenge for industrialized economies.

Unfortunately, till now this technological change (the introduction of ICTs in the economic structure) has been impacted by extreme disparities in the possibilities of access to this new culture between developing countries and developed ones, for to provide the infrastructure is an unavoidable condition but it is not a sufficient condition to the determination of this diffusion disparity because it does not exist only differences in the access to ICTs and their use between industrialised nations and developing ones, but also between rich and poor people of the same country and between different regions of the country itself.

Admittedly, in order to analyse the phenomenon of the technological revolution in its most large and practical meaning, it might be useful to personify industrialised countries' global experience, of developing countries and the rest of the world as well as the regional (touching almost all the regions) by analyzing the positioning of leaders who constitute much known models in the contribution of ICTs to economic performances. We agree in thinking that ICTs contribute to the economic

development in the world. On the macro-economic viewpoint, various contributions have evaluated this point. In a widest perspective, the question is to know if NICTs contribute to the economic development of nations. Are NICTs real leverages, real potentials for economic growth? In which sectors of economic life do they occur? Will the ICTs achieved performances directly involve in an economic growth? These are thus the key questions that this summary document seeks to answer. The facts show that the use of NICTs can reduce the cost of access to information and improve decision-making. This is true if there is no technical or tariff barriers to the access to this information. When the latter is made easier, businessmen can make clearer decisions that will have a positive business impact. Transaction costs can be reduced and market transparency should be strengthened. The popularization of one of NICTs technologies can contribute to change economy production structures. This would contribute to productivity growth and could even change the main sources of economic growth while the organizational capacity of local production units changes. Modes of production could be reconfigured to optimize the use of new technologies. In this sense, NICTs seem to be more easily adopted by all segments of the population. Therefore, the technology is simple and available at very low prices, especially in terms of voice communications and infrastructure needs that make them comparatively more affordable. Economic growth theories are intended to explain the sustained revaluation of life standards observed in many countries, SOLOW model indicates thus the importance of technical progress caused by NICTs on economic activity, in other words, the economic value of investment in ICTs. SOLOW emphasizes on the participation of ICTs in explaining growth. The NICTs industry is undergoing a worldwide revolution and has become the main driving force of the global economy (Youssef and Hatem 2004). This new NICTs improvement also acts on social development. Our societies are based on communication and all social aspects are affected by the general availability of this specific communication tool.

The objective of the study we are suggesting is to assess the contribution of ICTs to economic growth. This study will allow us to (1) proceed first to the definition of economic growth and its determinants, as well as NICTs and their major components; (2) focus on the impact of ICTs on economic growth by affecting different sectors of economic activity (jobs, education, trade etc) as well as the reduction of poverty and then (3) present the famous Solow paradox on ICTs to determine the impact and effects of ICTs on economic competitiveness and productivity.

LITERATURE REVIEW

The participation of NICTs in economic growth as

development engine of economic activity taken in a general way has always been the concern of researchers and why? The works of the researcher, Feather (1994, quoted by Osama 2001, p.66) show, for example, that the use of ICTs, changing the management system of enterprises and institutions, lead to structural significant changes of economic activities. Thus, the information would affect significantly the production and distribution of goods, would serve as support to services such as transportation, banks, insurance, and would provide additional basis of competitiveness. It is under this framework that was included the idea of His Excellency Mr. Paul Kagame, President of the Republic of Rwanda, during the General Debate of WSIS Plenary Session in Geneva, 2003 who stated that "Today, we all recognize that the adoption of ICTs is not a matter of choice but it is a necessity. It gradually became obvious to us as ICTs represent an essential tool for achieving our development decisions and achieving the Millennium Development Goals (MDGs)" Paul Kagame shows us that the adoption of ICTs today has become a key crossroad for every nation in the process of economic development for the capture, transmission of information and analysis of the decisions of each State through the use of the new technologies of information and communication (NTICs).

Besides, Youssef et al. (2004), in their article entitled "*The effects of technologies of information and communication on economic growth*", stated that in new economies, technology is a major driver, not just of improved life quality for underdeveloped or developing people, but also a lever of economic development in developed and industrialized countries, and even developing countries.

Assumptions

To grasp the background of this study, we state two hypotheses.

1. The first is related to the emergence of new technologies and economic growth. This first hypothesis stipulates that the development of new technologies positively affects economic growth.
2. The second hypothesis sets out areas in which NICTs operate. It states that economic growth through NICTs is strongly felt in specific sectors.

METHODOLOGY

To reach the apprehension of the impact that ICTs will have on economic growth, we go through a double approach.

It concerns the qualitative and quantitative analysis. The qualitative approach will allow us to leaf through literature on the theoretical foundations underlying the

relationship between New Information and Communication Technologies (NICTs) and economic growth.

The quantitative approach will focus on the participation of NICTs in economic development by sector. In the absence of reliable figure data and statistics for relevant economic analysis, a study of growth model (SOLOW model) is provided. At the end of this research, we expected the following results: 1. to raise the positive importance brought by new information and telecommunication technologies in the nations' development and economic growth. 2. To list the activity fields in which NICTs operate great changes. 3. To succeed in contradicting with convincing justifications of the productivity paradox of NICTs as being economic growth engine.

ICTs' role in the economic growth

ICTs are essential in developing countries, to enable everyone to participate fully in the knowledge economy of the twenty-first century. We found concrete impacts on services such as health and education on markets where ICTs record a strong growth," states Dr. TouréHamadoun, General Secretary of the UIT. The development of a new generation of Information and Communication Technologies (ICTs) in the early 1990s, has been associated with various assumptions such as the occurrence of a new economy (digital economy that is not only measured by the weight of ICT sector but also by the impact of ICTs on the whole economic activity). During the phase of planetary spread, corresponding to the end of the last century and that has been decisive, "the thesis of the new economy foreshadowed not only new growth tendencies in industrialized countries, but also the hopes of fast catching up by developing countries" (Boyer, 2002; Bellon et al., 2003). ICTs are in fact generic technologies, that is to say, the technology used by all other activities: therefore, the fact that the backing role to economic growth that Information and Communication Technology (NICTs) play is a necessary condition, though insufficient, fears of an increasing marginalization of developing countries before the spectrum of the digital divide in the explanation of the transition to a new economic order in the whole world (Figure 1).

THE ICT AND ECONOMIC GROWTH

Concept and measurement of economic growth

Economic growth refers to the increase of goods and services produced by an economy over a given period: hence "growth is the continuous increase over a long period of significant quantities and that the pursuit basically involves changes in economic structure" Jacques (1988). This concept refers to sustainable growth of national wealth accompanied by transformation

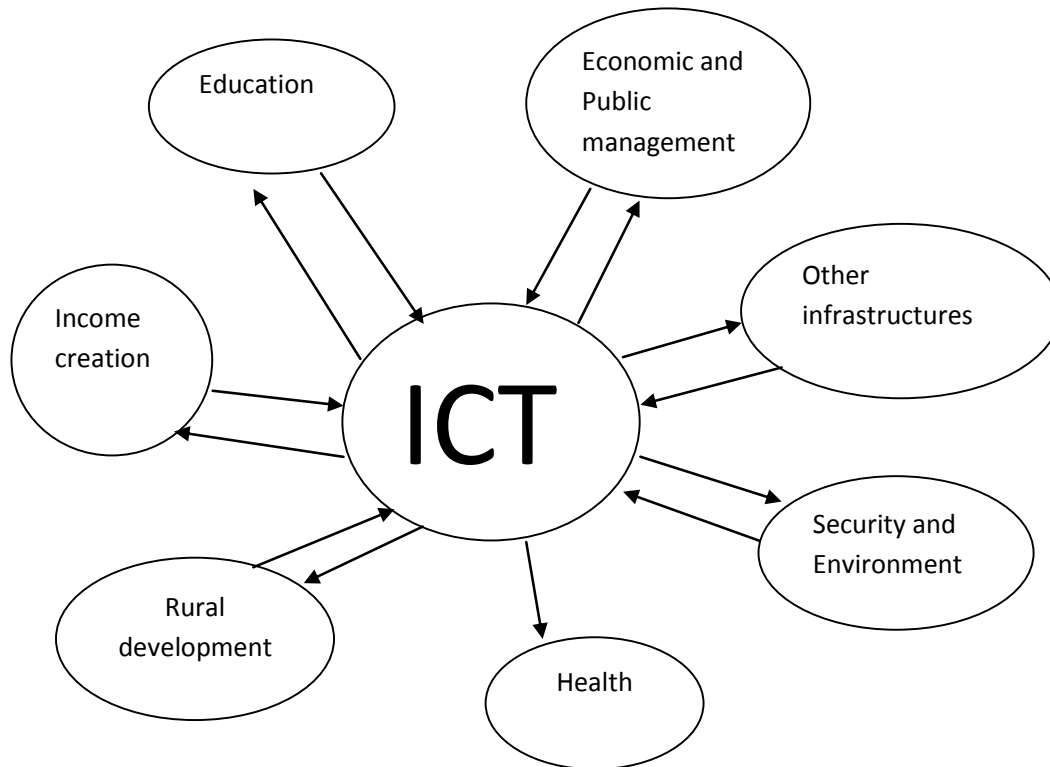


Figure 1. Schematic illustration of the potential between ICT and general development.

of economic structures. Growth is a fundamental process of contemporary economies. It transforms individuals' life by providing more goods and services. In the long term, individuals' living standard depends solely on growth. Similarly, the enrichment resulting from economic growth alone allows (but not necessarily) to remove material misery.

In practice, economic growth is generally measured by the use of economic indicators of which the most commonly used is the Gross Domestic Product (GDP). Economic growth is measured by reference to the rate of growth which is the rate of change of GDP. The formula for calculating the rate of GDP in the year "n" is the following: " $[GDP(n) - GDP(n-1)] / GDP(n-1)$ ". Similarly, growth of GDP per inhabitant is used to measure the growth of living standards.

Concept of New Information and Communication Technologies (NICTs)

New Information and Communication Technologies (NICTs) appear as a set of computer technology used to process, change and share information and education that contribute to a genuine economic revolution, especially their applications in economic field. The main advent of ICTs is without doubt the Internet that opens

the door to the information society. Domain of NICTs can be seen as the convergence of means by which the human being can make use of electricity as information vector. For their part, discussions held in the framework of policies' committee of information, computer science, Cooperation and Economic Growth Organisation, OECD (2000) led to consider domains of NICTs as that of all economic sectors that contribute to visualization, processing, storage and transmission of information by electronic means (Didier Lombard, Patrice Roussel and Sylvie Du martin, 2001) NICTs can affect the development of production in several ways. First, investment of enterprises in the field of NICTs and the consumption of NICTs by households, similarly to services produced by NICTs, constitute tools involved in expansion of the nation's total expenditure volume and, therefore, to that of GDP. Furthermore, these new technologies (NICTs) constitute constitutive a percentage of the added value of a particular economy. The share of NICTs'producing industries in the GDP is a key indicator, which we may conclude, an improvement at the level of the sector's contribution to GDP growth if the considered economy as a compartment and this sector's added value variation proportions are known. So even if the share of these firms in added value is relatively low, a huge growth related to this sector can generate a significant contribution of this sector to a global economic growth.

Field of New Information and Communication Technologies (NICTs)

Over the years, the display of various products related to data processing has given rise to a new area that some call digital economy according to Moulton, 1999 and other NICTs (OECD,2000). The branch of NICTs produces goods and services that support the process of economy digitization and act either as capital goods or as intermediate consumptions in productive system, or as household durables . All other activities from NICT sector are collected by "non- NICT sector." This delimitation is difficult, both for conceptual and operational reasons. Therefore ICTs' sector includes those of activities that produce goods and services that enable the digitization of economy, that is to say, the transformation of used or supplied instructions into digital instructions, easy to handle, restore, store and report.

Characteristics of the New of Information and Communication Technologies (NICTs)

In this new millennium, and in the context of globalization all specialists stick to emphasize the crucial importance of so-called NICTs or digital economy for economic growth and employment. It has become common to relate N ICTs to the concept of Information Society .In other workds, with the development of NICTs, there would be modifications or changes in society.

We notice nowadays more and more objects or composite products that combine three sectors: computer science, telecommunications, television, along with development, creation and propagation of sound and image ,speech recognition, written or spoken language, associated with the mobile phone. These various technologies and products are characterized by their ambiguity and their ability of hybridization.

IMPACT OF INFORMATION TECHNOLOGY ON ECONOMIC ACTIVITIES

Impact of ICTs on education

To enrich learning through technology is one of policy areas of NICTs. In our current economies, highly competitive and globalized, education is no longer confined to classrooms. New technologies (ICTs) can enable on the one hand education in a traditional setting and support individuals to meet the challenges of teaching throughout life on the other hand. ICTs maketraining easy and allow to customize and make it more flexible (Reding, 2005). Education (training) based on ICTs can be at the same time interactive and collaborative. It provides a much better motivated learning atmosphere and besides, it is therefore about activities

that involve active participation of students and allow them to take advantage of the means of collaboration, communication, information retrieval and simulation offered by ICTs and multimedia. Enriching, inside the classroom or elsewhere. These modern systems must also allow personalized learning that meets needs of individuals in both content (what we learn) and method (how and when we learn it) . Education may be provided when desired by the channel you want: Internet, a computer, TV even mobile phone. These ICTs components give a great value to learning throughout life, which is necessary to consolidate economic aspects. This change in education system creates new markets for education and training fields and also allows economies of scale. This compelling result transforms the way to understand training and learning.

Education for all; at any time and in any place

New and relevant learning and training systems appear as an absolute necessity in all areas, from economic competitiveness to social integration. In order to better master digital tools, ICTs can contribute to their structuring by improving traditional education and providing more flexible training solutions throughout life. ICTs can help improve teaching ,training throughout life and social integration (Reding, 2005).

Information and communication technologies (ICTs) promote training throughout life, and thus allow to continue learning after formal education. By assisting people to acquire new skills, ICTs benefit both these people and economy as a whole, and keep a huge part of labor.

Another important aspect is, of course, the digital culture. Today, almost the majority of workers must be able to use ICTs, so that training in their use constitutes both a key aspect of the developed countries' plan of integration and an unavoidable clause to benefit from contribution of ICTs according to training. It offers a flexible and open structure with egalitarian relationships between learners and trainers. However, this concept is differently interpreted by Europeans and Americans. The former promote process and reasoning while the latter favor the realization of the task, final product, no matter the means. A difference to consider in educational projects between the two continents.As new technologies allow everyone to create and announce or publish contents more easily , an immediately precedent volume of information is available today on broadband networks. That is why, in global information society online that is ours, it is essential to have basic skills to separate the meanings of media messages we receive.

Impact of ICTs on Employment

Time is not to weigh the "prosandcons", says Elizabeth

Salguero Carrillo from Bolivia and Mr. Osamah Abu Ghararah from Saudi Arabia. In early 90s and with reference to programs by the International Monetary Fund (IMF), world of labor has undergone major changes and emerged under new economy emergence influence (economy based on knowledge and information) and more specifically in area of ICT (information and communication technology), a phenomenon that has caused an increase in the living standard and job characteristics, especially among the most qualified people and that has revolutionized the framework within which labor relations were traditionally subscribed and, through economic structure major changes by having an impact on employment, livelihoods and incomes of individuals. The interactive effect of these events had a deep effect, but still unsteady, affecting various economic sectors, trade in goods and services, as well as different types of businesses.

Thanks to consequences that ICTs have had on the various links making up industrial relations (labor contracts, working hours, payment of employees, employees' participation etc.), new forms of work and new types of long-term employment have emerged. The structure of formal employment has increased significantly. The concept of "employment" itself should now be used in the broadest sense, incorporating formal sector jobs, as well as new classes of employment such as jobs reserved to people with disabilities, subsidized employment, self-employment. It should be noted that changes in production process have deep results on demand for some job categories.

The sector of ICTs stands as one of the new and most dynamic sectors and offers the largest number of jobs. New economy knowledge changes the request on the labor market of worldwide countries. All nations that enabled the technological revolution to feel its impact, request for personnel with a high qualification level, particularly in ICTs, has also increased. Internet expands opportunities on market, both in terms of scope and scale. Future entrepreneurs can take advantage of the fact that there is less difficulty in entering various markets, the cost of equipment and investments being lower. In the case of intangible products such as software, knowledge and innovation are far more important than capital. as well as, telecenter, renting a mobile phone facility, gives birth to new jobs with a minimum investment. ICTs provide facilities decentralization of activities able to expand to other countries as developing countries provided they integrate with global value chains.

Impact of ICTs on poverty

Many people think that lack of access to ICTs is a component of poverty similar to insufficient nutrition or inadequate housing. If poverty is defined as a lack of access to Internet, for example, no other in the world

would have escaped poverty before 1969 when the first network was established. Despite this, Information and Communication Technologies play a crucial role in efforts made to escape and reduce poverty. Poor people are therefore aware. If this option is available to them, they are willing to spend more than two per cent of their income on telecommunications according to Charles Kenny, Juan Navas-Sabater and Christine Z. Qiang in "Les TIC et la pauvreté" because ICTs offer access to information that can create income opportunities, improve access to basic services or improve impact of interventions in health and training sectors. They also enable poor to meet their requests for support. Technological and economic changes affecting global communications network lead to transformation of the latter and thus open good aspects. ICTs can have a direct significant impact on the poorest's life quality. They allow weak and rich people to have access to markets, request services, receive an education and learn new skills.

They allow the disadvantaged to express themselves, enabling them to use their knowledge, skills and strengths to escape poverty trap. For example, ICTs can contribute to reduce prices that may be charged by manufacturers themselves for their goods. They also lead to reduction of the competitive advantage of a place, allowing a specific company (foreign) to offer goods at a better price than local one.

PARADOX OF SOLOW

Although debate on impact of ICTs on growth ends earlier, new economy (economy based on information, knowledge, expertise and technology) has been extensively used in late 20th century (1980). This notion is inserted in 1987 by the famous economics Nobel Prize R. Solow in a statement to New York Times Book Review (L'Express Fr. L'Entreprise com), known by his memorable paradox "We see computers everywhere except for productivity statistics".

With the production function of SOLOW (stationary model of SOLOW):

Where: α = Elasticity of the production with labor force
 $(1-\alpha)$ = Elasticity of the production with capital

Those coefficients explain the fluctuations of the production when the labor force and capital varied.

$$\Delta Y/Y = \Delta A/A + \alpha \Delta L/L + (1-\alpha) \Delta K/K$$

$\Delta A/A$ = Residus obtain by the influence of technical progress

He remarks existence of a part of economic interests of ICTs investment still proving that massive funding achieved by enterprises in ICTs would have not won major significant productivity gains and on the other hand that surplus productivity caused by computerization is, in fact, clear but obvious even not easily recordable in

economic activity. In other words, technical progress caused by New Information and Communication Technologies would not have much impact on the overall economy than previous industrial revolutions, which have cleared considerable deposits of productivity. Computerization is an evolution of society, during which hardwares used increase.

Most economists are surprised that this new dominant technology has not managed to move the needle of productivity and that productivity approximations do not seem to report a significant influence of new technologies. But distinct economists, like Paul David, taking example of dynamo, prove that any major technological innovation has an effect on overall production system after a certain period of adaptation (David, 1990). Thus, positive fruits of electricity on productivity have appeared only after 15 years of onset of dynamo. Solow's paradox would then be a temporary and necessary step in the development of ICTs. There are otherwise hidden costs that are related to ICTs diffusion (training, operations or dysfunctions, uses) that are a little difficult to assess and assimilate various economic analyzes on true extent of ICTs. A technological revolution that does not improve performance of work, this is a mystery. (Kalika, 2003). Currently one helps explain the Solow paradox by several conflicting thesis; whether ICTs have a minimum initial contribution to improvement of low economic productivity (due to the existence of several resulting : training effect, higher state of organization) or productivity has been massively increased after the existence of Solow paradox (1987). The overall findings are yet to be corrected, as productivity gaps are enormous depending on branches or certain fields of activity; such as banks and transportation, where profits of productivity are very touching. Therefore, one understood why the computer and Internet could and discontinued "(Maurice and Jean-Pierre, 2006), because, as author points out rightly ICT is the economy of both engine of change but also its consequence. Abbreviation of dynamoelectric machine, dynamo stands for a direct current machine operating as an electric generator. In fact, dynamo produces a DC stable, while current generated by the bicycle alternator is like an irregular flows. But recent trend of U.S. economy has given a new rise to productivity paradox. Since 1992, United States have undergone strong economic growth (3.5% per year on average), but it was special because it was 2.1% per year from 1996 to 1998. Similarly, while different productivity indicators have generally remained weak in Western countries, there has also been a sharp increase in labor productivity in United States since 1995 (2.5 % per year against 1.5% for periods earlier), if we consider that expansion of U.S. economy over past fifteen years, it appears that United States, after having swallowed massive entry of ICTs in economy between 1975 and 1995 have topped Solow paradox and are inserted into a new phase of growth in which ICTs take an essential task in medium and long term; from 3.5% in

1980 to 4.8 % in 1999 we notice an improvement of burden of ICTs in U.S. economic activity. Yet, in March 2009 ITIF published a fascinating study that confirms engine and important role of ICTs in U.S growth and productivity and therefore deserves to be widely disseminated and meditated in world, thus progress in technology information would be responsible for two-thirds of productivity growth since 1995 (France and most European countries have similar rates). In addition to this, U.S. GDP would increase in ten years from 2000 billion dollars thanks to only digital revolution.

Evolution is ultimately faster than the most optimistic forecasts made in late 1990s. This study also emphasizes that United States are not of course the only ones to benefit from this growth and ITIF gives example of China, Korea and India, which represent new digital powers who are asserting themselves since information technologies are responsible for 38% of total increase in productivity factors and 21% of GDP growth in these countries. ICTs represent the end of Solow paradox. In digital economy, it worth of Nobel Prize to see a computer on every office. However, to cause a disaster, you just need a computer, but disasters are not good for productivity (Rallet, 2002).

DISCUSSION AND CONCLUSION

The macro- economic implications of new technologies including rate of growth and productivity, sparked a broad debate in economics over last decade, as evidenced by the positions on productivity paradox of SOLOW. From the point of view of economic analysis, two circumstances can be mentioned. The first is to certify, on the basis of experiments established in United States and in some industrialized countries, that ICTs play an important role in accelerating economic growth potential of countries. The second position gives more explanation of growth supplement found in some developed countries to combination of several factors which have their origin in the early 80s (deregulation of markets, policy effective macro -economic stabilization, control of inflation by central bank intervention, existence of a labor market and vibrant capital markets, internationalization of strategies of firms and economic globalization etc) ICTs would be overestimated from the perspective of their contribution to growth (Boyer, 2002; Gilles and Horta 2003 and Gordon, 2003). Some Third World countries consider that mass adoption of ICTs can enable an accelerated catch "expedited" countries. ICTs could be cause of a change in their growth rate and better integration into the international division of labor (DIT). Shipping ICTs can indeed allow opening of respecialization "windows" for countries with a low level of development. New opportunities can be seized as evidenced by passage of China in computer industry and India in software. Thus, some nations have undertaken major reforms to facilitate the spreading of new technologies in their economies.

The Information and Communication Technologies would therefore be revolutionary instruments that will allow to give a human face to globalization (UNDP, 2007).

In this work we have tried to show how Information and Communication Technologies emerge to lead to an increase in economic growth, in other words how ICTs can enable developing countries to accelerate their growth and have positive effects. For this reason, we initially used presentation of ICTs' role as decisive in process of economic growth. Addressing the link between ICT and economic growth, we concluded that the stimulatory effects of economic activity went through education, employment stages and reduction of poverty (Campbell, 2001) Only ICTs allow developing countries an access to global mass economy. Indeed, impoverishment is due to lack of competitiveness and integration into global economic activity. In addition to this, speed and force of globalization create a vicious circle resulting in increasing marginalization of the poor and a growing gap between the haves and have-nots. We then sought to show key role of ICTs in economic activity by stimulating productivity and skills of economy through the use of economic importance of Solow paradox. Developing countries' economy continues to be a fundamental consumer and yet ICTs producer. To reach advanced stage of development would allow to better benefit from the use of these technologies. This requires a better trooping between producers and consumers sectors and a wider ratification (adoption) and diffusion of ICTs in economy. The initial delay in equipment, infrastructure and human capital can be a major handicap for growth and development (Aubert and Reiffers, 2004). It should be noted that many difficulties handicap assessment of the consequences of the spreading of ICTs on economic growth generally in developing countries with low income that concept of N ICTs still remains unclear due to diversity of its components and its quite complex uses.

RECOMMENDATIONS

1. Encourage nations to continually invest more in the area of communication and computer technology, in order to achieve a sustainable and efficient globally linked economic development.
2. Initiate inter-institution based ICT training programs for use and constant upgrades and updates of hardware and software applications for all sectors.
3. Encourage research in developing homebased and home grown applications of ICT changing structures of new information and communication technology for economic growth. For example, this innovativeness has happened in Kenya where the country has developed a money transfer system using mobile phones (called M-PESA) which has transformed the rural banking approaches and has greatly enabled the country to leap

from a poor country to a middle income country in less than ten years.

4. Each nation must establish a unit responsible for the promotion, supervision and regulation of use of NICTs in order to weigh in a qualitative and quantitative way effects of these new technologies in economic fabric. This can include even a cyber crime investigation department so as to guarantee a sustained trust amongst customers on new innovations.

Conflict of Interests

The author has not declared any conflict of interests.

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