

Chapter 9

INFORMATION AND COMMUNICATION TECHNOLOGIES AND ECONOMIC GROWTH

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ABSTRACT

Traditionally, economic growth has been one of the most analysed elements of economic literature. From the traditional neoclassic models of exogenous growth to the endogenous growth model of the considered variables to explain growth in an economy, there have been changes in order to explain the main changes that have occurred along time.

In the previous decades, a new transformation has taken place as a result of the development and implementation of Information and Communication Technologies (ICT). Consequently, many of the traditional parameters have changed, and they are conditioned by this new environment, i.e., the Information Society.

In this chapter we analysed factors which explain the expansion of these technologies and, consequently, development of the Information Society, to what extent these technologies can affect, directly or indirectly, economic growth, and which are the minimum conditions which should be considered so that these technologies clearly promote growth in their economies.

1. A NEW ECONOMIC ENVIRONMENT: THE INFORMATION SOCIETY

The first steps regarding the use of Internet data from the last years of the sixties, however, were in the nineties when the Net was wildly developed on a worldwide level. In fact, the so-called Information Society is developing at a fast pace because the accelerated convergence among Information and Communication Technologies (ICT) has provoked a

large increase of the offering of goods and services, and has established new opportunities so that developing countries can reach a proper socio-economic development.

This important expansion of the Information Society has taken place due to the confluence of several factors.

The strong increase of technological innovation in the last decade (optic fibre, digital technology, etc.) allowed diversifying possible access to the Net facilitating an increasing number of citizens who are aware of the advantages of the use of information and communication technologies. Moreover, some of these new accesses, such as cellular telephone, allow countries easily with a scarce infrastructure in communications to easily access the Internet. The new possibilities that these innovations open are provoking an important alteration in the economic and social citizens' behaviour at a worldwide level, especially in certain countries.

This innovation process does not seem to slow down; furthermore, an accelerant of this process has been observed because currently, not only the mechanisms that facilitate access are achieving not only on research but also on the speed of those mechanisms. Cost savings due to broadband in comparison with other systems, especially rented lines, can generate a strong increase of its use in developing countries, because the direct use of broadband wireless technology will be cheaper than creating the traditional wiring infrastructure¹⁵.

There have been significant changes in the legal framework that are encouraging the use of these technologies in certain countries. In many societies a process of liberalization has started, especially in the telecommunications sector, which allowed an increase of competence in this sector. In addition, several laws have been approved, mainly regarding personal data transmission and payment security, in order to guarantee stronger security in transactions made through the Internet. Development of these legal frameworks has created not only more opportunities in the use of ICT but has also allowed the creation of an environment in which citizens have become safer when using these technologies regarding economic transactions. However, these legal changes have been more significant in developed countries than in developing ones. In fact, one of the most important current concerns is the necessity to establish a proper regulation that guarantees the maintenance of the main fundamental human rights.

Authorities show more interest. In this sense, in the last decade it has been observed that in many countries, their own authorities, and some international institutions (UNO and ITU among them) is clearly favouring information society development.

ICT and its ability to foster growth and economic development is clearly manifested in the Millennium Declaration¹⁶ declared by the United Nations by a consensus of experts from the Secretary of the United Nations and the IMF, OECD and the World Bank. Under the framework of this Declaration, 8 objectives, 18 targets and 48 indicators were approved. In order to achieve objective 8 (referring to promoting a worldwide development association) one of the targets is the use of these technologies to promote collaboration with the private sector¹⁷.

¹⁵ There are several examples about this topic in <http://www.itu.int>.

¹⁶ Published by the Public Information Department of the United Nations DPI/2083/Rev.March 1, 2000.

¹⁷ See: <http://millenniumindicators.uhn.org/unsd/mispa>; <http://hdr.undp.org/report/global>;

<http://hdr.undp.org/docs/publication>; <http://unstats.un.org/unsd/mispa/>

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<http://www>

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The importance that in the Millennium Declaration is given to the utility of ICT in economic country development and of its role in achieving a higher economic growth, especially in developing countries, justified the celebration of a World Meeting about the Information Society.

The General Assembly of the United Nations adopted, on December 21, 2001, a resolution (A/RES/56/1869) in which it was approved to hold a World Meeting about the Information Society with the aim of analysing how the Information Society is being developed at the worldwide level. It was established that the Meeting had to have two phases: the first one, held in Geneva from December 10th to 12th, 2003; in this first phase a Declaration of Principles was adopted as well as an Action Plan. The second phase will be held in November 2005 in Tunisia. It will focus on strengthening achievements made in Geneva and to discussing new targets.

In the Declaration of Principles¹⁸ approved in the World Meeting about the Information Society held last December 2003 in Geneva, it is clearly explained that if an Information Society is required for everybody, it is necessary to encourage an Information Society that considers the person by itself, and that leads the potential of these technologies to promote new development targets established in the Millennium Declaration. That is, trying to eliminate poverty and hunger, achieving a worldwide minimum education, promoting equal rights for women, improving health and achieving an adequate and sustainable development in a more peaceful, wealthy and fair world.

Therefore, nowadays there is a clear international perspective that the proper use of these technologies can foster socioeconomic growth. In this new environment, that is, the Information Society can result in an out performance of the main parameters, those that are typically considered within economic growth¹⁹ and especially in an increase of the quantity and quality of human capital²⁰ and social capital²¹, which would favour countries' economic growth.

Moreover, as the Information Society turns into a real Knowledge Society, (a proper management of the information that can be achieved by using these technologies) it could increase this favourable effect on growth.

2. ROLE OF ICT IN ECONOMIC GROWTH

The strong development of ICT in the nineties has resulted in an important transformation of the socio-economic aspect that conditions economic growth. Nowadays, these technologies allow development of economic activities, the spread of knowledge and,

¹⁸ Declaration of Principles of the World Meeting about Information Society. Geneva 2003 – Tunisia 2005. See <http://www.itu.int/wsis>. February 2004.

¹⁹ For more information of the characteristics of the theoretical evolution about economic growth models, see Barro (1997) and Valdés (1999).

²⁰ Importance of human capital on economic growth is clearly backed on economic literature by several authors such as Romer (1986, 1987 and 1990), Kyriacou (1991), Mankiw, Romer and Weil (1992).

²¹ Some references about the importance of social capital on economic growth can be found in North (1990), Fukuyama (1995 y 2001), Putnam (1993 and 2002), Putnam and Goss (2003). Solow (2000), Woolcock and Narayan (2000).

more importantly, to interrelate in an easier and more flexible way all the different social agents, both public and private. These possibilities now make ICT be considered as a main factor in achieving economic growth in nations.

Table 1. Contributions of ICT investment to GDP growth, 1990-95 and 1995-2002, in percentage points

	1990-95	1995-2002 ¹
Australia	0,355	0,605
Belgium	0,380	0,781
Canada	0,334	0,600
Denmark	0,468	0,782
Finland	0,220	0,551
France	0,135	0,315
Germany	0,255	0,363
Greece	0,272	0,566
Ireland	0,199	0,601
Italy	0,135	0,427
Japan	0,310	0,518
Netherlands	0,283	0,626
New Zealand	0,257	0,516
Portugal	0,000	0,495
Spain	0,230	0,466
Sweden	0,455	0,937
United Kingdom	0,381	0,718
United States	0,509	0,836

¹1995-2002 for Australia, Canada, France, Germany, Japan, New Zealand and the United States, 1995-2001 for other countries.

Source: OECD Productivity Database, September 2004, [www.oecd.org/statistics/productivity]

If the OECD data regarding the contribution of these technologies to GDP growth of the main developed countries are analysed, it can be observed that such contribution does not seem to be very significant (Table 1 and Figure 1); however, it seems clear that its direct effect on economic growth is increasing, which can justify the special interest which authorities have in fostering the use of these technologies and in developing an Information Society.

Considering the benefits these technologies have had in countries such as the United States or Canada on economic growth, it is not strange that the authorities of almost every geographic area show a great interest in their use.

If Information Technologies and Communication Technologies (table 2) expenditures as a percentage of GDP are analysed, it can be observed how the European authorities maintain their interest on developing these technologies. In the European area, from 2000, several actions²² in order to use these technologies as a motor of economic growth have been carried

²² In December 1999, the European Union took up an initiative called "eEurope: an Information Society for everybody" which was widely accepted in the European Council held in Lisbon in March 2000. The European

out. In addition, their target was to try to create a more competitive Europe at a worldwide level, and with a more balanced economic growth.

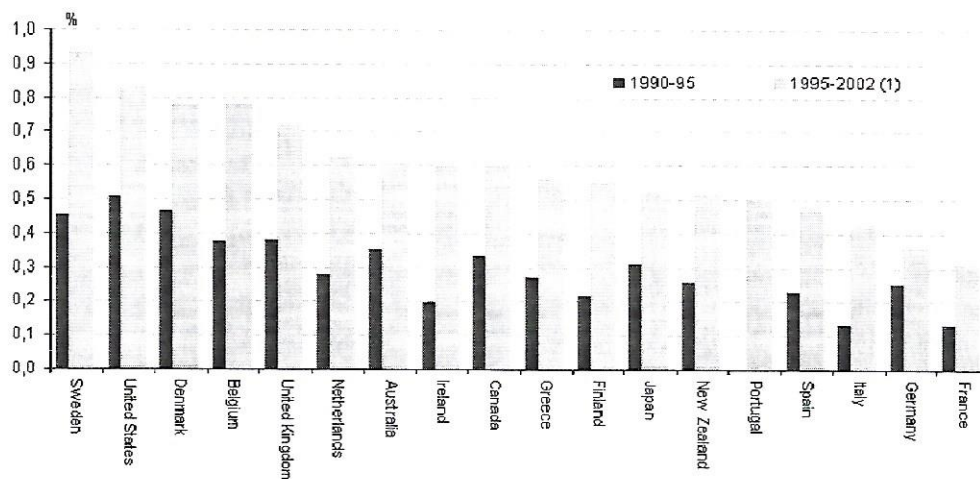


Figure 1. Contributions of ICT investment to GDP growth, 1990-95 and 1995-2002, in percentage

(1). 1995-2002 for Australia, Canada, France, Germany, Japan, New Zealand and the United States, 1995-2001 for other countries.

Source: OECD Productivity Database, September 2004, [www.oecd.org/statistics/productivity]

Currently, Europe has lower levels than those of more developed countries, which could justify that these technologies still contribute little to European GDP growth. However, it seems to be clear that there is a great interest in facilitating the access of these technologies to larger numbers of citizens, so that the biggest benefit could be achieved from them (Table 3).

This interest in developing an Information Society is not only being fostered by developed countries, but also by developing ones. As can be seen in table 4, developing countries are making a great effort in increasing the number of Internet²³ users because it is

Council asked the Commission to elaborate an action plan, eEurope, which was adopted in a Meeting of Nations' Presidents in Feira, in June 2002.

See: Comisión de las Comunidades Europeas (2001, 2002 and 2004). For further information see http://europa.eu.int/information_society/eeurope.

²³ In June 2000, in El Cairo, Latin America, African and Asian countries, that belongs to G-15, stated that they were able to face the adverse effects that the globalisation and the liberalization of markets were imposing them, even though some of them have very limited their actions due to the payment of their external debt and lack of international help. One of the instruments that can be used, as some of these countries say, to join properly to this economic globalisation process is the use of ICT, therefore some of developing countries are promoting their implementation and use, in many occasions with the support of international organizations (such as United Nations and International Telecommunication Union).

Some countries such as Cameroon, Kenya, Congo Democratic Republic, Mozambique, Somalia, Malawi, Zambia, Sudan, Ethiopia, Tanzania, Nepal, etc., are getting international help to develop the necessary technological infrastructures for the development of the telecommunications sector. So that those countries are being backed to join the globalisation process generated by Internet. Some of the projects carried out, for example by the International Telecommunication Union, are focussed to promote the use of Internet in Africa,

considered that it can create a proper socio-economic structure that can favour economic growth.

Table 2. ICT expenditure-IT expenditure (as a percentage of GDP)

	ICT expenditure – IT expenditure as a percentage of GDP				Telecommunications Expenditure as percentage of GDP			
	2001	2002	2003	2004	2001	2002	2003	2004
EU (25 countries)	3.1	2.9	2.9	2.9	2.5	2.5	2.6	2.6
EU (15 countries)	3.2	3.0	3.0	2.9	3.1	3.1	3.2	3.2
Euro-zone	2.9	2.7	2.6	2.6	3.0	3.0	3.0	3.0
Belgium	3.4	3.1	2.9	2.9	3.6	3.5	3.4	3.4
Czech Republic	3.3	3.1	3.4	3.4	5.0	4.9	5.1	4.8
Denmark	3.8	3.5	3.4	3.4	3.0	3.1	3.1	3.1
Germany	3.3	3.0	3.0	2.9	3.0	2.9	3.0	3.0
Estonia	2.7	2.7	2.7	2.6	6.8	6.7	6.5	6.4
Greece	1.4	1.3	1.2	1.2	4.1	3.9	3.7	3.6
Spain	1.8	1.6	1.6	1.5	3.4	3.3	3.2	3.2
France	3.5	3.3	3.1	3.1	2.6	2.6	2.5	2.5
Ireland	2.1	1.8	1.7	1.6	3.0	2.8	2.8	2.7
Italy	2.1	2.0	1.9	1.8	3.1	3.1	3.2	3.2
Cyprus								
Latvia	1.9	2.1	2.5	2.5	5.9	6.5	7.5	7.3
Lithuania	1.5	1.5	1.6	1.6	4.8	4.7	4.9	4.8
Luxembourg	4.9	4.4			2.5	2.4		
Hungary	3.0	2.6	2.8	2.8	5.9	5.3	5.7	5.5
Malta								
Netherlands	3.9	3.6	3.5	3.5	3.3	3.3	3.3	3.4
Austria	3.1	2.9	2.9	2.9	3.2	3.2	3.2	3.2
Poland	1.6	1.8	2.5	2.8	4.3	5.0	6.7	7.2
Portugal	2.2	1.9	2.0	2.0	4.5	4.4	4.5	4.6
Slovenia	1.8	2.0	2.1	2.2	3.6	3.9	4.0	4.0
Slovakia	2.7	2.7	2.5	2.4	4.6	4.6	4.2	3.7
Finland	3.5	3.4	3.4	3.4	3.1	3.1	3.2	3.2
Sweden	4.7	4.3	4.0	3.9	3.8	3.8	3.7	3.7
United Kingdom	4.0	3.8	4.4	4.0	3.4	3.3	4.0	3.7
Bulgaria	1.6	1.7	1.8	1.8	6.9	7.6	8.2	8.4
Croatia								
Romania	1.0	1.3	1.7	1.8	3.9	5.0	6.1	6.6
Turkey	1.3	1.0	0.8		4.3	3.1	2.4	
Iceland								
Norway	3.5	2.8	3.1	3.4	2.2	2.0	2.3	2.4
United States	5.2	4.8	4.7	5.5	3.4	3.4	3.3	3.9
Japan	3.5	3.5	3.5	3.5	4.0	4.3	4.3	4.3

Source: Eurostat. <http://europa.eu.int/comm/eurostat/newcronos>. February 26, 2005.

Asia or Latin America, focussing mainly in projects with a high social content, for example those that allow women to join in better conditions the labour market.

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Table 3. Level of Internet access-households (percentage of households who have Internet access at home)

	2002	2003	2004
EU (25 countries)	:	:	42
EU (15 countries)	39	43	45
Euro-zone	37	40	43
Denmark	56	64	69
Germany	46	54	60
Estonia	:	:	31
Greece	12	16	17
Spain	:	28	34
France	23	31	34
Ireland	:	36	40
Italy	34	32	34
Cyprus	:	:	53
Latvia	:	:	15
Lithuania	4	6	12
Luxembourg	40	45	59
Hungary	:	:	14
Netherlands	58	59	:
Austria	33	37	45
Poland	:	:	26
Portugal	:	22	26
Slovenia	:	:	47
Finland	44	47	51
United Kingdom	50	55	56
Turkey	:	:	7
Iceland	:	:	81
Norway	:	60	60

Source: Eurostat. <http://europa.eu.int/comm/eurostat/newcronos>. February 26, 2005.

Despite existing difficulties in quantifying exactly the effect that these technologies have on economic growth²⁴, especially in developing countries, a conclusion can be reached, that is, these technologies can directly promote countries' economic growth.

However, the most important effects of these technologies are the indirect effects that they have in increasing the quality of both, human and social capital.

²⁴ Some of the main international organisations that do this kind of statistics have expressed the difficulties faced in order to quantify the real impact that the use of these technologies have on societies. See report UNECE/UNCTAD/UNESCO/ITU/OECD/EUROSTAT (2003). <http://www.itu.int/wsis>.

Table 4. Internet users per 100 inhabitants (ITU estimations)

Countries	1998	1999	2000	2001	2002
Anguila			30.21	25.95	
Aruba		4.07	13.65	22.64	
Bahamas	2.33	3.75	4.31	5.51	19.23
Bahrein	3.31	4.84	6.30	20.34	24.56
Chipre	10.32	13.15	17.67	21.75	29.37
Dominica	2.64	2.61	7.78	11.57	16.03
Emiratos Árabes Unidos	7.06	15.10	23.56	27.98	31.32
Guam	4.52	8.54	16.15	25.45	31.25
Hong Kong (región administrativa especial de China)	14.47	21.20	27.83	38.68	43.01
Islas Cook		12.43	15.03	17.75	20.00
Islas Malvinas (Falkland)		70.95	73.40	79.87	77.74
Islas Vírgenes Británicas					18.18
Islas Vírgenes de los Estados Unidos	9.30	11.12	13.81	18.30	27.27
Israel	10.03	13.11	20.26	27.66	30.14
Jamaica	1.97	2.35	3.10	3.83	22.84
Macao	6.97	9.14	13.64	23.13	26.04
Malasia	6.90	12.83	21.39	26.52	31.97
Martinica	0.53	1.31	7.81	10.34	
Niue		15.68	26.93	33.56	52.75
Puerto Rico	2.67	5.29	10.50	15.63	17.55
República de Corea	6.83	23.77	41.40	52.11	55.19
Reunión	1.32	1.42	18.60	20.52	
Saint Kitts y Nevis	3.40	4.48	5.99	7.81	21.28
Singapur	19.12	24.05	32.36	41.15	50.44

(1) From data compiled by the Secretariat of the Pacific Community for Pacific Islands Regional Millennium Development Goals Report 2004, statistical annex, available from <http://www.spc.int/mdgs/>. Only considered countries more than 15 Internet users per 100 habitants

2.1. Effects of ICT on Human Capital

Over a decade ago, the main literature about economic growth clearly recognized that human capital development is one of the key factors in countries' economic growth.

Considering this point, any factor that can promote a nation's human capital, will indirectly influence the achievement of a nation's higher economic growth.

ICT has become a very important instrument in fostering nations' human capital. These technologies allow more access to information and knowledge and, consequently, they can be clearly used to promote citizens' education, increasing current nations' human capital and, as a result, economic growth.

A clear example of the importance that these technologies are thought to have as knowledge and human capital motors is what is happening in Europe. Due to the European Council held in Lisbon in 2000, there has been a strong transformation developing in the education area with a clear increase of ICT use as a way of educating in order to achieve, in the year 2010, a more competitive Europe at a worldwide level, able to reach a sustainable growth, better social cohesion and, to outperform their labour markets²⁵.

Thanks to ICT, it is possible to reach a higher level of knowledge. In addition, a more internationalised human capital is being developed, with a higher level of interactivity among institutions and more sensitive to cultural differences. All these factors allow the empowerment of knowledge and human capital skills, and, obviously, a greater chance of mobility of that capital which could reduce current regional differences in many nations and could lead to a more balanced economic growth.

2.2. Effects of ICT on Social Capital

The Welfare State crisis was provoking the idea that the percentage of people in a social exclusion situation was increasing in many countries. As part of a nation's population is not integrated in the nation itself, it can lead to non-desirable social situations that may make difficult proper social capital development, and consequently, economic growth.

When the effects of ICT on social capital are analysed, it is necessary to question two things. First, the use of these technologies that authorities do with the clear aim improves their relationships with citizens. Secondly, the use of these technologies trying to achieve social inclusion of those groups that are socially excluded.

Authorities of most of the countries, especially those of developed ones, are actively using these technologies in order to offer services, information and public arrangements in a faster, more efficient and cheaper way. The reason is that these services can be achieved without physically going to the public institutions, without waiting, and there are no restrictions about when to make the arrangements. Thanks to these measures, efficiency and quality of the offered public services are improved, but also the access ways are wider to public services. Regarding that, new interrelation mechanisms among public institutions and different social agents have been promoted. It can create new relationships that may favour a better social cohesion and, consequently, promote a higher social capital development in their economies.

²⁵ European Commission (2002). Further information about how this topic is being developed in the European Union can be found in:
<http://www.bolognaberlin2003.de>; <http://www.eua.be/eua/jsp/en>; <http://www.unige.ch/eua>;
<http://www.eaie.nl/pdf/bologna.asp>.

Moreover, these technologies can be used to favour social inclusion of groups that are in a marginal situation²⁶. This could maximise the existing resources in the economy, achieving not only a better social situation, but also a higher economic growth.

3. CONDITIONS UNDER WHICH ICT REALLY PROMOTES ECONOMIC GROWTH

In order to achieve a proper growth of these technologies at a national level, it is necessary to consider several points:

1. Being realistic when considering the consequences that investments made to promote Information Society may have. Being aware that funds set aside for this matter do have a cost of opportunity that needs to be valued.

The first step is to establish specific parameters that allow determining the exact consequences that development of an Information Society promotion have in a country. Any investment made in such countries should consider the special features of those nations, by properly analysing if its society is ready to implement this new technology, clearly stating where investments are going to be made, and, overall, making a proper track record of its impacts in the socio-economic field.

2. Select access mechanisms that allow the Information Society to become reachable to a larger number of citizens.

Technological advances allow, nowadays, access to the Internet through different mechanisms. Some years ago the most common way of connecting to the Internet was through computers and fixed phones, and that required important fixed telephony infrastructures. However, now we can get to the Internet through cellular phones, digital television, electrical wiring, etc.

The use of fixed telecommunications networks has been producing, in the best of the scenarios, accesses to the Internet has been mainly focusing in the urban centre, and has not reached rural areas or far away areas in which implementing these infrastructures could turn into a high cost due to the existing resources. This fact has been provoking a worsening of the regional situation in those countries in which potential advantages deriving from the use of the Internet have been clearly benefiting urban areas in contrast to rural ones.

Since access mechanisms have diversified, the possibility of increasing the use of the Internet in the rural areas has increased. For example, currently, the Global System for Mobile Communications (GSM) is the most convenient method of access. In countries such as Bangladesh, Uganda, United Tanzanian Republic, etc., there has been a significant increase of access to the Internet through cellular phone systems because, among other factors, due to this mechanism rural areas are starting to use the Internet²⁷.

²⁶ For example, in some countries thanks to the use of these technologies, women were able to get to education. In some cases, even, they were able to create small companies that allowed them to join economic activity, getting economic income and, more important, some independence in order to being able to defend their fundamental rights. In fact, some international institutions (ITU among them) are promoting public granted projects focussing on making women join society. For further information see <http://www.itu.int>.

²⁷ As an example of such changes, it can be the Points of Presence (POPs) that are being established in the rural areas of countries such as Tanzania.

Nowadays, due to current technological advances, it is possible to put the majority of the population closer to goods and services (mostly basic ones) that are offered through the Net without the necessity of carrying out large infrastructure investments. Authorities and international institutions involved in taking the decision over the use of ICT in various countries have the obligation to promote those accesses that allow a larger number of people to access to the goods and services offered through the Internet and, moreover, the obligation to avoid regional differences between rural and urban areas.

3. Promotion of social uses offered through the Internet.

From a social point of view, these technologies can provide large advantages to the countries, due to their uses in education, health system, elimination of inequalities due to sex, etc.; some social aspects in which these countries were lacking, are getting better. This use favourably influences human capital, especially on the nations' social capital, which will promote countries' economic growth.

4. Recognizing the real possibilities of these technologies for commercial transactions in these countries.

Currently, ICT can be used to establish economic relationships not only among enterprises (B2B), but also to maintain direct relationships among a company and its clients, consumers (B2C), a company and administration²⁸ (B2A), a company and its employees (B2E), consumers among them (C2C²⁹), etc. However, so that these different electronic commerce possibilities could perform properly, it is necessary that some minimum prerequisites exist. The most important prerequisites are:

- a flexible business structure is required because the Internet is a potential international market in which there is a strong competence as the web has millions of potential clients;
- clear legislation should exist, so that in an unmistakable way rights and obligations of the parts involved have to be established, as well as how likely conflicts that may take place should be solved;
- a proper payment infrastructure should be established, so that it allows the acceptance of electronic means of payments, because they are widely used regarding electronic commerce;
- an adequate transportation network should be developed so that it allows proper distribution of goods at reasonable prices;
- qualified personnel are needed, because if there is a lack of qualified personnel, the electronic base that is incorporated into the firm will not generate its best return.

If any of these factors is not properly developed, ICT will not have a clear, direct effect on economic growth. If these prerequisites are complied with, economic activities made with these technologies will be promoted. Therefore, there will be a positive economic effect, which will enhance nation's economic growth.

²⁸ For example, the payment of taxes.

²⁹ For example, auctions.

4. CONCLUSION

Nowadays, ICT is regarded as having a substantial potential to enhance the economic growth of economies. These technologies are already contributing to the Gross Domestic Product of nations, among other factors, because if they apply some basic conditions they can increase the number of commercial transactions developed in an economy, promoting production and employment in that economy.

Without considering these direct effects, in most of the cases a high level is not achieved. What can be said is that these technologies can considerably promote economic growth thanks to the advantages that their use has to enhance the human and social capital of an economy.

These technologies have become a very important element to transmit knowledge. They also open many possibilities regarding education, which, without any doubt, favour the creation of human capital. ICT allows the educative systems to become closer to the real necessities of the economy, as well as facilitating the establishment of a continuous education system for workers. Thanks to these uses, non-desirable situations of the labour markets can be reduced, for example, unemployment, so that they promote a better use of work and therefore achieve a higher economic growth.

On the other side, these technologies are generating more interaction among the different socio-economic agents, at both the national and international levels, which broadens the possibilities for a more profitable use of the existing resources in the economies and empowers their social capital.

From a technical, economic and social point of view, these technologies can promote nations' economic growth. However, to make this economic growth turn into economic development it is necessary to consider the socio-economic characteristics of the country and to avoid the use of these technologies, which could generate a digital gap. If these points are considered, not only a higher economic growth will be achieved, but also a sustainable growth which will lead to more balanced societies in the future.

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