NEW TECHNOLOGIES AND THEIR ROLE IN THE DEVELOPMENT OF ENTREPRENEURSHIP IN REGIONAL CITIES

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Abstract

The global financial crisis, the efforts for recovery from the recession, as well as the globalization of the economy -which significantly increased completion in the international market- created the need for exploration of new sources of development and new sustainable ways for economic progress.

An important tool that can be used to pursue the economic prosperity and development is the Information and Communication Technologies – ICT. Their use enables the abolition of geographical or other types of restrictions while they have the ability to accelerate of the entrepreneurship and innovation. The benefits that occur are associated with macroeconomic aggregates, new job opening and productivity growth. Particularly in areas that are not large urban centers the utilization of new technologies perhaps is the most significant tool for the development of entrepreneurship and improvement of economic and demographic characteristics of the region, while expanding the reach of each business for clients from the local to the global market.

Keywords: *Information and Communication Technologies- ICT, entrepreneurship, e-shops, e-business*

1. Introduction

Among the most important consequences of the economic crisis, the global recession and globalization is the re-configuration of the global economic environment. This environment consists from the continuous increase of competitiveness, smaller product and services life-cycles and faster substitution. The conditions above, as well as the continuous changes in the market demand, have created the need for countries to redefine new ways of development and sustainable economic growth with main target the global market, the promotion of innovation in manufacturing and the investment in new technologies. The traditional dependence of natural resources and raw materials are now inadequate to support a long-term development, which can only be achieved by investing in a rapidly growing digital economy.

As a result of the conditions that were described above, the international economic environment has reached a strategic inflection point as depicted in Figure 1 (Intel, 2011). This inflection point is mainly caused by the economic globalization. Moreover, the rapid evolution

of the technology and particularly the Information and Communication Technology – ICT contributed to a significant increase in competition in the markets.

At this critical inflection point, both the countries as well as the market as a total, should alter or modify existing business models based on the old economic theory and evolve to a new era, while investing in new forms of entrepreneurship.

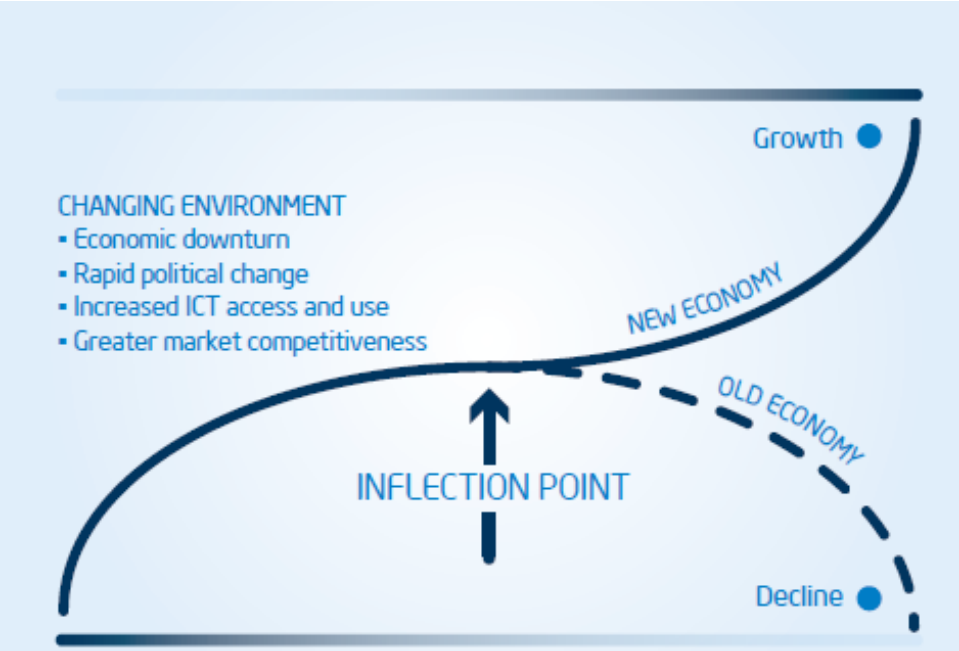

Figure 1 Inflection Point of the International Economic Environment (Source: Intel (2011), "The Path to Growth: Accelerating Entrepreneurship and Innovation Through ICT")

Among the main features that characterize the modern market there can be included the shorter product and services lifecycles, the lower production costs and the significantly frequent changes in the market requirements, than in the past. In this environment, it is necessary to redefine the ways of economic growth and investing in the future with a focus on supporting and accelerating entrepreneurship through innovation. Moreover, the promotion of ICT in business use is essential in order to achieve greater development, as a response to competition and global market access. In addition, the use of ICT in public administration at all levels, allows the efficient operation of the public sector, thus providing high quality services to citizens and more effective management of budgets.

2. Overview of ICT

A substantial amount of research has been performed and practical evidence has been studied, worldwide, in both developed and developing countries, which confirm the economic and social benefits of the ICT usage. The improvement of macroeconomic indicators, such as increase in per capita income, job creation and productivity improvements in total are included among these benefits.

The positive effect of ICT on the economy derives mainly from the modern history of telecommunications and their most important milestones, as well as the corresponding policies of the European Union (Liikanen, 2001). Each country used to operate telecommunications as

a state monopoly, until the end of the 80's decade, mainly due to economic, security and strategic reasons. The incumbent, mainly governmental, providers had the exclusivity in the provision of telephony and data transmission services. However, trends in international commerce and businesses forced the European Union and worldwide organizations in general, to make their first steps towards the liberalization of the telecommunications sector. Among the reasons leading to this decision were:

- the conclusion that the significant changes in the technology should be followed by changes in the administration and management of the telecommunications sector,
- the trend for globalization of the economy, expressed by the need of the internationally active firms (banks, airlines, etc.) which are based on high-quality telecommunications services for the smooth functioning of their systems and their operations,
- the global trend for liberalization of the telecommunications, especially in the USA.

Following the above, during the 90's decade all of the European Union countries proceeded with developing appropriate legislation which incorporated European Union's directives into the national law system and thus liberalizing the telecommunications sector. Greece and Portugal were the last countries to liberalize telecommunications, which happened in 2001.

Among the most important outcomes followed the liberalization of the telecoms sector are:

- The increase of research and development, as a result of the competition created by the entrance of new providers in the market.
- The substantial reduce in roaming costs, as well as retail prices.
- The convergence of voice and data technologies into a single network.
- The rapid improvement of the offered services, even of the incumbent providers, offering low quality – high price services so far. After the liberalization of the market and their consequent improvement most of the incumbent providers achieved to obtain a high market share.
- The development and deployment of mobile telephony networks and the very rapid diffusion of mobile telephony into the telecommunications market.

3. The effect of ICT on society and economy

The liberalization of telecommunications led, in a very short time, to the increase of data transmission rates and to high quality and range of services, with a reduction of prices at the same time due to the transformation of the market to a more competitive form. As a result, the current telecommunications landscape is described by broadband services, such as ADSL, VDSL, Fiber technology, VDSL 2 Vectoring, etc) while the mobile telephony enjoys the 4th Generation era (4G), with the next generation (5G) being just around the corner. The most important applications of the modern telecommunications technologies can be considered:

- SmartX: X= cities, factories, homes, appliances
- Internet of Things - IoT
- Cloud computing
- Factory 4.0 – "The new industrial revolution"

These developments have led to significant social and economic benefits, such as:

- Elimination of geographical and social exclusion
- Prospects for innovation, entrepreneurship and sustainable development
- Opportunities for development, business modernization and restructuring of the public sector
- Reduction of intermediaries for market access
- Access to a potential worldwide market

Inequality and elimination of exclusion is maybe the most important landmark of this century. As The President of the USA, Barack Obama stated at Stavros Niarchos Foundation Cultural Center in Athens, during his visit in Greece in 2016: "*This inequality now constitutes one of the greatest challenges to our economies and to our democracies. An inequality that was once tolerated because people didn't know how unequal things were now won't be tolerated because everybody has a cellphone and can see how unequal things are. The awareness that people have in the smallest African village, they can see how people in London or New York are living. The poorest child in any of our countries now has a sense of what other people have that they don't.*" (https://obamawhitehouse.archives.gov)

At the macroeconomic level it has been proved that ICT usage has a positive impact on competition at a worldwide level, to the increase of productivity and the Gross Domestic Product (GDP) and to other direct economic benefits. According to the World Bank (World Bank 2010), there is a strong and positive correlation between the GDP and the ICT Development Index (IDI) as illustrated in Figure 2. The direct conclusion is that the social welfare in a country increases as the use of new technologies increases as well, expressed in terms of Gross National Income (GNI).

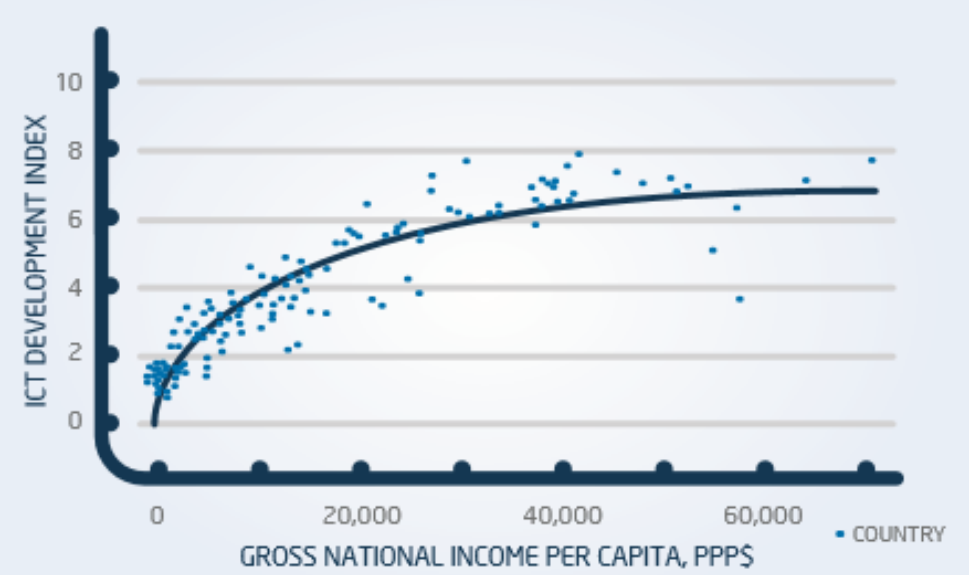

Figure 2 Gross National Income and ICT Development Index (Source: World Bank (2010), "Measuring the Information Society)

An additional indicator which reflects the impact of ICT use in a country's production process is the Per Capita Income. Figure 3 shows the effect of the increase of ICT usage by 10% in per capita income. As observed this effect is positive and significant. The most

important is probably the fact that the increased use of ICT has greater impact on the developing countries rather than the developed ones. The reason is that the use of ICT is widespread within the developed countries, with little room for its growth, as these countries have already made use of the positive impact of ICT on their economy. It should be noted that broadband connections (ADSL, VDSL, Fiber) and mobile phones are the two most important elements of ICT.

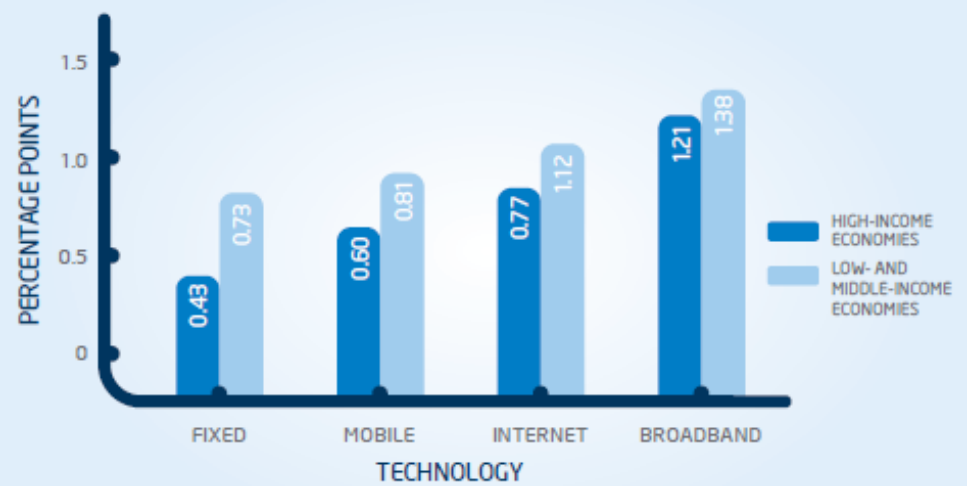

Figure 3 Effect of a 10% increase in technology penetration on per capita GDP growth. (Source: Intel (2011), "The Path to Growth: Accelerating Entrepreneurship and Innovation Through ICT")

4. Current situation in Europe and Greece

Internet penetration in Europe, as expressed through contemporary broadband connections (ADSL, VDSL, FTTx) is not in the same level for all countries, leading to the phenomenon known as digital divide. The digital divide has long preoccupied the European Union, which has developed several strategies for reducing, even eliminate it. The digital divide exists not only with respect to the broadband connections but also with other services and high-tech products, such as mobile penetration (http://ec.europa.eu/eurostat/). As depicted in Figure 4, the percentage of households in Greece who have a broadband connection is below 60%, occupying one of the last places in the European area, contributing to the digital divide (digital divide).

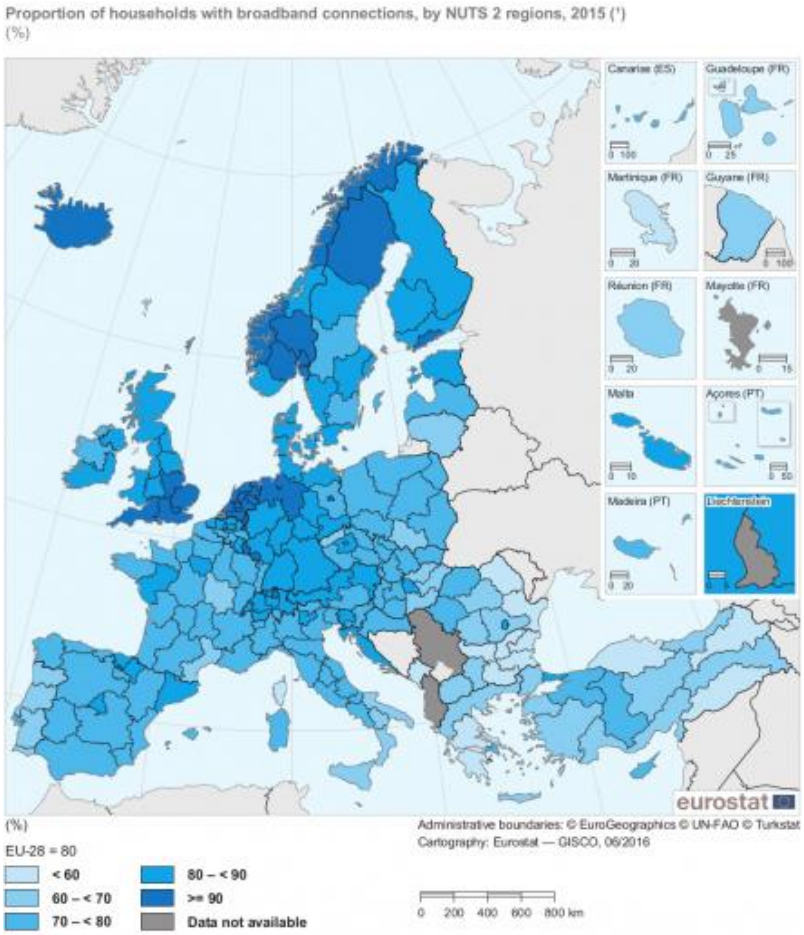

Figure 4 Percentage of households with a broadband connection (Source: Eurostat 2015)

A similar situation describes the use of internet services, as expressed, for example, by the usage of the internet to make purchases (Figure 5). As observed, Greece maintains a clear distance from the rest of Europe, lagging significantly in terms of the using modern technologies to perform daily activities. These statistical figures show a clear lag of the Greek population to familiarize with the use of new technologies, indicating the growth potential lost by the poor utilization. An important finding is the contradistinction of the penetration of ICT in central and especially northern European countries, such as the Scandinavian ones, which have always been a pioneer in adopting new technologies.

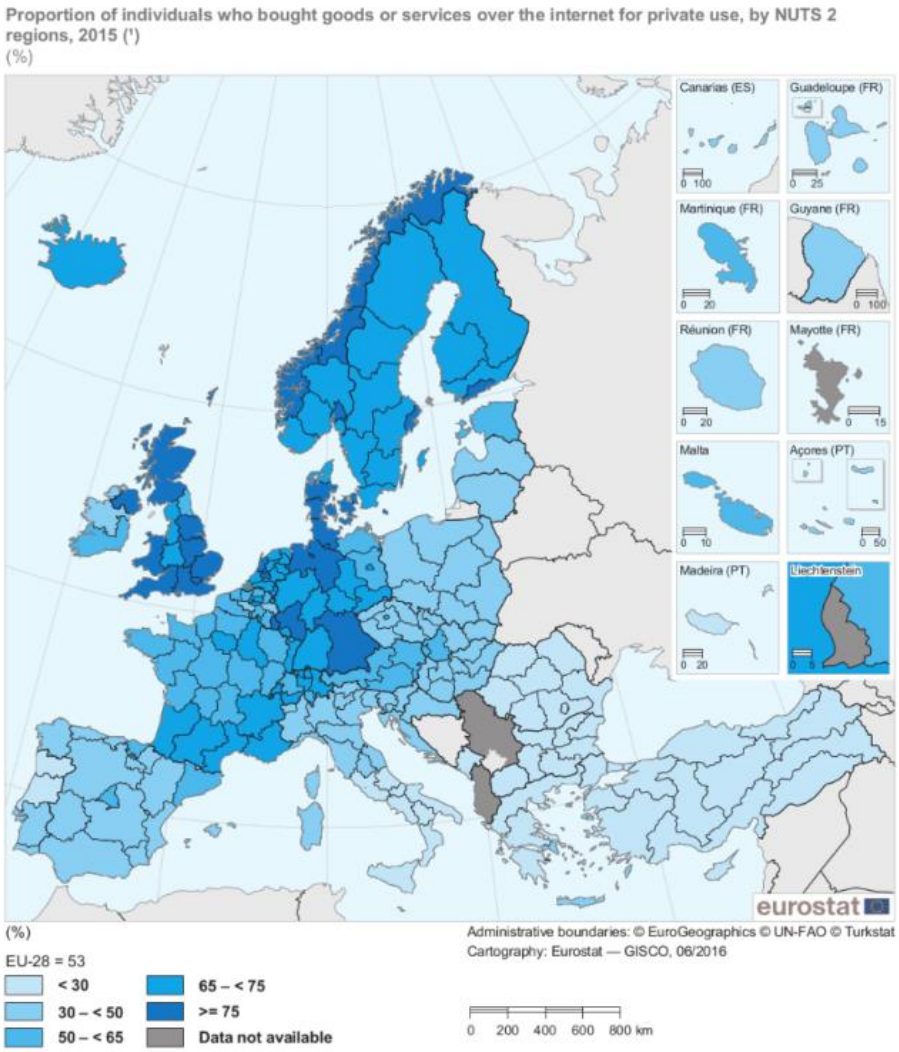

Figure 5 Percentage of individuals who purchased through the internet (Source: Eurostat 2015)

In a more detailed depiction regarding the use of internet for transactions, Figure 6 and Figure 7 illustrate the information for buying household goods and tourist services, respectively. The information presented corresponds to the wider European area (EU-28) and is also presented by urbanization category (urban centers Cities, Regional cities - Towns and suburbs, rural areas - Rural). Unfortunately, in this case as well Greece holds one of the lower positions in terms of penetration in the use of ICT, as compared to other European countries.

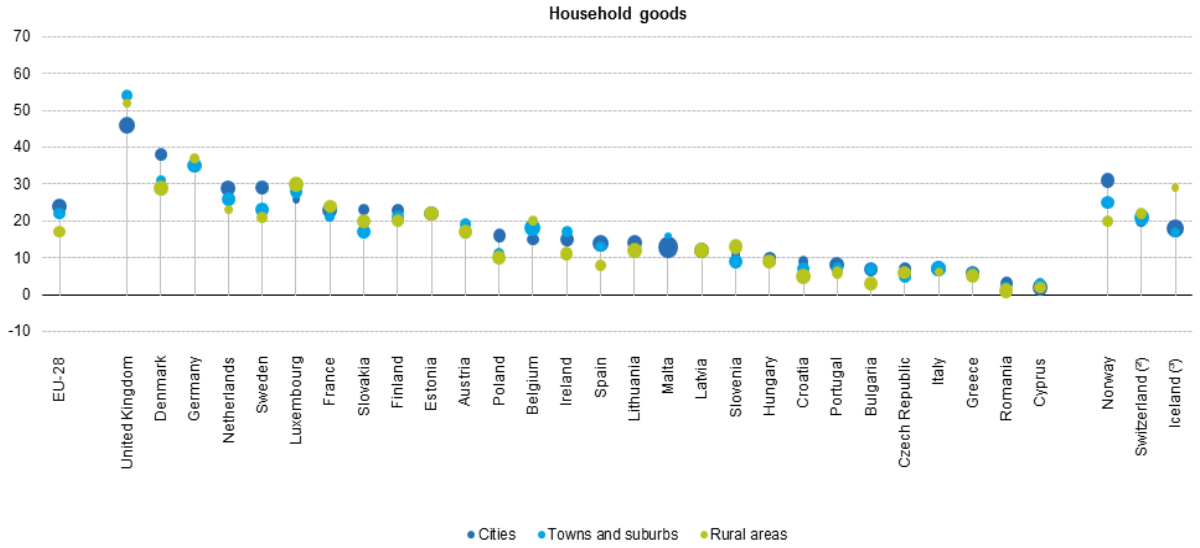

Figure 6 Percentage of users who used the internet to buy household goods in Europe, by category of urbanization (Source: Eurostat, 2015)

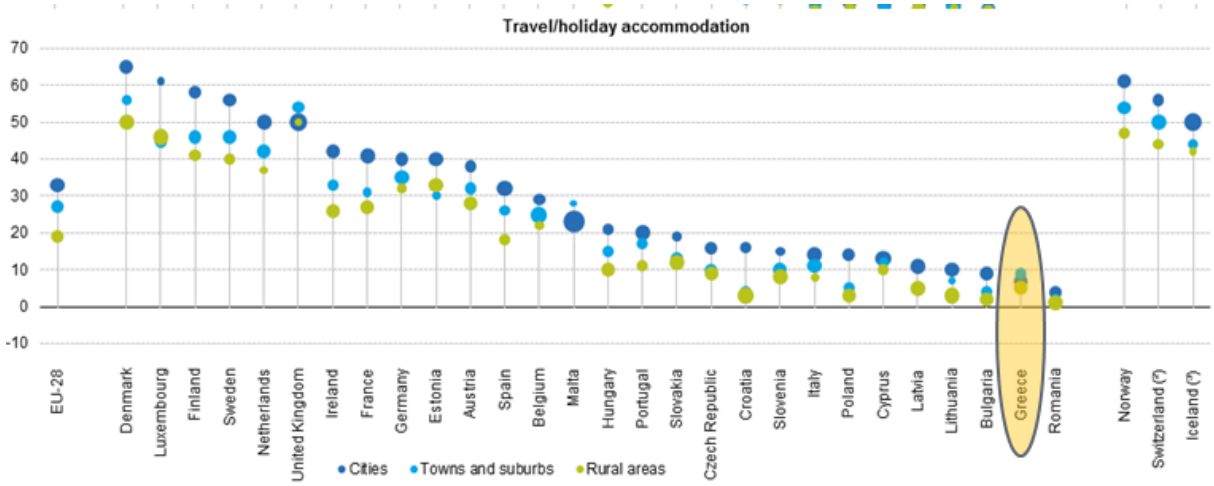

Figure 7 Percentage of users who used the internet to ordered household goods to buy travel/ accommodation services in Europe, by category of urbanization (Source: Eurostat, 2015)

Regarding the use of ICT in enterprises in Greece, the situation is better, as illustrated in Figure 8 (http://ict4growth.ktpae.gr/). Apart from areas of Western Greece and the islands of the eastern Aegean, where ICT has lower penetration, more than the 80% of the enterprises in the rest regions use PCs to operate. Of particular interest is the fact that the largest PC penetration is recorded in touristic areas, like Rhodes, Cyclades and the Ionian Islands, where there is an increased business activity, mainly with foreign countries. Finally, a percentage of only 7.9% of businesses do not employ computers to operate.

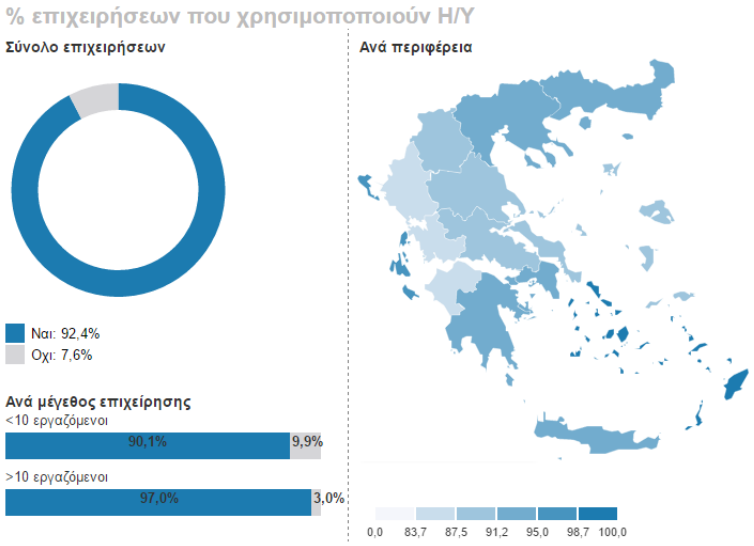

Figure 8 Percentage of Greek enterprises using computers to operate (Source: http://ict4growth.ktpae.gr/, 2015)

A slightly worse situation exists in businesses that have a presence on the internet by having a website (Figure 9). Of the small businesses with under 10 employees, almost 50% do not have a presence on the internet, while in larger companies this percentage climbs to a level of 80%.

The most important finding, however, according to the Greek Trade Annual report for the year 2016 is that only 3.4% of enterprises use the internet to promote products or services through e-shops. This is quite bad, since during the period of economic recession and crisis, when many physical stores have stopped their operation, sales through e-shops and e-commerce in general, are probably the most important way for sustainability and further business growth.

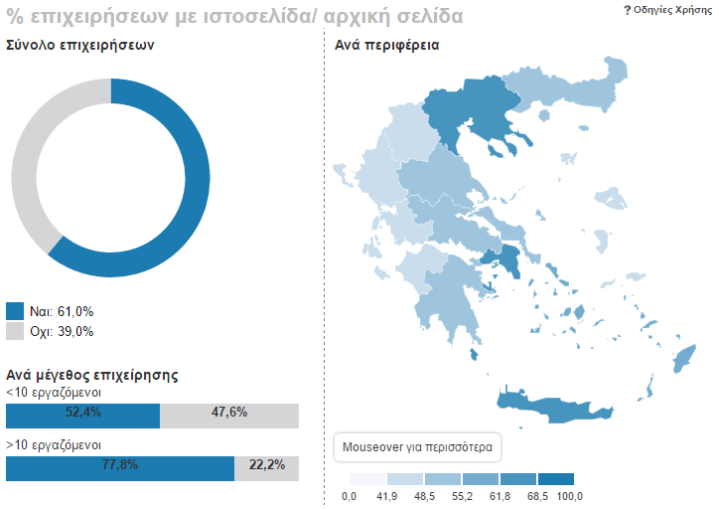

Figure 9 Percentage of Greek enterprises having a webpage (Source: ktpae.gr, 2015)

Despite these discouraging information, there is reasonable optimism for the systematic use of ICT in the future. For example and regarding the use of the internet to order goods in adults aged 16-74 years, Greece holds a good position in the ranking of European countries

(EU-28), as depicted in Figure 10. This figure shows a significant increase between years 2012-2015, marking a number of improvements, such as increasing the familiarization of users with e-commerce, trust in the security and privacy issues related to electronic trading, etc. Similarly, Greece's ranking in terms of using mobile devices to access the Internet is quite promising (Figure 11).

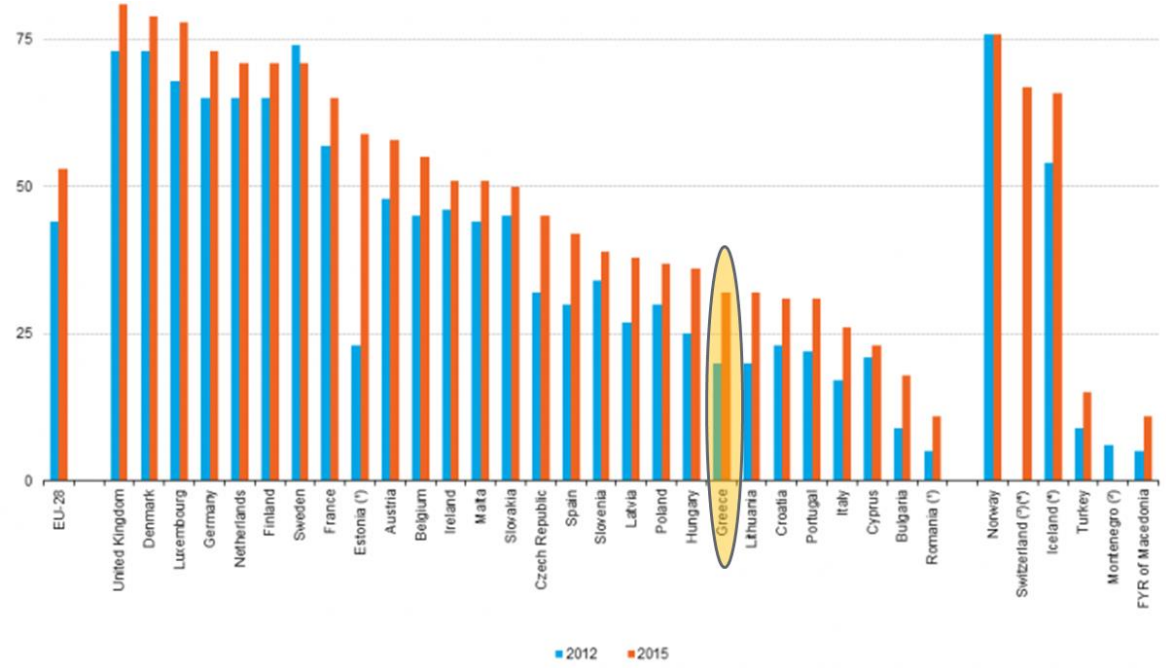

Figure 10 Use of the internet to order products (Source: Eurostat 2015)

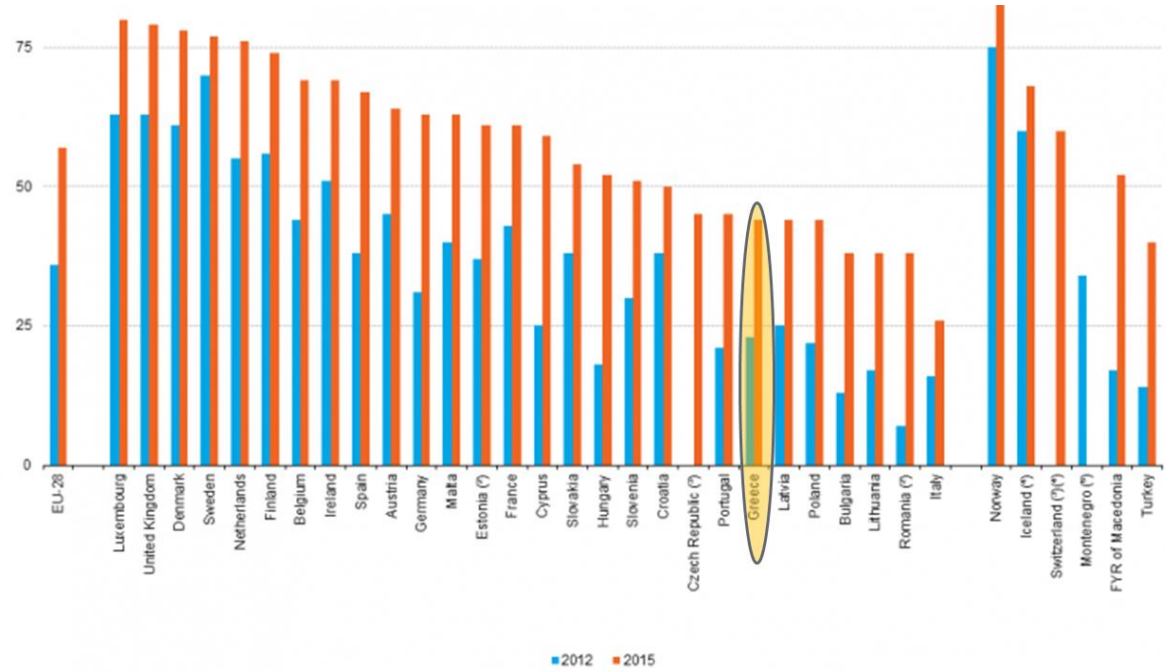

Figure 11 Use of laptop/ tablet/ mobile phone to access the internet, (SourceΠηγή: Eurostat 2015)

The more promising perspective regarding Internet use can be related to the popularity of the social networks among the Greek users (Figure 12).

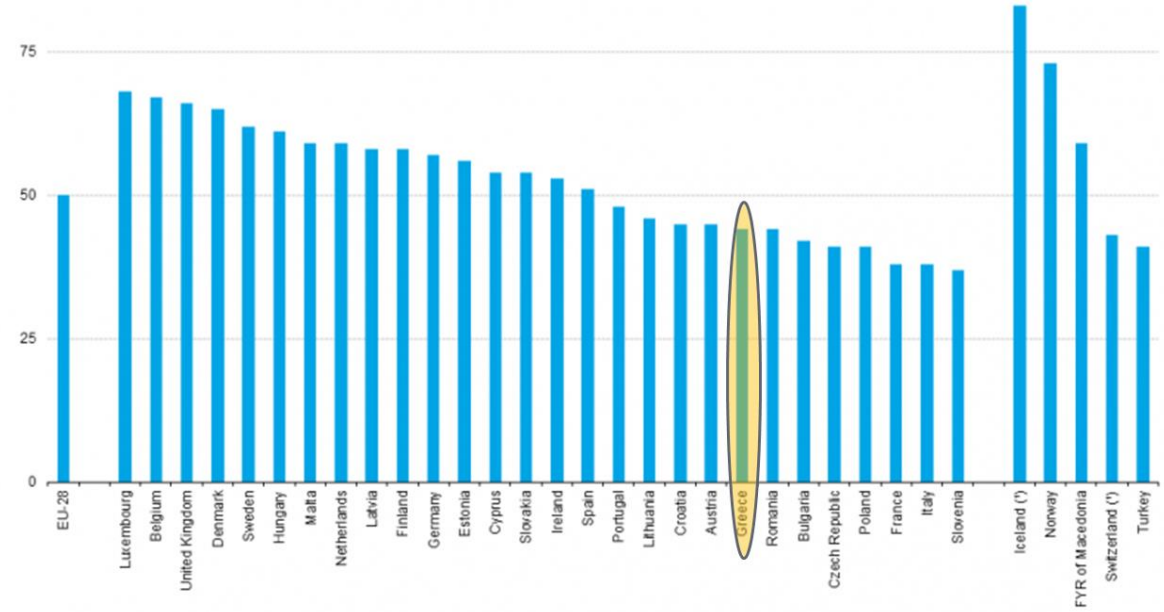

Figure 12 Use of social networks (source: Eurostat 2015)

It becomes apparent that Greece lags significantly in ICT use, both at the individual and the enterprise level, holding one of the bottom positions, as compared to other European countries. However, there is an observable increase in recent years, which creates the potential to support the e-commerce and other activities related to the use of new technologies, which can further contribute to the sustainable development of the economy.

5. Regional cities and ICT

The most common characteristics that describe regional cities can be summarized as follows:

- Geographic and demographic and social exclusion
- Reduced economic activity due to migration to larger urban centers
- Higher costs of production and distribution network
- Few initiatives regarding business
- Low labor mobility
- Low activity for innovation and technological research

Each one of the above characteristics can be further analyzed, since it contributes significantly to the maintenance of the gap between regional cities and large urban centers. Sustainable development in these cities can be supported by a number of appropriate interventions in order to boost their competitive advantage. These interventions derive by international practices and recommendations:

- **Support and extension of the ICT infrastructure**. It is the most important intervention to be initially done in order to have the necessary infrastructure to implement the rest. The major investments to be made correspond to:
  - Infrastructures for fixed (ADSL, VDSL, Fiber) and mobile broadband (4G / 4G + / 5G)
  - Promotion of the use of cloud computing and the offered services. This proposal allows for development of IT infrastructure with very low operating costs.
- **Education and training.** This intervention is equally important with the existence of infrastructure. A large number of projects have failed to a lesser or greater extent, due to the lack of education of the end users or the project beneficiaries. To this end, therefore, actions should be made regarding:
  - Development of infrastructure for information providing and access to education, and market, both domestic and international.
  - Promotion of distance and life-long learning, particularly in topics regarding innovation, entrepreneurship, ICT use, etc.
  - Promotion of innovation and entrepreneurship activities, especially for the young people.

- **Investments on research and development (R & D)**. As the economic crisis resulted to the need for the development of new business models, it is highly important to create and develop an environment which will support innovation and the competitive advantage of regional cities, ensuring their equal participation into a global market. A typical example is the promotion of e-shops, which correspond to the modern, rapidly growing trend of entrepreneurship. Obviously, regional cities can especially benefit from this approach, as not only the geographical restrictions lifted but also a great potential is offered to the respective communities to highlight the special features, products and services.

6. Successful models

This section describes two successful business models which, in line with international practices and experiences, can contribute to entrepreneurship and therefore to the sustainable development of regional cities. The models correspond to electronic commerce (e-commerce) and the touristic industry.

e-commerce

As described earlier, the electronic business is a rapidly emerging field, in which Greece lags behind the other countries. In regional cities, the contribution of e-commerce to sustainable development can be derived from the exploitation of the regions particular characteristics, such as the adoption of e-business and e-shops by local associations, such as agricultural, women, trade associations, etc. Through the online stores it is possible to enable the development of commercial activity and the access of the associations to a potential worldwide market. To make this possible, it is necessary to implement some simple but important interventions related to education related to:

- use of ICT
- improvement of the production process, strategic planning and product promotion
- management and support of customers

- business culture
- development and operation of e-shops

The benefits that can be derived through this approach are manifold, with the most important being:

- the bypassing of intermediaries
- the access to national or global electronic markets (e-bay)
- the creation of business reputation
- the economic growth and development of the wider region

Tourism industry

The tourism industry is known to be an important pillar of development in Greece, unfortunately not fully utilized. Besides the general tourism, there are a number of alternative ways, both domestic and international, such as thematic, scientific, religious, industrial, rural tourism, etc. The so far conventional promotion approach, through tourism agencies and conventional advertisements, are fully changed by the internet, which offers possibilities for:

- direct and personalized advertisement
- bypassing of intermediaries
- direct communication with domestic and international visitors
- access to international tourism platforms such as:
    - Airbnb – Tripping – HomeAway -9flats, …
    - more conventional: booking.com hotels.com, ...

This enables the creation of economies of scale, thus contributing to the overall development of a region. Moreover, complementary to the tourism industry business sectors can also benefit like tourism enterprises, local cooperatives, individual suppliers. In this way the whole market can be supported, including accommodation, restaurants, transport, local commerce, tourism companies, etc.

7. Conclusions

It is clear that the economy has entered a new era as a result of the global financial characterized, among others, by a significant increase in competition, thus creating the need to identify new sources of growth and business models. The use of Information and Communication Technologies - ICT is the most important tool to foster entrepreneurship and innovation and the development of markets and societies.

In this context the paper presented the recent developments in information technology and telecommunications, which support the implementation of innovative business models and the image of the ICT integration into the Greek society. In addition, indicative proposals were presented towards the direction of achieving sustainable development for regional cities, as well as frameworks to support SMEs for development, with emphasis on the extensive use of ICT.

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