ICT EVOLUTION IN EASTERN EUROPE COUNTRIES

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Abstract

Purpose – *The study focused on ICT analysis, to determine the level of development of countries, adaptation to new technologies and performance as a result of the implementation.*

Methodology/approach *- The study considers the use of ICT in enterprises using existing data in the Eurostat database, in three directions: e-commerce, internet connection and e-business.*

Findings – *The study shows that there are countries which dispose to favorable internal conditions such as: government policies, flexibility and availability, openness to competence and effort supported by the virtual transmission of public information, etc.*

Research limitations/implications – *Comparative analysis through the indicators present allowed the identification of the differences between countries in terms of ICT implementation in the private and public domain, differences that are reflected in their evolution and in the economic results they register.*

Practical implications – *From the existing data it is observed that there are countries that have started procedures to facilitate access to ICT but also countries that have delayed their implementation.*

Originality/value – *ICT is no longer a specific sector, but an integral part of modern innovative economic systems. Thus, for managing the challenges of globalization, the inclusion of ICT in business and communities is a way to maintain and develop.*

Key words: *ICT development, innovative economic systems, internet and digital technologies.*

Introduction

The evaluation of digital development has become increasingly important due to the benefits of ICT technologies on enterprises and national economies (Aerts et al., 2004; Elmualim and Pelumi-Johnson, 2009). The advantages offered by internet technologies and applications produce changes both in terms of flexibility and receptivity but also in the way the entire system of organization and functioning of companies, processes and economic and social life is conducted (Elmualim & Pelumi-Johnson, 2009, Wang and Xie, 2002).

The opportunities offered by e-commerce (increasing competitiveness, rapid expansion of commercial transactions and international trade) are the effect of globalization, these being found in all countries of the world, regardless of their degree of economic development (Biagi and Loi, 2013, Chiu and Lee, 2019). Electronic transactions are found in all types of economic interaction, affecting the market, products, industrial structures, commercial and competitive rules, laws and regulations that will be in a continuous adaptation (Zhu, 2004; Luu and Freeman, 2011; Mishra and Narayan, 2014).

The digital divide has become an important social and economic problem gaining significant interest among governments, world organizations and specialists around the world (Bagchi, 2005; FAITTNM, 2013; Ayanso et al., 2014). Improving access to and use of ICT is a priority on the political agenda of many states because it allows improving the quality of life through access to online resources that thus lead to socio-economic integration and development (Deichmann, 2006; Fryer and Grander, 2008).

In this study, an analysis was made of the evolution of ICT in enterprises over a period of 5 years, for 8 countries in Eastern Europe, through the indicators: Enterprises having received orders online, Share of enterprises' turnover on e-commerce, Enterprises with broadband access, Enterprises giving portable devices for a mobile connection to the internet to their employees, Enterprises whose business processes are automatically linked to those of their suppliers and / or customers, Enterprises using software solutions, like CRM to analyse information about clients for marketing purposes.

Material and Method

The study included the period 2013-2017 for the following Eastern European countries: Czech Republic (CZ), Lithuania (LT), Estonia (EE), Slovakia (SK), Hungary (HU), Poland (PL), Romania (RO) and Bulgaria (BG). The study considers the use of ICT in enterprises using existing data in the Eurostat database, in three directions: e-commerce, internet connection and e-business. On all three directions, companies with at least ten employees were considered.

For e-commerce, the following indicators were included in the study: Share of enterprises having received orders online (EHROO) (%) and Share of enterprises' turnover on e-commerce (SETEC) (%).

For the connection to internet, the following indicators were included in the study: Share of enterprises with broadband access (EBA) (%) and Share of enterprises giving portable devices for a mobile connection to the internet to their employees (EGPDMC) (%). For EBA, companies that use fixed or mobile connections and that use xDSL technology on a modernized cable network for internet traffic or other broadband technologies have been considered. For EGPDMC, the enterprises that offer employees portable devices with at least 3G technology for internet access (through a computer with modem or receiver that uses UMTS or GPRS) were considered.

For e-business, the following indicators were included in the study: Share of enterprises whose business processes are automatically linked to those of their suppliers and / or customers (EWBPALTTSC) (%) and Share of enterprises using software solutions, like CRM to analyse information about clients for marketing purposes (EUSSAIACMP) (%). For the EWBPALTTSC indicator, the enterprises that have computer programs that allow: the exchange of information between suppliers and customers to coordinate the availability and delivery of products or services to the final consumer, accessing forecasts, inventory, production, distribution or development were taken into account, products, data collection via computer networks or other connections between computers in different enterprises, excluding handwritten internet messages. For the EUSSAIACMP indicator, the enterprises that use software solutions for customer relationship management or other software solutions necessary for the enterprise management were considered.

Results and Discussion

The global competitiveness of the European Union can be assessed at EU level also in terms of individual performance, respectively the capacity through which countries improve their position permanently.

For the e-commerce activity were presented in Figure 1 the companies that carry out online activities.

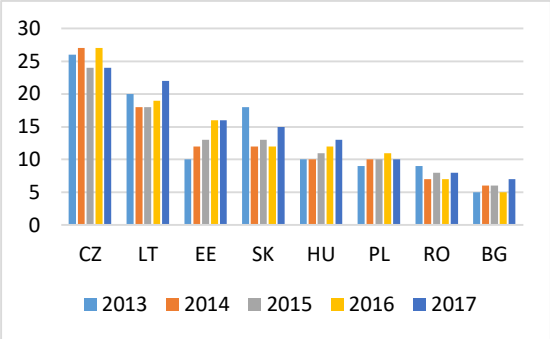

Figure 1. Distribution of the share of the companies that received online orders

From Figure 1 most companies that register online transactions are found in the Czech Republic, Lithuania and Estonia. In 2017, there were increases in Lithuania, Slovakia, Hungary, Romania and Bulgaria. From the analysis of each country it is observed that values above the average registered by these 8 countries are found only in the Czech Republic and Lithuania during the 5 years studied. Estonia registers above average values only in 2015-2017, and Slovakia in 2013, 2015 and 2017.

Figure 2 shows the situation of countries depending on the share of e-commerce in the turnover of companies.

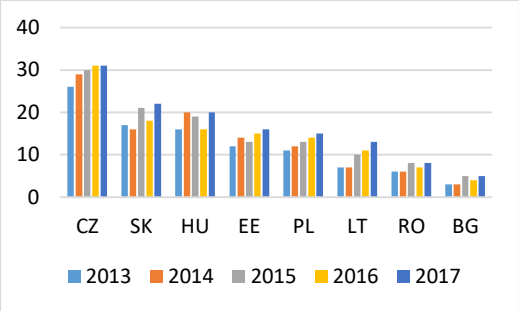

Figure 2. Distribution of the share of e-commerce in the turnover of enterprises

From the analysis of Figure 2 the first three places are: Czech Republic, Slovakia and Hungary. The Czech Republic has an upward evolution from year to year, as do Estonia, Poland, Lithuania and Romania. Changes are also registered in Slovakia, Hungary and Bulgaria, these countries reaching in 2017 the level of 2015, as a result of the decreases suffered in 2016. Above these values above average values are obtained in the following countries: Czech Republic, Slovakia and Hungary. Estonia also has above average values, except for 2015.

The possibility of companies connecting to the Internet is studied through the indicator that measures broadband access, which is shown in Figure 3.

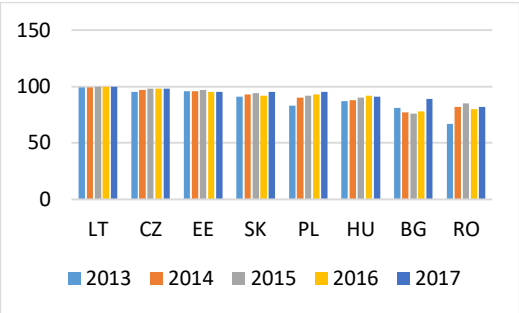

Figure 3. Distribution of the share of companies that have broadband access

From the analysis of this indicator, presented in Figure 3, there are quite small differences in the countries studied (below 20%). Among the countries that recorded values above the average of the 8 countries studied are: Lithuania, Czech Republic, Estonia, Slovakia and Poland (except for 2013). Hungary also registers above average values only in the years: 2013 and 2016.

Figure 4 shows the countries according to the share of companies that offer portable devices for a mobile internet connection to employees.

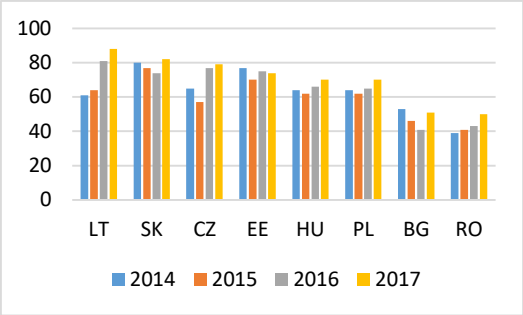

Figure 4. Distribution of the share of companies that offer portable devices

The analysis of Figure 4 shows that in 2017, Lithuania, Slovakia and the Czech Republic are on the first places. Above average values are recorded in the following countries: Lithuania (except 2014), Slovakia, Czech Republic (except 2015), Estonia, Hungary (except 2017) and Poland (except 2017).

Figure 5 shows the share of enterprises whose processes are automatically linked to those of suppliers / customers.

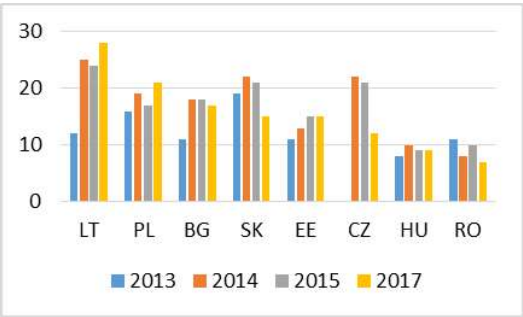

Figure 5. Distribution of the share of companies that have commercial processes

From the analysis of Figure 5 in 2017, Lithuania, Poland and Bulgaria are on the first places. For this indicator there is no information for 2016 in the Eurostat database. Above average values for this indicator were obtained in the following countries: Lithuania (except 2013), Poland, Bulgaria (except 2013) and Slovakia (except 2017). Values above average were also obtained by the Czech Republic (in 2014 and 2015).

Figure 6 shows the share of enterprises that use software solutions to analyse information about customers for marketing purposes.

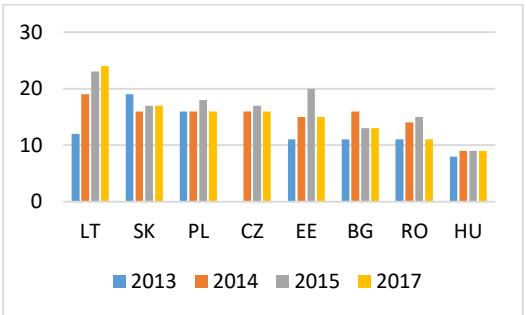

Figure 6. Distribution of the share of companies that use software solutions

From the analysis of Figure 6, in 2017, the following countries are on the first places: Lithuania, Slovakia, Poland and the Czech Republic. Above average values are recorded in: Lithuania (except 2013),

Slovakia, Poland, Czech Republic (except 2013 for which no data are available) and Estonia (except 2013). Bulgaria registers above average values only in 2014.

Figure 7 shows the distribution of countries in terms of indicators for 2017.

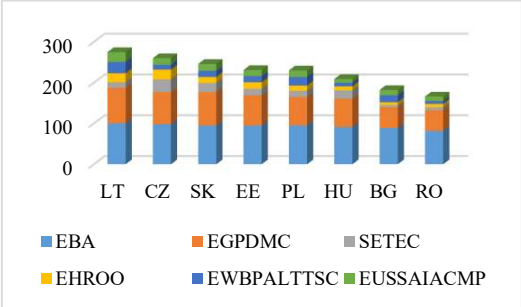

Figure 7. Distribution of countries in terms of indicators in 2017

From the analysis of Figure 7 if we centralize the results to all 6 indicators, in 2017, Lithuania, the Czech Republic, Slovakia and Estonia are on the first places, followed at a relatively short distance from Poland.

The arithmetic average registered at the level of the 8 countries in 2017 amounts to 37.48. Values above the average are registered by the countries: Lithuania (45.83), Czech Republic (43.33), Slovakia (41), Estonia (38.50) and Poland (38.33). Values below the average of the 8 countries are registered by the countries: Hungary (34.83), Bulgaria (30.33) and Romania (27.67), which shows the existing gap at the level of these countries.

Conclusions

The study shows that there are countries in Eastern Europe, such as: Lithuania, Czech Republic, Slovakia, Estonia and Poland, which due to favourable internal conditions (government policies, flexibility and availability of people involved in the business environment, openness to competence and effort supported by the virtual transmission of public information, etc.) registers an ICT development in all three directions: e-commerce, internet connection and e-business.

The study shows that Lithuania is the only country with the best values, ranking first in the indicators: Share of companies with broadband access, Share of companies giving portable devices for a mobile connection to the internet to their employees, Share of enterprises whose business processes are automatically linked to those of their suppliers and / or customers and Share of enterprises using software solutions, like CRM to analyse information about clients for marketing purposes.

The Czech Republic is the next country in the ranking, being only with two indicators on the first place: Share of enterprises' turnover on e-commerce and Share of enterprises having received orders online, on the second place on the Enterprises with broadband access indicator, on the third place on the indicator Share of enterprises giving portable devices for a mobile connection to the internet to their employees, on the fourth place to Share of enterprises using software solutions and on the sixth place to Share of enterprises whose business processes are automatically linked to those of their suppliers and / or customers.

Slovakia is on the 3rd place in 2017, being only with three indicators on the second place: Share of enterprises' turnover on e-commerce; Share of enterprises giving portable devices for a mobile connection to the internet to their employees and Share of enterprises using software solutions, on the fourth place at the indicator Share of enterprises having received orders online; Enterprises with broadband access; and Share of enterprises whose business processes are automatically linked to those of their suppliers and / or customers.

Estonia is the country that registered two positions on the 3rd place (on the indicators: Share of enterprises 'turnover on e-commerce and Enterprises with broadband access), two positions on the 4th

place (on the indicators: Share of enterprises' turnover on e-commerce and Share of enterprises giving portable devices for a mobile connection to the internet to their employees), and 2 positions on the 5th place (at the indicators: Share of enterprises using software solutions and Share of enterprises whose business processes are automatically linked to those of their suppliers and / or customers).

The result obtained by Lithuania in the field of ICT can be understood as a result of the existing conditions in terms of internal policies adopted, it taking the first steps since 1991, starting with the adoption of the development strategy for ICT, e-government (2002), e-Service portals, e-nationality, e-bill, digital electronic signature (2011) [14].

The Czech Republic is the country that has specialized services of e-government, e-commerce, e-communication and e procurement, e-signatures legislation, this register since 2010 impressive values for indicators: Percentage of enterprises with Internet access (95%), Percentage of enterprises with a broadband connection (86%), Percentage of enterprises with a broadband connection (20%) [15].

Slovakia enjoys a very strong development in the field of ICT due to the country's attractiveness for outsourcing centres, but also due to the emergence of a start-up ecosystem and the emergence of e-government services [16].

Estonia has also made significant progress in the field of ICT with the introduction of e-Identity (1992-2014), e-tax (2002), e-Business (2007), Computer Security (2009), e-Residency (2014) [17] .

Poland has been implementing the e-government strategy since 2005, in 2006-2008 it built the digital government services platform, the EPUAP platform and the web-Tax platform and later e-Procurement and e-Tendering [18].

The gap registered by Hungary, Bulgaria and Romania can be explained by the existence of a delay in the governmental policies for establishing and implementing the National Strategy on the digital agenda. In Romania, this Strategy was defined in 2015 (by Government Decision 245/2015) which led to a lack of progress in the field of ICT found both at the level of public services (lack of electronic resources) and at the level of enterprises.

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