The Influence of ICT on Labour Productivity in Romanian Companies

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Abstract

The ICT technologies are today a constant presence in every sector of economic and social life. These technologies have greatly influenced the development of economic activities for all types of enterprises. The boost of labour productivity can be explained along with other important factors, considering the role of ICT. This paper intents to analyse the influence of different indicators related to these technologies of labour productivity in Romanian companies. We considered the percentage of the employees using computers with Internet connection, the percentage of the companies providing training for their employees regarding their ICT skills and the percentage of enterprises using ERP software package to share information between different functional areas. The only significant correlation was identified in case of the percentage of the companies providing training for their employees regarding their ICT skills and the productivity levels.

Key words: ICT, labour productivity, employees using computers, ERP software, ICT skills
J.E.L. classification: J24, M15

1. Introduction

Within the actual economic context, the countries and companies are struggling to maintain and improve their level of competitiveness. The Romanian companies are no exception and their race for improved level of competitivity is essential for the success in the single economic European space, our country being part of it.

One of the most important indicators that reflect this level of competitiveness is represented by the labour productivity registered by each country. During the last decade Romania has registered a continuous increase of this indicator. This reflects an increasing of productivity level for the companies that are operating in our country.

In the same period the information and communication technologies (ICT) have rapidly developed and became an important part of social and economic life of modern societies. This situation represents a reality in Romania. Moreover, the pandemic period determined an increased use of these technologies in domestic economic activities. Such evolution had a positive influence over the productivity levels registered by the Romanian companies.

This paper aims to investigate the correlation between different indicators associated with ICT and the labor productivity levels registered by our country during 2017 and 2021. Therefore, the paper will be structured as follows: an introductory par, a second part focused on a briefly literature review on this subject, a part that will present the research methodology, followed by a section of results and another one presenting the conclusions of this study.

2. Literature review

The topic of the ICT impact on productivity represented a disputed research theme. According to Rangriz and Raja (2011), Jorgensen et.al. (2005) and other researchers who performed studies in this field it was established a positive and significant impact of ICT on productivity of companies and countries.

The ICT development was approached in different studies through specific key indicators such as ICT infrastructure, ICT use, ICT readiness, ICT producing and trade (OECD 2011, ITU 2012). Considering this indicators Mačiulytė-Šniukienė and Gaile-Sarkane (2014) have discovered in their study that for those countries with low and medium labour productivity the influence is generated by ICT use and ICT readiness indicators.

The results of the studies regarding the correlation between ICT and labour productivity remain controversial. For example, Ceccobelli et. al. (2012) have reached the conclusion that without complementary investments, it will not be possible to fully benefit from the advantages of ICT capital for productivity growth. Same conclusions have been reached by Skorupinska and Torrent-Sellens (2015) who noted that ICT do not act alone in impacting productivity, but require other factors such as human capital, work organization, knowledge and technology creation and institutions

The ICT use will not increase without and increase of ICT skills. This represent an constant preoccupation for European Union and also for Romania, that tries to fill the gap between our country and EU level (Titan et.al.,2014).

The positive impact of ICT use on labour productivity in Romanian companies was determined by other researchers (Tofan and Aivaz, 2022) that studied the influence of use of computers and Internet on employee's productivity.

Considering the studies presented this topic of correlation between ICR an labour productivity proves to be a complex one and needs further investigations, especially in case of Romanian companies.

3. Research methodology

The research objective of this paper will be reached using an analysis of the considered indicators and their correlations labour productivity, the percentage of the employees using computers with Internet connection, the percentage of the companies providing training for their employees regarding their ICT skills and the percentage of enterprises using ERP software package to share information between different functional areas.

We formulated the following research hypothesis:

H1 There is a significant statistical correlation between labour productivity indicator and the percentage of the employees using computers with Internet connection.

H2 There is a significant statistical correlation between labour productivity indicator and the percentage of the companies providing training for their employees regarding their ICT skills.

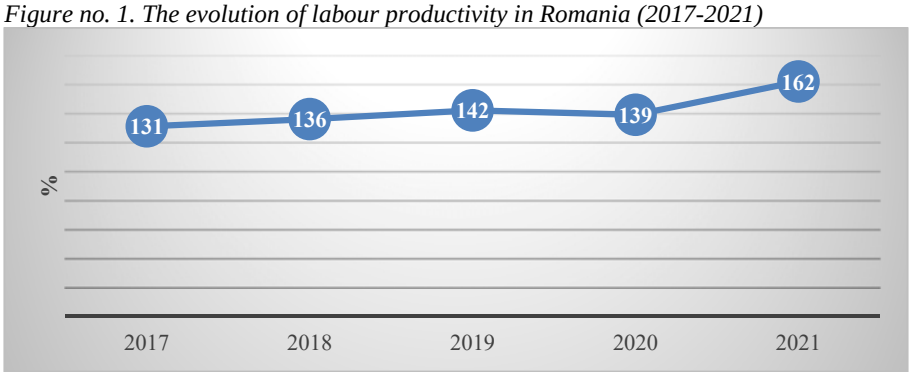
H3 There is a significant statistical correlation between labour productivity indicator and the percentage of enterprises using ERP software package to share information between different functional areas.

All the data used are retrieved form the Eurostat database and cover the period between 2017 and 2022.

4. Results

The evolution of labour productivity in case of Romania has constantly improved in the considered period. This positive evolution it is presented in figure number 1, listed below.

Figure no. 1. The evolution of labour productivity in Romania (2017-2021)

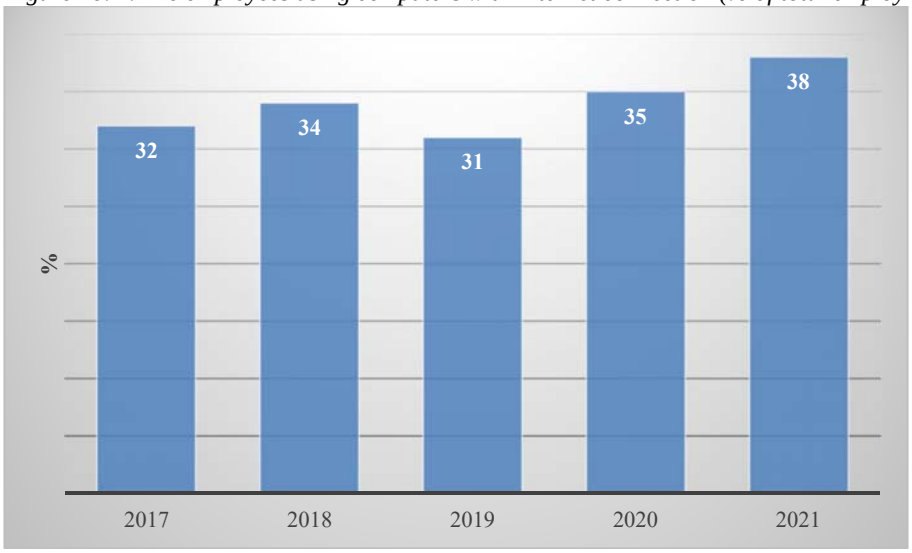


Source: (Authors' representation using Eurostat database)

The data presented in the figure number 1 shows that the labour productivity has registered a positive evolution in the considered period. The reference year is considered 2010 according to the Eurostat details. A slight decrease can be noticed in 2020 and could be explained by the COVID 19 pandemic.

Another indicator used in our analysis was the one regarding the percentage of the employees using computers with Internet connection. The data are presented in figure number 2.

Figure no. 2. The employees using computers with Internet connection (% of total employment)

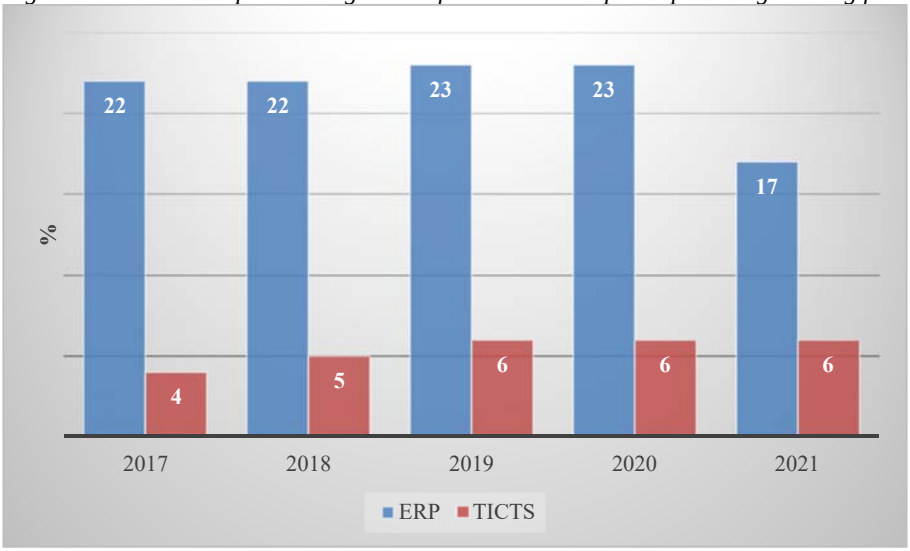


Source: (Authors' representation using Eurostat database)

The evolution presented in the figure above reflects a positive trend, with a slight decrease in 2019. These data show a trend of increasing use of ICT by the Romanian employees. Nevertheless, the percentage are still reduced which determine us to assume that there is still room for improvements.

Figure number 3 presents the data concerning the percentage of the of enterprises using ERP software package to share information between different functional areas and the percentage of the companies providing training for their employees regarding their ICT skills.

Figure no. 3. The enterprises using ERP software and enterprises providing training for ICT skills



Source: (Authors' representation using Eurostat database)

The data reflect a relatively constant evolution in case of the enterprises using ERP software package. The downturn registered in 2021 could be explained by the sock created by the pandemic that force a considerable number of companies to suspend o close definitively their activities.

The percentage of enterprises providing training for their employees regarding the ICT skills was relatively constant during the analysed period and in this case, there are numerous opportunities for improvement.

In order to test the hypothesis presented in the previous section we used the Spearman's test. The results indicated that for the first hypothesis there was no significant statistical correlation between labour productivity indicator and the percentage of the employees using computers with Internet connection (r_S=.400, p=.505>.05). In case of the second hypothesis, we also determined using the same test that there is a significant statistical correlation between labour productivity indicator and the percentage of the companies providing training for their employees regarding their ICT skills (r_S=.894, p=.041<.05). The third hypothesis was also invalidated, no significant statistical correlation between labour productivity indicator and the percentage of enterprises using ERP software package to share information between different functional areas being tested (r_S=-.105, p=.866>.05).

5. Conclusions

Nowadays, ICT are widespread in all economic and social activities. The influence that these technologies exert on the efficiency of the economic activities was major topic of research. The correlation between ICT an labour productivity represented a particular field of interest for different researchers.

Modern companies are facing an increased competition every day and they are constantly trying their level of productivity to stay and maintain competitive.

The data provided by the Eurostat database reflected a constant improvement of labour productivity level in case of Romania. The ICT technologies became widespread in all economic activities, especially in the context generated by the COVID 19 pandemic. This paper intended to analyze the correlation between labour productivity indicator and several specific indicators reflecting the use of ICT in Romanian companies.

The research hypothesis tested proved that only the percentage of enterprises providing training for their employees in relation with their IC skills was statistically significant correlated with the labour productivity indicator.

This situation leads to the conclusion that those companies that are constantly seeking to improve the skills of their employees manage to attain higher levels of productivity.

The results obtained from testing the other two research hypothesis revealed our research limitations. Thus, the use of ERP software by the Romanian companies is still at a low level and could be improved. Another discussion related with this topic can be developed around the size an the activity sector of the companies that are using such software. The indicator provided by the Eurostat database considered the companies with 10 or more employees without the financial sector. We can assume, considering the national statistics that a future research direction should be concentrated on those companies with less than 10 employees (that are very numerous in Romanian economy). Those enterprises have an important contribution to the overall level of productivity. Also, the financial sector could be approached as separate research topic, knowing that in this case the use of ICT is well represented and the productivity of the sector registered high level in the past years.

The percentage of the employees using computers with Internet connection was not tested as being statistically significant correlated with the labour productivity levels. Even if the percentage is constantly increasing in the analyzed period, we can assume that this lack of correlation can by explained by the fact that not all the employees that are using computers are contributing directly to an improvement of productivity levels. This topic needs further detailed research.

Considering the results of this research we can conclude that ICT became a real presence in Romanian economy and is constantly evolving. The use of this technologies has a positive influence on productivity level of the Romanian companies.

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