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THE IMPACT OF E-COMMERCE ON EMPLOYMENT IN THE EU

Abstract

The main purpose of this study is to present a new e-commerce trends and their impact on international labor market. The fact is that nowadays a high speed of digitalization process caused significant changes in job preferences and employment. Electronic commerce effected labor demand by creating new jobs and destroying unnecessary ones. In this study the changes in labor market via e-commerce tendencies were described qualitatively and quantitatively.

Key words: e-commerce, labor demand, ICT, employment.

Introduction

The revolution in ICT over the last decade shown that technological advances and usage of e-commerce opportunities will grow rapidly. The development of e-commerce caused dramatic changes in society and economy. The growth of e-commerce has both a direct and indirect impact on the labor markets and especially on employment. As nowadays e-commerce creates more business opportunities, widespread changes in the labor market and in the skills needed for employees are inevitable. Labor markets need more skilled and adaptable to modern technology workers.

Today the impact of e-commerce on population employment is an under-researched topic in practical analysis. The use of fundamental results of quantitative studies of the impact of ICTs on employment in EU countries will increase the employment rate of highly qualified staff.

The subject of this study is the volume of electronic sales and purchases by EU companies, the use of the Internet to fulfill work goals by employees, and the employment rate in EU.

The purpose of the scientific work is to define the impact of e-commerce and ICTs parameters on employment growth in the European Union.

To achieve this goal, a number of tasks were performed:

- analysis of the results of existing research related to the impact of ICT and e-commerce on the labor market,
- an analysis of employment rate in EU countries and e-commerce trends in European businesses,
- econometric modeling related to the impact of e-commerce and ICTs parameters on employment rate in the EU.

The scientific novelty is a comprehensive analysis of the impact of e-commerce on employment growth using econometric modeling.

Literature overview

In a study written by Benjamin Balsmeir and Martin Woerter (2019) [1] about the impact of e-commerce on job creation and the elimination of low-tech jobs, the authors note the particularly positive effects of the introduction of new technologies into the daily workflow. The research is practical and involves the construction of an econometric model of the impact of investment in the implementation of e-commerce systems and the digitization of work processes on the employment of workers with different levels of education. Researchers have statistically confirmed that investing in e-commerce is positively related to the employment of highly skilled workers and negatively related to the employment of low skilled workers. Thus, e-commerce in general has a net positive impact on employment. Also, based on the simulation, the scientists gave theoretical advice to companies on hiring workers. The paper emphasizes that the features of machine technology can be seen as powerful tools that allow workers to improve their productivity if they are skilled enough to use them to their full potential.

Contrary to a previous study, researchers Federico Biagi and Martin Falk (2017) [2], who considered the impact of ICTs and e-commerce on employment in Europe, deny the fact that the introduction of high-tech information and communication systems in enterprises is destroying jobs. The results of the study indicate that the tools that support information and communication systems are sufficiently neutral in terms of employment. However, the implementation of ERP systems is generally positively

related to employment. The result obtained by scientists during the study is innovative, as ERP systems are often associated with job losses due to additional changes in organizational structures. For the high-quality use of high-tech solutions at the enterprises of the countries, it is necessary to ensure proper innovative information and communication systems and facilitate their use in all sectors of the economy.

The Martin Falk and Eva Hagsten (2015) [3] study also draws on Micro Moments Database data and explains e-commerce trends and their impact on productivity growth in European countries. Overall labor productivity in the fourteen European countries studied increased by 17%. The positive and significant correlation between changes in labor productivity and changes in the proportion of enterprises using e-commerce systems indicates that higher productivity gains are observed in industries that are increasing the share of online businesses. Researchers found that increasing the proportion of e-commerce businesses by 1% will increase productivity by 0.35-0.40%. One of the major drawbacks of this analysis is that only the impact of e-sales, not e-procurement, can be explored, since procurement can also have a significant impact on labor productivity.

Results

In this study, a regression model is used to analyze the impact of e-commerce on the employment of the EU Member States. The dependent variable is employment, and wages, cost of capital, and e-commerce options (number of employees using the Internet, number of employees using a computer, using the Internet to gather information, using the Internet to provide information, e-purchases, e-commerce) are independent variables. Thus, we will get four different models that will determine the impact of each parameter of e-commerce and information and communication technologies on employment in the European Union.

One of the results are shown in table 1. According to the results all coefficients are significant except for the price of highly skilled labor, which has a coefficient of significance of 0.23. These results are evidence that the use of e-commerce in businesses has a positive impact. Also, wages and the cost of capital have a negative impact on employment. These results are in full agreement with those of previous scientific studies.

Table 1

Impact of the use of electronic sales of goods and services by businesses on the employment of the EU population

<i>Variable</i>	<i>Coef</i>	<i>St.Error</i>	<i>t-statistics</i>	<i>Probability</i>
Constant	1,678	0,084	20,012	0,11
ln(Wage)	-0,029	0,004	-7,222	0,03
ln(Cost of labor)	-0,010	0,002	-4,032	0,23
ln(e-selling)	0,013	0,001	9,739	0,09
F-statistics	8,883			0,01
Hausman test	13,710			0,01

The results of this model can be interpreted as follows: a wage increase of 1% would reduce employment by 0.029%, and a decrease in the cost of capital by 1% would reduce employment by 0.01%. From the table. 1 also shows that the coefficient along with e-sales is positive, indicating that businesses that use the Internet for e-commerce are more busy. Thus, businesses in countries that have a system of selling goods and services over the Internet can increase employment by 0.013% with every 1% increase in online sales. The general model can be interpreted as:

$$\ln(\text{Employment}_{it}) = 1,678 - 0,029 \cdot \ln(\text{Wage}_{it}) - 0,01 \cdot \ln(\text{Cost of labor}_{it}) + 0,013 \cdot \ln(\text{eselling}_{it}) + e_{it}$$

Based on the simulation, which confirmed the established assumptions about the effect of e-commerce parameters on the employment of the population in EU countries. Thus, it was determined that with the increase of electronic sales of enterprises of EU countries by 1% employment of the population will increase by 0.013%. The e-procurement parameter showed a greater correlation, with employment increasing by 0.265% at a 1% increase. Regarding the use of the Internet by employees for work tasks, the increase of this parameter by 1% causes the employment growth of the population by 0.042%. The theoretical assumptions regarding the negative impact of average wage germination and the price of highly qualified staff on the employment of EU citizens were also confirmed.

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