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## **MODELING THE IMPACT OF E-COMMERCE ON INDICATORS OF ECONOMIC DEVELOPMENT**

### **Abstract**

Nowadays, due to the exponential growth of information technology, digitization and digital transformation around the world have become consequential, which has contributed to the enhancement and promotion of e-commerce in a wealth of countries. This process brings to pass the comprehensive renovation of most business processes and trade and economic relations in society. The reason that e-commerce, as a new advanced proceeding in the world, requires detailed research is to clearly understand the impact of e-commerce on the economic growth of different countries.

**Keywords:** e-commerce, e-business, economic growth, indicators of economic development.

**Introduction.** Due to the rapid development of information technology, increasing the role of the global Internet and integrated automation of industries, the use of e-commerce for businesses has become important not only to maintain but also to expand market position.

The urgency of the work is that the use of the Internet in business is gaining strategic importance. The Internet allows companies to enter the huge world market with their goods, significantly reduce costs in the supply and demand channels they build, serve customers at a level they could not even dream of, enter previously geographically inaccessible markets, create new labor markets. and capital, new income streams and,

finally, to reconsider the very nature of their activities. That is why the task is to investigate the impact of e-commerce on economic growth.

**Purpose.** Every year the share of e-commerce in the structure of the world economy is growing rapidly. That is why the main purpose of this work is to investigate the impact of e-commerce on country's economic development and growth.

**Methodological approach.** The theoretical basis of the study is the work of domestic and foreign scientists [1-5] to study the impact of e-commerce on the economic development of the country. In the process of research, the Cobb-Douglas production function was taken as the basis of the model. The least squares method and the method of successive concessions were used to solve it.

**Literature review.** The elaboration of e-commerce and its impact on the economic development of disparate countries are attracting a lot of attention in Ukrainian and foreign scientific articles.

By way of illustration, M. N. Georgiou in his work [1] using the tools of statistics and econometrics showed that the growing share of e-commerce in the overall structure of total turnover of enterprises has a significant positive impact on economic development. In this study, were used panel data from 13 Western European countries. The main practical result of this study is the obtained equation:

$$Y_{it} = 0,017 + 0,001x_{it},$$

where x - share of e-commerce in the overall structure of total turnover of enterprises; y - annual GDP growth rate at 1995 prices; i refers to country and t refers to year.

The model satisfies three necessary criteria of homoscedasticity and normality. The coefficients are positive and statistically significant. There is no serial correlation. Therefore, the above model is robust.

Anvari Rana and Norouzi Davoud in their research [2] also demonstrated the impact of e-commerce measured in Internet purchasing by individual consumers (along with other factors such as R&D expenditure, health expenditure and government size) on GDP per capita.

The consequence shows that the independent variables of the 12 selected countries have a considerable effect on per capita income. By way of explanation, in accordance with the outcome of the co-integration test, e-commerce and research and development expenditure have a long-term positive impact on per capita GDP, but e-commerce seems to be more necessary in augmentation of economic growth.

As the worldwide market leader in regards of e-commerce is China, we will consider the article of Qu Lili and Chen Yan [3]. As an indicator of economic growth was chosen the value of China's GDP and as explanatory factors acted five components that volume the development of e-commerce (the amount of domain names, Internet users, e-commerce enterprises, web-store customers and e-commerce transactions).

Final regression model suggests that when the amount of Internet users, e-commerce enterprises and web-store customers get 1-unit enhancement, will induce GDP rise 5,06 units, 11,54 units and 5,19 units, accordingly.

In the next article by Ukrainian scientist Tetiana Zatonatska [4], maneuvering the Cobb Douglas production function, the effect of e-commerce on the country's development indexes is investigated on the instance of Ukraine, Poland and Austria.

When estimating the reliance on e-commerce variables such as Internet transaction volume, Internet penetration rate and the country's GDP growth rate, it was discovered that the influence of e-commerce indexes on economic development was the frailest in Austria. The Ukrainian function demonstrates that the country's GDP is easily affected by Internet consumption, while Poland's GDP is easily affected by the volume of transaction conducted through the Internet. The modeling outcomes demonstrate that e-commerce has affected the country's economic growth and helped increase the GDP of these three countries.

The last article analyzed is work of Florin-Valeriu Pantelimon, Tiberiu-Marian Georgescu and Bogdan-Ştefan Posedaru [5]. The conclusion of the research is the growing of e-commerce has really had a valuable influence on the gross domestic product of the researched countries.

In addition, the globally status of the Covid-19 pandemic has had a valuable influence on global e-commerce purchasing, but the impact on GDP is still uncertain, as there are another economic spheres crushed by this status.

**Results.** The main practical result of this study is the obtained equation:

$$\ln \text{GDPpc} = 9,97 + 0,52\ln \text{ECS} - 0,37\ln \text{IU}\%$$

where GDPpc – GDP per capita in dollars, ECS – e-commerce sales in trillion dollars, IU% – individuals using the Internet (% of population).

**Table 1**

**Regression analysis of the impact of e-commerce on economic development**

	<i>Coefficien ts</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	9,97	1,5800	6,3083	0,0080
ln ECS	0,52	0,1902	1,9585	0,1451
ln IU%	-0,37	0,4363	-1,3101	0,2814

**Source: author calculations**

The constructed model is adequate and statistically significant because the coefficient R Square and Significance F is 0,907 and 0,028 accordingly. The overall impact of e-commerce on indicators of economic development of Ukraine is 15%.

**Conclusions.** Since e-commerce has a fairly significant growth rate in this paper, the impact of e-commerce on economic growth was investigated. A review of Ukrainian and foreign literature related to this topic led to the conclusion of a significant positive

impact of the expansion of e-commerce on the economic development of the country. This conclusion was verified by constructing a model in the form of a Kobe- Douglas production function. In addition, it was determined that globally status of the Covid-19 pandemic has had a valuable influence on global e-commerce purchasing, but the impact on GDP is still uncertain, as there are another economic spheres crushed by this status.

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