

# DYNAMICS OF THE RELATIONSHIP BETWEEN ONLINE PURCHASES AND CONSUMER INCOME IN THE EUROPEAN UNION

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## ***Abstract***

*In the digital economy, online purchases are on the rise, seen as an indicator of economic well-being at national and regional levels. The geographic focus of the study is on online purchases and income of individuals from the 27-member states of the European Union. The main goal of the development is to investigate the dynamics of the relationship between online purchases of European consumers and disposable income, and on this basis to arrive at the derivation of corresponding dependencies. The following research tasks are set: interpretation of conceptual interpretations of the determinacy of online purchases by the amount of disposable income; adoption of a methodological framework for analyzing and evaluating the dependence between the variables „consumer spending, including for online purchases - disposable income“; formulating more important generalizations from the research conducted. The measurement of the studied relationship between the variables is carried out using the statistical software for computer processing - IBM SPSS Statistics and the Excel program. The analysis is based on the method of linear regression and correlation. The data refer to the time interval 2013-2021. The results of the study take into account the variation of consumer spending on online purchases while observing the fluctuations in the income of the respondents. The formulated conclusions are useful for characterizing the determinants of the changing behavior of European consumers.*

**Key words:** online purchases of goods and services, disposable income, consumer spending, online consumer purchases in the European Union.

**JEL:** L81, D31, F14.

## **1. Introduction**

Online purchases are gaining increasing economic importance as a result of increasing online shopping in various product groups and growing consumer attitudes. Over the past few decades, extensive research has been conducted on the shift from offline to online shopping. The influence of a number of determinants

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considered essential for improved distribution is tested. Some previous studies define the characteristics of online purchases, reducing them to their usefulness and ease of implementation (Yu, et al., 2005). Other researchers focus on consumer experiences, psychographics and interests (Agarwal & Prasad, 2000); (Fiore & Kim, 2007). There are studies focusing on socio-economic and demographic consumer characteristics, such as age, gender, level of education, income, place of residence (Bigne, et al., 2005). Highlighted features are used for market segmentation purposes of changes in online purchases (Venkatesh, et al., 2003). Their interpretation and evaluation are essential for understanding the dynamics of consumer behavior.

The main objective of the present study is to investigate the dynamics of the relationship between online consumer purchases and disposable income, and on this basis to arrive at the derivation of corresponding dependencies. The development of the relationship under consideration is analyzed and evaluated by geographically focusing the study on online purchases and consumer incomes from the 27 member states of the European Union. The development assumes that income, as a socio-economic determinant, has a relatively high moderating effect on consumer behavior when making online purchases.

The measurement of the studied relationship between the variables of income and online purchases is carried out using the statistical software for computer processing - IBM SPSS Statistics and the Excel program. The analysis is based on the method of linear regression and correlation.

As main limitations in the research process are introduced: search for support in the causal relationship of online purchases from the modeling effect of income, as a variable that can promote or limit this type of purchases; income dominance versus socioeconomic determinants of consumer online shopping.

The results of the research take into account the variation of consumer costs for online ordering and purchasing of goods and services while observing fluctuations in the incomes of consumers from individual member states of the European Union. The formulated conclusions are useful for characterizing the determinants of the changing behavior of European consumers.

## **2. Literature review**

In macroeconomics, aggregate consumption is defined by planned spending, which is positively dependent on real income. Analyzing the causal relationship between disposable income and consumption, the British economist who significantly influenced modern macroeconomics J. Keynes, proposed the hypothesis of absolute income and the dependence of consumption on disposable income (Keynes, 1936)

As a determinant that can promote or constrain consumption, including consumer online purchases, it has attracted considerable research attention. A research group including K. Serenko, O. Turel and S. Yol is engaged in this problem. The cited authors interpret the moderating roles of demographics and economic characteristics of users and their satisfaction in the context of mobile services (Serenko, et al., 2006). Several studies in a row include income as an explanatory variable of consumer shopping behavior (Miyazaki & Fernandez, 2001); (Al-Somali, et al., 2009).

Higher incomes presuppose consumers' perception of lower implicit risks when making online purchases and thus resonate on the demand for online goods and services. Relatively lower incomes predispose to limiting online transactions and consumer perceptions of coping with possible financial losses. As a rule, the amount of income is a reflection of the professional status or social position of the user – different professional categories are accompanied by different consumer attitudes and behaviors regarding online shopping. A similar opinion is shared in a research paper by G. Hubona E. Kennick, in which the impact of certain variables, including income, on consumer behavior when using information technology is assessed (Hubona & Kennick, 1996).

In the specialized literature, statements are cited according to which, with the increase in technological experience gained in the online environment, users perceive smaller risks when adopting new information and communication technologies (Hubona & Kennick, 1996). Proponents of this understanding assume that consumers with more technological experience are influenced to a lesser extent by the amount of disposable income. In this sense, in the context of the expressed position that digitization and the digital market should rule the future, it is reasonable to expect an increase in the preference for online over offline shopping, taking into account the impact of key determinants (Proceedings, 2022). In this direction, the corporate responsibilities and opportunities of the market participants should be taken into account (Petrusheva, 2022)

The present study shares the assumption that the amount of disposable income predetermines, both in the short and long term, the behavior of consumers when making online purchases in corresponding amounts. Therefore, the magnitude of income has a manifest modeling effect on the magnitude of online purchases and consumer attitudes, and there is a causal relationship between them.

### **3. Materials and methods**

The present research focuses on analyzing and evaluating the dynamics of the relationship between the variables „expenditure for final consumption by purpose of consumption, including online purchases - amount of disposable income“ of consumers from the 27-member states of the European Union.

In turn, online purchases are interpreted as an indicator of economic well-being of consumers. Within the framework of the development, the highlighted type of purchases are interpreted through the prism of their determination by the amount of disposable income of European consumers.

Methodologically, the measurement of the assessed dependence „consumer expenses, including for online purchases - disposable income“ is carried out by applying the method of linear regression and correlation. The analysis and assessment of the studied dependence are carried out using the statistical software for computer processing - IBM SPSS Statistics and the Excel program. Data on respondents' budgets published by the European statistical service Eurostat are used as the main source of information. The data on online purchases made and on the amount of disposable income of European consumers refer to the time interval 2013-2021.

The results of the research take into account the variation of online purchases while observing the fluctuations in the incomes of individuals from the individual member states of the European Union. The formulated conclusions are pollen for characterizing the determinants of the changing behavior of the European consumers.

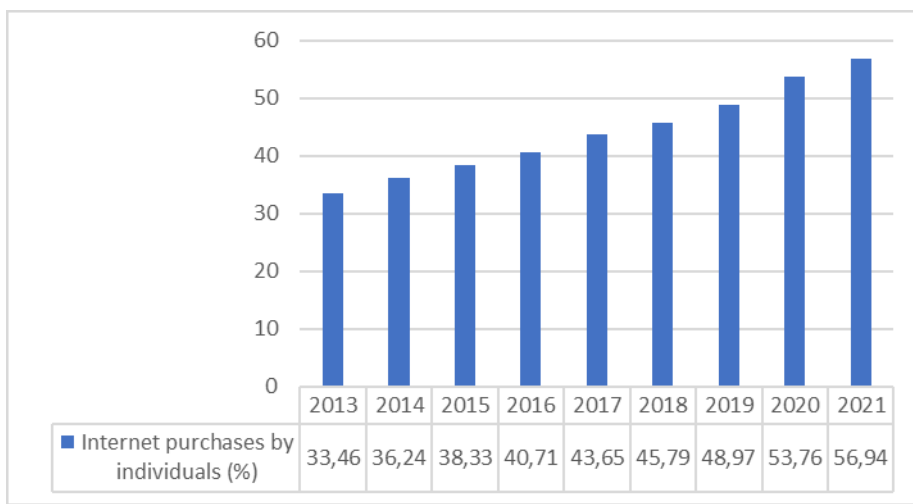
#### **4. Research results**

The dynamically changing online environment, taking advantage of the possibilities of digital technologies, creates new added value in satisfying consumer expectations. New research confirms that today's consumers still prefer shopping in physical stores to digital reality, but are looking to more technology to enhance their shopping experience. The data collected by the global trade association - Shop Association, allow the finding that more than 80% of surveyed online consumers expect augmented reality (AR) to improve shopping in physical stores, and more than 65% accept that increasing personalization is a key factor in decisions about future online purchases (Shop. Association, 2023).

The search for greater convenience and efficiency in shopping is changing the behavior of European consumers. According to data released by Eurostat, during the analyzed period 2013-2021, the average growth rate of online purchases made by individuals in the 27-member states of the European Union took the value of 1.07% (see Fig. 1.).

The reported value of the average annual growth rate of online purchases reflects the average speed of development of the studied phenomenon related to electronic shopping. Based on the total population of all European consumers, it is found that in 2021 the relative share of respondents ordering and purchasing goods or services online increased to 56.94%, which is 23.48% more than in 2013. The analyzed data reflects the effects of improving the digital skills of European online users and also of building a relatively more secure and sustainable digital infrastructure. A correlation should be sought between the growth of e-shopping

and online purchases on the one hand and, on the other hand, the age, level of education, employment status and other demographic and socio-economic characteristics of the respondents. Among the socio-economic determinants is the amount of disposable income. According to Eurostat data, those with the highest incomes among consumers from the 27-member states of the European Union are those from Germany, France and Italy, while the lowest values are reported for Estonia, Lithuania and Latvia (Eurostat, 2023).



Source: Eurostat (isoc\_ec\_ibuy) and (isoc\_ec\_ib20).

**Figure 1:** Internet users from the 27-member States of the European Union who ordered or purchased goods or services, 2013-2021.

In the next Table 1. the results obtained from a study of the dependence „consumer expenses, including for online purchases - disposable income“ of individuals from the 27-member states of the European Union are presented. In a specific analytical plan, the data visualizes the values of the correlation and determination coefficients.

**Table 1:** Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.882	0.778	0.747	195012.273
The independent variable is Disposable income.			

Source: Eurostat. [https://ec.europa.eu/eurostat/databrowser/view/nama\\_10\\_co3\\_p3/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nama_10_co3_p3/default/table?lang=en); [https://ec.europa.eu/eurostat/databrowser/view/nasa\\_10\\_nf\\_tr/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nasa_10_nf_tr/default/table?lang=en)

Through Table 2. data on the reported variance value are presented.

**Table 2:** Anova

	Sum of Squares	df	Mean Square	F	Sig .
Regression	935250212940.420	1	935250212940.420	24.593	0.002 _
Residual	266208505064.568	7	38029786437.795		
Total	1201458718004.989	8			
The independent variable is Disposable income.					

*Source:* Eurostat.

[https://ec.europa.eu/eurostat/databrowser/view/nama\\_10\\_co3\\_p3/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nama_10_co3_p3/default/table?lang=en);

[https://ec.europa.eu/eurostat/databrowser/view/nasa\\_10\\_nf\\_tr/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nasa_10_nf_tr/default/table?lang=en)

The displayed data using Table 3. present the calculated coefficients reflecting the variation in the values of the variable quantities.

**Table 3:** Coefficients

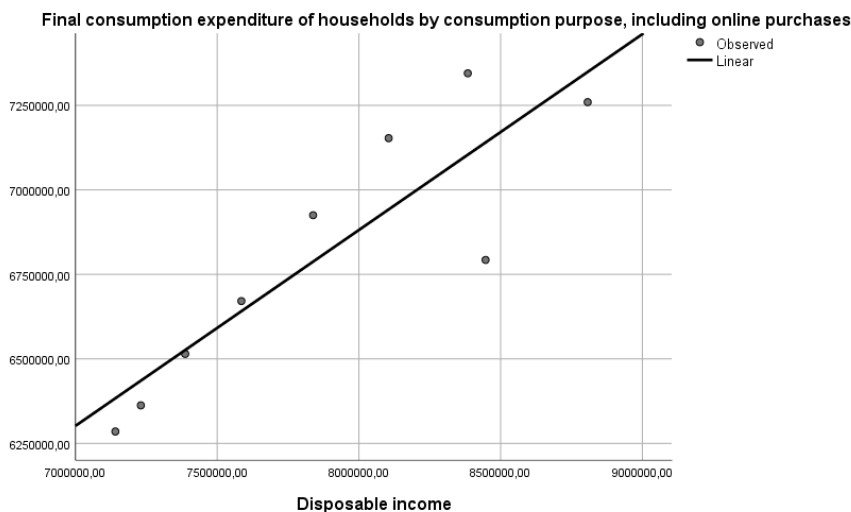
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Disposable income	0.579	0.117	0.882	4.959	0.002
(Constant)	2245524.316	923133.350		2.433	0.045

*Source:* Eurostat.

[https://ec.europa.eu/eurostat/databrowser/view/nama\\_10\\_co3\\_p3/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nama_10_co3_p3/default/table?lang=en);

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Using the following Figure 2. visualization of the relationship between consumer spending, including for online purchases, and the disposable income of individuals from the 27-member states of the European Union is achieved.



Source: Eurostat.

[https://ec.europa.eu/eurostat/databrowser/view/nama\\_10\\_co3\\_p3/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nama_10_co3_p3/default/table?lang=en);

[https://ec.europa.eu/eurostat/databrowser/view/nasa\\_10\\_nf\\_tr/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nasa_10_nf_tr/default/table?lang=en)

**Figure 2:** Relationship between consumer spending, including online purchases, and disposable income of individuals from the 27-member states of the European Union, 2013-2021

The three coefficients of regression, correlation and determination are of cognitive analytical value when measuring the assessed dependence. Compliance with the data from Table 3. allows to establish that the regression coefficient takes the value 0.579. The reported value allows formulating the assumption that when the disposable income of consumers from individual countries in the European Union increases by 1 euro, an average increase of about 0.579 is achieved in consumer spending, including for online purchases. According to the data visualized by Table 1., the coefficient of variation  $R$  takes the value of 0.882. The presented coefficient is defined as a measure of the strength of the dependence between the studied variables. Based on the references in the specialized theory, a strong dependence is established at  $0.7 < R \leq 1.0$ , i.e. a high degree of dependence or a high correlation between the two variables. In the analytical sequence, the third coefficient of calculation is that of determination. The highlighted ratio measures the relative weight of variation in consumer spending, including for online purchases. According to the data from Table 1. the value of the coefficient of determination amounts to:  $R^2 = 0.778$ . The obtained result allows formulating the analytical assessment that more than 78% of the differences between users from individual countries in the European Union of online goods and services are due to the differences between them in the amount of disposable income. What is shown in Figure 2. is a basis for the statement that the existence of a dependence between the two evaluated

quantities predetermines the distribution of the actual values of consumer costs, including for online purchases, around or near the regression line.

## **5. Discussion**

The results obtained in the present study are grounds for interpreting the power of influence of the evaluated determinants on the change in the behavior of European consumers when making online purchases. In the outlined research field, there are opportunities for discussion and comparison of published results in the specialized literature by other researchers. In their theoretical-empirical studies, L. Passinety and P. Leon claim that the amount of real household income determines the level of consumption in the short term. The cited researchers adhere to prioritizing the impact of disposable income over the level of consumption. In the present work, this research position finds acceptance and confirmation. In its essence, the reasoning shown shows that the behavior of consumers is predetermined by the power of influence of certain factors, among which those of an economic nature have a special weight.

## **6. Conclusions**

The presented study, investigating the online purchases of individuals from the 27-member states of the European Union, allows the formulation of relevant conclusions and generalizations. In the era of the digital economy, with improved information and communication skills and digital infrastructure, there is a significant increase in online purchases by European consumers. This type of purchases should be considered as an indicator of the achieved level of economic well-being both in a general European plan and at the level of an individual country. A correlation should be sought between the increase in the disposable income of the respondents from the individual member states of the European Union and the magnitude of online purchases. It is of practical and analytical utility to consider the research result that a significant part of the differences between European online users from individual countries is due to the inequality between them in the amount of disposable income. From this point of view, it is important that future decisions for the development of the European digital economy and society take into account the relatively high moderating effect of disposable income, as an economic determinant, on the dynamics of consumer behavior when making online purchases. In this sense, it is reasonable to observe the trend of increasing consumer attitudes and preferences for online versus offline shopping.



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