Impact of Digitalization of Business Processes on The Economic Security of The National Economy

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Abstract

In the article, the impact of digitalization of business processes on the economic security (ES) of the national economy through the analysis of its intermediate and final results is investigasted. The mechanism of the impact of digital technologies (DT) on ES is theoretically substantiated, within which the digitalization of business processes forms productivity growth, contributes to a change in the export structure in favor of goods with higher technological complexity and strengthens the innovative potential of the economy. The empirical basis of the study is cross-country data from the European Union countries, which made it possible to take into account differences between countries in the level of digital business activity. A multifactor regression model was built, which showed a statistically significant impact of the use of artificial intelligence technologies (AIT) on productivity, which confirms the transformative, long-term nature of digitalization. It was established that the impact of data analytics and cloud services has an indirect effect, which is realized under the condition of sufficient digital maturity of the business environment. Comparative analysis of the Global Innovation Index showed that countries with a higher level of digitalization have a more stable and competitive export structure, which is an important factor of ES. The results obtained confirm that the digitalization of business processes does not provide an immediate economic effect, but in the long term it forms the basis for increasing productivity, GDP and increasing the economic stability of the national economy. The practical significance of the study lies in possible use of the obtained conclusions and models to substantiate the state policy of digital transformation (DTR), innovative development and strengthening ES.

Keywords: Digitalization; Economic Security; Productivity; Digital Technologies; Artificial Intelligence; Data Analytics; Cloud Computing; Export Structure; National Economy.

Introduction

In the context of the global DTR of the economy, the digitalization of business processes is gradually transforming from a tool for increasing

operational efficiency into one of the key factors in shaping the ES of national economies. The rapid spread of DT, in particular data analytics, cloud computing and AI, is changing the nature of production processes, management decisions and competition in global markets. In these conditions, the ability of the economy to adapt to digital changes becomes a determining element of its stability, resilience and long-term development.

ES increasingly depends not only on macroeconomic stability or resource potential, but also on the level of digital maturity of the business environment, labor productivity and technological sophistication of exports. Countries that successfully integrate digital solutions into business processes receive additional benefits in the form of increased productivity, increased innovative capacity and resilience to external economic shocks. On the other hand, an insufficient level of digitalization or its fragmented nature can exacerbate structural imbalances and threaten ES, especially in conditions of crisis phenomena and military risks.

In view of this, it is relevant to study the mechanism of the impact of digitalization of business processes on the ES of the national economy through key indicators - productivity and economic growth. Of particular importance is the cross-country analysis, which allows comparing countries with different levels of digital activity and innovative development. In this context, this study is aimed at quantitatively assessing the impact of DT on business productivity in the countries of the European Union, as well as analyzing the role of high-tech exports and innovative development in the formation of long-term ES.

Literature Review

In the context of modern transformation of economic systems, the digitalization of business processes is becoming one of the key factors in increasing the competitiveness of business entities, accelerating innovative development, and optimizing the resource provision of economic activity. In the scientific literature (Obydiennova et al. (2024); Tanasiichuk et al. (2024)) digitalization of business processes is most often considered as a systemic process of integrating digital technologies into all levels of operational and management activities of enterprises, including planning, production, logistics, marketing, accounting, financial management and interaction with counterparties. Researchers (Zybareva et al. (2023); Popelo et al. (2025)) emphasize that the transition to digital models of business organization provides acceleration of information processing, increase of transparency of management decisions, optimization of costs and formation of a new level of adaptability of the enterprise to changes of the external environment. In this aspect, digitalization is considered not as purely technological update, but as a strategic direction of structural transformations, which changes the mechanisms of creation of added value and influences functioning of market infrastructure.

In parallel, within the framework of ES research (Reshetov & Polusmiak (2022); Zhytar et al. (2022)) DTR of the business environment enhances the significance of the information component of ES and increases the role of the technological factor in ensuring the sustainability of the national economy. In this context, the digitalization of business processes acts both as a factor in strengthening ES through increased productivity, innovation and resource efficiency, as well as a source of new threats associated with cybersecurity risks, loss of control over critical digital infrastructures and increased technological dependence.

Special attention in the literature (Di Vaio et al. (2020); Khakurel et al. (2018); Kholiavko et al. (2023); Parubets et al. (2023)) focuses on the relationship between the DTR of enterprises and the systemic sustainability of the economy. In particular, it is noted that digitalization creates conditions for increasing the flexibility of business models, activating innovative activities and expanding the possibilities of integration into international production chains. At the same time, researchers emphasize that these processes may be accompanied by structural imbalances, primarily due to the differentiation of the level of digital maturity of enterprises, uneven access to financial and technological resources, as well as the concentration of digital solutions in a narrow circle of large companies. This creates risks for the balanced development of the national economy and complicates the implementation of policies to support the sustainability of strategically important sectors.

Koibichuk et al. (2021) and Nikiforov et al. (2022) link their research to the issue of cyber threats as a key risk of digitalization of business processes. The growing dependence of enterprises on digital management systems, cloud services, electronic document management and network platforms increases the vulnerability of economic processes to cyberattacks, data leakage, manipulation of information flows and blocking of operational activities. Under these conditions, DTR becomes a factor of potential destabilization of economic activity not only at the enterprise level, but also at the macro level, since disruption of the functioning of critical business chains can have a multiplier effect on production, financial stability and the labor market.

In modern conditions, a significant part of enterprises uses software, digital platforms and data management tools created by transnational companies, which can create risks of restricting access to critical technologies, increase the threats of uncontrolled data outflow and increase the vulnerability of the business environment to external influences (Rudenko et al. (2021); Marhasova et al. (2024)). In this context, researchers emphasize the need to develop a national digital infrastructure, form a domestic market for digital services, and intensify state policies to support cyber resilience and digital autonomy.

Thus, a theoretical vacuum is forming in the modern literature regarding insufficiently systematized approaches to a comprehensive assessment of the impact of digitalization of business processes on ES in the context of the interaction of the micro and macro levels. This necessitates further deepening of scientific research on the assessment of digital risks, the formation of a system of ES indicators in the digital economy, and the identification of prospects for increasing the economic sustainability of the national economy.

The purpose of the study is to comprehensively substantiate the impact of digitalization of business processes on the ES of the national economy by quantifying the relationship between the use of DT by enterprises, the level of productivity and economic growth, as well as determining the role of DTR in shaping the long-term economic sustainability and competitiveness of countries.

Methodology

In conducting a study of the impact of digitalization of business processes on the productivity and ES of national economies, a complex of interconnected general scientific and special economic and statistical methods was used, which ensured the logical integrity and reliability of the results obtained.

At the theoretical stage, methods of scientific abstraction, analysis and synthesis were applied, which allowed to generalize modern approaches to the interpretation of the digitalization of business processes, productivity and ES, as well as to form a conceptual model of the mechanism of their interaction. The method of induction and deduction was used to move from individual empirical observations to generalized conclusions regarding the role of DT in ensuring sustainable economic development.

Methods of comparative analysis and cross-country comparisons were used, which made it possible to take into account the differences between EU countries in terms of the level of digital business activity and innovative development. Graphical and tabular methods were used for a visual interpretation of the dynamics of indicators and calculation results. The combined use of these methods provided a comprehensive approach to the analysis of the digitalization of business processes as a factor in the formation of productivity and long-term ES of national economies.

As part of the study of the impact of digitalization of business processes on the ES of the national economy, an econometric model has been built that allows to quantitatively assess the relationship between the use of key DT by enterprises and the level of their productivity as an intermediate result of ES. In the model, the dependent variable (y) is labor productivity, which is considered an integral indicator of the efficiency of the business sector and a basic prerequisite for GDP growth, and therefore - strengthening the economic stability and security of the country.

The independent variables reflect different directions of digitalization of business processes. The variable x1 characterizes the percentage of enterprises that use data

analytics, which reflects the level of application of big data processing tools to support management decisions and optimize operational processes. The variable x2 represents the percentage of enterprises that use cloud computing services (Cloud computing services), which is an indicator of the development of digital infrastructure and flexibility of business models. The variable x3 reflects the percentage of enterprises that implement AIT, i.e. the most advanced level of DTR, associated with automation, forecasting and intelligent management support.

The empirical basis for building this regression model was generalized statistical data on the countries of the European Union for 2025. The sample includes countries that differ significantly in the level of digital business activity, the scale of implementation of modern ICT solutions, the degree of maturity of digital infrastructure and innovation potential. This heterogeneity of the sample allows for a more correct assessment of the impact of individual digital tools on productivity in different institutional and technological conditions, and reduces the risk of obtaining distorted conclusions inherent in the analysis of homogeneous economies.

Using data from EU countries allows to consider the digitalization of business processes not as a local or industry phenomenon, but as a systemic factor of economic development and security, the impact of which manifests itself differently depending on the level of digital maturity of the country. In this context, the constructed model allows to identify general patterns of the relationship between the use of data analytics, cloud services and AI and productivity, which is of fundamental importance for the formation of a sound DTR policy in countries with different levels of economic and innovative capacity.

Results

The massive introduction of DT into production, management, financial and logistics processes changes the structure of added value, increases labor productivity, transparency of economic relations and the ability of business entities to adapt to external and internal threats. At the same time, digitalization creates new challenges for ES associated with cyber risks, technological dependence, uneven access to digital resources and the vulnerability of critical infrastructure.

Research is becoming particularly relevant, as it allows to identify how DTR strengthen or, conversely, weaken the stability of the economic system, its competitiveness, and its ability to develop long-term.

Egodawele et al. (2022) examine trends and theoretical approaches to DTR, including its relationship to increased organizational capacity and adaptability-factors that influence ES in a broad way. As a result, they argue that DTR enhances a business's ability to adapt to external shocks, which is an important component of ES.

Kukhar et al. (2022) argue that DTR contributes to strengthening the ES of enterprises and improving risk management through the introduction of modern DT, automation of business processes and strengthening protection against risks; analyze the mechanisms by which digital innovations change approaches to ensuring ES and increase the productivity and adaptability of business structures.

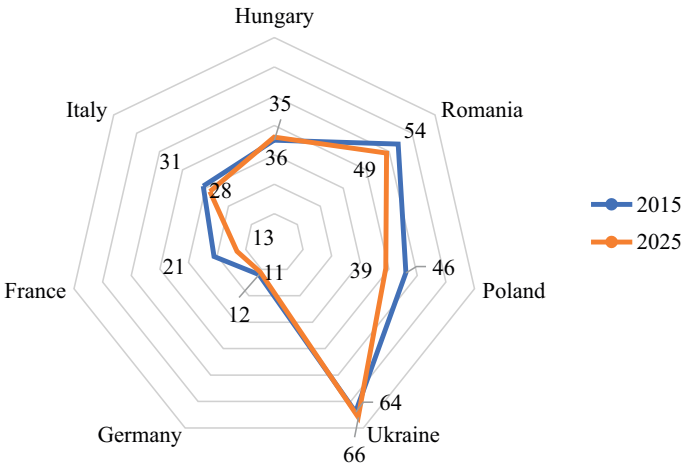
Onofriichuk et al. (2024) examine how DT are changing investment processes and at the same time impacting ES and emphasize that digital tools (data analytics, automation, AI) can significantly enhance transparency and adaptability, which are important components of national ES.

Reshetov & Polusmiak (2022) consider the impact of widespread economic digitalization on the ES of national systems and emphasize that DT change the economic structure, create new opportunities, but at the same time generate risks that require forecasting and strategic management. That is, the digitalization of the economy has both positive and negative consequences for ES - it is a complex phenomenon that must be assessed not only through innovative development, but also through risks (cyber threats, digital inequality, etc.).

That is, studies show that the digitalization of business processes not only increases productivity and efficiency, but also creates new challenges for ES, including cyber risks, digital inequality, the need for skilled personnel, and data protection.

Research into the country's innovation development index reveals the depth of DTR, the economy's ability to create and implement innovations, as well as its competitiveness at the global level. It is Global Innovation Index (GII) is the most representative comprehensive indicator that allows for a systematic assessment of the innovation capabilities of economies, including digital infrastructure, human capital, scientific and technical potential, the development of high-tech sectors. At the same time, the pace of change and the direction of movement of the index of the analyzed countries differ (Fig. 1).

Figure 1. Dynamics of Global Innovation Index (GII) in 2015 and 2025



Source: compiled by the author 's based on The Global Innovation Index (2015) and GII (2025)

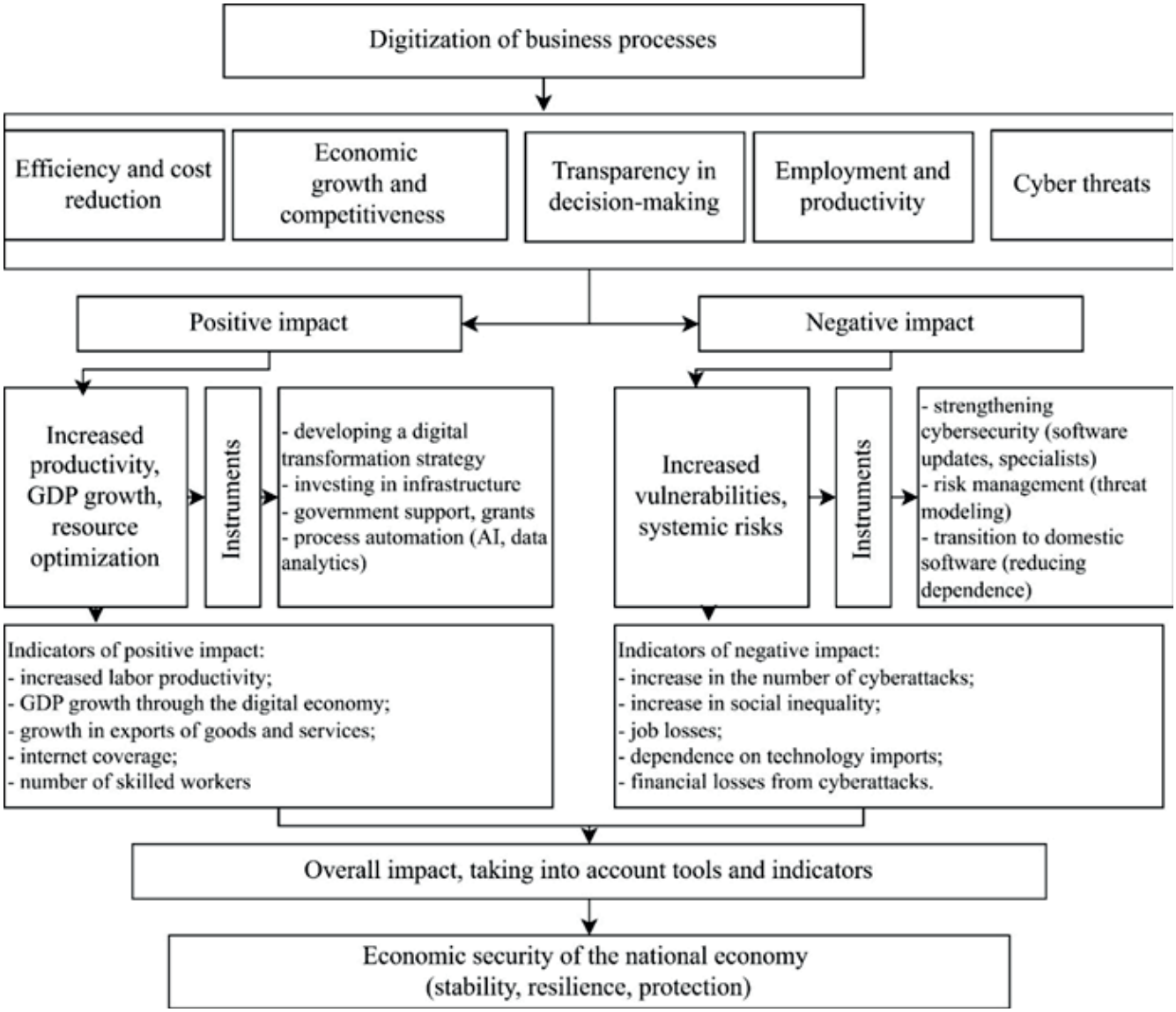
For countries with transformational economies during 2015–2025, stagnation or deterioration of positions in the GII is characteristic, which indicates structural limitations in transforming the digitalization of business processes into a sustainable innovation result. Ukraine demonstrates a decrease in both the ranking position (from 64 to 66 places) and the index score (from 36.45 to 29.7), which reflects the weakening of innovation potential in conditions of military risks, loss of production and human resources and fragmentation of digital ecosystems. Similar trends, although less sharp, are observed in Romania and Poland, where a slight deterioration in scores with relatively stable places in the rating indicates a limited effect of DTR without deep institutional changes. Hungary demonstrates relative stability, which indicates partial compensation of external shocks through integration into European production and digital chains.

Instead, the leading EU countries – Germany, France and Italy – maintain high positions in the Global Innovation Index throughout the period. A slight decrease in index scores in 2025 compared to 2015 is not accompanied by a sharp drop in positions, and therefore does not reflect the degradation of innovation systems, but rather the saturation of the effect and the transition to more complex forms of DTR. For these economies, business process digitalization is not a separate driver of growth, but a component of a systemic innovation model that ensures stability, productivity and technological sovereignty, which are key elements of ES.

Comparative analysis shows that all countries share the recognition of the digitalization of business processes as a necessary condition for innovative development, but the differences lie in the ability to transform digital tools into long-term macroeconomic and security effects. While for Germany, France and Italy digitalization is already integrated into the mechanisms of increasing productivity, GDP growth and resilience to shocks, for Ukraine and some EU countries digitalization remains fragmented and vulnerable to external risks.

High or stable GII values reflect not only the ability of countries to generate and implement innovations, but also the formation of institutional, technological and managerial mechanisms through which digital solutions affect the efficiency of economic processes. At the same time, the dynamics of the index allows to identify potential vulnerabilities that accompany DTR, in particular, increased technological dependence, uneven development of human capital and growth of cyber risks. In this context, it is advisable to generalize the mechanism, which combines both positive effects - increased productivity, competitiveness and transparency of the economy, and negative consequences - increased structural imbalances and new threats (Fig. 2).

Figure 2. The mechanism of influence of digitalization of business processes on the economic security of the country



Source: compiled by the authors

Digitalization of business processes is the integration of DT into all key business processes – from production and management to marketing and customer service. This process significantly changes the traditional economic structure, creating the prerequisites for both increased efficiency and the emergence of new risks.

One of the main positive mechanisms of digitalization's impact on ES is increasing efficiency and reducing operating costs. The introduction of automated systems, AI, big data, and other digital solutions allows enterprises to optimize production and management processes, accelerate decision-making, and reduce the share of inefficient costs. Reshetov & Polusmiak (2022) argue that DTR contributes to GDP growth and increases the economy's ability to adapt to global challenges, as well as productivity growth through the use of DT in production and services.

Digitalization also contributes to economic growth and competitiveness by providing access to new markets, creating innovative products and services, developing

exports and investments. Increasing the level of digital development increases the rates of economic growth of countries, promotes integration into global value chains and creates a favorable environment for innovative industries.

Another positive effect of digitalization is the increase in transparency and quality of decision-making, which is essential for ES. The introduction of digital analytics platforms, transparent electronic accounting systems, blockchain for supply chains, etc. creates conditions for minimizing corruption, reducing information asymmetries and improving public administration.

Along with the positive impacts, the digitalization of business processes creates new challenges and risks that can weaken ES. The main negative is the growth of cyber threats, which is a consequence of the wider use of DT and the connection of critical infrastructure elements to networks. Buriak & Maslii (2025) point out that digitalization is accompanied by increased exposure to cyber attacks, data leaks, and malicious interventions that disrupt the normal functioning of businesses, financial systems, and government institutions, which directly threatens ES.

Digitalization also affects the structure of employment and the labor market. Automation and AI can replace traditional labor functions, which poses risks to employment and social stability, and the decline in employment in traditional sectors is a source of economic and social tensions. This, in turn, increases the need to adapt the education system, retrain personnel and create new jobs in the digital economy.

Cybersecurity and information protection are becoming a critical component of ES in the digital age. Muravskyi & Tolpezhnikov (2024) indicate that insufficient preparation to counter digital risks leads to significant economic losses and even paralysis of certain sectors if comprehensive data protection and strategic risk management systems are not implemented.

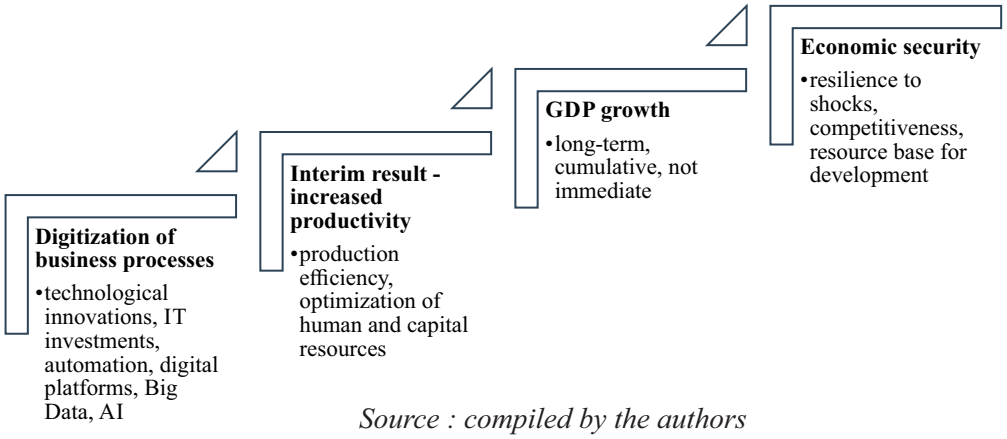
The networked interconnectedness of the digital economy creates situations where local problems can have global consequences, so states must integrate their national digitalization strategies with international cybersecurity and information exchange standards to increase the resilience of their economies.

Thus, the digitalization of business processes affects the ES of the state through the following key channels:

1. Positive effects: increased efficiency and cost optimization, stimulation of economic growth and competitiveness, transparency and quality of management.
2. Negative effects: increased cyber risks, structural changes in the labor market, vulnerability of critical infrastructure.

Digital innovations do not have an instant effect, but form long-term structural changes that manifest themselves through a gradual increase in the efficiency of economic agents, changes in production models, optimization of resources, and integration into global markets (Fig. 3).

Figure 3. The concept of the impact of digitalization of business processes on the economic security of the national economy



Source : compiled by the authors

The process – digitalization of business processes → increased productivity → GDP growth → increased ES – is one of the central mechanisms explaining how modern technologies transform national economies. This chain of logic is based on the concept that digital innovations do not have an instant effect, but rather shape long-term structural changes.

Digitalization means the introduction of DT into key operations: automation of production, use of IT solutions in supply chain management, implementation of ERP/CRM systems, analysis of Big Data, AI, etc. This creates the basis for more efficient, fast and adaptive business structures. Higón and al. (2026) prove that DT contribute to the optimization of operational efficiency and management processes, which in the long term strengthens the operational capacity of companies and entire sectors of the economy.

The introduction of DT increases labor and capital productivity, reduces transaction costs, and speeds up information processing. This is not a one-time effect, but the cumulative result of systemic DTR (Dong & McIntyre (2014); Autor et al. (2020)).

Gradual productivity growth is not an end in itself, but a successful mechanism for increasing the aggregate output of the economy. Through increased production efficiency, expanded exports of technological products, more efficient use of resources, and faster implementation of innovative solutions, the overall level of GDP increases. Mura & Donath (2023) found that technological investment is positively correlated with GDP growth rates in the long run.

ES is an integral result. In this context, GDP is not an end in itself, but an indicator of strengthening ES. Higher and more stably growing GDP means that the country has greater internal resources to counteract external crises (market turbulence, energy shocks); maintain social stability; finance infrastructure; invest in human capital. Digitalization thus indirectly strengthens the evolutionary stability of the national economy (Xi & Wang (2023)).

The effects of digitalization do not occur instantly – they manifest themselves in a multi-stage transformation:

technology implementation → organizational structure change →

personnel adaptation → productivity improvement →

impact on macro results .

Thus, one should not expect an instant effect in the form of a GDP jump from the digitalization of business processes. Real macroeconomic changes usually take several years and are supported by systemic political, educational and institutional reforms.

The impact of individual elements of business process digitalization on enterprise productivity is reflected in the constructed model, which allows to assess the extent and nature of this impact, as well as to determine whether it is homogeneous for different DT. The model allows to identify not only the presence or absence of a direct statistical relationship, but also to assess the nature of this impact - positive, neutral or transformationally negative in the short term.

Table 1. Results of regression analysis of the relationship between digitalization of business processes and productivity

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,604624
R Square	0,365571
Adjusted R	0,289439
Standard E	8,65349
Observatic	29

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regressior	3	1078,724	359,5748	4,801828	0,008924
Residual	25	1872,072	74,88289		
Total	28	2950,796			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	120,0014	6,993355	17,15935	2,42E-15	105,5984	134,4045	105,5984	134,4045
X Variable	-0,03881	0,196146	-0,19788	0,844737	-0,44278	0,365155	-0,44278	0,365155
X Variable	0,046225	0,111886	0,413142	0,683025	-0,18421	0,276657	-0,18421	0,276657
X Variable	-0,61054	0,210136	-2,90545	0,007569	-1,04333	-0,17776	-1,04333	-0,17776

Source : compiled by the author's based on calculations

The results (Table 1) indicate the presence of a statistically significant, but moderate in strength, relationship between the digitalization of business processes and productivity. The obtained value of the multiple correlation coefficient (Multiple R = 0.605) indicates an average level of consistency between the actual and calculated productivity values. The coefficient of determination ($R^2 = 0.366$) means that about 36.6% of the variation in productivity is explained by the combined influence of three factors of digitalization - the use of data analytics, cloud services and AI. At the same time, the adjusted R^2 (0.289) signals that after taking into account the number of variables, the explanatory power of the model decreases.

The overall adequacy of the model is confirmed by the results of the analysis of variance (ANOVA). The value of the F-statistic (4.80) at the significance level Significance F=0.0089 allows to reject the null hypothesis of no relationship between the indicators of digitalization of business processes and productivity.

Analysis of individual regression coefficients shows significant differentiation of the impacts of different DT. Share of enterprises using Data analytics (x1), has a negative but statistically insignificant coefficient (–0.0388; p = 0.845). This means that the current level of data analytics use alone does not have a noticeable impact on productivity. This result is more likely to indicate a superficial or fragmented nature of data analytics use. analytics, when technology is not integrated into key management and production processes.

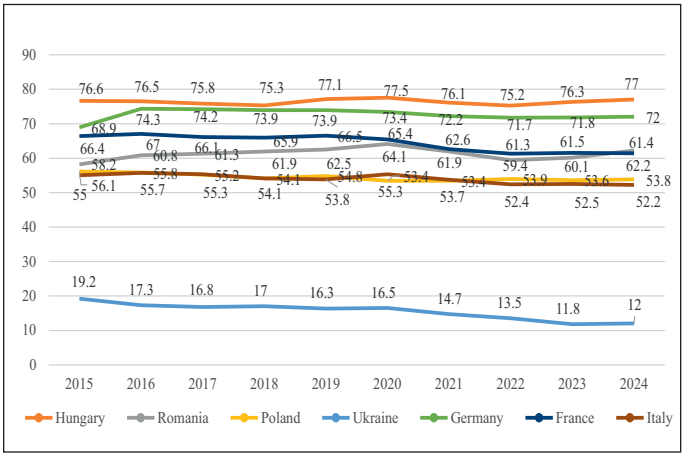
The use of cloud services (x2) shows a positive, but also statistically insignificant effect (0.0462; p = 0.683). This indicates that cloud computing in the current environment performs more of an infrastructure function, creating the prerequisites for digitalization , but not directly transforming into productivity gains. Thus, cloud services are a necessary but not sufficient condition for increasing business efficiency.

The most significant result is the effect of the share of enterprises using AI (x3). The coefficient on this variable is negative and statistically significant (–0.6105; p = 0.0076), and the confidence interval does not contain the zero value. This means that an increase in the share of enterprises using AI is associated with a decrease in productivity in the short term. This effect can be interpreted as a manifestation of transformation costs: the implementation of AI requires significant investments, restructuring of business processes, training of personnel and adaptation of organizational structures, which temporarily reduces efficiency.

Overall, the results of the regression analysis support the thesis that the impact of digitalization of business processes on productivity, and through it on ES, is complex and mostly long-term in nature. Basic digital tools (data analytics and cloud services) do not provide automatic productivity growth without deep integration into the development strategy of enterprises, while advanced technologies, in particular AI, can even worsen performance in the short term, while at the same time forming the basis for future growth. This is consistent with the concept of the lag effect of digitalization, according to which the positive impact on GDP and ES appears only after the adaptation phase and institutional consolidation of new technologies are completed.

The analysis logically complements the previous analysis of the digitalization of business processes, productivity and ES, as it reflects the result of the internal digital and innovative capacity of the economy (Fig. 4).

Figure 4. Dynamics of the share of exports of goods using medium technologies in production and high - tech level in the total volume of exports of goods in EU countries, %



Source : compiled by the author 's based on World Bank Group

Dynamics demonstrates a clear differentiation of countries by the level of technological complexity of exports. Hungary consistently maintains a very high share of medium and high - tech exports – within 75-77%. This stability indicates a deep integration of digital solutions into production business processes, which correlates with high productivity indicators and confirms the presence of long-term prerequisites for ES. Similarly, Germany and France demonstrate high values of this indicator (over 60-70%), although with a moderate downward trend, which is a consequence of structural changes.

Poland, Romania and Italy form a group of countries with an average level of technological export. Poland is characterized by a gradual decrease in the indicator from 56.1% to about 53.8%, where digitalization does not always provide an instant increase in productivity. This indicates the transformational nature of the process: investments in DT take time to turn into stable competitive export advantages. Romania, on the contrary, demonstrates positive long-term dynamics, which indicates a gradual increase in the technological component of exports and strengthening of positions in the European production space.

Ukraine differs significantly from other countries in the sample. Share of exports medium and high - tech goods is the lowest and has a clearly pronounced downward trend - from 19.2% in 2015 to about 12% in 2024. This confirms the gap between the potential of digitalization and its real economic effect. Low technologicality of exports indicates weak integration of DT into production business processes, which limits productivity growth and negatively affects ES, especially in conditions of military and structural shocks.

In general, it can be argued that countries with a higher and more stable share of technological exports tend to have better results in terms of productivity and innovative development, which is consistent with the constructed model of the impact of digitalization of business processes. Share medium and high - tech exports act as a kind of "mirror" of the depth of the DTR of the economy and an important indicator of ES. For Ukraine, the dynamics of this indicator confirms the need for systematic digitalization of production and management business processes, since without this, the growth of productivity, GDP and long-term economic sustainability will remain limited.

Discussion

The results of the study provide grounds to assert that the digitalization of business processes is one of the determining factors in the transformation of the modern economy, which significantly affects the level of ES of the national economy. Agreeing with Shlapak et al. (2025), that the introduction of DT into the activities of business entities contributes to the acceleration of information circulation. At the same time, DTR creates new types of vulnerabilities, which necessitates the rethinking of traditional mechanisms for ensuring ES at the macro and micro levels.

Djakona et al. (2021) notes that the digitalization of business processes can have a positive impact on ES by increasing labor productivity, increasing the competitive advantages of enterprises, and enhancing their adaptability to changes in the market environment, which is also confirmed by the results of our study. At the macroeconomic level, this can create increasing the country's investment attractiveness, and developing new sectors of the economy, in particular digital services and technological entrepreneurship.

At the same time, the digitalization of business processes (Di Vaio et al. (2020)) is accompanied by significant risks that can negatively affect ES. First, the vulnerability of enterprises to cyber threats is increasing, which becomes systemic in the case of attacks on critical production or financial segments.

Hryhoruk et al. (2024) and Fedyshyn et al. (2022) identify the unevenness of the DTR of business as an important aspect. In the absence of an effective state policy to support DTR, such a situation can lead to the concentration of market power, a decrease in the level of competition and an increase in economic risks associated with the monopolization of certain sectors. At the same time, an insufficient level of digital literacy of personnel and a shortage of qualified personnel in the field of information technology can complicate the effective integration of

digital solutions and increase technological risks.

In view of the above, on the basis of Koibichuk et al. (2021) statements the formation of an appropriate ES level in the context of digitalization of business processes requires a transition from fragmented response measures to a systemic approach that combines state regulatory instruments, support for digital infrastructure and development of institutional capacity in the field of cyber protection. An important prerequisite is the creation of an effective digital risk management system, which will include mechanisms for monitoring cyber threats, developing standards for the safe operation of digital systems, strengthening responsibility for information security violations and encouraging enterprises to implement modern data protection practices.

In summary, it should be noted that the digitalization of business processes is an important factor influencing the ES of the national economy, creating the prerequisites for increasing efficiency and innovative potential, but creating new risks that can cause systemic imbalances in the functioning of the economy.

Conclusions

Thus, the digitalization of business processes is a systemic and long-term factor in the formation of ES of national economies, the impact of which is realized not directly, but through intermediate results - productivity growth, a change in the structure of exports, GDP growth and strengthening of innovative capacity. The constructed econometric models and cross-country analysis confirmed that the level of use of DT by enterprises forms the basis for increasing the efficiency of the economy, however, this effect manifests itself unevenly depending on the depth of DTR and the institutional environment.

The results showed that digitalization does not provide an immediate increase in productivity, especially in the case of the introduction of complex technologies such as AI. This indicates the transformational nature of digital change, when in the initial stages costs increase, the structural restructuring of business processes and the need for new competencies. At the same time, in countries with a high level of digital maturity, this effect is transformed in the long term into sustainable productivity growth and the formation of a high-tech export structure.

A comparative analysis of EU countries and Ukraine has proven that countries that have been able to integrate digital solutions into production business processes demonstrate greater resilience to external shocks, higher competitiveness and better positions in global value chains. For Ukraine, the recorded downward dynamics of this indicator indicates structural threats to ES and the need to reorient digitalization from fragmented solutions to systemic business transformation.

The result of the study is an analytical model that can be used to assess the effectiveness of digital policy at the level of countries or regions, as well as to justify the priorities of state support for the DTR of business. Overall, the study confirms that the digitalization of business processes is not only a technological trend, but also a key tool for strengthening ES and sustainable development of the national economy.

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