UDC 330.3, 330.5
JEL classification: O11, O47
DOI: https://doi.org/10.17721/1728-2667.2026/228-1/1

Olena BAZHENOVA, DSc (Econ.), Prof.
ORCID ID: 0000-0003-3197-8426
e-mail: olenabazhenova@knu.ua
Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

Givi BEDIANASHVILI, DSc (Econ.), Prof.
ORCID ID: 0000-0003-4521-737X
e-mail: givi.bedianashvili@tsu.ge
Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia

Vladyslav TALALAIEVSKYI, Student
ORCID ID: 0009-0002-2466-9318
e-mail: vladyslav.talalaievskyi@knu.ua
Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

ECONOMIC GROWTH DRIVERS: EMPIRICAL FINDINGS FOR DEVELOPING EUROPEAN COUNTRIES

Background. ***The relevance of this article lies in the persistent importance of economic growth in developing economies as a central subject of modern economic research. The growing integration of global markets and rapid technological change have significantly influenced the pace and structure of development across countries. Identifying the fundamental drivers of growth is essential for shaping policies that ensure long-term stability and sustainable progress. The experience of countries that have successfully transitioned from developing to advanced status offers valuable empirical evidence. Examining these cases makes it possible to determine the most significant factors contributing to economic growth. In this context, the study of growth drivers in developing European economies acquires particular importance for understanding their prospects for accelerated and sustainable development.***

Methods. ***The study applies a combination of theoretical analysis, comparative assessment, and regression modeling to provide a comprehensive examination of economic growth drivers.***

Results. ***In this study, using empirical analysis, it was found that the most important factors of economic growth were the amount of investment in real assets, the effectiveness of public spending, and investment in science and technology. However, the quality of institutions and demographic changes require a deeper analysis, since their impact has been ambiguous.***

Empirical analysis has shown that the significant factors of economic growth are the volume of investment in real assets, the rate of population growth, and the share of international trade in GDP. In contrast, the quality of institutions and spending on education and R&D require deeper analysis, since their impact is not observed in the short term.

Conclusions. ***Based on the analysis of theoretical models and empirical findings, the key factors that have the greatest impact on the growth rate of GDP per capita have been identified. Drawing on both the theoretical analysis and empirical results, practical recommendations were formulated for Ukraine's future economic strategy. Today, the urgent need to define and build a path to post-war recovery and further economic growth in Ukraine makes this research relevant.***

Keywords: ***economic growth, economic growth drivers, developing economies, gross domestic product, factors of production, panel data model, modelling.***

Background

Economic growth in developing economies remains one of the most critical issues in contemporary economic research. The increasing integration of global markets and the rapid technological advancements have significantly influenced the pace and patterns of economic development across countries. However, despite these advancements, many developing economies continue to face structural challenges that hinder their sustained growth.

Identifying the key drivers of economic growth is essential for formulating effective policies that can enhance long-term development and stability. Traditional economic growth models provide fundamental insights into the mechanisms of economic expansion. However, these models do not fully capture the complexity of contemporary economic realities, including institutional factors, technological progress, and human capital development.

The experience of countries that have successfully transitioned from developing to advanced economies in recent decades offers valuable lessons. Analyzing these cases allows us to identify patterns and factors that contribute most effectively to economic growth. Therefore, studying the drivers of economic growth in developing European economies is crucial for understanding how these countries can accelerate their progress and achieve sustained economic growth.

Literature review. The exploration of economic growth in developing countries has evolved significantly over the past decades, mainly focusing on the mechanisms that contribute to long-term development in the global context. Some publications are based on economic growth foundations, such as the Solow-Swan model and endogenous growth models, while expanding to incorporate country-specific conditions, structural constraints, and institutional realities typical for developing economies. Thus, theoretical foundations of economic growth may be found in (Solow, 1956; Kaldor, 1961; Diamond, 1965; Kuznets, 1971; Lucas, 1988; Romer, 1990; Krugman, 1994) and etc. They mainly considered technological progress as the main pillar of economic growth in the long run. For example, Romer treated technological progress as "improvements in the instructions for mixing raw materials" (Romer, 1990). In addition, he distinguished social infrastructure (fiscal policy, government actions and etc.) to be a factor of economic growth (Romer, 2011). For Young (Young, 1995), long-term growth is ensured only by raising the total factor productivity (TFP). At the same time, Kuznets considered epochal innovations ("breakthroughs" in the level of human capital) as the main trigger of economic growth (Kuznets, 1971).

Some empirical studies focus on identifying key variables that statistically correlate with gross domestic

product (GDP) growth in low- and middle-income countries. These studies, using panel data models, often converge on the view that growth is driven by a mix of domestic and external factors, including capital accumulation, labor force dynamics, technological adaptation, and the quality of governance. For instance, Beqiraj, Fedeli and Giuriato (2025) studied the impact of counterfeiting on economic growth in Italy during 2008–2019 and demonstrated its ambiguous effect on economic growth. Yeboah et al. (2024) explored the drivers of inclusive growth in the BRICS countries by applying wavelet analysis, focusing on relationships between life expectancy, environmental sustainability, and economic growth. Feliciano, Ferreiro and Rodriguez-Fuentes (2025) studied the peculiarities of growth drivers depending on the three growth regimes in Spain during 2000–2019. Minh and Tran (2025) used a panel data model for Vietnam to demonstrate that FDI inflows stimulate economic growth and governance quality, decreasing the informal economy. At the same time, poverty and unemployment drive Vietnam's informal economy. The study of Yilmazkuday (2025) is devoted to the research of drivers of growth spillovers across 85 countries during 1961–2022. Due to the results of the research, "growth spillovers are statistically significant for 97% of the advanced economy pairs, whereas this ratio reduces to 56% for spillovers from advanced economies to emerging markets and developing economies". Younas, Qureshi, and Al-Faryan (2022) showed that financial inclusion provides a positive impact on economic growth; at the same time, the size of the shadow economy demonstrates a significant negative effect by using a panel data model with fixed effects for developing economies during the period 2008–2017. In addition, in (Zhylinska et al., 2020) and (Bedianashvili, & Kokhreidze, 2024), the economic growth factors are analyzed for economies on the way to the EU integration, especially concerning R&D impact, in (Bazhenova, 2023) the economic growth drivers in the post-war period are revealed.

Moreover, other contributions to the literature emphasize the heterogeneity of development paths. Scholars argue that there is no one-size-fits-all formula for growth in developing countries, challenging the universality of traditional models. For instance, cross-country analyses by Rodrik (Rodrik, 2003; 2007) and Hausmann (Hausmann et al., 2005) highlight that policy space, institutional capacity, and even historical contingencies shape growth outcomes in ways that resist simple categorization.

Another important trend in the literature is the attention given to growth sustainability. Researchers increasingly assess not only how fast countries grow, but also the quality and inclusiveness of that growth. This includes considerations such as income inequality, environmental degradation, and political stability. The "quality of growth" paradigm, as explored by Sen (Sen, 1999) relates development more closely to human well-being than mere GDP metrics, adding complexity to the search for growth drivers.

To summarize, the literature on drivers of economic growth in developing economies paints a picture of high complexity and variability. While some common drivers can be identified, such as the role of investment, trade, and education, the effectiveness of these drivers is mediated by institutional quality, political stability, and global economic conditions.

The research objective of this study is to analyze the key drivers of economic growth in developing European countries to determine the most influential drivers in their economic expansion.

That is why the following tasks have been set:

• Examine the theoretical foundations of economic growth, focusing on traditional and modern growth models.

• Identify and analyze drivers not included in traditional models but significantly impacting economic development.

• Conduct a case study analysis of countries that have recently transitioned from developing to advanced economies.

• Construct a regression model to empirically determine the most effective drivers of economic growth.

• Propose policy recommendations based on the theoretical and empirical findings.

Methods

The econometric approach used to estimate the relationship between GDP per capita growth and various explanatory variables is based on panel data modeling techniques. The model is specified as follows:

$$y_{it} = \alpha_i + \beta_1 x_{1it} + ... + \beta_k x_{kit} + \varepsilon_{it},$$

x_{1it} , .., x_{kit} represent the explanatory variables (excluding the intercept), α_i denotes individual-specific intercepts that vary across observational units i, ε_{it} are random error terms, assumed to be independently and identically distributed with a mean of zero and constant variance σ_ε^2.

Results

Economic growth is a fundamental process that reflects the ability of a national economy to increase its output of goods and services over the long term. In the macroeconomic context, it is usually measured by the growth rate of real gross domestic product (GDP) or real GDP per capita, which allows us to assess changes in the overall welfare of the population. Growth in real GDP indicates an increase in economic productivity, more efficient use of resources, and better living standards. At the same time, it is important to distinguish between extensive and intensive types of growth: the former is achieved by increasing the number of resources used, while the latter is achieved through increased efficiency of their use, innovation, and technological progress (Romer, 2012).

In developing countries, economic growth has its own specific characteristics and challenges. These economies are often characterized by an unstable institutional framework, limited access to financial resources, low levels of technological development, and dependence on commodity exports. They may also face high unemployment, uneven income distribution, and infrastructure constraints. These factors complicate the process of sustainable economic growth and require targeted reforms and strategic planning to overcome structural problems (Bazhenova, 2023).

Economic growth is driven by a variety of drivers that stimulate economic development. Among them, the key role is played by investments in human capital, in particular in education and healthcare, which increase labor productivity. Innovations and research, and development contribute to the introduction of new technologies and processes that increase production efficiency. Infrastructure development, including transportation and energy networks, provides the necessary conditions for economic activity. In addition, a favorable business environment, political stability, and effective institutions are important prerequisites for attracting investment and supporting entrepreneurship. Successful examples of countries that have achieved high growth rates demonstrate the importance of a comprehensive approach to development that includes both domestic reforms and integration into the global economy.

Although economic development models can provide a deep understanding of the causes and drivers of economic growth, they do not take into account certain factors that cause differences in the dynamics of development between countries. While most economic models emphasize the accumulation of human and physical capital as the main driver of economic growth, Easterly and Levine have devoted a separate paper to the study of drivers other than value accumulation (Easterly, & Levine, 2001). The basis of their research is the concept of Total Factor Productivity (TFP), which the authors consider as a factor that accounts for the differences in growth levels across countries. TFP is defined as the portion of output growth that cannot be explained by an increase in measurable inputs. It reflects enhancements in labor productivity driven by factors such as technological innovation, externalities, institutional adoption, legal frameworks, and property rights.

Rodrik (Rodrik, 2007) provides strategies and advice on economic growth policy in developing countries. He analyzed the economic policies and measures taken by the governments of actively developing countries at the end of the last century and compared them with economic indicators. His study identified geography, international integration, and institutions as the main determinants of economic growth beyond capital accumulation.

Following the works of the scholars mentioned above, innovation, international integration, geography, demographics, and institutions are the major factors that should be considered as key drivers of growth outside of traditional economic models (Prasetyo, 2012).

Technological innovation is a major driver of economic growth since it raises productivity, generates new industries, and creates market opportunities. Technological advancement, through simplification and automation processes, enables companies to produce more efficiently, resulting in greater aggregate output. A case in point is the application of computer-aided design (CAD) software in manufacturing, which has revolutionized product development with the capability to rapidly prototype and precision, reducing production cycles and costs (Toxigon, 2025).

Besides optimizing existing processes, technological innovation gives rise to whole new industries. The internet, for example, has spawned e-commerce websites, digital marketing companies, and the gig economy, all of which have contributed enormously to economic growth by offering new sources of income and jobs. Similarly, progress in biotechnology has transformed the health sector through the production of customized medicines and advanced diagnostic apparatus, enhancing health outcomes and reducing spending on healthcare (MilanoIP, 2025).

Publicly funded R&D investments lie at the heart of sustaining such growth based on innovation. Publicly funded R&D has high social returns, as evidenced by the past provision of productivity growth. For instance, it is argued that publicly funded R&D has significantly contributed to the U.S. productivity since World War II, highlighting that more investment in technological research is essential for ensuring economies remain competitive (Financial Times, 2025).

At the same time, the relationship between technological advancement and increased productivity is not necessarily obvious. "Productivity paradox," coined by Robert Solow, means those instances in which technological change does not become evident as increases in predicted productivity levels in numbers. While technologies such as AI have proliferated, there has been some stagnating growth in productivity. For example, Britain has seen an average productivity growth of just 0.3% per year over the past 16 years, which suggests that the reward for technological innovation may not always show in economic statistics immediately (The Times, 2025).

International integration, including the flows of trade, investment, and the exchange of ideas through which countries become participants in the global round of permanent economic expansion, is critical for economic development. For developing countries, this integration is particularly significant as it offers avenues for accelerated development and poverty reduction.

One of the primary benefits of international integration is the expansion of markets. By engaging in global trade, developing nations can access a broader customer base beyond their domestic markets, leading to increased production and economic expansion. With this access, those countries can specialize in sectors where they have a comparative advantage, so they are better off due to more efficient allocation of resources and output.

International integration also draws in foreign direct investment (FDI), an essential driver in infrastructure building, technology transfer, and promotion of employment. FDI brings in capital that can be utilized for building essential infrastructure such as roads, ports, and telecommunications, thereby improving the overall business environment. Foreign investments may also entail new technologies and managerial approaches that improve worker productivity and thus the competitive capacity of local industries. According to the World Bank, the promotion of regional integration assists countries in breaking natural barriers to the trade of goods, services, capital, labor, and knowledge that are growth inhibitors, especially for developing countries (International Monetary Fund (IMF), 2001).

Engagement in global value chains (GVCs) is also a channel by which internationalization drives growth at the macro level. By integrating into GVCs, developing countries can access the international market at certain stages of production processes, allowing them to participate in international markets without having to develop entire industries domestically. This engagement may result in enhanced industrialization, export diversification, and job skill development. The Trade and International Integration Research Program of the World Bank seeks to strengthen the knowledge base on the development effects of global economic integration on poverty reduction for developing countries.

However, the path to successful integration is not without challenges. Developing countries must navigate potential risks such as increased competition for domestic industries, exposure to global economic fluctuations, and the need to implement appropriate regulatory frameworks to manage integration effectively. To mitigate these risks, developing nations can engage in cooperative efforts and share technical expertise and knowledge with countries facing similar challenges. Access to technology and capacity building are crucial for equitable participation in global cooperation.

A country's favorable geographical location gives it a comparative advantage over other countries, allowing it to use its significant mineral reserves and proximity to international trade routes to accelerate its economic growth. This is especially relevant for developing countries, as it allows them to compensate for their economic weaknesses and integrate into the global system. Elements such as location, climate, and terrain significantly affect income levels and growth rates, affecting transportation costs, the spread of disease, and agricultural productivity. For example, landlocked countries typically face higher transportation costs and limited access to international markets, which can hinder trade and economic growth.

Another important driver that is part of the geographical location is the availability of natural resources and minerals. Such a privilege significantly increases the country's economic potential in the global market and makes it more independent from others in terms of resource availability.

Norway is a perfect example of how to use natural resources for economic benefit in a country. North Sea oil and gas, the largest reserves of hydrocarbons in the world, have become the impetus for the development of an energy sector that accounts for around half of the country's exports and 17% of its GDP. Moreover, Norway uses almost 100% renewables (mainly hydro) for consumption (Enerdata, 2025), making it feasible for the country to export most of its fossil resources and ensuring a high standard of living.

Demographic indicators and tendencies play an important role in determining economic growth trajectories, especially in developing countries. Recent research by the IMF, World Demographics and Aging Forum, and other international think tanks uncovers the growing interrelation between population age structure and economic metrics while highlighting challenges as well as opportunities (IMF, 2020).

The notion of "demographic dividend" means the growth potential that becomes possible due to changes in the age structure of the population, namely, when the share of the workforce in a country rises compared to the disabled groups. The research that estimated South Asian Association for Regional Cooperation (SAARC) countries showed the existence of a positive correlation between the demographic dividend and economic expansion of countries in the period from 1990 to 2017. The research underscored that to use this opportunity fully, these nations need to have policies in place that nudge their labor forces toward full employment, since an underutilized skill set can decrease the potential gains (Nusrat et al., 2021).

On the other side, as other research proves, an increasing number of elderly individuals may become a nudge for positive economic trends. The research covered 84 developing countries in the period between 1971 and 2015. The conclusion was the following: a higher share of young dependents (children under 14 years old) negatively affects economic growth in the long run, while a higher number of older individuals (65 and older) can have a positive influence, meaning that older people can be more efficient in specific fields. However, relationships between these indicators are very complex and heavily depend on the specifics and context of each researched economy (Pham, & Vo, 2019).

Also, international trends point to an up-and-coming "youth scarcity" crisis by way of rapidly declining fertility rates with major economic implications as populations age. The trend of this severity questions traditional economic systems that require a large supply of working younger people to support retirees, leading to fears over the sustainability of the pension system and higher intergenerational economic costs.

Another crucial driver that shapes economic growth is the quality of a country's institutions. Institutions are usually described as legal, political, and social frameworks that set the behavior of individuals and organizations in the economy. Their quality determines the efficiency of the economic system. Strong institutions ensure the fair functioning of the markets, protection of property rights, and accessibility of all benefits from people's work and innovations. In the institutional approach of economic theory, strong institutions are valued as important conditions for economic growth.

Recent empirical researches support the theoretical facts. Yildirim and Gökalp (2016) analyzed 38 developing countries in the period between 2000 and 2011 and demonstrated that the quality of institutions strongly correlates with macroeconomic indicators. Their panel data analysis found key institutional variables that dramatically increase the GDP per capita: integrity of the legal system, trade openness, and labor market flexibility. For example, an improvement in legislation was found to raise income per capita by 8,6%. It illustrates the critical role of trustworthiness in facilitating economic transactions.

At the same time, drivers such as ineffective legislative systems, excessive government spending, and unstable political environments impair economic growth. The research also revealed an unexpected finding: Greater judicial independence without parallel reforms, which in combination can increase efficiency, does not always lead to higher economic output.

Over the past three decades, against the backdrop of increasing globalization and political and economic integration of European countries, the process of economic growth has become increasingly differentiated, and the mechanisms of drivers influencing the pace of development have become increasingly complex. Eastern European countries are particularly interesting for this study, as most of them, sharing a common soviet past, have gone through a process of changing economic, social, and political ideologies and principles, and have radically altered the structure of their internal markets and economic growth models. Despite similar starting conditions after the collapse of the soviet union, the countries of the region have demonstrated very different dynamics of economic development. Some of them have managed to take advantage of the historical moment and build an effective growth model, while others remain in the group of countries with economies in transition, facing lingering barriers to sustainable development.

Among the key drivers of economic growth in European developing countries are institutional reforms, integration into the European Union, attraction of foreign direct investment, development of innovations, and infrastructure. However, not all countries in the region were able to equally take advantage of these opportunities. For example, Hungary experienced an economic decline of 0.2% in the first quarter of 2025 compared to the previous quarter, which was the fourth fall in six quarters. This is due to low business confidence, reduced investment, and weak external demand. On the other hand, the Czech Republic showed stability, growing by 0.5% in quarterly terms and 2.0% in annual terms, mainly due to consumer demand (Reuters, 2025a).

In the Western Balkans, such as Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia, the World Bank predicts collective economic growth of 3.2% in 2025. This growth is supported by lower inflation, rising wages, increased public investment, and robust consumer demand. However, the region faces challenges such as political instability, slow economic activity in the EU, and global trade fluctuations (Reuters, 2025b).

One of the most striking examples of a successful transition is Estonia. Despite the lack of significant natural resources and a small domestic market, the country was able to make an "economic leap" thanks to clear political will, transparent institutional reforms, early digitalization, investment in human capital, and rapid integration into the European Union. These factors have become the drivers that have made Estonia one of the few post-Soviet states that has been able to reach the level of development similar to Western European countries in some respects.

In contrast, Ukraine, a country with much greater potential – strategic geographic location, richer resources, large domestic market, and a highly educated population – still faces difficulties in implementing a sustainable growth strategy. Economic growth is significantly constrained by such factors as chronic political instability, corruption, a weak legal system, low trust in institutions, and delays in the implementation of key economic reforms. In addition, external factors such as the annexation of Crimea and, since 2022, full-scale military aggression by russia have had a significant negative impact.

Historically, Estonia gained independence after the collapse of the USSR in 1991. At that time, the country faced typical post-socialist problems, such as outdated infrastructure, inefficient state-owned enterprises, a closed market, and hyperinflation. Nevertheless, the Estonian government concluded in favor of applying a shock therapy strategy. This economic practice involves rapid and fundamental changes through radical political reforms. Deep macroeconomic and structural changes were implemented, a national currency (kroon) was created, and the legal system was built on the German model. This liberal approach laid the foundation for the country's rapid modernization. At the time of the collapse of the USSR, Estonia's GDP per capita was on par with the other Baltic countries, but as of 2024, it is significantly ahead of them (Fig. 1).

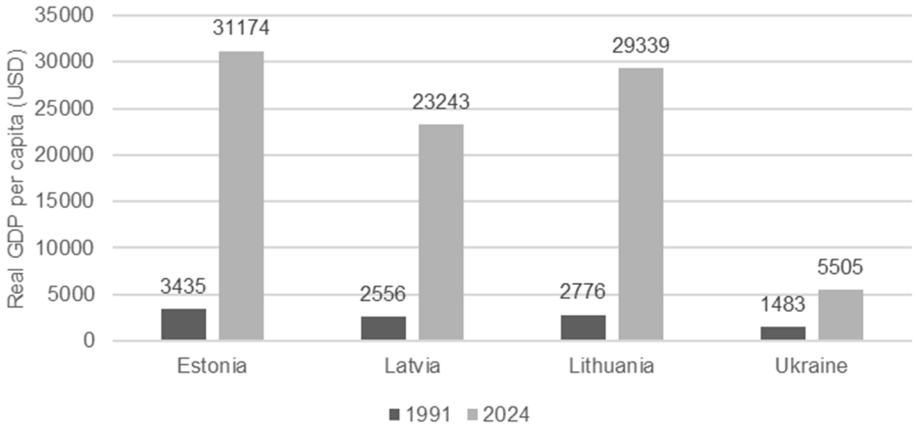

Fig. 1. Real GDP per capita in Baltic countries and Ukraine in 1991 and 2024

Source: compiled by authors based on (Countryeconomy, 2025)

Since gaining independence in 1991, Ukraine has begun the transition from a planned to a market economy. However, unlike Estonia, the reform process has been less consistent, resulting in delays in the development of institutions and economic structure. In the period from 2000 to 2008, Ukraine experienced a period of economic growth, in particular due to favorable external economic conditions, export growth, especially in metallurgy and machine building, and rising domestic consumer demand. GDP grew by an average of 7% annually. However, the global financial crisis of 2008 hit the Ukrainian economy hard. In 2009, GDP declined by 14.8%, driven by lower external demand, falling prices for export goods, hryvnia devaluation, and a crisis in the banking sector. Nevertheless, the economy began to recover in 2010, with GDP growth of 4.1%, driven by favorable external conditions and rising domestic demand. Since 2014, the country has faced military aggression from russia, which has significantly complicated the economic situation. The full-scale invasion in 2022 caused a 29.1% drop in GDP due to the destruction of infrastructure, the blockade of ports, and mass migration.

Despite these challenges, the Ukrainian economy is showing signs of recovery. In 2023, real GDP grew by 5.3%, exceeding the expectations of most analysts. This growth was driven by businesses adapting to the war conditions, increased investment activity, and support from international partners. In particular, investment activity grew by 52.9%, indicating renewed confidence in the economy. In 2024, GDP is projected to grow by 4%, although the growth rate may slow to 2.7% in 2025 due to ongoing security risks, energy challenges, and labor shortages (Ukraine Business News, 2024).

Thus, to analyze the impact of various drivers on economic growth, the panel regression model with fixed effects has been used.

Given the production function of the form Y = Af(K, L, H), where Y is output, A is total factor productivity, K is capital stock, L is labour, and H is human capital, for the purpose of exploring the effect of economic growth factors, we used such indicators.

First of all, economic growth will be measured in annual real GDP growth (in percent). To measure the Capital stock, the indicator of gross capital formation as a percentage of real GDP was applied. The Labour will be presented in the form of an annual increase in the labor force. Human Capital will be measured as the level of quality of education. To study this factor precisely from the point of view of the government policy, it was decided to measure this indicator as public spending on education for the year (as a percentage of real GDP).

Moreover, based on the theoretical analysis outlined above, we included the following drivers:

• The level of participation in international trade is measured as a percentage of international trade in the real GDP.

• The level of innovation development is reflected in expenditure on Research and Development (% of real GDP).

• Institutions' efficiency will be represented by the Government Effectiveness index that measures the quality of public institutions' services, and their independence from political pressures.

In the research, we explored 20 European economies – emerging and developing Europe – in accordance with the classification of the International Monetary Fund, as well as countries that joined the EU after 2004. They are Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovak Republic, Slovenia, Turkey, and Ukraine (Kosovo is excluded due to a lack of data). The data covers the period

from 2001 to 2023. The source of data is the World Bank Open Data database.

Therefore, the econometric model has the following form:

$$GDPgrowth_{it} = \beta_i + \beta_1 Lgrowth_{it-1} + \beta_2 I_{it} + \\ + \beta_3 EDUC_{it-5} + \beta_4 TRADE_{it} + \beta_5 R\&D_{it-5} + \beta_6 GE_{it} + \varepsilon_{it},$$
$$i = 1, \dots 20; \quad t = 1, \dots 23,$$

where $GDPgrowth_{it}$ – annual Real GDP per capita growth rate (%); $Lgrowth_{it-1}$ – annual labor force growth rate (%) with lag 1; I_{it} – investment in real assets as % of Real GDP; $EDUC_{it-5}$ –public spending on education as % of Real GDP with lag 5; $TRADE_{it}$ – share of International trade as % of Real GDP; $R\&D_{it-5}$ – share of spending on the R&D as % of Real GDP with lag 5; GEI_{it} – government effectiveness index; ε_{it} – perturbations.

Table 1 gives the estimates of regression parameters for a sample of twenty European countries for 2001-2023 for the model mentioned above. We observe that three out of six explanatory variables are statistically significant. Given that economic development is influenced by a wide array of institutional, structural, political, and external factors – many of which are difficult to fully quantify or capture in a single econometric model – it is common for panel data regressions to yield modest R^2 values.

Table 1

Results of panel data model estimation

Dependent variable	**Per capita GDP growth rate**
Independent variables	**Coefficients**
Intercept	–19.19 (–3.59)[1]
Lgrowth(–1)	–63.80** (–3.31)
I	0.40*** (4.34)
EDUC(–5)	0.32 (0.67)
TRADE	0.08*** (3.94)
R&D(–5)	0.65 (0.46)
GEI	0.43 (0.22)
R-squared	*0.439*
Adjusted R-squared	*0.426*

Note: *** – significance at 1%, ** – significance at 5%; [1] – t-statistics are in brackets.

Among the independent variables, the strongest positive effect is demonstrated by Capital investment. This result suggests that an increase in investment in real assets strongly stimulates economic growth. Thus, investments appear to be a key driver of development for the selected group of countries. On the contrary, we may conclude that public spending on education is used inefficiently or that its effects appear only in the long run and are not reflected in short-term growth. The positive impact of the share of International trade proves foreign trade to be an inevitable driver of sustained economic growth.

In developing European countries, there can be a negative relationship between GDP per capita growth and population growth due to several economic and demographic dynamics. First of all, population growth may be a consequence of migration processes in Europe. It puts pressure on infrastructure, education, healthcare, housing, and public services. Governments in developing countries often struggle to keep up with these demands, leading to lower productivity per worker, poorer education and health outcomes, and slower improvements in living standards. Moreover, more people entering the labor force without matching job creation can cause high unemployment or underemployment, and lower wages due to excess labor supply. This reduces household income and limits consumption and investment, slowing GDP per capita growth. In addition, with rapid population growth, governments may struggle to maintain education and healthcare quality. This limits the development of human capital, reducing productivity and long-term economic growth per capita. Thus, moderate or slower population growth often aligns more closely with sustained per capita income growth in these contexts.

In developing European countries, R&D and education expenditures may not influence GDP per capita significantly due to long time lags, structural inefficiencies, talent migration, weak linkages between research, industry, and policy, and, finally, broader economic and institutional challenges.

In conclusion, using empirical analysis, it was found that the significant drivers affecting economic growth are investment in real assets and the share of International trade. At the same time, the quality of institutions and demographic changes require a deeper analysis, since their impact has been ambiguous. This emphasizes that it is critically important for developing countries not only to invest, but also to improve resource utilization mechanisms and efficiency of the institutional framework.

Discussion and conclusions

Discussion. Based on the theoretical background of economic growth and the results of empirical research, we have identified the key drivers of GDP growth in developing European countries. In this context, we might highlight the main pillars of economic strategy in Ukraine. Thus, the formation of an effective political and economic strategy of Ukraine should be based on stimulating investment activity, increasing the efficiency of public spending, especially in the field of education and innovations, improving the institutional environment, and integration into global economic processes.

First of all, it is extremely important to create a favorable environment for attracting both domestic and foreign investments. Moreover, special attention should be paid to reforming the judicial system, ensuring the protection of property rights, combating corruption, and simplifying regulatory procedures. Liberalizing access to financing, developing the capital market, and introducing effective mechanisms to support the private sector are key prerequisites for expanding investment in the economy. In April 2025, Ukraine and the US signed an agreement to establish a Joint Reconstruction Investment Fund to finance projects in the critical materials, oil, gas sectors and etc. The fund will leverage foreign investment and technology support, particularly through the U.S. International Finance Corporation, and all profits are expected to be reinvested in Ukrainian infrastructure tax-free for the first ten years. Additionally, it is advisable to introduce mechanisms for political insurance of investments and expand institutional support for small and medium-sized businesses. Transparent tax incentives, simplification of registration and licensing procedures, as well as the creation of mechanisms for assessing the effectiveness of investment projects, can significantly increase the investment attractiveness of Ukraine.

Public spending should be refocused on projects that have a high return in the long run. In particular, it is important to ensure not just an increase in education spending, but also an increase in their efficiency through the modernization of educational programs, the development of STEM areas, and support for vocational and higher education focused on the needs of the labor market. Ukraine is implementing a Strategic Action Plan until 2027, which

envisages the digital transformation of education, the development of qualification frameworks, and partnerships between the public and private sectors. Also, the "New Ukrainian School" reform is aimed at the personal development of students and the acquisition of key competencies that meet the requirements of the contemporary labor market. At the same time, it is necessary to create conditions for the effective commercialization of scientific developments, in particular by stimulating private-public partnerships in the field of R&D. Further, it is important to integrate higher education institutions with enterprises through the development of dual education programs, support for IT education, and stimulation of research activity at universities.

Special attention should be paid to the development of the innovation ecosystem. Spending on research and development should increase not only in absolute terms but also be accompanied by reforming the science management system, stimulating venture capital, developing the startup industry, and attracting international technological partnerships. In this case, investment in innovation will be transformed into a real increase in productivity. The Association Agreement between Ukraine and the EU, including the Deep and Comprehensive Free Trade Area, has granted Ukraine preferential access to the EU single market, contributing to economic diversification, export growth, and job creation.

From the point of view of international integration, Ukraine should continue to expand access to world markets, reduce barriers to trade, and more actively integrate into regional economic associations. Deepening cooperation with the European Union, the implementation of its standards in the regulatory and technical spheres will contribute not only to increasing the competitiveness of domestic products but also to ensuring a high-quality institutional environment. In addition, Ukraine should intensify trade diplomacy, stimulate the expansion of enterprises into the markets of Asia, the Middle East, and Africa, and develop logistics infrastructure and export support tools. The introduction of digital platforms to support exporters, export credit and guarantee systems, as well as improving the institutional architecture of foreign trade support, will increase the international competitiveness of Ukrainian enterprises.

Taking into account demographic challenges, especially the decrease in the share of the working-age population due to emigration and aging, it is necessary to develop a comprehensive policy to support the birth rate, attract labor migrants, and the reintegration of citizens who have left abroad. The demographic situation in Ukraine is difficult, in particular due to military aggression, a decrease in the birth rate, an aging population, and mass migration that has an impact on human social security (Bazhenova, Banna, 2025). According to UNFPA, the Government of Ukraine, with the support of international partners, is implementing the National Demographic Strategy aimed at improving conditions for young people and families, developing health care and education. In addition, the active implementation of programs for improving the skills and retraining of the population will help maintain high labor productivity. Separately, it is worth noting the importance of introducing a policy of "positive migration" - creating conditions for the return of Ukrainians from abroad, supporting the integration of foreign specialists, as well as developing mechanisms to stimulate labor mobility within the country. In the long run, it is appropriate to formulate a policy of balanced regional development in order to reduce urbanization pressure on large cities and support the sustainable development of small communities.

To sum up, we would like to stress that the implementation of such a comprehensive policy will not only ensure sustained economic growth, but also create the prerequisites for a long-run increase in people's well-being and Ukraine's convergence towards the advanced economies.

Conclusions. This research aimed to analyze the drivers of economic growth in developing European countries, with a particular focus on recommendations for Ukraine's economic recovery strategy.

Aside from looking at well-known drivers from traditional economic growth theories, such as capital and labor force growth, we focused on such drivers of development as technological innovation, international economic integration, geographical conditions, demographic trends, and institutional quality. Each of these aspects was shown to have a meaningful influence on the pace and sustainability of economic growth, particularly for developing European economies. As an example, we conducted a comparative analysis of Estonia and Ukraine cases of economic growth. Estonia's economic success was attributed to comprehensive reforms, effective governance, active digitalization, and strategic European integration. In contrast, Ukraine's economic growth was significantly constrained by institutional weaknesses, inconsistent reforms, demographic challenges, and, more recently, the devastating impact of military conflict.

Moreover, the results of the panel regression model to determine the significant drivers affecting GDP per capita growth in 20 developing European countries confirmed the strong positive impact of capital investment, highlighted the mixed effects of government expenditure on education and R&D, and revealed the complex relationship between institutional quality and economic growth.

Finally, we have formulated the pillars for Ukraine's economic recovery strategy. These include enhancing investment attractiveness, improving the efficiency of public spending, promoting innovation and human capital development, strengthening institutional frameworks, deepening international trade integration, and addressing demographic imbalances.

Commenting on the possible directions of future research, we would focus on Ukraine's convergence towards advanced economies studies.

Authors' contribution: Olena Bazhenova – conceptualization, literature review and theoretical framework development; Givi Bedianashvili – formulation of conclusions, compilation of the bibliography; Vladyslav Talalaievskyi – writing – original draft and editing, empirical data collection and validation methodology design, data analysis.

Sources of funding. This study did not receive any grant from a funding institution in the public, commercial, or non-commercial sectors. The funding is covered by the authors' own expense.

References

Bazhenova, O. (2023). Drivers of economic growth: cases of post-war recovery. *Bulletin of Taras Shevchenko National University of Kyiv. Economics,* 2(223), 5–9 [in Ukrainian]. [Баженова, О. (2023). Драйвери економічного зростання: кейси повоєнного відновлення. *Вісник Київського національного університету імені Тараса Шевченка. Економіка*, 2(223), 5–9]. https://doi.org/10.17721/1728-2667.2023/223-2/1

Bazhenova, O., & Banna, O. (2025). The impact of the war on human social security in Ukraine. *Bulletin of Taras Shevchenko National University of Kyiv. Economics,* 2(227), 5–11. [Баженова, О., & Банна, О. (2025). Дослідження впливу війни в україні на соціальну безпеку людини. *Вісник Київського національного університету імені Тараса Шевченка. Економіка,* 2(227), 5–11]. https://doi.org/10.17721/1728-2667.2025/227-2/1

Bedianashvili, G., & Kokhreidze, G. (2024). Global sustainable competitiveness for countries on the way toward EU integration. *TEM Journal*, 13(2), 1684–1694.

Beqiraj, E., Fedeli, S., & Giuriato, L. (2025). Shadow economy or economic driver? The impact of counterfeiting on Italy's growth, *Economic Analysis and Policy,* 87, 1275–1291, https://doi.org/10.1016/j.eap.2025.07.012

Countryeconomy. (n. d.). Real GDP per capita measures for Estonia, Latvia, Lithuania, Ukraine. https://countryeconomy.com

Diamond, P. (1965). National Debt in a Neoclassical Growth Model. *American Economic Review*, 55, 1126–1150.

Easterly, W., & Levine, R. (2001). It's not factor accumulation: Stylized facts and growth models. *The World Bank Economic Review*, 15(2), 177–219. https://documents1.worldbank.org/curated/en/430741468330877586/pdf/773550JRN0200100Factor0Accumulation.pdf

Enerdata. (2025). *Norway Energy Information.* https://www.enerdata.net/estore/energy-market/norway/

Feliciano, D., Ferreiro, J., & Rodriguez-Fuentes C.J. (2025). Growth regimes, growth drivers and private demand in financialised economies: *The case of Spain, Structural Change and Economic Dynamics*, 74, 878–894, https://doi.org/10.1016/j.strueco.2025.06.005.

Financial Times (2025). *The folly of America's R&D cuts*. https://www.ft.com/content/9309c11e-d997-4557-b209-62dcf27cb51d

Hausmann, R., Rodrik, D., & Velasco, A. (2005). *Growth diagnostics. John F. Kennedy School of Government.* Harvard University. https://growthlab.cid.harvard.edu/files/growthlab/files/growth-diagnostics.pdf

International Monetary Fund. (2001). *Global trade liberalization and the developing countries.* https://www.imf.org/external/np/exr/ib/2001/110801.htm

International Monetary Fund. (2020). *Changing demographics and economic growth.* https://meetings.imf.org/en/IMF/Home/Publications/fandd/issues/2020/03/changing-demographics-and-economic-growth-bloom

Kaldor, N. (1961). Capital Accumulation and Economic Growth. In D.C. Hague (Eds.), The Theory of Economic Growth. (pp. 177–222). St. Martin's Press. https://doi.org/10.1007/978-1-349-08452-4_10

Krugman, P. (1994). The Myth of Asia's Miracle. *Foreign Affairs*, 73(6), 62–78.

Kuznets, S. (1971, Dec. 11). *Modern Economic Growth: Findings and Reflections. Lecture in the memory of Alfred Nobel*. The Nobel Foundation. http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1971/kuznets – lecture.html

Lucas, R. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22, 3–42.

MilanoIP. (2025). *How innovation drives economic growth.* https://www.milanoip.com/blog/how-innovation-drives-economic-growth

Minh, H. C., & Tran, N. H. (2025). Foreign direct investment, economic growth, governance quality, and the informal economy: *Empirical insights from an emerging economy, International Economics,* 183, 100619, https://doi.org/10.1016/j.inteco.2025.100619stabilnosti-ta-doviri-gromadyan-popri--bezpretsedentni-viprobuvannya-viynoyu

Pham, T. N., & Vo, D. H. (2021). Aging Population and Economic Growth in Developing Countries: A Quantile Regression Approach. *Emerging Markets Finance and Trade,* 57(1), 108–122. https://doi.org/10.1080/1540496X.2019.1698418

Prasetyo, E. (2012). *Uncovering drivers of economic development.* https://www.researchgate.net/publication/234016714_Uncovering_Drivers_of_Economic_Development

Reuters. (2025a, April 28). *World Bank expects six Western Balkan economies to grow 3.2% collectively in 2025.* https://www.reuters.com/markets/europe/world-bank-expects-six-western-balkan-economies-grow-32-collectively-2025-2025-04-28/

Reuters. (2025b, April 30). *CEE economy: Hungary's economy falls back in the first quarter, Czech growth is maintained*. https://www.reuters.com/markets/europe/cee-economy-hungarys-economy-falls-back-first-quarter-czech-growth-maintained-2025-04-30/

Countryeconomy. (n. d.). *Real GDP per capita measures for Estonia, Latvia, Lithuania, Ukraine.* https://countryeconomy.com

Rodrik, D. (2003). *In search of prosperity: Analytic narratives on economic growth. Princeton* University Press. https://www.jstor.org/stable/j.ctt1r2fkg

Rodrik, D. (2007). *One economics, many recipes: Globalization, institutions, and economic growth*. Princeton University Press. https://www.jstor.org/stable/j.ctvcm4jbh

Romer, D. (2011). *Advanced Macroeconomics.* 4th ed., McGraw-Hill.

Romer, P. (1990). Endogenous Technological Change. *Journal of Political Economy*, 98(5), 71–102.

Sen, A. (1999). *Development as freedom.* Oxford University Press. https://www.c3l.uni-oldenburg.de/cde/OMDE625/Sen/Sen-intro.pdf

Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70(1), 65–94. https://doi.org/10.2307/1884513

The Times. (2025). *You see AI everywhere, except in the productivity figures.* https://www.thetimes.com/business-money/economics/article/you-see-ai-everywhere-except-in-the-productivity-figures-zbql6bd90

Toxigon. (2025). *Technology and economic growth: How they work together.* https://toxigon.com/the-role-of-technology-in-economic-growth

Ukraine Business News. (2024). *The National Bank explains why, in 2023, real GDP grew by 5.3%.* https://ubn.news/the-national-bank-explains-why-in-2023-real-gdp-grew-by-5-3/

Yeboah, S. D., Gatsi, J. G., Appiah, M. O., & Fumey, M. (2024). Examining the drivers of inclusive growth: A study of economic performance, environmental sustainability, and life expectancy in BRICS economies. *Research in Globalization,* 9,100267. https://doi.org/10.1016/j.resglo.2024.100267

Yildirim, A., & Gokalp, M. (2016). Institutions and economic performance: A review of the developing countries. *Procedia Economics and Finance*, 38, 347–359. https://www.sciencedirect.com/science/article/pii/S2212567116302076

Yilmazkuday, H. (2025). Drivers of growth spillovers. *Economic Systems*, 2025, 101327. https://doi.org/10.1016/j.ecosys.2025.101327

Younas Z.I., Qureshi A., & Al-Faryan M.A.S. (2022). Financial inclusion, the shadow economy and economic growth in developing economies. *Structural Change and Economic Dynamics*, 62, 613-621. https://doi.org/10.1016/j.strueco.2022.03.011

Young, A. (1995). The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience. *Quarterly Journal of Economics*, August, 641–680.

Zhylinska, O., Bazhenova, O., Zatonatska, T., Dluhopolskyi, O., Bedianashvili, G., & Chornodid, I. (2020). Innovation Processes and Economic Growth in the Context of European Integration. *Scientific Papers of the University of Pardubice, Series D. "Faculty of Economics and Administration",* 28(3). https://doi.org/10.46585/sp28031209

Отримано редакцією журналу / Received: 01.10.25
Прорецензовано / Revised: 10.10.25
Схвалено до друку / Accepted: 20.10.25

Олена БАЖЕНОВА, д-р екон. наук, проф.
ORCID ID: 0000-0003-3197-8426
e-mail: olenabazhenova@knu.ua
Київський національний університет імені Тараса Шевченка, Київ, Україна

Гіві БЕДІАНАШВІЛІ, д-р екон. наук, проф.
ORCID ID: 0000-0003-4521-737X
e-mail: givi.bedianashvili@tsu.ge
Тбіліський державний університет імені Іване Джавахішвілі, Тбілісі, Грузія

Владислав ТАЛАЛАЄВСЬКИЙ, студ.
ORCID ID: 0009-0002-2466-9318
e-mail: vladyslav.talalaievskyi@gmail.com
Київський національний університет імені Тараса Шевченка, Київ, Україна

ДРАЙВЕРИ ЕКОНОМІЧНОГО ЗРОСТАННЯ: ЕМПІРИЧНІ ВИСНОВКИ ДЛЯ КРАЇН ЄВРОПИ, ЩО РОЗВИВАЮТЬСЯ

В с т у п . ***Актуальність статті зумовлена постійною важливістю економічного зростання в країнах, що розвиваються, як одного із центральних об'єктів сучасних економічних досліджень. Зростання інтеграції глобальних ринків і стрімкі технологічні зміни суттєво вплинули на темпи та структуру розвитку країн. Визначення фундаментальних чинників цього зростання є ключовим для формування політик, що забезпечують довгострокову стабільність і сталий розвиток. Досвід країн, яким вдалося успішно перейти від статусу таких, що розвиваються, до розвинених, надає цінні емпіричні докази. Аналіз цих випадків дозволяє виявити найважливіші фактори, що сприяють економічному зростанню. У цьому контексті вивчення чинників зростання в країнах, що розвиваються, в Європі, набуває особливої важливості для розуміння їхніх перспектив прискореного та сталого розвитку.***

М е т о д и . ***У дослідженні застосовано поєднання теоретичного аналізу, порівняльного оцінювання та регресійного моделювання з метою комплексного вивчення чинників економічного зростання.***

ISSN 1728-3817

Результати. *У результаті емпіричного аналізу встановлено, що найважливішими факторами економічного зростання є обсяг інвестицій у реальні активи, темп зростання населення та питома вага міжнародної торгівлі у ВВП. Водночас якість інститутів і видатки на освіту й R&D потребують глибшого аналізу, оскільки їхній вплив виявився неоднозначним.*

Висновки. *На основі аналізу теоретичних моделей, чинників економічного зростання і результатів емпіричного дослідження визначено ключові фактори, які мають найбільший вплив на темпи зростання ВВП на одну особу. З огляду на теоретичні підходи й емпіричні результати, сформульовано практичні рекомендації для майбутньої економічної стратегії України. Нині нагальна потреба у визначенні та побудові шляху післявоєнного відновлення й подальшого економічного зростання робить це дослідження особливо актуальним.*

Ключові слова: *економічне зростання, чинники економічного зростання, країни, що розвиваються, валовий внутрішній продукт, фактори виробництва, панельна модель, моделювання.*

Автори заявляють про відсутність конфлікту інтересів. Спонсори не брали участі в розробленні дослідження; у зборі, аналізі чи інтерпретації даних; у написанні рукопису; в рішенні про публікацію результатів.

The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; in the decision to publish the results.