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ASSESSMENT OF THE IMPACT OF PRODUCTION FACTORS ON THE SUSTAINABLE DEVELOPMENT OF AZERBAIJAN'S ECONOMY

Introduction. *The sustainable and dynamic development of a national economy is closely associated with economic growth and a range of macroeconomic indicators, including both the quantitative and qualitative expansion of gross domestic product (GDP).*

Problem Statement. *Products generated through expanded reproduction must satisfy consumer demand in terms of both quantity and quality. Products that fail to meet market requirements cannot be successfully realized in the sphere of circulation, and their value therefore remains outside the reproduction process.*

Purpose. *This study aims to determine the relationship between the productivity of the principal production factors — labor and capital — and the development of the Azerbaijani economy during 2001—2023 by estimating a Cobb–Douglas production function and to develop evidence-based recommendations for promoting sustainable economic development based on the estimated model.*

Materials and Methods. *The study has been based on data obtained from publicly available economic sources. The research has employed theoretical and methodological approaches, empirical research methods, the Cobb–Douglas production function, and econometric modeling techniques.*

Results. *The econometric assessment of the Azerbaijani economy over the period 2001—2023 has revealed a strong relationship between GDP and the principal production factors, namely labor and capital ($R^2 = 0.895$). The results have demonstrated that capital accumulation has been the dominant driver of economic growth, whereas the contribution of labor has remained comparatively limited. Capital productivity has been estimated at 5.6 units of output per unit of capital, while labor productivity has amounted to 0.17 units of output per worker. The analysis has also identified the growing importance of economic diversification and international investment in promoting sustainable economic development.*

Conclusions. *Strengthening the interaction between labor and capital, deepening international economic cooperation, and directing investment toward high-technology and high-value-added industries can enhance productivity, improve competitiveness, and increase the resilience of the Azerbaijani economy.*

Keywords: Cobb–Douglas, production function, factors of production, productivity, efficiency.

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The complex development of infrastructure has a significant impact on the development of tangible and intangible production sectors, as well as on the improvement of the material and cultural well-being of society members, and ultimately on the sustainable socio-economic development of the country. Since the relations between the phases of the re-production process are disrupted in countries with poorly developed infrastructure, economic and technological relations between enterprises and organizations operating there also continue at a low level, which, as a result, slows down all economic processes. Since the perfect connection between production and consumption is not created, all sectors of the economy lose their equilibrium, and the economy and social life tend to decline.

Since the development of infrastructure sectors that form the competitiveness of the national economy in Azerbaijan is considered an important factor of sustainable economic development, the effective development of production, social and market infrastructures is always in the spotlight. The development of service sectors has also given impetus to the development of tangible production sectors such as industry and agriculture in the country. As a result, the gross domestic product in the country has increased significantly in recent years.

In general, economic growth is the main indicator of the dynamic development of the country's economy. The issue that economists have always focused on has been to predict the future economic situation by defining and modeling economic growth. In order to determine economic growth, ensure sustainable economic development, and determine the development of the economy, various types and aspects of economic growth models have been developed. When it comes to the economic level of each country, the terms economic growth and economic development are important. Economic growth and economic development can be distinguished in a certain sense. Economic development mainly means an increase in the standard of living of people. The human development index is mainly used to measure economic development.

In the research work, the Cobb–Douglas production function was chosen for econometric evaluation in terms of both its simplicity from a practical point of view and its easier implementation. For this purpose, first, a brief summary of the work carried out in this direction in both local and international practice is given, and then theoretical information related to economic growth and production functions is summarized and classified. Based on the theoretical framework, a database was collected, processed, and on this basis, the Cobb–Douglas production function was econometrically estimated. Finally, conclusions and suggestions were given, and the main literature used was noted.

Researchers have always focused on the study of production factors affecting economic growth, especially labor and capital, and the assessment of their impact on economic events and processes. In international practice, economists have studied production functions using various mathematical models. During the study, investments and their effects on production processes and economic growth were evaluated.

Foreign and local researchers have studied the impact of investments on economic growth in different periods. In our country, Professor Yadulla Hasanli's research, PhD, attracts more attention in this direction [1, 2].

Researchers A. Suleymanov, E. Alekperov, E. Rustamov, and R. Musayev cnducted research on calculating labor and capital productivity through econometric evaluation of the Cobb–Douglas production function on the example of Azerbaijan and investigated the theoretical foundations of economic growth and production functions [3, 4].

At the same time, researchers V. Ahmadov and G. Tahirova conducted a comparative analysis of empirical economic growth models in their research, focused on growth accounting, growth regression, and diagnostic methods, and identified growth models specific to the country's economy [5].

Researcher H.A. Mammadov investigated the econometric assessment of the production infrastructure in Azerbaijan based on the Cobb–Douglas production function and proposed increasing

the potential of qualified personnel for the future development prospects of the country's economy [6].

Researcher E.Z. Huseynov tried to determine the dynamic equilibrium level of economic growth in the Azerbaijani economy based on the Domar model [7].

Researchers Erden L. and Holcombe R.G. evaluated the mutual influence of public and private investments and their role in creating economic growth [8]. At the same time, researchers Watson S.I., Michael A., Ilegbinosa I.A., and others determined the impact of public and private investments on economic growth based on annual time series covering many years (40—50 years) in the case of Nigeria [9].

Researchers Onyinye M.O., Mgbemena O., and Kalu C.U., Chistofer U. evaluated the impact of domestic investments on economic growth by applying the "vector error correction" model based on the Cobb–Douglas production function using long-term data [10].

A considerable amount of research has been conducted and is still ongoing on the basis of production functions, especially econometric methods, to evaluate the factors of production that affect the creation of economic growth in the production process. However, these studies differ from each other in terms of their object, database, selection of data, and interpretation of the results obtained.

In the history of economic thought, the issue that always concerned representatives of economic schools has been increasing wealth, achieving economic growth in the country, and improving the well-being of the population. For this purpose, determining economic growth in the country, assessing the factors affecting it, and solving important issues such as optimal programming of the economic situation in future periods using economic-mathematical models have always been the focus of attention of economists [1].

It is known from classical economic teachings that in order to achieve wealth growth and sustainable economic development, it is significant to determine the level of economic development in a country. There are various types of economic growth models to determine the level of development and the productivity of production factors that affect it. These models can be used to measure the level of economic development in a country [2].

According to the level of use of production factors, economic growth in a country occurs in two forms: First, the intensive form of economy, which creates growth by increasing the use of existing limited resources, that is, by increasing the amount of labor (economically active population), capital investment (investment in the economy, allocation of financial resources) and the use of natural resources, and secondly, the extensive form, which creates economic growth by improving the quality of existing resources, that is, by enriching economic processes with more skilled, educated, creatively thinking personnel, attracting new innovative technologies, and improving the quality of the production process. However, it should be taken into account that an absolutely intensive and absolutely extensive form of economy is not possible. The financial sector has become safer, faster, and more accessible with the help of digitization. Technologies such as digital payment systems, mobile banking, and blockchain have changed the shape of financial transactions around the world [11]. Every intensive economy has signs of extensive, and within an extensive economy there are signs of intensive economy. This determines the type of economy that is more dominant among the forms of economy. As a result of the strategy of the socio-economic policy of the Azerbaijani state, based on a solid foundation, the improvement of Azerbaijan's financial capabilities from year to year made it possible to carry out successful reforms in the country [12].

It is considered appropriate to study the productivity of production factors (labor and capital as measurable quantities) involved in the creation of products and services that are the result of economic activity using the production function (taking into account the functional dependence of the existing quantities on each other).

By approaching the economic process at the micro and macroeconomic levels, several production functions and models are used to conduct econo-

mic analyses more adequately. The main variables of the models are capital or investment, labor resources or labor force as measurable quantities.

During the econometric assessment of the impact of production factors on the sustainable development of the Azerbaijani economy, the Cobb–Douglas production function was used, as it differs from other models and functions in terms of simplicity and ease of understanding. In order to increase the scientific value and economic significance of the study, the theoretical foundations of the Cobb–Douglas production function were interpreted based on the results of previous studies in the same direction, and the sustainable development of the Azerbaijani economy was assessed using real statistical data.

The study is concluded with conclusions and suggestions, and the main reference list is indicated at the end.

THEORETICAL BASIS OF ESTIMATING THE PRODUCTIVITY OF PRODUCTION FACTORS IN THE AZERBAIJANI ECONOMY USING THE COBB–DOUGLAS PRODUCTION FUNCTION

Several production functions and models are mentioned in economic literatures. Production functions can be theoretically classified as follows:

1. Leontief production functio:

$$y = \min\{aC, bL\};$$

2. Linear production function:

$$y = a_0 + a_1 C + a_2 L;$$

3. CES (Constant elasticity of substitution) production function:

$$y = a\left(\delta C^p + (1-\delta)L^p\right)^{\frac{-n}{p}};$$

4. Cobb–Douglas production function:

$$y = AC^{\alpha}L^{\beta}.$$

In our research, the Azerbaijani economy was econometrically assessed using the Cobb–Douglas production function, and labor and capital productivity were determined [4].

The Cobb–Douglas production function essentially expresses the extent to which output growth depends on the basic factors of production, labor and capital. Labor and capital productivity are calculated by the Cobb–Douglas production function using the following formulas.

Labor productivity:

$$\frac{GDP(C,L)}{L} = \frac{\alpha F \cdot C^{\alpha C} \cdot L^{\alpha L}}{L}. \quad (1)$$

Capital productivity:

$$\frac{GDP(C,L)}{C} = \frac{\alpha F \cdot C^{\alpha C} \cdot L^{\alpha L}}{C}. \quad (2)$$

By studying the econometric assessment of the impact of production factors (labor, capital) on the sustainable development of the Azerbaijani economy, the Cobb–Douglas production function was compiled based on the above formulas based on real statistical indicators obtained from official sources. Labor and capital productivity in the Azerbaijani economy was calculated and conclusions were drawn based on that production function [3].

Based on the collected data, appropriate mathematical transformations should be considered for the econometric evaluation of the Cobb–Douglas production function.

The model can be described mathematically as the following functional dependence:

$$GDP(C,L) = \alpha F \cdot C^{\alpha C} \cdot L^{\alpha L}, \quad (3)$$

here: *GDP* — Gross Domestic Product calculated at the prices of the year taken as the base using the deflator, *C* — the prices of the total fixed capital stock for the same year using the wholesale price index of industry; *L* — the number of employed people; αF — the efficiency parameter; αC — the capital parameter; αL — the labor force parameter [5].

When building a model, an optimal direction should be chosen that ensures adequacy during econometric evaluation. That is why, in our research, we try to evaluate in different ways when building a model, and as a result, we have managed to provide analyses based on the results we consider more adequate.

As can be seen, the production function is an exponential function. However, regression mo-

dels are mainly used to estimate linear functional dependencies. When using the model to ensure compatibility, the series are entered into the model logarithmically. As a result of the logarithmization of the exponential function, the production function is converted to a linear form. This leads to the Cobb–Douglas production function taking a logarithmic form in terms of establishing a linear relationship when performing regression estimation using the least squares method [13].

$$\log\left[GDP(C,L)\right] = \log(\alpha F \cdot C^{\alpha C} \cdot L^{\alpha L}) = \\ = \log \alpha F + \alpha C \cdot \log C + \alpha L \cdot \log L; \quad (4)$$

$$\log\left[GDP(C,L)\right] = \\ = \log \alpha F + \alpha C \cdot \log C + \alpha L \cdot \log L. \quad (5)$$

BUILDING AN OPTIMAL MODEL BASED ON THE DATABASE

Based on economic-theoretical methods and real statistical data, an econometric assessment of the impact of production factors on the sustainable development of the Azerbaijani economy is carried out. The dependence of GDP in Azerbaijan on production factors on a time series basis is econometrically assessed using the Cobb–Douglas production function. In this case, the number of people employed in economic activity and the total accumulation of fixed capital are taken as production factors. To obtain reality, nominal indicators by year are used, the GDP deflator and the industrial wholesale price index. The results are checked for different base

Table 1. **Real Statistical Database Used for Estimating a Production Function**

Year	Nominal GDP (AZN million)	GDP deflator (in percentage terms as compared with the previous year)	Total fixed capital accumulation (AZN million)	Industrial wholesale price index	Employed population
2001	5315.6	102.5	1216.3	103.3	3891.4
2002	6062.5	103.1	2066.1	99.4	3931.1
2003	146.5	106.0	3779.1	117.2	3972.6
2004	8530.2	108.4	4922.8	113.5	4016.9
2005	12522.5	116.1	5172.9	117.3	4062.3
2006	18746.2	111.3	5567.	110.1	4110.8
2007	28360.5	121.0	6069.0	117.7	4162.2
2008	40137.2	127.8	7457.0	123.4	4215.5
2009	35601.5	81.2	6700.0	80.6	4271.7
2010	42465.0	113.6	7714.5	130.5	4329.1
2011	52082.0	122.5	10508.9	133.5	4375.2
2012	54743.7	102.9	12292.8	104.5	4445.3
2013	58182.0	100.4	15007.4	96.1	4521.2
2014	59014.1	98.7	16187.8	94.9	4602.9
2015	54380.0	91.1	15131.4	69.4	4671.6
2016	60425.2	114.7	15127.3	127.5	4759.9
2017	70337.8	116.0	16752.5	136.8	4822.1
2018	80092.0	111.5	16574.3	126.0	4879.3
2019	81896.2	99.8	17304.3	103.2	4785.6
2020	72578.1	92.4	16450.9	75.2	4721.2
2021	93203.2	121.3	15124.2	169.6	4831.1
2022	133972.1	137.3	16092.3	184.3	4901.1
2023	123128.4	90.6	16192.3	89.0	4963.3

Source: compiled by the authors based on data from the State Statistics Committee of the Republic of Azerbaijan [14].

Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 03/10/25 time: 12:15
Sample: 2001 2023
İncluded observations: 23

Variable	Coefficient	Std.Error	t-Statistic	Prob.
LOG(C)	0.502376	0.288556	1.742005	0.1050
LOG(L)	6.462883	3.808077	2.095520	0.5062
C	–58.88298	28.02805	–2.061880	0.0597

R-squared	0.894633	Mean dependent var	5.570348
Adjusted R-squared	0.856893	S.D. dependent var	0.926314
S.E. of regression	0.324202	Akaike info criterion	0.813814
Sum squared resid	1.432849	Schwarz criterion	0.958675
Log lokelihood	–3.480512	Hannan–Quinn criter.	0.821232
F-statistic	48.74732	Durbin–Watson stat	0.301470
Prob (F-statistic)	0.000001		

Results of the econometric evaluation model
Source: compiled by the authors using the Eviews software package.

years by applying the GDP deflator and the industrial wholesale price index chain method (Table 1). An econometric model is built based on the data of the Cobb–Douglas model in the assessment [6].

Using the above real data base, a model was developed based on the econometric estimation of the Cobb–Douglas production function and mathematical functional dependence.

First, the correlation relationship between time series is considered, since the correlation relationship allows us to determine the sign of the relationship between the series. Finding correlation relationships can indicate how accurate the elasticity coefficient of production factors is in advance (Table 2).

Looking at the results in Table 2, it is seen that the relationships between GDP (LOG_GDP) and production factors (LOG_C and LOG_L) are positive, which is considered appropriate. The closeness of the coefficient to positive unity suggests that the explanatory variables can linearly express the explained variable.

In this regard, it is considered acceptable to build a linear regression model using the least squares method. The model is evaluated using the Eviens software package with the least squares method. The result of the model is reflected in Figure below.

In econometric estimation models, we first convert the series into real expressions and show them as logarithmic functions to make them suitable for the model.

Before analyzing the model, we look at the R-squared parameter shown in Figure above to determine the adequacy.

This parametric parameter reflects the reality of the variables. According to the obtained result, we can note that the model reflects 89.5% real dependence. At the same time, since the indicators of

Table 2. **Correlation Relationships between the Variables**

	LOG_GDP	LOG_K	LOG_L
LOG_GDP	1000000	0.938716	0.946214
LOG_K	0.938716	1000000	0.946190
LOG_L	0.946214	0.946190	1000000

Note: compiled by the authors.

the other parameter are also satisfactory, the *t*-statistics of the coefficients can be looked at.

Finally, we can express the production function we obtained as a result of the econometric model in the following mathematical form:

$$\log(GDP) = -58.88 + 0.50 \log C + 6.5 \log L. \quad (6)$$

If we show our result in the standard form of the Cobb–Douglas production function, we can write it as follows:

$$GDP = e^{-58.88} \cdot C^{0.50} \cdot L^{6.5}. \quad (7)$$

ECONOMIC GROWTH IN AZERBAIJAN DURING 2001–2023 AND ITS COMPARATIVE ANALYSIS WITH REGIONAL COUNTRIES

The analysis of the impact of production factors (labor and capital) on economic growth in Azerbaijan during 2001—2023 and its comparison with regional countries revealed that, starting from 2001, the Azerbaijani economy has been characterized by a large-scale wave of investments. Revenues obtained from the oil and gas sector were directed toward fixed capital through the state budget and the State Oil Fund; infrastructure projects, industrial enterprises, and the development of the service sector became major investment priorities. The recorded increase of more than 11% in investments approaching 2024 indicates the sustainability of the capital accumulation trend. Such rapid capital growth has become the main determinant of economic expansion and has supported macroeconomic stability.

From the perspective of the labor factor, the years 2001—2023 represent a period of systematic development of human capital. The expansion of educational infrastructure, modernization of workforce training, and alignment of the labor market with technological requirements contributed to the growth of labor productivity. Nevertheless, the pace of productivity growth has not yet reached a level sufficient to fully offset the dynamics created by capital intensity. This indicates that the primary source of growth in the Azerbaijani economy remains physical capital accumulation, and the relative role of the labor factor will become more significant in the next stage of structural transformation.

For comparison, it should be noted that the neighboring Republic of Georgia implemented radical economic and institutional reforms after 2003, taking significant steps to simplify the business environment, promote foreign investment, and develop the logistics and service sectors. According to statistical data, Georgia recorded an average real economic growth rate of more than 5% during 2003—2023.

Research shows that, unlike the Azerbaijani model, capital accumulation plays a relatively more balanced role in Georgia's economic growth. Here, growth results from the interaction of investments, labor market flexibility, and institutional quality. The expansion of the service sector has increased the importance of the labor factor in economic growth, while structural reforms have enhanced both capital efficiency and labor productivity. Thus, the Georgian model is characterized by a reform-oriented growth structure based on the service sector and high demand for human capital.

As compared with Azerbaijan and Georgia, the Turkish economy is more complex, with a large-scale industrial base, an export-oriented production structure, and a sizable labor force. Economic reforms implemented after 2001 improved the investment climate in Turkey, increased industrial production, and expanded the service sector.

The main distinguishing feature of the Turkish model is the parallel and high-level integration of labor and capital into economic growth. Programs aimed at developing human capital, the expansion of technological production, and the growth of exports have contributed to rising labor productivity.

As compared with Azerbaijan, capital accumulation in Turkey is more industry- and technology-based, while the labor factor is more diversified and productivity-oriented. Therefore, Türkiye's economic growth is driven both by capital intensity and the effective utilization of its labor resources.

INTERNATIONAL INVESTMENT AND TECHNOLOGY TRANSFER IN AZERBAIJAN'S ECONOMIC DIVERSIFICATION

In recent years, the Azerbaijani economy has implemented a sustainable development strategy, ensuring steady growth across various sectors. One of the key characteristics of this development is its multinational nature. The concept of multinationalism is characterized by the economy's reliance not only on domestic resources but also on international cooperation, investment inflows, and technology transfer. Strategic sectors in Azerbaijan's economic policy energy, non-oil industries, agriculture, tourism, and information technologies are being modernized through the attraction of international investments and cooperation with foreign companies. This process strengthens the competitiveness of the economy by facilitating the transfer of technology, management practices, and professional knowledge.

At the same time, participation in regional and global integration initiatives, the expansion of international trade relations, and the modernization of logistics infrastructure contribute to enhanced economic stability. Thus, the multinational character serves as a key pillar of sustainable development not only from a financial and investment perspective but also from technological and institutional dimensions.

Over the past decades, Azerbaijan's economy has undergone significant changes through structural transformation and increasing international integration. The main feature of this process is the economy's transition from dependence solely on internal resources to a multinational structure based on international investment, technology, trade, and institutional cooperation. The multinational components of Azerbaijan's sustainable economic development, analyzed based on the macroeconomic indicators, sectoral structure, and investment trends derived from the data of the State Statistics Committee, show that:

In 2024, the country's gross domestic product (GDP) amounted to AZN 126.3 billion, recording a 4.1% increase versus 2023. In the same year, while the decline in added value in the oil and gas sector was minimal (0.3%), added value in the non-oil sector grew by 6.2%. In 2023, GDP amounted to AZN 123.0 billion, showing an overall growth of 1.1%, with a decrease in added value in the oil and gas sector, while the non-oil sector recorded a 3.7% increase. In January—July 2025, GDP increased by 0.9% as compared with the same period of 2024; during this period, added value in the oil and gas sector declined, while the non-oil and gas sector grew by 3.1% [14].

These indicators show that in recent years, a significant share of Azerbaijan's economic growth has come from the non-oil sector rather than the oil and gas sector. The share of industries such as manufacturing, trade, construction, agriculture, and services in GDP has increased, reflecting diversification and the expansion of the economy. Such structural changes are essential in the context of sustainable development, as fluctuations in global oil markets pose risks for countries dependent on oil revenues, while the strengthening of non-oil sectors enhances economic and financial stability.

Another important aspect of multinationalism is investment. In Azerbaijan, the structure of investments in fixed capital has increasingly shifted toward the non-oil sector in recent years: in 2022, funds directed to fixed capital amounted to AZN 18,272.3 million, which is a 5.5% increase as compared with 2021. During this period, investments in the oil and gas sector declined, while investments in the non-oil and gas sector increased. Capital investments were distributed among goods production, services, and construction-installation works, indicating expansion not only in the energy sector but also in manufacturing, services, and infrastructure.

Thus, the investment strategy has not been limited solely to the oil and gas sector; instead, an investment structure has been formed that supports multi-sectoral economic development. This demonstrates that foreign and domestic investments that is, multinational capital inflows play a significant role in economic diversification.

According to general findings of empirical research, in developing countries, public and private investments through capital accumulation, labor, technology, and infrastructure accelerate economic growth and sustainable development. This theoretical context helps explain the impact of Azerbaijan's investment policies on economic growth and structural transformation. The multinational character is not limited to investments; it also enables the transfer of technology, management, and professional expertise through global integration, international trade, and institutional cooperation. This is particularly evident in industrial production, services, logistics, infrastructure, and other sectors.

Thus, the Azerbaijani economy has transformed into an "open" economic model based not only on domestic factors but also on international cooperation and integration principles. This ensures that the economy becomes more adaptable, competitive, and aligned with global markets.

It should be noted that in developing countries with a balanced economy and a balanced labor and capital market, the Cobb–Douglas production function gives adequate results.

Although the model we are considering is not adequate, the following economic ideas can be put forward based on the adequacy of several criteria:

- The growth of each production factor individually can affect the growth of GDP and production. Thus, the more labor and capital increase, the more the production output grows.
- Since the αF — efficiency parameter in the model is close to zero, it can be said that intermediate products are used more to increase productivity. In other words, the Azerbaijani economy can be considered more raw material intensive.

The productivity of production factors expresses the amount of GDP per unit of production and is evaluated as effective. The productivity of production factors characterizes the efficiency of the process. The productivity of capital as a factor of production in the Azerbaijani economy was calculated according to formula (2) and was 5.6. This means that 5.6 units of product were produced per unit of capital.

Labor productivity was calculated based on the formula (1) and was 0.17. This means that 0.17 units of output are produced per labor force.

Summarizing the above, it can be concluded that capital investment in the Azerbaijani economy was more productive than production factors during 2001—2023. Based on the model, it can be concluded that in order to ensure the sustainable development of the Azerbaijani economy, it is important to direct the attracted investments mainly to science and innovation-intensive areas that create added value.

The sustainable development of Azerbaijan's economy is directly linked to multinational cooperation, which enhances the country's competitiveness in the global economic environment and contributes to long-term prosperity. Sustainable development is achieved through multinational cooperation and investment policies directed toward both the oil-gas and non-oil sectors. Macroeconomic indicators, sectoral structural changes, and investment flows demonstrate that the country is transitioning from a single-resource oil economy to a more complex, diversified, and internationally integrated economic model. This trend creates favorable conditions for long-term economic stability, institutional development, technology and professional knowledge transfer, increased competitiveness, and the improvement of social welfare.

Research shows that the economic growth models of Azerbaijan, Georgia, and Turkey differ significantly in terms of labor and capital productivity and the roles these factors play in economic processes:

- The Azerbaijani model is based on a resource-intensive development trajectory driven mainly by capital accumulation; although the role of labor is increasing, it is still not as influential as capital.
- The Georgian model is distinguished by institutional reforms and the dominance of the service sector, with a more balanced contribution of labor and capital.

- The Turkish model, supported by a diversified industrial and service structure, a wide export base, and strong human capital, represents a complex economic system where labor and capital create synergy.

During 2001—2023, capital accumulation has been the primary determinant of economic growth in Azerbaijan. However, the development of human capital, expansion of the non-oil sector, and deepening of institutional reforms have the potential to further strengthen the contribution of the labor factor to growth. A comparison with regional countries shows that, in the next stage, Azerbaijan must enhance the interaction between labor and capital, accelerate technological transformation, and continue economic diversification in order to achieve more sustainable and productivity-based growth.

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ОЦІНКА ВПЛИВУ ВИРОБНИЧИХ ФАКТОРІВ НА СТАЛИЙ РОЗВИТОК ЕКОНОМІКИ АЗЕРБАЙДЖАНУ

Вступ. Сталий і динамічний розвиток економіки країни безпосередньо пов'язаний з економічним зростанням та низкою інших макроекономічних параметрів, зокрема й кількісне та якісне зростання валового внутрішнього продукту (ВВП) країни.

Проблематика. Продукція, створена у процесі розширеного відтворення, повинна відповідати споживчому попиту як за кількістю, так і за якістю. В іншому випадку продукція, що не відповідає потребам ринку, не може бути реалізована у сфері обігу, внаслідок чого її вартість залишається поза процесом відтворення.

Мета. Визначити залежність продуктивності факторів виробництва (праці та капіталу), що впливають на розвиток економіки Азербайджану у 2001—2023 роках, на основі економетричного оцінювання виробничої функції Кобба–Дугласа та розробити обґрунтовані рекомендації щодо забезпечення сталого розвитку економіки із використанням побудованої моделі.

Матеріали й методи. Використано матеріали відкритих економічних джерел, застосовано теоретико-методологічні та емпіричні методи дослідження, виробничу функцію Кобба–Дугласа й економетричні моделі.

Результати. Економетричне оцінювання економіки Азербайджану за 2001—2023 роки із застосуванням виробничої функції Кобба–Дугласа продемонструвало тісний взаємозв'язок між ВВП та основними факторами виробництва — працею і капіталом (R^2 = 0,895). Показано, що накопичення капіталу було домінуючим чинником економічного зростання, тоді як внесок праці залишався порівняно нижчим. Продуктивність капіталу становила 5,6 одиниці продукції на одиницю капіталу, тоді як продуктивність праці — 0,17 одиниці продукції на одного працівника. Визначено зростаючу роль економічної диверсифікації та міжнародних інвестицій у забезпеченні сталого розвитку.

Висновки. Посилення взаємодії між працею і капіталом, поглиблення міжнародного співробітництва та спрямування інвестицій у високотехнологічні виробництва з високою доданою вартістю сприятимуть підвищенню продуктивності, конкурентоспроможності та стійкості економіки Азербайджану.

Ключові слова: Кобб–Дуглас, виробнича функція, фактори виробництва, продуктивність, ефективність.