**ВАЛОВИЙ ВНУТРІШНІЙ ПРОДУКТ УКРАЇНИ В КОНТЕКСТІ ГЛОБАЛЬНИХ ВИКЛИКІВ**

**GROSS DOMESTIC PRODUCT OF UKRAINE IN THE CONTEXT OF GLOBAL CHALLENGES**

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**Анотація:** У статті розглядається динаміка валового внутрішнього продукту (ВВП) України в умовах сучасних глобальних викликів, таких як збройна агресія росії, пандемія COVID-19, енергетична криза та порушення міжнародних торговельних ланцюгів. Проаналізовано основні чинники, що впливають на економічне зростання та рецесію, зокрема вплив зовнішньої фінансової допомоги, внутрішніх структурних реформ і адаптації до нових геополітичних умов. Особлива увага приділяється порівнянню макроекономічних показників України з іншими країнами Центрально-Східної Європи. У підсумку зроблено висновки щодо перспектив відновлення української економіки та стратегічних напрямів її розвитку в умовах тривалих криз.

**Ключові слова:** Валовий внутрішній продукт, економіка України, глобальні виклики, війна, COVID-19, енергетична криза, макроекономічна стабільність, міжнародна допомога.

**Annotation:** The article examines the dynamics of Ukraine’s Gross Domestic Product (GDP) in the context of contemporary global challenges such as the armed aggression of russia, the COVID-19 pandemic, the energy crisis, and disruptions in international trade chains. It analyzes the key factors influencing economic growth and recession, including the impact of external financial aid, internal structural reforms, and adaptation to new geopolitical conditions. Particular attention is paid to the comparison of Ukraine’s macroeconomic indicators with those of other Central and Eastern European countries. The article concludes with an assessment of the prospects for Ukraine’s economic recovery and strategic directions for development amid ongoing crises.

**Keywords:** Gross Domestic Product, Ukrainian economy, global challenges, war, COVID-19, energy crisis, macroeconomic stability, international aid.

In recent years, Ukraine has faced complex challenges that significantly affect its economy. On the one hand, the global pandemic of COVID-19 led to a global economic crisis, which significantly affected all sectors of the national economy. On the other hand, Russia's full-scale invasion and partial occupation of the territories caused the biggest fall in GDP during the years of independence and, as a result, in 2022, real GDP in Ukraine fell by 29.1% [1]. As of February 24, 2023, based on the NBU's summaries of estimates by the World Bank, the European Commission, the United Nations, and the CMU, the needs for restoration and reconstruction amount to 411 billion dollars. USA. Priority sectors include critical and social infrastructure ($5.7 billion), energy infrastructure ($3.3 billion), and private sector support ($2.7 billion) [1]. The structure of the national economy also underwent significant changes, which was manifested in the growth of the role of the public sector, a decrease in the income of the population and a decline in the volume of private consumption. In addition, the economic challenges for Ukraine today are the significant negative impact of the war on employment, the growing number of migrants who do not plan to return to Ukraine, as well as high inflation and exchange rate expectations.

The relevance of the study of Ukraine's GDP in the context of global challenges is determined by the fact that this indicator is one of the most important in the system of national accounts, gives a generalized idea of ​​the economic development of the country as a whole and allows to assess the final result of the economic activity of its residents. In international statistics, for the purpose of classifying countries according to the level of economic development, the indicator of GDP per person is used. To assess the well-being of the population of countries, the ratio of real GDP and population is used. The dynamics, structure and nature of changes in all economic processes are reflected in GDP. In this context, it is appropriate to carry out a detailed analysis of the economic content of the gross domestic product, which will allow monitoring the main trends in the country's economy and making effective management decisions taking into account global challenges.

The purpose of the proposed study is to assess the state of the national economy by analyzing the gross domestic product, taking into account the global challenges caused by the pandemic and military aggression of the Russian Federation. The realization of the set goal requires the fulfillment of a number of tasks: analysis of the GDP level and assessment of the impact of the COVID-19 pandemic on the Ukrainian economy; identification of the main challenges faced by the economy of Ukraine in the conditions of martial law; determination of prospects for the development of the economy in the conditions of post-pandemic and post-war recovery.

Considering the essence and value of the gross domestic product (GDP) as one of the key indicators of economic development, it is advisable to rely on the scientific research of leading domestic scientists in the field of economics and finance. Among the classics of economic thought, who considered GDP as a macroeconomic indicator, one should note V.D. Bazilevicha, V.M. Geets, I.H. Mantsurova, A.S. Galchynskyi, A.A. Tasks, etc. In the works of I.O. Steblyanko, L.O. Petkova, M.M. Odintsov O.B. Peleh, A.V. Tomashevska, T.I. Stepanova, I.M. Sevruk, A.S. Tropinina, I.I. Kasilov, V.V. Bugas, A.P. Doroshenko, O.O. Doroshenko, E.O. Konchakovsky are investigating the issue of assessing the dynamics of GDP and its development. In the encyclopedia of modern Ukraine, the definition of gross domestic product is interpreted as "one of the most important indicators of economic development, which is the total market value of all final goods and services produced by economic residents of the country on its territory for a certain period" [2]. For a deeper understanding of the essence of the gross domestic product, let's consider its interpretation in the scientific works of domestic researchers (Table 1).

In addition, it should be noted that GDP indicators are used to build economic-mathematical models, in particular, to analyze the growth rates of the gross domestic product based on price indices, import and export factors [4, p. 405]. Some scientists consider the dependence of GDP on investments in the country's economy, which is an urgent task today. In particular, E. Shafizad and N. Aslanova consider the dynamic model of such dependence on the example of the economy of Azerbaijan [5, p. 200]. Among domestic scientists, research in a certain direction should be noted

AND. Chupilko, O.L. Semenyuk, I.H. Babets, V.O. Gordienko, who summarize that among the factors affecting GDP growth and the success of the country's GDP forecasting model, the key factors are adequate determination of the amount of investments and effective use of available resources in the processes of forming the main sources of the country's economic growth in modern conditions [1]. Scientific intelligence provides grounds for formulating the conclusion that the gross domestic product (GDP) is a key indicator that determines the country's economic strength, its competitiveness on the world stage, its ability to ensure sustainable development and raise the standard of living of the population.

Recent years have become a challenge for Ukrainian society and the national economy. The whole world did not have time to recover from the negative consequences of the COVID-19 pandemic, when Ukraine faced a new challenge - a full-scale Russian armed invasion, which caused significant losses of labor and production resources, caused colossal losses to the domestic economy and damage to the environment. In recent years, under the influence of various negative factors, a drop in production, an increase in the number of unemployed, a threat to currency stability, a budget deficit, and a decrease in other indicators of economic development have been recorded. The priority was to adhere to the strategy of economic development in the conditions of martial law and to develop a strategy and tactics for the reconstruction of national politics.

Table 1- Interpretation of the definition of "gross domestic product"

|  |  |  |
| --- | --- | --- |
| Source | Link  to the source | Characteristics of the category |
| Tomashevska A.V. | [3, p. 26] | GDP - characterizes the aggregate market value of final goods and  services produced by enterprises, organizations and institutions in the current period on the economic territory of the country. |
| Kasilov I.I. | [4, p. 43] | GDP is the main indicator of economic development, which is as complete as possible  characterizes the total volume of production of goods and services for a certain period. |
| Bugas V.V., Bugas V.V. | [5, p. 219] | GDP is the basis for measuring the structure of international production  comparisons of the quality of life, assessment of the state budget deficit, monetary emission. |
| Doroshenko A.P., Doroshenko O.O., Konchakovskyi E.O. | [6, p. 73] | GDP is an indicator that characterizes the level of business activity dynamics (manifested through production and consumption) within the  territory of a certain country and can be calculated using different methods: according to income, according to expenses and according to added value. |
| Peleh O.B. | [7, p. 61] | GDP is a generalized economic indicator calculated in the system of national accounts, which assesses the final results of the  total production on the territory of the country for a certain period of time, as a rule, for a year. |

Despite social and political challenges, Ukraine remains open to economic dialogue and fulfillment of obligations under previously concluded agreements. An example is the fulfillment of obligations of the grain agreement. During the 11 months of the war, Ukraine exported 44.4 million tons of agricultural products. Including wheat - 9.9 million tons, corn - 18.2 million tons. In January 2023, 5.5 million tons of grain, oil crops and their processing products were shipped, including sunflower oil - 347,000 tons. tons, corn - 2.6 million tons, and wheat - 1.3 million tons, legumes - 345 thousand. tons and meal - 295 thousand tons [2].

In these difficult conditions, the global economic crisis was reflected in the decline of key indicators not only of the economy of Ukraine, but also of other countries of the world. The factors that caused the slowdown of economic growth in most regions of the world include large-scale quarantine measures in China, disruption of supply chains, cancellation of fiscal incentives for economic development, and stricter monetary policy of central banks of developed countries. However, it was the war in Ukraine that became the main factor in slowing down the economies of European countries and other regions in the second half of 2022. In many countries, inflation has reached double digits, energy prices have increased significantly, and the existing food shortage has worsened. According to the Global Report on the Food Crisis, prepared by the international organization Food and Agriculture Organization, by mid-2022, the number of people facing the three highest phases of acute food insecurity was greater than at any time in the report's six-year history. Thus, 258 million people in 2022, against 193 million people in 2021, faced acute food insecurity [3]. This indicates the importance of supporting the economic development of our country and compliance with international cooperation agreements.

As mentioned earlier, one of the key indicators reflecting the state of the economy is the gross domestic product, which measures the total value of goods and services produced within the country during a certain period of time. It serves as a measure of economic activity and the size of the economy. Economists consider GDP as a vital tool for evaluating and comparing the economic performance of different countries or regions, and provides insight into the overall health and growth of an economy, as well as its productivity and standard of living. GDP is often used to make political decisions, assess economic trends, and predict future events. GDP can be calculated using different approaches and methods: production method (by value added); distributive or income method (by distribution); cost method (by final use) [4]. Regardless of the chosen method, it is necessary to take into account the final results of the calculations, which must coincide. Each method focuses on different aspects of economic activity, including consumer spending, investment, government spending, exports, imports, or income from production. Economists analyze GDP data to better understand economic trends, business cycles, and the overall health of the economy. By comparing GDP growth rates over different periods, patterns can be identified and the impact of various factors such as fiscal policy, monetary policy, technological progress, or changes in consumer behavior can be assessed. In addition, GDP per capita, obtained by dividing GDP by population, provides an understanding of the average standard of living in a country, which is also used to compare the standard of living in different countries or track changes in the standard of living in a country over time. It is important to note that although GDP is a widely used indicator, it has limitations. It does not take into account factors such as income inequality, environmental sustainability or the cost of unpaid work, which can affect people's well-being and the overall sustainability of the economy. For this purpose, other indicators are considered, which make it possible to obtain a more complete understanding of the economic well-being of the country. GDP is a fundamental concept in economics and is a valuable tool for analyzing and evaluating the productivity and size of the economy in different periods of development of national and global economies.

We will analyze the dynamics of nominal and real GDP for the period 2007-2022. It should be noted that during 2007-2019 there was a steady trend towards the growth of the nominal GDP calculated in the national currency. The exception was 2009 (decrease in nominal GDP was 3.7%), which was characterized by the global financial crisis, which did not bypass Ukraine. Analysis of GDP dynamics, calculated in dollars. USA, indicates a decrease in nominal GDP in dollars. USA in the mentioned 2009 (-34.9%), in 2014 (-28.1%) and 2015 (-31.3%) [15, p. 22]. The COVID-19 pandemic significantly changed the world agenda, caused a large-scale economic crisis that directly affected Ukraine. For the development of the Ukrainian economy, in 2020 the slowdown in the pace of development of the world economy under the influence of coronavirus restrictions was of great importance, which significantly complicated the external conditions of economic development due to the drop in demand in many foreign markets and the deterioration of the conditions for obtaining external financing (since many countries needed external assistance, strongly affected by global crisis phenomena) [16 p. 66; 17, p. 41]. In 2022, a drop in Ukraine's GDP was observed at the level of 30.4%, which is the worst result since independence [1]. Let us analyze the dynamics of the nominal GDP of Ukraine (Table 2).

Table 2 - Nominal GDP of Ukraine for 2018-2022

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Years | million hryvnias | The absolute value of  treasurer, UAH million | Relative value of the indicator, % | million dollars USA | The absolute value of  treasurer, UAH million | Relative value of the indicator, % |
| 2018 | 3558706 | +575786 | +19.3 | 130832 | +18678 | +16.7 |
| 2019 | 3974564 | +415858 | +11.7 | 153781 | +22949 | +17.1 |
| 2020 | 4194102 | +219538 | +5.5 | 155582 | +1801 | +1.2 |
| 2021 | 5459574 | +1265472 | +30.2 | 200090 | +44508 | +28.6 |
| 2022 | 5191028 | -268546 | -4.9 | n.d. | - | - |

Source: created by the authors based on data [6].

The data show that, despite the global COVID-19 pandemic, which has made adjustments to the development of the national economy, the nominal GDP in the conditions of the slowdown of economic processes maintains the growth of the indicator in 2020 by 5.5% and in 2021 by 30.2 % to the data of the previous year. Before the Ukrainian economy had time to recover from the consequences of the pandemic, it faced a new challenge - a full-scale military invasion of Ukraine, which led to a slowdown in the growth of the world economy and a decline in the national economy in 2022. The annual growth of the GDP indicator until the beginning of 2022 is due to either an increase in production in the country, or an increase in the prices of goods and services, or both at the same time. In particular, during the pandemic, the e-commerce market gained momentum - mainly online trading of essential goods.

During the analyzed period of time, we observe rather strong volatility of the indicator, and significant differences between nominal and real GDP are explained by the presence of inflation with a simultaneous reduction in the volume of production and consumption of goods. In particular, Ukraine faced a significant reduction in real GDP in 2022 by 29.1%, and the decline in the second half of the year amounted to 31%. In nominal hryvnia equivalent, Ukrainian GDP decreased by 4.8% to UAH 5.2 trillion, significantly exceeding expectations. The dollar equivalent of GDP decreased by 20.8% to 159 billion dollars. USA. Studies indicate general economic instability in the country [1].

Informative is also the analysis of GDP dynamics as a result indicator (Y), which depends on other factors, in particular, exports of goods and services (x1), imports of goods and services (x2), direct investments in the economy of Ukraine (x3), the level of inflation ( x4), the level of unemployment (x5) and the amount of the minimum wage (x6). Source data for 2014-2022. for correlation and regression analysis are given in the table. 3. The value of factor x6 "minimum wage" for analysis was taken at the end of the corresponding year according to the data of the Ministry of Finance.

Table 3 - Dynamics of the main macroeconomic indicators, 2014-2022.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Years | GDP,  million dollars USA | Export of goods and services, million dollars. USA | Import of goods and services, million dollars. USA | Direct investments, million dollars.  USA | Inflation,  % | The level of unemployment, in  % to the economically active  population | Minimum wage, UAH |
| 2014 | 131805 | 64106.8 | 60750.6 | 50218 | 124.9 | 9.3 | 1218 |
| 2015 | 90615 | 46804.2 | 42976.0 | 48694 | 143.3 | 9.1 | 1378 |
| 2016 | 93270 | 45112.7 | 44571.1 | 50426 | 112.4 | 9.3 | 1600 |
| 2017 | 112154 | 52579.5 | 55080.6 | 50459 | 113.7 | 9.5 | 3200 |
| 2018 | 130832 | 57280.9 | 63493.7 | 49829 | 109.8 | 8.8 | 3723 |
| 2019 | 153781 | 64050.3 | 67739.4 | 56810 | 104.1 | 8.2 | 4173 |
| 2020 | 155582 | 59367.9 | 60045.7 | 55142 | 105.0 | 9.5 | 5000 |
| 2021 | 200090 | 80857.9 | 80819.6 | 69926 | 110.0 | 9.9 | 6500 |
| 2022 | 158471 | 53372.8 | 56273.5 | 54822 | 126.6 | 30\* | 6700 |

Source: created by the authors based on data [3].

\* taken from open sources [3].

At the first stage of the analysis, it is necessary to establish the existence of a relationship between the GDP of Ukraine and the selected factors. The connection density is represented by the correlation matrix (Table 4). The off-diagonal elements of the matrix are linear correlation coefficients that estimate the concomitant relationships between correlated indicators.

As evidenced by the pairwise correlation coefficients, the relationship between GDP and such factors as the size of exports of goods and services, the size of imports of goods and services, the amount of direct investment and the minimum wage is direct and close. The relationship between GDP and inflation, as well as the level of unemployment, is insignificant at the critical value of the pair correlation coefficient r1-0.05 (9) = 0.67 determined with a probability of 0.95. Taking into account the obtained results, it is advisable to carry out regression analysis for indicators characterized by a close connection. The results of the regression analysis are shown in Table 5.

Table 4 - Correlation coefficients between GDP and selected factors

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Y | x1 | x2 | x3 | x4 | x5 | x6 |
| Y | 1 | 0.876 | 0.903 | 0.880 | -0.453 | 0.251 | 0.850 |
| x1 |  | 1 | 0.959 | 0.844 | -0.419 | -0.149 | 0.526 |
| x2 |  |  | 1 | 0.814 | -0.567 | -0.085 | 0.641 |
| x3 |  |  |  | 1 | -0.395 | 0.069 | 0.731 |
| x4 |  |  |  |  | 1 | 0.299 | -0.386 |
| x5 |  |  |  |  |  | 1 | 0.546 |
| x6 |  |  |  |  |  |  | 1 |

It is worth noting the existence of a close connection between export and import of goods and services (pair correlation coefficient is 0.959).

The relationship between GDP and selected macroeconomic indicators is characterized by linear dependence. At the same time, the models and their parameters are statistically significant. The built model of the dependence of GDP on the size of exports of goods and services allows us to state that an increase in the volume of exports of goods and services by 1 million dollars. USA causes an increase in nominal GDP by an average of 0.274 million dollars. USA.

Table 5 - Results of regression analysis of GDP and individual macroeconomic indicators

|  |  |  |
| --- | --- | --- |
| Factor signs | Coefficient of determination | Regression equation |
| Export of goods and services, million dollars. USA | 0.767 | Y=0.274 x1+21200 |
| Import of goods and services, million dollars. USA | 0.816 | Y=0.298 x2+18523 |
| Direct investments, million dollars. USA | 0.774 | Y=0.166 x3+3197.5 |
| Minimum wage at the end of the year, UAH | 0.723 | Y=0.051 x6 - 31435 |

The analysis of the dynamics of the GDP of Ukraine for 2018-2022 indicates the existence of significant volatility of the indicator in dollars. USA. This is explained primarily by the influence of negative factors, such as the annexation of the Autonomous Republic of Crimea and the beginning of the war in the East of Ukraine, the pandemic and the large-scale Russian invasion. Among macroeconomic indicators, the volume of export-import transactions, the amount of investments, and the amount of the minimum wage have the greatest influence on the change in GDP. Other factors considered in the study have an insignificant relationship with GDP. Therefore, raising the minimum wage can stimulate GDP growth. Support for the export-import activities of national enterprises will also have a positive impact on GDP.

Prospects for further research lie in the area of ​​determining economic incentives for export-import activity and increasing Ukrainian exports of goods and services.

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