

Lyudmila Verbivska¹
Tetiana Trubnik
Marianna Oliskevych
Mykola Pugachov
Volodymyr Pugachov
Mykhailo Goncharenko

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FORECASTING MACROECONOMIC INDICATORS OF THE DEVELOPMENT OF THE UKRAINIAN ECONOMY DURING THE WAR (2022–2023)

Abstract: *The full-scale military invasion of the Russian Federation on the territory of sovereign Ukraine has led to the emergence of a number of destabilizing factors in the development of the Ukrainian economy. Moreover, it has caused the increase of macroeconomic instability and problems of a social - economic nature, which requires an immediate solution and development of forecasts of economic and social development. The purpose of the research is to forecast macroeconomic indicators of the economy development of Ukraine during the war (2022–2023). The forecasting results give evidence of the critical and threatening values of the analysed macroeconomic indicators of the Ukrainian economy development in war conditions. This causes a decrease in the life quality of the population and the sustainable competitiveness of the country and requires the formation and implementation of an effective macroeconomic policy. The substantiated influence of macroeconomic indicators on the level of life quality of the population indicates a strong interrelationship between the analysed indicators ($R=0,933$). The budget deficit in 2024 is forecast at the level of -2,7%; the GDP volume will decrease to 5,8%; the poverty level will increase to 62%, and the unemployment rate will increase to 33%.*

Keywords: *Macroeconomic Instability, Gross Domestic Product, Budget Deficit, Macroeconomic Indicators, Sustainable Economic.*

1. Introduction

Strengthening the destabilizing influence of the negative factors of a military nature, which were formed as a result of the armed aggression of the Russian Federation in relation to Ukraine and its full-scale invasion of the sovereign country's territory, led to the aggravation of the problems of developing Ukraine's economy, which,

having not recovered from the challenges of the COVID-19 pandemic, succumbed to the deepening macroeconomic instability. Destructive changes were manifested in a drop in the values of the primary macroeconomic indicators of economic development as a result of the annexation of the country's significant territories and the impossibility of ensuring the stable functioning of economic agents. In the conditions of the strengthening of the social-

¹ Corresponding author: Lyudmila Verbivska
Email: verbivskaa@chnu.cv.ua

economic and social-political crisis in Ukraine, the issue of ensuring macroeconomic stability and achieving optimal values of indicators of economic development is intensifying. Significant disparities in economic development cause the emergence in the national economy of such phenomena and processes as the depreciation of the national currency and the growth of inflation, the budget deficit, the increase in the level of unemployment and poverty of the population, as well as the shadowing of the economy. The military invasion of the Russian Federation on the territory of Ukraine has further deepened the existing problems that require the search for effective methods and ways out of the economic, social and political crisis, an effective tool for which can be the forecasting of macroeconomic indicators of the economy development, which will make it possible to outline the strategic vectors of the formation and implementation of macroeconomic policy, develop a set of effective measures to counter destabilizing factors and destructive factors and achieve the desired economic effect.

The purpose of the research is to forecast macroeconomic indicators of Ukraine's economy development during the war (2022–2023). The methodological basis of the research comprises the list of scientifically based methods, with the help of which it is possible to determine the essence of macroeconomic indicators of developing Ukraine's economy (analysis, synthesis and abstraction), conducting empirical studies of macroeconomic indicators of developing Ukraine's economy (analogy and comparison), carrying out a visual display of the obtained results (graphical and tabular methods), forming hypotheses and formulating conclusions based on research results (systematization and generalization), determining the influence of macroeconomic indicators of developing Ukraine's economy on the level of the population's life quality and sustainable competitiveness (correlation-regression analysis).

2. Literature Review

Ensuring macroeconomic stability in Ukraine is one of the priority areas of state economic policy. However, the systematic strengthening of the financial-economic and social-political crisis leads to the emergence of significant destabilizing factors in the development of the economy, society and politics, as a result of which there is a decrease in the values of macroeconomic indicators and protracted macroeconomic instability, which, according to the viewpoint of Kiley (2022) and Koval et al. (2021), significantly affects macroeconomic indicators of the economy development. Kyrpayanidi (2020) has singled out the basic problems of macroeconomic analysis, determined their impact on the forecasting of macroeconomic indicators of economy development, and proposed to carry out forecasting processes depending on the key vectors and strategic directions of the development of the national economy. Along with this, Zhukova & Sobolieva-Tereshchenko (2021) offer their own methodology for analysing the dynamics of macroeconomic indicators, based on the study of the main trends of changes in economic indicators and the impact of destabilizing factors on them, which are considered to be absolutely appropriate and justified.

The views of scientists are shared by Kuzmina & Parkhomchuk (2022), who believe that, in addition to the specified method of forecasting macroeconomic indicators of economic development, it is worth using methods of statistical data analysis, in particular, comparative analysis. Moreover, Chirwa & Odhiambo (2016) are convinced of the need to involve various econometric methods of assessing the determinants of economic growth in this process.

Kopytko et al. (2018) propose to consider the problems of the development of Ukraine's economy through the prism of ensuring the

proper level of macroeconomic security of the state, and identify macroeconomic figures with its indicators. In-depth studies in the direction outlined were made by Podra et al. (2021), who detailed approaches to the study of macroeconomic indicators in Ukraine and emphasized the importance of analysing trends in monetary indicators of the development of the national economy in the context of investigating the criteria for ensuring the financial security of the state. From among the most significant macroeconomic threats, Podra et al. (2021) have identified as follows: the high level of inflation, the instability of the exchange rate, the reduction of gold and foreign reserves of Ukraine, the growth of the money supply and the level of dollarization of the national economy, which, in addition to others, are actually indicators characterizing the development of the economy.

Myskiv & Vinichuk (2022) take up the position that it is the effective monetary policy of the state that is able to ensure stability and high growth rates of the country's economy and emphasize the need to study the shadow sector of the economy and determine its impact on monetary and other macroeconomic indicators, which is substantiated in more detail in the works of Vinichuk & Ryzkova (2021), Blikhar et al. (2022) and Pushak & Vinichuk (2017). Moreover, Khoma & Skip (2018) prove the dominant influence of such an economic phenomenon as unemployment on the process of forecasting macroeconomic indicators of the development of the Ukrainian economy.

In this context, Milojević et al. (2021) consider the macroeconomic indicators of the development of European countries that are in a state of transformational restructuring and outline the macroeconomic parameters of such development, and Vu & Chi (2022), Bondarenko et al., (2018) believe that innovations, which are one of the sources of competitive advantages of the country's economy, are of particular importance under such circumstances.

Equally important in this direction are the studies of Cook & Davidsdottir (2021) and Latysheva et al. (2020), who have evaluated the interrelationships of macroeconomic indicators and determined the importance of their forecasting in the context of ensuring the economic well-being of the country and its sustainable economic development. In view of such trends, Kiki (2017) suggests intensifying the economic integration of the Ukrainian economy into the international space and carrying out the development of the national economy based on and in accordance with European standards.

Studying the issues of post-war recovery and the development of Ukraine's economy is equally significant, as well as implementing a comparative characterization of the forecasted macroeconomic indicators with those that will be achieved in future periods. Consequently, these are the prospects for subsequent scientific studies.

3. Methodology

The methodological basis of the research consists of the methods as follows: analysis, synthesis and abstraction, which have been used to determine the essence of macroeconomic indicators of the development of Ukraine's economy; analogy and comparison, with the help of which the analysis of macroeconomic indicators of the development of the Ukrainian economy has been carried out; graphical and tabular methods used to clearly display research results; systematization and generalization for the purpose of forming hypotheses and formulating conclusions based on research results; economic and mathematical methods, in particular, correlation and regression analysis in order to determine the influence of macroeconomic indicators of the development of Ukraine's economy on the level of the life quality of the population and sustainable competitiveness.

The research information base is based on reports for 2010–2021: Quality of Life Index

by Country by indicator of the quality of life of the population; Statistical Yearbook of Ukraine for 2020 by indicators of GDP volume, consumer price index, budget deficit, unemployment rate; Shadow economy: general trends of January–September 2021 according to the indicator of the level of the shadow economy; Informational and analytical report on the standard of living of the population in January - December 2021 according to the poverty level indicator.

4. Results

The problems of ensuring macroeconomic stability in Ukraine have existed for a long time and are especially exacerbated under the influence of social-economic and social-political upheavals. It is extremely difficult to predict the main trends of the development of Ukraine’s economy in the conditions of wartime posture; however, it is possible due to the forecasting of macroeconomic indicators. At the same time, the attention should be paid to the fact that in certain regions of Ukraine, which are under the occupation of the aggressor country, it is impossible to obtain data on the state and trends of economic development.

The war of Ukraine with the Russian Federation has created catastrophic humanitarian and economic losses and caused a large-scale economic downturn. A significant share of the country’s population, estimated at 13,7 million people, was forcibly displaced, of which 5,7 million people left the country (Ukraine Internal Displacement Report, 2022).

It should be noted that the main value indicator of the development of the national economy of the country is the gross domestic product, which reflects the final results of the implementation of production activities. The obtained research results show that during 2022–2023 (Figure 1), there is an ambiguous trend regarding changes in the volume of real GDP in Ukraine in 2010–2023. During periods of aggravation of social and political instability in 2014–2015 and in 2020, in particular, a sharp drop in GDP was recorded to -6,6% in 2014, -9,8% in 2015, and -4% in 2020 (Statistical Yearbook of Ukraine for 2020, 2021). Forecast estimates for the period 2022–2023, made on the basis of official data of the State Statistics Service of Ukraine, show a positive trend and growing tendencies in GDP at the level of 8,4% in 2023.

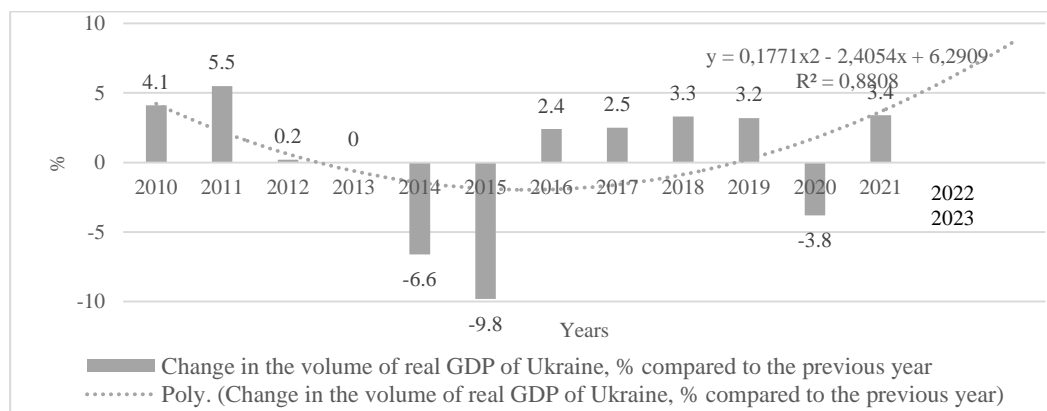


Figure 1. Dynamics of changes in the volume of real GDP in Ukraine in 2010–2023 (2022–2023 – forecast estimates) in the pre-war period, %
Source: based on the data (Key figures on European business, 2022)

However, such optimistic forecasts cannot be considered realistic, forasmuch as the World Bank has forecast changes in the volume of real GDP for the period until 2024, according to which the GDP of Ukraine will fall to -45,1% in 2022 (Figure

2) (Statistical Yearbook of Ukraine for 2020, 2021; War in the Region. Europe and Central Asia Economic Update, 2022), which significantly differs from forecasts based on statistical data.

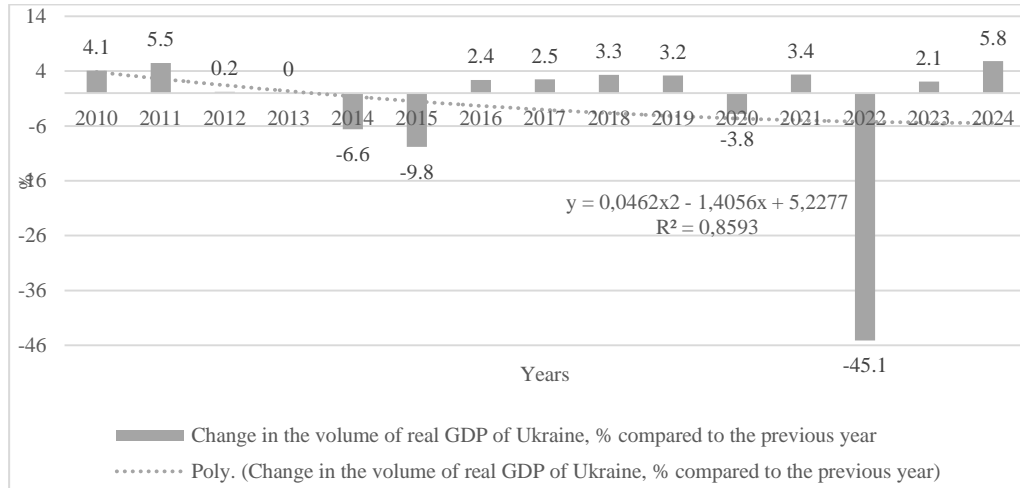


Figure 2. Dynamics of changes in the volume of real GDP in Ukraine in 2010–2024 (2022–2024 – forecast estimates of the World Bank) taking into account the forecast estimates of the World Bank

Source: it has been compiled based on: Statistical Yearbook of Ukraine for 2020; War in the Region. Europe and Central Asia Economic Update 2022

The primary factor in such a rapid fall in GDP is the military confrontation between Ukraine and the Russian Federation and the increasing influence of such factors as a decrease in the number of the working population, the number of entrepreneurial structures, the economic activity of businesses, the occupation of significant territories of the country and the strengthening of the influence of military and economic risks. As a result, the processes of debt dependence are intensifying in the country and the volume of public debt is growing.

It should be noted that the specified numerical data on the forecast estimates of GDP volumes are not final, forasmuch as the hostilities and mass destruction continue and periodically intensify, which increases the degree of uncertainty. The outlined

tendencies prove that in Ukraine, the dominant role in the formation of GDP is played by inflationary factors, the increasing influence of which leads to the devaluation of the national currency. The study of tendencies in the consumer price index in Ukraine in 2010–2021 (Figure 3) shows its rapid growth in the period 2014–2015 (+42,8%) and a gradual slight decrease in the period until 2020. In 2021, crisis phenomena caused by the COVID-19 pandemic again have led to an increase in inflation to 110% (Statistical Yearbook of Ukraine for 2020, 2021).

It should be noted that such tendencies confirm the hypothesis of interrelationship between GDP growth and inflation, forasmuch as its decline is observed in the same period when a significant increase in the consumer price index has been recorded.

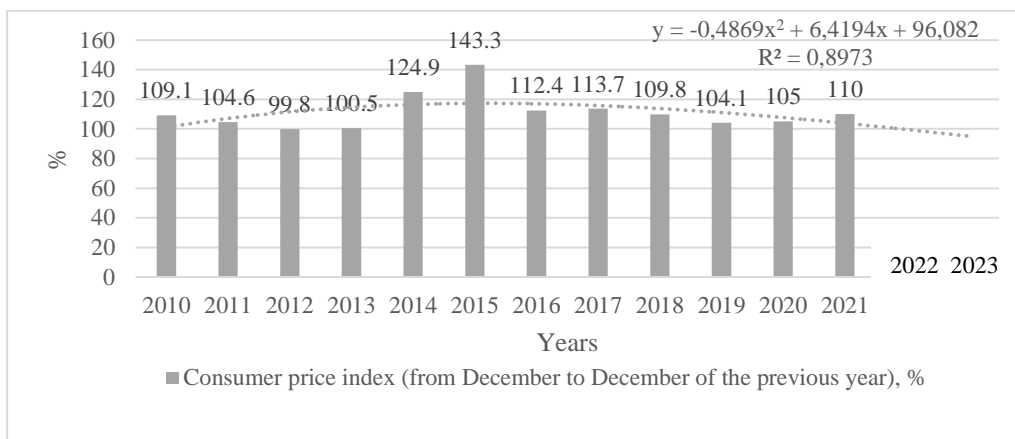


Figure 3. Dynamics of the consumer price index in Ukraine in 2010–2023 (2022–2023 – forecast estimates based on official statistics)

Source: it has been compiled based on: Statistical Yearbook of Ukraine for 2020

According to the forecasts of the World Bank for 2022 - 2024, the inflation level will continue to grow by an average of 4-5% annually until 2023, and the decrease in the

consumer price index is predicted only in 2024 to the level of 108,4% and a slight decrease in 2015 and 2016 to 105% and 103%, respectively (Figure 4).

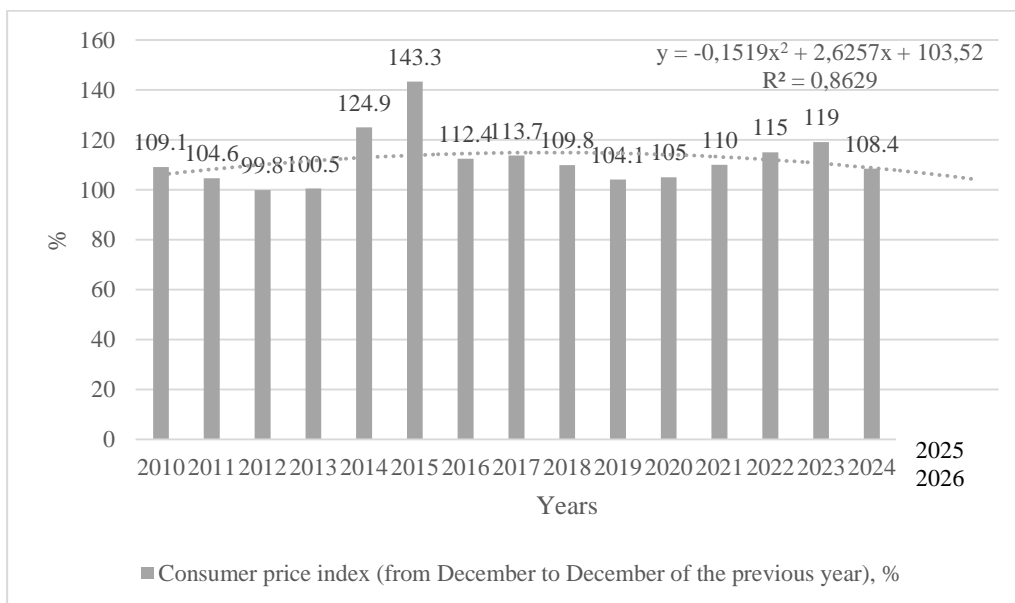


Figure 4. Dynamics of the consumer price index in Ukraine in 2010–2026 (2022–2024 – forecast estimates of the World Bank; 2025–2026 – forecast estimates) taking into account the forecast estimates of the World Bank

Source: it has been compiled based on: Statistical Yearbook of Ukraine for 2020; War in the Region. Europe and Central Asia Economic Update 2022

It is beyond argument that the outlined situation requires in-depth research in the direction of searching for methods of curbing inflation and prompt response to fluctuations in the national currency. In this context, it is expedient to introduce an inflation targeting regime, justified by a significant and stable growth in the money supply in circulation. Ensuring price stability is one of the factors in overcoming macroeconomic imbalances. It should be noted that the strengthening of the devaluation shock in 2014–2015 has led to a critical increase in the dollar exchange rate to 30,01 UAH on the official market and up to 40 UAH on the shadow market, intensifying the development of galloping inflation. A similar situation is observed in the conditions of 2022, which is confirmed by the devaluation of the national currency to 36 UAH for a dollar on the official market and up to 40 UAH on the shadow market and intense price growth in the domestic market. The national system of macroeconomic forecasting of the National Bank of Ukraine, Forecasting and Policy Analysis System (FPAS), which corresponds to the

requirements of strategic monetary policy in the medium term, has made it possible to predict the inflation rate for 2022 at the level of 106,2%, and for 2023 – 105,3%. According to our calculations, the consumer price index in Ukraine in 2022–2023 will be in the range of 101–103%.

Significant problems of ensuring macroeconomic stability create a reliable basis for the destabilization of the budget system of Ukraine. Investigating the main tendencies regarding the revenue and expenditure parts of the Consolidated Budget of Ukraine (Table 1) (Consolidated budget of Ukraine. Ministry of Finance of Ukraine, 2010-2022), it has been established that during 2010–2021 there was a budget deficit, which, according to forecast estimates for 2022, continues to grow and as of June has reached a mark of 11,60% of GDP, which indicates its chronic nature in the pre-war period and critical values in the war period. The aforementioned intensifies the need to search for effective ways of using state financial resources.

Table 1. The main indicators characterizing the Consolidated Budget of Ukraine in 2010–2022

Years	GDP volumes, billion UAH	Income to the budget, billion UAH	Budget expenditures	Tax revenues to the budget, billion UAH	Share of taxes, total, %	Forecast deficit, % of GDP
2010	1120,6	314,5	377,8	246,4	21,99	–6,00
2011	1349,2	398,6	416,9	334,7	24,81	–1,75
2012	1459,1	445,5	492,5	360,6	24,71	–3,60
2013	1522,7	442,8	505,8	354,0	23,25	–4,37
2014	1586,9	456,1	523,1	367,5	23,16	–4,60
2015	1988,5	652,0	679,9	507,6	25,53	–1,56
2016	2385,4	782,7	835,6	650,8	27,28	–2,29
2017	2981,2	1016,8	1056,8	828,2	27,78	–1,41
2018	3560,3	1184,3	1250,2	986,3	27,69	–1,90
2019	3977,2	1289,8	1370,1	1070,3	26,91	–2,12
2020	4191,9	1376,7	1595,3	1136,7	27,12	–5,34
2021	5459,6	1662,2	1844,4	1453,8	26,63	–3,63
2022*	2997,3**	808,0	1156,5	450,7	15,04	–11,60

* data for 2022 are given as of June 2022

** forecast data of the World Bank

Source: it has been compiled based on: Consolidated budget of Ukraine. Ministry of Finance of Ukraine, 2010-2022

The results of the conducted investigations make it possible to clarify the main trends in the budget sphere and indicate a significant decrease in all analysed indicators in 2022. In particular, according to the estimates of the World Bank, there was a sharp drop in the country's GDP to 45,1%, revenues to the budget decreased to 808 billion UAH, which in comparison with 2021 is 48,61%, the amount of tax revenues also decreased to

450,7 billion UAH (by 31%), and the Consolidated Budget deficit increased to 11,60%.

In Figure 5, we will forecast the value of the indicator of the budget deficit of Ukraine for the period 2023–2024, the results of which testify to the deepening of the crisis and the continued growth of the budget deficit to 450 billion UAH in 2024 (–6.42%).

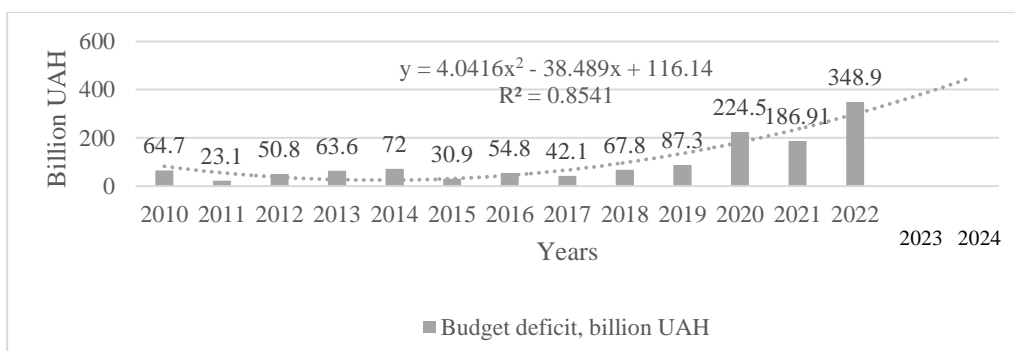


Figure 5. Dynamics of the budget deficit in Ukraine in 2010–2024 (2022–2024 – forecast estimates)

Source: it has been compiled based on: Statistical Yearbook of Ukraine for 2020; Consolidated budget of Ukraine. Ministry of Finance of Ukraine, 2010-2022

The level of unemployment is another, equally important indicator of the development of Ukraine's economy, which significantly changes its meaning in the conditions of war. According to the estimates of the State Statistics Service of

Ukraine, the level of unemployment in the country during 2010–2021 has a cyclical nature and sharply increases during the period of intensification of crisis phenomena in the country (Figure 6).

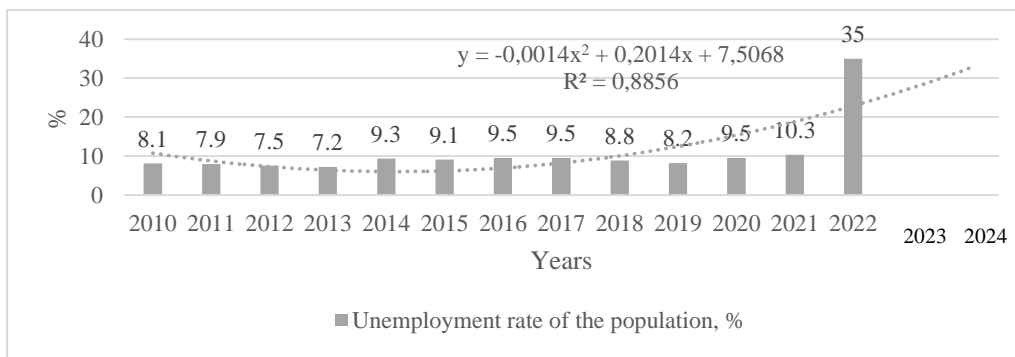


Figure 6. Dynamics of the budget deficit in Ukraine in 2010–2024 (2022–2024 – forecast estimates)

Source: it has been compiled based on: Statistical Yearbook of Ukraine for 2020; Consolidated budget of Ukraine. Ministry of Finance of Ukraine, 2010-2022

In 2022, according to the estimates of the National Bank of Ukraine (Inflation Report, July 2022), the unemployment rate has reached a record high of 35%, which is of the population is observed.

According to the results of the assessments of the unemployment level in Ukraine, the period 2010–2013 is characterized by a downward trend; in the period from 2014 to 2017, an increase in the value of the analyzed indicator was recorded to 9,5% of the economically active population. In 2018–2019, the phenomenon of unemployment reduction to 8,2% was also observed; however, in 2019–2021, the unemployment rate increased sharply to 9,5% in 2020 and 10,3% in 2021.

It should be noted that the value of the unemployment rate of 10,3% is quite unjustified, forasmuch as such a phenomenon as shadow economic activity in Ukraine is observed, and it is constantly

caused by an unprecedented humanitarian crisis, a deep recession of the economy, and active displacement of the population. At the same time, a sharp reduction in the incomes intensifying, providing the possibility of unofficial employment, which indicates much higher values of the indicator analysed.

In this context, particular attention should be paid to studying the trend of the shadow economy in Ukraine, the level of which, according to the estimates of the Ministry of Economy of Ukraine, also does not have a stable tendency and fluctuates (Figure 7). Threatening trends in the growth of the volume of the economy’s shadow sector are accompanied by significant structural deformations and disproportions in the development of the Ukrainian economy, as well as the emergence of a number of problems of a social-economic nature.



Figure 7. Dynamics of the level of the shadow economy in Ukraine in 2010–2023 (2022–2023 – forecast estimates)

Source: it has been compiled based on: Shadow economy: general trends January–September 2021

The obtained results of studying the dynamics of the level of the shadow economy in Ukraine in 2010–2021 give evidence of the fact that during periods of

social-economic and social-political crisis, the volume of the shadow sector begins to increase. In particular, such a tendency was observed in 2014 - 2015 – during the period

of the beginning of the military aggression of the Russian Federation and its annexation of the Autonomous Republic of Crimea. In the period of 2019 - 2021, there has been also an increase in shadowing of the economy, as evidenced by the growing trend of the level of the shadow economy from 27% in 2019 to 31% in 2021 (Shadow economy: general trends January–September 2021, 2021). At the same time, periods of growth in the level of the shadow economy are characterized by a drop in real GDP volumes, in particular to -6,6% in 2014, -9,8% in 2015, and -4% in 2020. According to forecast estimates for 2022–2023, the value of the analysed indicator should decrease to approximately 24%; however, taking into account the deepening influence of destabilizing factors of the external and internal environment, it is extremely difficult to ensure the achievement

of such a result in the conditions of military confrontation. Undoubtedly, the outlined trends lead to a decrease in the rate of development of Ukraine’s economy and require the immediate development of a set of measures for unshadowing the national economy.

The existing problems of macroeconomic stability in Ukraine threaten to decrease the level of development of the national economy and lead to significant social inequality in the society due to the significant differentiation of the population’s incomes, which is manifested in the formation of an insignificant share of the very rich and an increase in the share of the very poor population. It is expedient to analyse the level of poverty in Ukraine in the period 2010-2021 (Figure 8).



Figure 8. Dynamics of the poverty level in Ukraine in 2010–2024 (2022–2024 – forecast estimates)

Source: it has been compiled based on: Informational and analytical note on the standard of living of the population in January–December 2021

According to the results obtained, a similar trend can be observed, which is also manifested in previous macroeconomic indicators: in periods of instability and crises, the processes of impoverishment of the population deepen, which is evidenced

by the increase in the poverty level to 58,3% in 2015, 58,6% in 2016 and 50% in 2020 (Informational and analytical note on the standard of living of the population in January–December 2021, 2021). The period of military confrontation of Ukraine against

the Russian Federation is characterized by significant structural changes in all spheres, as a result of which the poverty level indicator, which, according to World Bank estimates, reached 70% in 2022, becomes critical, indicating the impoverishment of the main mass of the population. Forecast estimates of this indicator show an increase in the poverty level in subsequent periods up to 60% in 2023 and 62% in 2024, respectively; however, such trends remain threatening.

On the basis of the studies conducted, it is possible to single out and systematize the

main factors that deepen the macroeconomic instability of Ukraine in the conditions of war (Figure 9). The most common factors are as follows: a decrease in the number of enterprises and a decrease in the activity of their activities due to the occupation of territories, a sharp drop in sales and a decrease in financial income; the incomplete transition of the economy to “military rails”, leading to an increase in the influence of military and economic risks on investors, as a result of which investment volumes have decreased by 57,5%.

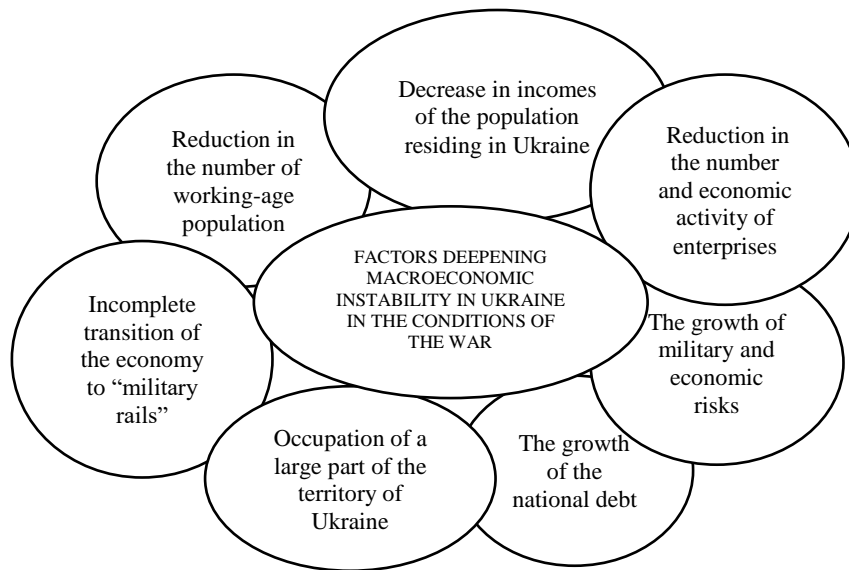


Figure 9. The main factors negatively affecting the macroeconomic stability of Ukraine in the conditions of war

Source: author’s development

One of the most important factors is a significant decrease in the country’s GDP, the drop of which in 2022 is observed at the level of 45,1%, and due to the growing volumes of public expenditures, in particular, on the security and defence sector; the country’s debt dependence is deepening. As of 2022, the state debt has increased by 40% compared to 2021.

A significant factor in the destabilization of the macroeconomic situation in the country is the occupation of territories, as a result of which the infrastructure is destroyed and production volumes decrease. In 2022, inflation growth has been recorded at the level of 15%. In order to resolve problems in the monetary sphere, the National Bank of Ukraine has introduced restrictions on currency circulation.

The forced displacement of the population from the occupied territories and those under constant shelling has created a situation in which a significant number of the population lost their jobs, as a result of which the population's income decreases, and, accordingly, its competitiveness and consumption. It should be noted that private consumption has decreased by 50% and public consumption by 10% in 2022.

Accordingly, overall negative structural changes in the development of the economy have a significant impact on the quality of life of the population in Ukraine, the results of which are shown in Figure 10, and forecast estimates show a decrease in the quality of life index of the population in 2022–2023 to 109 (Quality of Life Index by Country, 2012–2021).

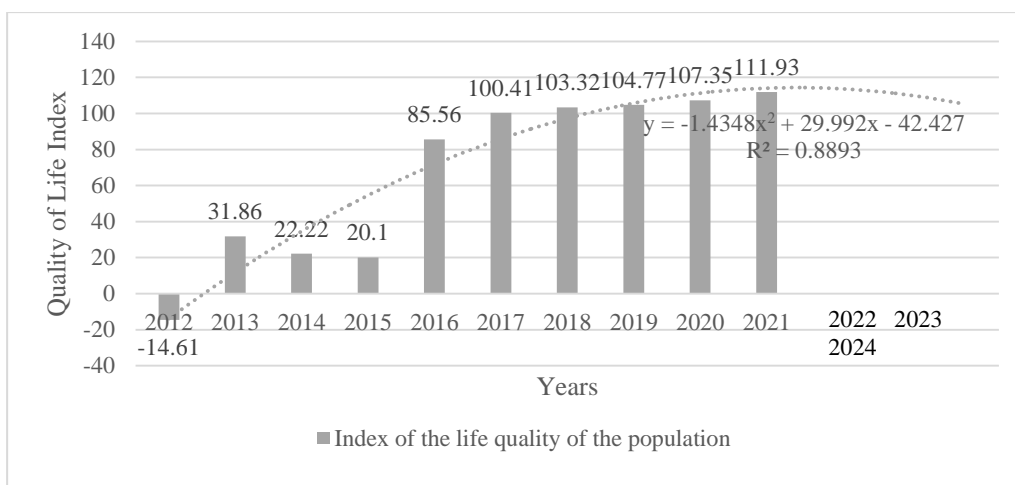


Figure 10. Dynamics of the level of the life quality of the population in Ukraine in 2012–2024 (2022–2024 – forecast estimates)

Source: it has been compiled based on: Informational and analytical note on the standard of living of the population in January–December 2021

We propose to conduct the in-depth studies of macroeconomic indicators of the development of Ukraine's economy and determine their impact on the level of the life quality of the population in the pre-war period and during the period of military confrontation. In order to do this, we will apply the correlation-regression analysis technology using the Statistica 6.0 software package and build two models. When performing the calculations, we will consider the level of the life quality of the population (Y) as the effective indicator, and the GDP volume (x_1), the consumer price index (x_2), the budget deficit (x_3), the unemployment rate (x_4), the level of the shadow economy (x_5), and poverty level (x_6) as indicators-factors.

The obtained results of the correlation-regression analysis, according to the data of the pre-war period, have made it possible to reveal a strong interrelationship between the analysed indicators, which confirms the correlation coefficient $R=0,929$ and the statistical significance of the obtained model (F-value of Fisher's test $F(6,3) = 3,178$) (equation 1).

$$Y = 51,29 + 0,23x_1 - 0,14x_2 - 0,16x_3 - 0,50x_4 - 0,53x_5 - 0,09x_6 \quad (1)$$

$$R=0,929; R^2=0,864; p<0,5000.$$

where: Y – the level of the life quality of the population; x_1 – the GDP volume; x_2 – the consumer price index; x_3 – the budget deficit; x_4 – the unemployment rate; x_5 –

the level of the shadow economy; x_6 – the poverty level of the population.

Thus, it is possible to state the degree of influence of indicators-factors on the level of the life quality of the population in Ukraine. It has been established that the value of the life quality of the population depends significantly on all analysed macroeconomic indicators. At the same time, the growth of GDP has a positive effect on the life quality of the population in the country, as evidenced by the regression indicator $r = 0,23$. As for all other factors, there is an inversely proportional interrelationship between them and the level of the life quality of the population, namely: an increase in the life quality of the population is possible with a decrease in the consumer price index ($r = -0,14$), the budget deficit ($r = -0,16$), the level of unemployment ($r = -0,50$), the level of the shadow economy ($r = -0,53$) and the level of poverty ($r = -0,09$).

The study of the degree of influence of the analysed indicators on the living standard of the population in the conditions of war, taking into account the forecast data of the World Bank, the Ministry of Finance of Ukraine and the National Bank of Ukraine also makes it possible to reveal a strong interrelationship between the indicators (correlation coefficient $R=0,933$; statistical significance of the obtained model (value F – Fisher’s test $F(6,4) = 4,488$) (equation 2).

$$Y = -43,91 - 1,39x_1 + 0,35x_2 + 0,41x_3 + 1,89x_4 + 0,86x_5 + 0,14x_6 \quad (2)$$

$$R=0,933; R^2=0,871; p<0,5000.$$

where: Y – the level of the life quality of the population; x_1 – the GDP volume; x_2 – the consumer price index; x_3 – the budget deficit; x_4 – the unemployment rate; x_5 – the level of the shadow economy; x_6 – the poverty level of the population.

The results of the correlation - regression analysis proved that in the conditions of Russia’s military aggression against Ukraine, the following dependence has been established, namely: the value of the quality

of life of the population decreases significantly with a decrease in GDP, which is indicated by the regression indicator $r = -1,39$. Other indicators-factors are correlated with the index of the life quality of the population in an inversely proportional interrelationship, namely: a decrease in the life quality of the population is observed with an increase in the consumer price index ($r = 0,35$), the budget deficit ($r = 0,41$), the unemployment rate ($r = 1,89$), the level of the shadow economy ($r = 0,86$) and the level of poverty ($r = 0,14$).

When performing the calculations, we will consider the sustainable competitiveness index (The Global Sustainable Competitiveness Index, 2010–2021) (Y) as the effective indicator, and the GDP volume (x_1), the consumer price index (x_2), the budget deficit (x_3), the unemployment rate (x_4), the level of the shadow economy (x_5), and poverty level (x_6) as indicators-factors.

The obtained results of the correlation - regression analysis of the interrelationship between the index of sustainable competitiveness and the GDP index of consumer prices, the budget deficit, the level of unemployment, the level of the shadow economy and the level of poverty have made it possible to reveal a strong interrelationship (correlation coefficient $R=0,949$ and the statistical significance of the obtained model (value F –Fisher’s test $F(6,5) = 7,607$) (equation 3).

$$Y = -19,84 - 0,19x_1 + 0,83x_2 + 0,72x_3 + 0,07x_4 + 0,93x_5 + 0,38x_6 \quad (3)$$

$$R=0,949; R^2=0,901; p<0,5000.$$

where: Y – sustainable competitiveness index; x_1 – the GDP volume; x_2 – the consumer price index; x_3 – the budget deficit; x_4 – the unemployment rate; x_5 – the level of the shadow economy; x_6 – the poverty level of the population.

The degree of influence of indicators - factors on the index of sustainable competitiveness in Ukraine proves that the value of the index of sustainable

competitiveness also depends on the value of the main macroeconomic indicators. A decrease in GDP volumes leads to a decrease in the sustainable competitiveness index, which is evidenced by the regression indicator $r = -0,19$.

An increase in the value of the consumer price index leads to a decrease in the country's competitiveness ($r = 0,83$). Similar tendencies are observed with regard to the growth of the budget deficit, which also provokes a decrease in competitiveness ($r = 0,72$). As for the level of unemployment, the level of the shadow economy, and the level of poverty, they are also inversely proportional to the performance indicator, and a decrease in their value contributes to an increase in the index of sustainable competitiveness (respective regression coefficients ($r = 0,07$), ($r = 0,93$) and ($r = 0,38$)).

Thus, it can be argued that the selected macroeconomic indicators have the same effect on both the level of the population's quality of life and sustainable competitiveness. At the same time, the forecast values of macroeconomic indicators of economic development (Table 2) indicate a deepening of macroeconomic instability during 2022 - 2024, which requires the development and implementation of effective measures to counter destabilizing factors.

Table 2. Forecast values of the main macroeconomic indicators of the development of the economy of Ukraine in 2022–2024. Source: author's development

Forecast indicators	Forecast values		
	2022	2023	2024
Change in the volume of real GDP, %	-45,1	2,1	5,8
Consumer price index, %	115	119	108,4
Budget deficit	-11,60	-3,0	-2,7
Unemployment rate, %	35	30	33
Poverty level, %	70	60	62
Index of the life quality of the population	109	105	102
Competitiveness index	45,9	46,1	46,5

Therefore, the conducted studies confirm the presence of macroeconomic instability in Ukraine, the strengthening of which is predicted in 2022–2023, which will lead to a slowdown in the pace of economic development; consequently, this requires the formation and implementation of a balanced macroeconomic policy.

5. Conclusion

Thus, studies of theoretical aspects and practical recommendations for forecasting macroeconomic indicators of the development of the Ukrainian economy during the war (2022–2023) give grounds to assert that there are significant macroeconomic problems in Ukraine. It has been established that the main macroeconomic indicators of the economy have reached critical values and negatively affect the living standard of the population and the sustainable competitiveness of the country. According to forecast estimates, negative trends will not be overcome in 2022–2024, and their deepening is provoked by political instability against the background of the aggravation of the military conflict with the Russian Federation and other consequences caused by the war in Ukraine. The study of relationships between the analysed macroeconomic indicators, the level of the life quality of the population and sustainable competitiveness, conducted using the technology of correlation - regression analysis, has made it possible to reveal a strong interrelationship between them. The results of macroeconomic forecasting indicators of economic development showed that the volume of GDP will decrease sharply under the current state of the country's existence. Inflationary factors will intensify, leading to an increase in the consumer price index to 119%. At the same time, the state budget deficit will reach -11,60, and the poverty level will increase to 70%. At the same time, the level of the population's life quality and the index of sustainable competitiveness will

significantly decrease. Deepening negative trends are expected with regard to the growth of the unemployment rate, which has already reached a critical value of 35% of the economically active population in 2022. Under such conditions, the development and

implementation of an effective macroeconomic policy of the state, the policy of unshadowing the economy and containment of inflationary factors become of primary significance.

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Lyudmila Verbivska
Yuriy Fedkovych Chernivtsi
National University,
Chernivtsi, Ukraine
l.verbivska@chnu.cv.ua
ORCID 0000-0002-2768-9157

Tetiana Trubnik
Taras Shevchenko National
University of Kyiv, Kyiv,
Ukraine
tetrubnik@gmail.com
ORCID 0000-0002-0467-8930

Marianna Olishkevych
Ivan Franko National
University of Lviv, Lviv,
Ukraine
oliisk.@ukr.net
ORCID 0000-0003-1264-1684

Mykola Pugachov
Institute of Agrarian
Economics, Vilnius, Lithuania
avtor0785@ukr.net
ORCID 0000-0002-7507-5870

Volodymyr Pugachov
Institute of Agrarian Economics,
Vilnius, Lithuania
avtor0785@ukr.net
ORCID 0000-0002-5456-5862

Mykhailo Goncharenko
Interregional Academy of
Personnel Management, Kyiv,
Ukraine
goncharenkomf@ukr.net
ORCID 0000-0002-9193-9202
