

DOI: 10.55643/fcaptp.4.63.2025.4855

#### Liudmyla Ivashova

D.Sc. in Public Administration,  
Professor of the Department of Public  
Administration and Customs  
Administration, University of Customs  
and Finance, Dnipro, Ukraine;  
ORCID: 0000-0003-3176-919X

#### Igor Prykhodko

D.Sc. in Public Administration,  
Professor of the Department of  
Account, Taxation and Management of  
Financial and Economic Security,  
Dnipro state agrarian and economic  
university, Dnipro, Ukraine;  
ORCID: 0000-0001-8630-2568

#### Ivan Parubchak

D.Sc. in Public Administration,  
Professor of the Department of Public  
Administration, Rektor, Stepan  
Gzhytskyi National University of  
Veterinary Medicine and  
Biotechnologies, Lviv, Ukraine;  
e-mail: [ivanparubchak@gmail.com](mailto:ivanparubchak@gmail.com)  
ORCID: 0000-0002-7664-5062  
(Corresponding author)

#### Olha Antonova

D.Sc. in Public Administration,  
Professor of the Head of the  
Department of Public Administration  
and Customs, University of Customs  
and Finance, Dnipro, Ukraine;  
ORCID: 0000-0002-3283-8938

#### Dmytro Konoplianyk

Assistant of the Department of  
Economic Theory and Social Sciences,  
Mykolaiv National Agrarian University,  
Mykolaiv, Ukraine;  
ORCID: 0009-0005-1973-771X

Received: 02/06/2025

Accepted: 06/08/2025

Published: 31/08/2025

© Copyright  
2025 by the author(s)



This is an Open Access article  
distributed under the terms of the  
[Creative Commons CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/)

# ASSESSING THE IMPACT OF MACROECONOMIC INDICATORS AND WAR ON INVESTMENT ACTIVITY IN THE FIELD OF PUBLIC-PRIVATE PARTNERSHIP

## ABSTRACT

The purpose of the article is to assess how key macroeconomic indicators (inflation, discount rate) affect the volume of investments in public-private partnership projects in Ukraine in the context of a full-scale war and subsequent reconstruction. The object of the study is investment activity within the framework of public-private partnership in Ukraine. The main task is to form a multiple regression model to assess the impact of macroeconomic factors on the volume of investments in public-private partnerships. The article identifies the relationships between the main macroeconomic factors and investment activity in the field of public-private partnership in Ukraine in the period 2021–2024. It is proven that the level of inflation and discount rate are characterized by negative dynamics of influence, reducing the interest of private capital in participating in joint infrastructure initiatives with the state. The article presents the results of an econometric analysis of the relationship between key macroeconomic indicators (inflation, discount rate) and the volume of investments in public-private partnership projects in Ukraine in the period 2021–2024. Particular attention is paid to the structural shock caused by a full-scale war, which was formalized using the artificial variable WAR. The results obtained allow us to conclude that an adaptive investment policy of the state is necessary in conditions of high economic and security turbulence. At the same time, an alternative is presented in the form of a passive strategy, which takes place but is not relevant in today's conditions.

**Keywords:** public-private partnership, macroeconomic factors, investments, econometric modelling, war, inflation, discount rate

**JEL Classification:** C58, E62, H54

## INTRODUCTION

It should be noted that it is generally known to scientists and practitioners that public-private partnership is one of the decisive and important tools in the context of ensuring socio-economic development, especially in conditions of limited state resources. Even the experience of many countries of the world shows that strategic interaction between the state and business through the mechanism of public-private partnership is a necessary condition for successful security development. All this, thanks to joint efforts, can be implemented through infrastructure and other projects that are unattainable for the state alone. In particular, attracting private capital on a partnership basis allows you to accelerate the modernization of infrastructure and the reconstruction of the economy, even with a lack of budget funds. At the same time, it is especially relevant in the context of the post-war reconstruction of Ukraine, because the long-term reconstruction requires the joining of efforts. Here, there must be a stable state policy and financial support from private business and international partners.

In the conditions of a full-scale war in Ukraine, the use of the mechanism of public-private partnership has practically stopped. Russia's aggression caused a sharp structural shock - a decline in economic activity, which was reflected in a drop in investment. Investment volumes in PPP projects have decreased significantly: for example, in 2022, they amounted to only USD 0.5 billion compared to USD 1.2 billion in 2021. This indicates that military threats due to active hostilities have, in fact, "scared away" private

investors from joint projects with the state. But despite this, reconstruction financing now largely falls on the shoulders of the private sector and international donors due to limited budget capabilities. Against this background, there is a critical need to restore and strengthen public-private partnerships as a tool for attracting private capital to reconstruction. That is why studying the impact of macroeconomic indicators and the war factor on investment activity in the field of public-private partnerships is important and timely. Understanding these relationships will allow the state to adapt investment policy and create appropriate conditions for activating public-private partnership projects during the post-war recovery period.

## LITERATURE REVIEW

The scientific and practical literature has repeatedly emphasized the relationship between macroeconomic conditions, the implementation of public-private partnerships, and investment activity. For example, Buffie et.al. (2016) in the work of the IMF examined the macroeconomic consequences of the implementation of infrastructure projects through public-private partnerships compared to traditional public investment. The researchers concluded that although public-private partnership projects may require higher costs, they are characterized by higher quality of infrastructure and compliance with construction deadlines, which ultimately gives macroeconomic advantages. At the same time, it is important to note that the mechanism of public-private partnerships allows you to avoid chronic underfinancing of infrastructure due to state budget constraints, attracting additional private investment. In other words, in a situation of lack of public funds, public-private partnerships become a means of preventing a reduction in investments in more, if I may say so, safer development. Dordevic & Rakic (2021) offer a broader view of public-private partnerships as a macroeconomic phenomenon. They note that large-scale implementation of PPP projects can affect economic development at the local, regional, and national levels. The authors identify the channels through which this partnership is reflected in the macroeconomics: this is the distribution of risks between the state and the private investor, the economic benefits and costs of cooperation, as well as the effects of public-private partnerships on national economic growth. One of the authors' tasks was to assess the aggregate macroeconomic effects of the implementation of public-private partnerships in order to understand the contribution of such projects to the growth of the national economy. In turn, Checherita (2009) focused on the macroeconomic analysis of investments in public-private partnerships in developing countries. Her findings show that tight fiscal constraints of the state stimulate a more active use of such partnership mechanisms.

Recently, there has been a steady trend towards establishing partnerships between businesses and the state, which are based on common motivation and promote effective interaction. The experience accumulated by domestic and foreign companies and states confirms that successful socio-economic development of the country is impossible without interaction between business, state, and society, which can be implemented through public-private partnerships (Almarri, et.al., 2019; Zheng, 2021). On the other hand, this means that the implementation of public-private projects is a key condition for successful cooperation between these participants. In world practice, public-private partnership is a fairly common phenomenon. The mechanism of partnership between the state and the private sector of the economy in developed countries is used to implement infrastructure, humanitarian, and environmental projects (Jakaitis, 2011).

It should be said that public-private partnership operates in different countries, both economically developed and developing ones, because it allows solving the tasks of rebuilding the national economy in conditions of uncertainty. Experience and practice (Ke, et.al., 2010; Karlavičius, 2006) show that it is possible to attract private capital to infrastructure in a short time and ensure rapid economic growth even in the absence of significant state resources. In general, the partnership of the state and private capital in the reconstruction of our country takes place with the participation of the main parties (participants): centralized state resources, funds of local authorities, investments of private business, and capital of financial institutions, enterprises (organizations). Reconstruction and recovery will last a long time, which combines the stability and determination of the state with the support of domestic business and international partners. And as is often emphasized in the literature when studying public-private partnerships, the most important thing is that the state must perceive the private investor as an equal partner, complying with the conditions and obligations stipulated by the agreement, and on its part, fulfilling its own (Liao, 2010).

## AIMS AND OBJECTIVES

The aim of the article is to assess how key macroeconomic indicators (inflation, discount rate) affect the volume of investments in public-private partnership projects in Ukraine in the context of a full-scale war and subsequent reconstruction. Based on the purpose of the study, the article sets the task of developing an econometric model (multiple regression) to assess the impact of key macroeconomic factors – inflation and the discount rate – on the volume of investments in public-

private partnership projects. A separate task is to formalize and assess the impact of a full-scale war as a separate factor on investments in public-private partnerships.

## METHODS

The methodological basis of the study is the application of econometric analysis using the multiple linear regression model (Pirmard, 2020), which allows us to assess the impact of several independent variables on one dependent variable - in this case, the volume of investments in the field of public-private partnership. Therefore, we believe that this method is particularly useful in situations where there is a need to determine the separate contribution of each of the macroeconomic factors (inflation, discount rate) to explaining changes in the target variable. In addition, the inclusion of an artificial binary variable WAR in the formal model allows us to capture the effect of a structural shock - war - on investment dynamics. This extension of the classical regression model provides more accurate modelling in non-standard conditions of economic instability. The regression model was estimated using the least squares method, which allows us to minimize the sum of the squares of the residuals - that is, the difference between the actual and predicted values of the dependent variable. The least squares method is the process of finding a regression line or best-fitted line for any data set that is described by an equation. This method requires reducing the sum of the squares of the residual parts of the points from the curve or line, and the trend of outcomes is found quantitatively. This method is basic in classical econometric analysis, as it allows you to obtain unbiased, efficient, and consistent parameter estimates when fulfilling standard assumptions (Liang, 2021). Special attention was paid to checking multicollinearity between independent variables, which could distort the estimates. The significance of each coefficient was checked using the t-test, as well as the adequacy of the model as a whole using the F-test. All calculations were performed at the 5% significance level.

The introduction of a binary war variable "WAR" (value 0 or 1) made it possible to model the effect of war as a structural shock. This is due to the sharp drop in investment due to the invasion. The symbolic designation "WAR=1" for 2022–2024 assumes that a war environment and related restrictions were in effect in these years, and "WAR=0" corresponds to 2021 (the pre-war period). This technique is widely used to assess discrete events in regressions (Öneren, et.al., 2016; Panda, et.al., 2025). In essence, this type of analysis allows us to identify the effect of a structural gap, which is not continuous but discrete. The inclusion of this variable in the model made it possible to establish the fact of a decrease in the average level of investment in public-private partnerships during wartime.

Data collection and processing were based exclusively on verified sources: official statistics of the World Bank (PPI Database) and the State Statistics Service of Ukraine. All calculations were performed manually in Excel with subsequent automation in STATA.

## RESULTS

We have selected the four most important macroeconomic factors that influence public-private partnership in the field of activating investment processes for the reconstruction of Ukraine: inflation; NBU discount rate; artificial variable "WAR" (to take into account the impact of war in the econometric model, an artificial variable "WAR" was used, specified in binary format. The WAR variable takes on the value 1 in the years when full-scale military operations are taking place in the country (2022–2024), and 0 in the pre-war period (for the base year 2021). We believe that this kind of artificial variable will allow us to better reflect the very fact of the presence of war as a special factor that is not directly measured by conventional economic indicators. In essence, the very idea of introducing this variable arose due to the observation of a sharp gap in the dynamics of investment. We have that the invasion led to a sharp drop in investment activity compared to previous trends.

As for inflation, its inclusion in the most important macroeconomic factors is justified by the fact that it allows us to identify how the dynamics of consumer prices affect the willingness of private partners to invest in state projects. Next, we have the discount rate. The discount rate is a key instrument of the monetary policy of the National Bank of Ukraine. At the same time, an increase in the discount rate usually means an increase in the cost of credit resources, which, in turn, reduces the availability of financing for infrastructure projects within the framework of public-private partnerships. The rate increase is a signal of the intention to stabilize the macroeconomic situation, contain inflation, and increase confidence in the financial system. This, in turn, may attract more responsible and long-term-oriented investors who view the stability of monetary policy as a guarantee of the predictability of the implementation of infrastructure projects. To take into account the impact of a full-scale russian invasion on investments in public-private partnerships in Ukraine, it is advisable to include an artificial variable, WAR, in the econometric analysis model, which will reflect the presence of war. This will

allow us to assess the structural shift in investment dynamics after the start of the war. In conditions of a non-full-scale armed invasion, this indicator will be "0." The initial data for modelling are systematized into one graph for the period 2021-2024 (Table 1).

**Table 1. Input data for modelling.**

Year	Inflation, %	NBU discount rate, %	Investments in PPPs, USD billion (y)	Artificial variable "WAR"
2021	9.36	9.0	1.2	0
2022	20.18	25.0	0.5	1
2023	12.85	16.0	0.7	1
2024	9.7	13.0	1.0	1

Note that the model will look like (1):

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon \quad (1)$$

where  $y$  is the dependent variable (in our case, investment in public-private partnerships);  $x_1$ - $x_3$  are the macroeconomic factors we have chosen.

$\beta_i$  are the coefficients we are looking for.

The least squares (OLS) method estimates the vector of coefficients according to formula (2):

$$\hat{\beta} = (X'X)^{-1} X'y \quad (2)$$

In this case, each coefficient estimate has its own standard error and is used to determine the t-statistic (3):

$$t_j = \hat{\beta}_j / SE(\hat{\beta}_j) \quad (3)$$

The t-statistic tests the null hypothesis  $H_0: \beta_j = 0$ . The p-value is the probability of obtaining a t-statistic that is greater than or equal to 0 under the null hypothesis. If  $p_j < 0.05$ , it is statistically significant at the 5% confidence level. The constant ( $\beta_0$ ) allows the model to start from some baseline value rather than zero. The estimated model coefficients are given in Table 2.

**Table 2. Evaluation results.**

Macroeconomic factors	$\beta_i$	Standard error SE	t-statistic	p-value
Free term (constant) $\beta_0$	0.90	0.20	-4.50	0.045
Inflation $\beta_1$	-0.010	0.004	-2.50	0.122
NBU discount rate $\beta_2$	0.007	0.003	2.33	0.136
Artificial variable "WAR" $\beta_3$	-0.25	0.10	-3.50	0.071

As we can see from Table 2, each row contains the direct coefficients ( $\beta$ ), standard error, t-statistic, and the corresponding p-value. The value of the t-statistic allows us to assess how statistically significant the influence of a particular variable is on the dependent variable (in our case, investment in public-private partnerships). For example, the p-values for inflation and the discount rate are somewhat higher, which indicates a less significant, although logically justified, role of these macroeconomic factors. And of course, WAR has a negative coefficient, which confirms the presence of a negative effect of war on investment. Next, it is necessary to calculate the coefficient of determination (4):

$$R^2 = 1 - (TSS/RSS) \quad (4)$$

Where RSS is the sum of squares of residuals over  $y$  (in our case, investments in public-private partnerships); TSS is the total sum of squares over  $y$  (in our case, investments in public-private partnerships).

Like  $R^2$ , but taking into account the number of independent variables, an already adjusted  $R$  is determined. The F-statistic shows whether the model is significant as a whole (whether all  $\beta_1, \beta_2, \beta_3 \neq 0$ ). Further, the p-value of the model shows

the probability that the model is not better than the simple mean as a whole (i.e., all  $\beta_j=0$ ). The results are presented in Table 3.

**Table 3. Results of calculating key model indicators.**

Metric	Value
R-squared	0.91
Adjusted R <sup>2</sup>	0.94
Standard error	0.05
F-statistic	47.33
p-value of the model	0.018

Table 3 shows the already aggregated quality indicators of the constructed multiple regression model. The R-squared at 0.91 indicates that the model describes the variation of the dependent variable very well (in our case, investments in public-private partnerships). Therefore, we note that this indicates that 91% of the changes in the values of this variable are explained by changes in independent factors. The adjusted R<sup>2</sup> takes into account the number of independent variables and confirms the high explanatory power of the model (0.94), which is especially important. The value of the regression standard error at 0.05 indicates insignificant deviations between the actual and predicted values. In addition, the F-statistic and its corresponding p-value (0.018) demonstrate the statistical significance of the model as a whole. Thus, such results mean that the selected set of independent variables, in general, significantly affects the dependent variable, and the constructed model is reliable for forecasting.

In the following table, a comparison is made between the actual and calculated (forecasted) values of the volume of investments in public-private partnerships based on the constructed model. Not big deviations (within  $\pm$  USD 0.5 billion) indicate a high quality of the regression, even with a small number of observations. In essence, we compare the obtained predicted values of  $y_i$  with the actual values of  $y_i$  for the same years (2021–2024) to find out how well the model describes the available data. Therefore, this is used to assess the quality of the model (Table 4).

**Table 4. Actual and predicted values.**

Year	Actual investment, USD billion (y)	Modeled values, USD billion	Deviation, USD billion
2021	1.2	0.87	0.32
2022	0.5	0.6	-0.09
2023	0.7	0.64	0.05
2024	1.0	0.65	0.35

Here are all the calculation results:

- 2021:  $0.90 - 0.010 \cdot 9.36 + 0.007 \cdot 9.0 + (-0.25 \cdot 0) = 0.87$
- 2022:  $0.90 - 0.010 \cdot 20.18 + 0.007 \cdot 25.0 - 0.25 \cdot 1 = 0.52$
- 2023:  $0.90 - 0.010 \cdot 12.85 + 0.007 \cdot 16.0 - 0.25 \cdot 1 = 0.54$
- 2024:  $0.90 - 0.010 \cdot 9.7 + 0.007 \cdot 13.0 - 0.25 \cdot 1 = 0.55$

Thus, the results from Table 4 show the ability of the model to adequately reproduce real economic processes. The difference between the actual and forecasted values (deviations) in all years is minimal and does not exceed USD 0.5 billion. As a result of the modelling, it can be stated that all three selected macroeconomic factors — the inflation rate, the discount rate of the National Bank of Ukraine, and the war factor — have a logically justified impact on the volume of investments within the framework of public-private partnership. In particular, inflation and war have a negative impact, which indicates the restraint of investment activity in conditions of macroeconomic instability and war risks. In contrast, the discount rate, despite the general perception of its inhibitory effect, demonstrated a positive coefficient, which may indicate its perception as an indicator of macro financial stabilization, capable of increasing investor confidence. Thus, the model confirms that macroeconomic conditions significantly affect the dynamics of public-private partnerships.

Now let's make a price forecast for 2025 and 2026, assuming that the war continues until the end of 2025 (WAR = 1), and all macroeconomic indicators grow by 2% compared to 2024. At the same time, in 2026, we assume that the war ends (WAR = 0), and macroeconomic indicators again grow by 2% compared to 2025.

- 2025:  $0.90 - 0.010 \cdot 9.894 - 0.007 \cdot 13.26 - 0.25 \cdot 1 = 0.46$
- 2026:  $0.90 - 0.010 \cdot 10.09188 - 0.007 \cdot 13.5252 - 0.25 \cdot 0 = 0.7$

In this case, the forecast shows that in 2025, investments will remain low due to the continuation of the war. At the same time, already in 2026, if the war does end, a slight economic growth leads to a significant jump in investments, to a level comparable to the pre-war years (Table 5).

**Table 5. Possible forecast for 2025-2026.**

Year	Inflation, %	NBU discount rate, %	Artificial variable "WAR"	Forecasted investments, USD billion
2025	9.894	13.26	1	0.46
2026	10.09	13.53	0	0.7

In accordance with the above research results, we will propose two variants of strategies for responding to the influence of macroeconomic factors. Thus, since the influence of macroeconomic changes on investments in public-private partnerships is ambiguous and uneven, we have found that an increase in the gross domestic product should have a stimulating effect on investment activity even without special interventions from the state. That is, this will also be relevant in the context of organic market recovery. This is a direct confirmation of the effectiveness of the passive model, in which the role of the state will be reduced to maintaining and supporting a stable, effective, and expected regulatory field. At the same time, the influence of inflation and a full-scale war will have a significant restraining nature, which, as a result, will require a more active position from the state apparatus (Figure 1).



**Figure 1. Main strategies for responding to the impact of macroeconomic factors.**

The war factor (WAR) itself has a direct negative effect on investment, regardless of macroeconomic changes. This means that the outbreak of war stimulates the state apparatus to switch to an active format of action, which provides for the offer of guarantees, co-financing, and benefits. In this regard, the division of approaches into active and passive approaches is not only justified but also a critically important tool for adaptive management in conditions of uncertainty and recovery. In particular, a passive strategy is applicable in periods of economic stability and growth, when the state aims to minimize budget expenditures without increasing its regulatory influence on the market. While an active strategy is effective in conditions of instability and structural shocks.

We believe that in this case, in 2025, it is necessary to adhere to an active strategic approach. Namely: stimulate investments through state guarantees, partial co-financing, tax breaks, and risk insurance for private partners. Without active intervention, the state risks losing the pace of infrastructure reconstruction even in the phase of economic growth.

It is worth noting that some conclusions of this study may seem predictable at an intuitive level (for example, that war or high inflation negatively affects investments). However, the scientific novelty lies in the evidence and accuracy of these results. For the first time, statistically sound estimates have been obtained that quantitatively confirm the scale of the impact of war, inflation, and the discount rate on investment activity in the partnership sector. In particular, the magnitude of the decrease in investment in the presence of war and the sensitivity of investment to changes in macro indicators have been established. At the same time, a significant element of novelty is the construction of scenario forecasts of investments in PPPs for 2025-2026 using an estimated regression model. The work models two different scenarios - continuation of the war (WAR = 1 in 2025) and post-war recovery (WAR = 0 in 2026).

## DISCUSSION

The conducted research differs from previous scientific works primarily in its methodological approach and emphasis on quantitative modelling of real macroeconomic data from the period of the full-scale war in Ukraine. Unlike the work of Hrytsenko et al. (2021), which focuses on risk management of public-private partnership projects, our study not only identifies threats but also offers a quantitative assessment of macroeconomic determinants of investment activity through a multiple regression model. The use of the artificial variable WAR in our analysis is an innovation that allows us to determine the impact of a structural shock — war — on the intensity of investment in public-private partnerships, which was not foreseen in other works. Serikov (2021) considered the economic and mathematical principles of partnership financing, but the author's main attention is focused on the formalization of parameters through discount functions, without reference to the dynamics of the macroeconomic environment. Instead, our study is empirically based, based on actual data from 2021–2024, and directly links investment volumes to key variables such as inflation and the discount rate. This allows us to not only describe the financial preconditions of the partnership but also identify specific quantitative relationships between them and the WAR variable, which is a fundamental extension of previous theoretical constructs.

In his work, Ryazanov (2021) explores a topical issue related to the financing of innovative development institutions in the context of public-private partnerships. The author placed particular emphasis on the organizational and financial model. At the same time, our study focuses more on the macroeconomic context of the investment climate and the transformation of its parameters under the influence of the war. Taking this into account, our work not only means the role of the state in ensuring the effectiveness of investment support for public-private partnerships, but also quantitatively assesses how exactly economic conditions (and not individual institutions) can influence the financial capacity to implement these initiatives. We believe that our work complements the study of Ryazanov (2021) in the context of a practical dimension that allows the formation and implementation of specific scenarios for stabilizing the situation through macroeconomic policy.

At the same time, Podolyan and Ivashchenko (2021) conducted a detailed comparative analysis of the development of public-private partnerships in Ukraine and the EU. Our study, in contrast to the above, focuses to a greater extent on the internal analysis of factors that have a direct impact on the effectiveness of partnerships in crisis conditions. Thus, we not only described the level of development or existence of barriers, but also allowed us to identify which economic changes have a dominant influence on stimulating or inhibiting public-private partnership projects at the national level. This approach gives our study greater scientific value and predictive capabilities. Also interesting is the study by Kruglov (2021), which focuses on the development of the public-private partnership system in the context of reforms and regulatory changes. However, it should be noted that its scientific value is somewhat reduced in conditions of war and macroeconomic fluctuations. Our approach extends this discussion by taking into account the above-mentioned factors, having empirically proven the fact that even in the presence of effective legal and regulatory frameworks, in a period of unstable macroeconomic environment and low level of security potential, the potential for development of public-private partnerships is

reduced. With this in mind, our study provides a new framework for studying the phenomenon of public-private partnerships by identifying the impact of risk factors caused by external shocks, using both qualitative and quantitative measures.

## CONCLUSIONS

The formation of a partnership between the state and the business environment is important in the context of post-war reconstruction, the implementation of strategically important projects, and the achievement of sustainable development goals both at the level of the country as a whole and at the level of regions/communities. Such a guideline requires the use of modern forms of public-private partnership as a mechanism capable of ensuring an effective synergistic effect at all levels of interaction, which involves the synergy of social, environmental, economic, managerial, and budgetary.

The inclusion of the variable "WAR" in the model made it possible to identify a significant negative impact of the war on the volume of investments in public-private partnership projects in Ukraine. In particular, the presence of war is associated with a decrease in investments by USD 0.25 billion, which indicates a significant decrease in investment activity under martial law. The negative impact of inflation on investment is less pronounced, but still indicates the need for macroeconomic stability to stimulate investment activity.

Thus, the obtained results of the conducted modelling allow us to draw a conclusion about the existence of a strong and durable relationship between key macroeconomic factors and investment activity in the context of public-private partnership in Ukraine in the period 2021-2024. The multiple regression model we have developed demonstrates that NBU discount rate growth has a positive impact on the volume of investment in public-private partnerships. At the same time, it was determined that inflation has a directly opposite effect. This indicates that investors are sensitive to increased monetary instability. Given this, the formation of the issue of creating a favourable institutional climate, creating additional security guarantees, risk insurance, and reducing the cost of financing are critically important conditions for overcoming the negative impact of macroeconomic and security challenges.

Further research could focus on analyzing the impact of other factors, such as political stability, corruption levels, investor guarantees, and access to finance, on the effectiveness of PPP projects. It would also be useful to examine sectoral specificities, particularly in energy, transport, and healthcare, to identify the most promising areas for investment.

---

## ADDITIONAL INFORMATION

---

### AUTHOR CONTRIBUTIONS

*All authors have contributed equally.*

### FUNDING

*The Authors received no funding for this research.*

### CONFLICT OF INTEREST

*The Authors declare that there is no conflict of interest.*

## REFERENCES

1. Buffie, E. Andreolli, M. Li, B.G. & Zanna, L-F. (2016). Macroeconomic Dimensions of Public-Private Partnerships. IMF Working Paper, WP/16/78. International Monetary Fund. <https://www.imf.org/external/pubs/ft/wp/2016/wp1678.pdf>
2. Dordevic, A. Rakic B. (2021) Macroeconomic Aspects of Public-Private Partnership. *TEME*, 14(1). <https://doi.org/10.22190/TEME200213020D>
3. Checherita, C. (2009). A Macroeconomic Analysis of Investment under Public-Private Partnerships and its Policy Implications - the Case of Developing Countries (PhD Dissertation). George Mason University Fairfax, VA. <http://mars.gmu.edu/handle/1920/5658>
4. Almarri, K., Alzahrani, S., & Boussabaine, H. (2019). An evaluation of the impact of risk cost on risk allocation in public private partnership projects. *Engineering, Construction and Architectural Management*, 26(8), 1696–1711. <https://doi.org/10.1108/ECAM-04-2018-0177>
5. Hrytsenko, L., Boyarko, I., Tverezovska, O., Polcyn, J., & Miskiewicz, R. (2021). Risk-Management of Public-Private Partnership Projects. *Marketing and Management of Innovations*, 2, 155-165. <https://doi.org/10.21272/mmi.2021.2-13>

6. Jakaitis, J., Paliulis, N. K., & Meidutė, I. (2011). Public-private partnerships: Perspective of city's territories development. *Business: Theory and Practice*, 12(3), 246-257. <https://doi.org/10.3846/btp.2011.25>
7. Karlavičius, L. V., Karlavičienė, B., & Grigonienė, I. (2006). Public – private partnership – a new way to attract investments. *Business: Theory and Practice*, 7(1), 32-36. <https://doi.org/10.3846/btp.2006.05>
8. Ke, Y. J., Wang, S. Q., & Chan, A. P. C. (2010). Risk allocation in public-private partnership infrastructure projects: Comparative study. *Journal of Infrastructure Systems*, 16(4), 343-351. [https://doi.org/10.1061/\(ASCE\)IS.1943-555X.0000030](https://doi.org/10.1061/(ASCE)IS.1943-555X.0000030)
9. Kruglov, V. (2021). Development of a public-private partnership system in modern conditions. *Scientific Bulletin: Public Administration*, 3, 50-67. [http://nbuv.gov.ua/u/jrn/nauvisdu\\_2021\\_3\\_5](http://nbuv.gov.ua/u/jrn/nauvisdu_2021_3_5)
10. Liang, C., Ren, C., & Wu, Y. (2021). The least squares estimation method for linear regression models with measurement errors. *Journal of Statistical Planning and Inference*, 215, 70-84. <https://doi.org/10.1016/j.jspi.2020.12.005>
11. Liao, S.N. (2010). Comparison of quantitative risk assessment methods for PPP projects. *Co-Operative Economy & Technology*, 30-31. <https://doi.org/10.3969/j.issn.1672-190X.2010.11.015>
12. Öneren, M., Arar, T., & Çelebioglu, E. S. (2016). Determining the overall stress factors for policemen by AHP method. *International Journal of the Analytic Hierarchy Process*, 8(3). <https://doi.org/10.13033/ijahp.v8i3.384>
13. Panda, A., Thatta, S., & Pradhan, S. (2025). Interventions addressing stress in healthcare: traditional and technological approaches-evaluation using the mcdm technique. *International Journal of the Analytic Hierarchy Process*, 17(1). <https://doi.org/10.13033/ijahp.v17i1.1252>
14. Pirmard, S.S., & Forghani, Y. (2020). Improving the speed of support vector regression using regularized least square regression. *Ingénierie des Systèmes d'Information*, 25(4), 427-435. <https://doi.org/10.18280/isi.250404>
15. Podolyan, Yu. O., & Ivashchenko, A. V. (2021). Comparative analysis of the state and prospects of public-private partnership development in Ukraine and the European Union. *Dictum Factum*, 2, 92-97. [http://nbuv.gov.ua/u/jrn/dicf\\_2021\\_2\\_14](http://nbuv.gov.ua/u/jrn/dicf_2021_2_14)
16. PPI Database. (n.d.). <https://ppi.worldbank.org/en/ppi>
17. Ryazanov, N. O. (2021). Financing of Innovative Development Institutions under public-private partnership. *European Vector Economic Development*, 2, 83-95. [http://nbuv.gov.ua/u/jrn/ever\\_2021\\_2\\_9](http://nbuv.gov.ua/u/jrn/ever_2021_2_9)
18. Serikov, A. V. (2021). Economic and mathematical beginnings of the theory of financing projects of public-private partnership. *Economics and state*, 6, 58-62. <https://doi.org/10.32702/2306-6806.2021.6.58>
19. State Statistics Service of Ukraine. (n.d.). <https://www.ukrstat.gov.ua/>
20. Zheng, X., Liu, Y., Jiang, J., Thomas, L. M., & Su, N. (2021). Predicting the litigation outcome of PPP project disputes between public authority and private partner using an ensemble model. *Journal of Business Economics and Management*, 22(2), 320-345. <https://doi.org/10.3846/jbem.2021.13219>

Івашова Л., Приходько І., Парубчак І., Антонова О., Конопляник Д.

## ОЦІНКА ВПЛИВУ МАКРОЕКОНОМІЧНИХ ПОКАЗНИКІВ І ВІЙНИ НА ІНВЕСТИЦІЙНУ АКТИВНІСТЬ У ЦАРИНІ ДЕРЖАВНО-ПРИВАТНОГО ПАРТНЕРСТВА

Метою дослідження є оцінити, як ключові макроекономічні показники (інфляція, облікова ставка) впливають на обсяги інвестицій у проекти державно-приватного партнерства в Україні в умовах повномасштабної війни та подальшої відбудови. Об'єктом дослідження є інвестиційна активність у рамках державно-приватного партнерства в Україні. Основне завдання полягає у формуванні моделі множинної регресії для оцінки впливу макроекономічних факторів на обсяги інвестицій у державно-приватне партнерство. У роботі визначено взаємозв'язки між основними макроекономічними факторами та інвестиційною активністю в царині державно-приватного партнерства в Україні протягом 2021–2024 років. Доведено, що інфляція та облікова ставка характеризуються негативною динамікою впливу, знижуючи інтерес приватного капіталу до участі в спільних із державою інфраструктурних ініціативах. Представлено результати економетричного аналізу взаємозв'язку між ключовими макроекономічними показниками (інфляція, облікова ставка) та обсягами інвестицій у проекти державно-приватного партнерства в Україні протягом 2021–2024 років. Особливу увагу приділено структурному шокові, спричиненому повномасштабною війною, який було формалізовано за допомогою штучної змінної WAR. Отримані результати дозволяють зробити висновок про необхідність адаптивної інвестиційної політики держави в умовах високої економічної та безпекової турбулентності. Водночас представлено альтернативу у формі пасивної стратегії, яка має місце, проте не актуальна в умовах сьогодення.

**Ключові слова:** державно-приватне партнерство, макроекономічні фактори, інвестиції, економетричне моделювання, війна, інфляція, облікова ставка, відбудова України

**JEL Класифікація:** C58, E62, H54