

DOI: [10.55643/fcaptop.3.44.2022.3774](https://doi.org/10.55643/fcaptop.3.44.2022.3774)

Vovchak O.

D.Sc. in Economics, Professor, Banking University, Lviv, Ukraine;
e-mail: vovchak.olga@meta.ua
ORCID: [0000-0002-8858-5386](https://orcid.org/0000-0002-8858-5386)
(Corresponding author)

Dziurakh Yu.

PhD in Public Administration, Lviv Polytechnic National University, Lviv, Ukraine;
ORCID: [0000-0001-7131-7468](https://orcid.org/0000-0001-7131-7468)

Kulyniak I.

PhD in Economics, Associate Professor, Lviv Polytechnic National University, Lviv, Ukraine;
ORCID: [0000-0002-8135-4614](https://orcid.org/0000-0002-8135-4614)

Halkiv L.

D.Sc. in Economics, Professor, Lviv Polytechnic National University, Lviv, Ukraine;
ORCID: [0000-0001-5166-8674](https://orcid.org/0000-0001-5166-8674)

Rachynska H.

PhD in Economics, Associate Professor, Lviv Polytechnic National University, Lviv, Ukraine;
ORCID: [0000-0001-5678-4172](https://orcid.org/0000-0001-5678-4172)

Received: 18/05/2022

Accepted: 05/06/2022

Published: 30/06/2022

© Copyright
2022 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/)

ECONOMIC MECHANISM OF STATE REGULATION OF THE INVESTMENT ACTIVITY IN AGRICULTURE

ABSTRACT

The main task of the state investment strategy in the development of agriculture is to form an effective policy of state promotion of investment in the agricultural sector, which will increase the level of investment attractiveness of the farm sector. Given the study's relevance, the article aims to justify the feasibility of introducing an economic mechanism of state regulation of investment activities in agriculture by combining the levers of state regulation with financial instruments of banking institutions. The study's goals were solved using the following general scientific methods: synthesis and analysis, economic statistics, systematization, theoretical generalization, and abstraction. The information base was the work of domestic and foreign scientists, analysts, practitioners, and statistics of the State Statistics Service of Ukraine. In the article, the authors propose a model of financing investment activities based on the principles of attracting private (bank) capital. The structural and logical interpretation of the state budget savings from the introduction of the recommended financial support model for agricultural producers' investment activities is given. Based on a sample of indicators for 2010-2020, a multi-factor regression model of the dependence of Ukraine's GDP in agriculture on the factors of development of investment activity in agriculture ("the volume of investment in agriculture" and "expenditures to support state regulators of the agricultural sector"). To check the quality of the constructed model, the multiple correlation coefficient (R-squared), the test for heteroskedasticity of model residues (t-statistics), and the probability of error P(t) were determined. The student's t-test was calculated to assess the statistical significance of the correlation coefficient, and Fisher's F-test was used to test the effectiveness of the regression model. The change of GDP of Ukraine in agriculture for 2021-2024 under the conditions of state regulation of parameters of investment development in agriculture is forecasted. The proposed economic mechanism and tools for implementing the main strategic guidelines for further development of investment activities in agriculture of Ukraine is a prerequisite for determining the aid to promote this process at the local level by local governments and civil society organizations.

Keywords: mechanism of state regulation, investment, State Agency for Investment and Development, financing of investment activities, agriculture, correlation and regression analysis, GDP of Ukraine in agriculture

JEL Classification: E22, G38, H81, O13, Q14

INTRODUCTION

New prospects for expanding the investment activity in agriculture are opened with the introduction of the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on the Conditions of Circulation of Agricultural Land" [1; 2]. The expected positive impact of this law on the investment process is caused by the fact that the ownership of agricultural land will be protected legislatively, which, in turn, opens up opportunities for long-term investment and forms the attitude to land as fixed capital. It can be stated that the introduction and functioning of the market of agricultural land based on positive legislative changes will also mean the formation of the legal field of regulation of the investment activity in agriculture in Ukraine.

One of the promising areas of the implementation of an investment strategy through the economic mechanism is the formation of such an instrument as a system of funds for the investment development of agriculture. The organization of such funds expects to determine the basic parameters of the system of financial incentives for investment activity. One of the most limiting factors of business activity of agricultural enterprises is gaining access to relatively inexpensive credit resources. Therefore, the main emphasis in the formation of a financial mechanism of investment incentives in agriculture should be made on the grounding of state policy of the financial support for agricultural producers. Substantiating this direction, it should be noted that today in Ukraine there is already a model of support for farmers, but it has several shortcomings and depends on the procedures of financing state programs from the state budget. To make the state policy of financial support of the investment activity of farmers more flexible and effective, it is necessary to combine the levers of state regulation and financial instruments of banking institutions.

Improving the state regulation of the investment activity in agriculture largely depends on the effective use of tools of the economic mechanism, the rational use of which, depending on the requirements of the situation can greatly contribute to increasing the economic efficiency of agricultural production.

LITERATURE REVIEW

According to the results of statistical analysis and research, the low attractiveness of agriculture for potential investors is determined by the difficult financial situation of the vast majority of direct agricultural producers [3; 4; 5], narrowness or no collateral, which are now only fixed assets with low liquidity due to high moral and physical wear [6; 7], as well as the problems caused by the COVID-19 pandemic [8]. Researcher J. Zwolak [9] substantiates the need to restore fixed assets in Polish agriculture by calculating the marginal productivity and average marginal productivity of fixed assets in rational management. Researchers Z. Omarkhanova et al. [10] also conclude the need to increase investment in the modernization of fixed assets of agriculture and show the positive dynamics in the development of agricultural production through the growth of capital investment and increase the investment potential of agriculture in the Republic of Kazakhstan.

The study of the role of state regulation of investment activity in agriculture has attracted the attention of such scholars as A. Burliai and A. Revutska [11], K. Khomitov et al. [12], B. Aimurzina et al. [13], and others. In the process of agricultural reforms, special financial instruments have been developed to attract funds that can be used as investments, primarily mortgage purchases and interest compensation on loans [14; 15; 16]. A. Starodubtsev and Y. Bakai [17] emphasize the importance of introducing a credit guarantee system in Ukraine and establishing the Fund for Partial Credit Guarantee in Agriculture, a specialized non-banking financial institution. Reimbursement of interest rates on loans granted by commercial banks supports investment initiatives of enterprises that have purchased fixed assets, modernized them, increased production capacity, and more. And although this instrument is not in itself a direct manifestation of investment activity, it increases the benefits of farms by reducing the cost of credit.

In the modern world practice of investment regulation, the standards of project management PMBOK, developed and constantly improved by the international organization Project Management Institute, have become widespread [18].

However, despite the significant scientific achievements, taking into account the peculiarities of the agricultural market and changes caused by the introduction of new means of government regulation, the emergence of new investment instruments, changing needs and preferences of investors, deepening the distribution and redistribution of investment resources, and on a global scale, needs further research and justification.

OBJECTIVES

The purpose of the article is a theoretical and methodological justification of the feasibility of implementing the economic mechanism of state regulation of the investment activity in agriculture by combining the levers of state regulation with financial instruments of banking institutions.

METHODS

The objectives set in the study were solved through the following general scientific methods: methods of synthesis and analysis (while studying various approaches to the state regulation of investment activity and the formation of its model of financing the investment activity in agriculture in Ukraine); methods of financial statistics (when interpreting the economy of the state budget from the implementation of the recommended model of financial support for the investment

activity of agricultural producers); methods of systematization, theoretical generalization and abstraction (while formulating the conclusions and generalizing the obtained scientific results). The works of domestic and foreign scientists, analysts, practitioners, and the statistics of the State Statistics Service of Ukraine served as an information base. To forecast the change in Ukraine's GDP given the state regulation of the parameters of the investment development in agriculture, the econometric method of correlation-regression analysis was used, which allowed determining quantitative patterns and relationships between "the volume of the investment in agriculture", "expenditures to support state regulators of the agricultural sector" (explanatory variables) and "Ukraine's GDP volume in agriculture" (dependent variable). The least-squares method was used to estimate the parameters of the multiple regression model. To check the quality of the developed model, the following indicators were determined: a multiple correlation coefficient (R-squared), a test for the heteroskedasticity of the model remains (t-statistics), and the probability of error P(t). The Student's *t*-test was calculated to assess the statistical significance of the correlation coefficient, and Fisher *F*-criterion was used to test the significance of the regression model. Stata software was used to build the multi-criterion function. To carry out correlation-regression analysis, a sample of the values of indicators for 2010-2020 was formed.

RESULTS

The main mechanisms of state regulation of the investment activity in agriculture are as follows: legal, administrative, and economic. The legal mechanism is a set of complementary imperatives of legislative and regulatory support for the implementation of the strategy, including the formation of the effective legal protection of public and private property of investors.

The organization of state regulation of the investment activity in agriculture formed in Ukraine is not integral and effective. It consists of the bodies of national and regional levels of government, executive power, and local self-government bodies, which have certain powers to influence investment processes. The inefficiency of the regulation of the investment activity in agriculture is primarily caused by the lack of a body for the coordination of such activity, the concentrated coordination of strategic goals, regulatory and legal support, and the use of economic instruments and proper control of the achieved results [19]. In the context of the administrative mechanism, it is necessary to pay attention to the importance of resuming the work of the State Agency for Investment and Development or creating a full-fledged analogue with a separate function of state regulation of the investment activity in agriculture.

In the current conditions of socio-economic development and globalization processes, the introduction of such an administrative body will allow intensifying the system of state regulation in the direction of promoting investment development [20; 21]. The termination of this body in 2015 had extremely negative consequences for investment policy both in agriculture and in other sectors of the economic complex of Ukraine. The main reason for the liquidation of the State Agency for Investment and Development, according to media reports [22], was its inefficient operation and inefficient spending of significant amounts of budget funds. However, the lack of a single coordinating body in the field of investment policy excludes opportunities for rapid and effective development and the implementation of public investment programs.

Advisory services should be provided by public authorities to agricultural enterprises to develop and implement investment projects. The State Agency for Investment and Development, which is proposed to resume its activity, should be the subject of providing services. Some of the advisory functions can be assigned to financial institutions, which will be involved in the government programs of the investment support for agricultural producers [23; 24].

The quantitative indicators of the economic mechanism and the main instruments of state regulation of the investment activity in agriculture include [25; 26; 27]:

- expenditures from state budgets to support state regulatory bodies of agriculture;
- targeted subsidy financing of agricultural producers;
- VAT reimbursement for agricultural exports;
- public procurement of agricultural products from agricultural producers;
- formation of a system of funds for the investment development of agriculture;
- financing of personnel development of agricultural workers and relevant educational programs;
- stimulating the development of advanced agricultural technologies.

The process of financing the investment activity of farmers based on the principles of attracting private capital is proposed to implement under the model presented in Fig. 1.

The model is a logical continuation of the model of state regulation of the investment support for agricultural producers [28]. The competent state body (State Agency for Investment and Development, the activity of which is offered to resume under new grounds), prepares the investment application of the agricultural producer and includes it into the program of state support approved by the Cabinet of Ministers of Ukraine before each budget year. According to the program, a mechanism is provided for the issuance of soft loans to farmers with the subsequent compensation of interest to banks from the state budget.

A cooperation agreement must be signed between the bank and the State Agency for Investment and Development and the regulations for cooperation within the state program of investment support for farmers must be approved. After that, a list of investment projects is formed and approved, within which the bank will be able to issue loans to finance investments.

The state program provides for a schedule of reimbursement from the state budget for the difference in interest, which is formed through the introduction of preferential lending conditions for farmers. The amount of interest compensation of the bank from the state budget can be calculated by the formula:

$$AC = \sum_{i=1}^n r_e \cdot l_i - \sum_{i=1}^n r_i \cdot l_i = \sum_{i=1}^n l_i (r_e - r_i) \quad (1)$$

where AC – the amount of compensation of the bank from the state budget; r_e – the effective interest rate of the bank; l_i – the amount of the loan under the loan agreement between the bank and the agricultural enterprise; r_i – the preferential interest rate of the bank.

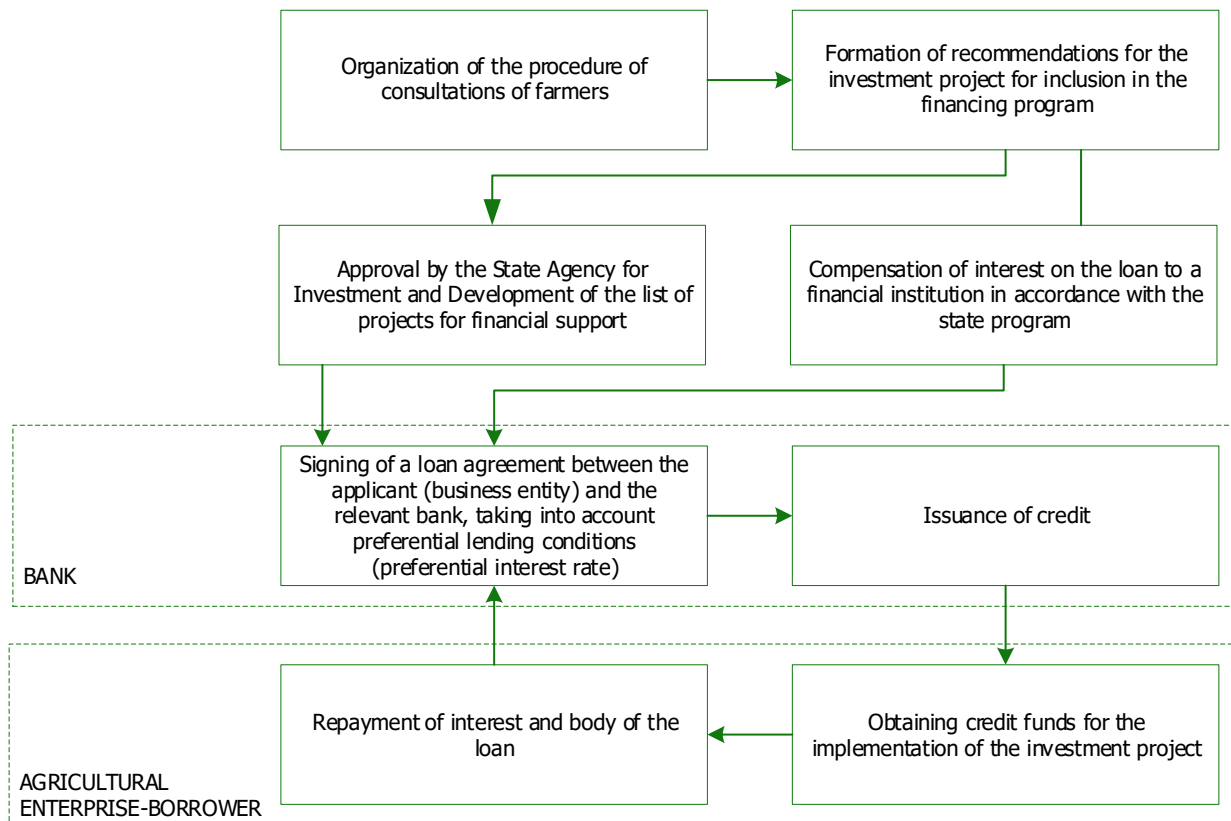


Figure 1. Model of financing investment activity based on the principles of attracting private (bank) capital.

According to formula 1, the amount of compensation of the part of the interest from the state budget paid by the enterprise under investment loans for agriculture is determined. The stated amount of compensation can be interpreted as the difference between the effective (i.e. current) and preferential interest rates. The effective interest rate expresses the total debt burden under the loan to the enterprise in the bank. The preferential interest rate characterizes the special financial burden, which can be determined in the relevant state programs for the state support of the investment activity in agriculture.

The authors would like to note that the preferential interest rate under-investment loans depend not only on the terms of a particular government program but also on the terms of lending by a particular bank [29]. Given that the above scheme of investment incentives can only work on the terms of state support, it is advisable to implement such programs only through state banks.

It should be noted that the configuration of financial support, which involves banks in the financing scheme of investment projects, is effective and will avoid the mistakes that were made during the operation of the State Agency for Investment and Development until 2015. The inclusion of a financial institution in the model of financial support contributes to the solution of the following tasks:

1. Significantly strengthen control over the targeted use of funds that were issued as a soft loan. Previously, the State Agency for Investment and Development was not able to ensure the implementation of this function due to the specifics of its activity and a lack of necessary tools (it was not a financial institution). However, this function can be performed by a bank that has all the necessary tools to effectively control the movement of financial flows and their use in the implementation of investment projects;
2. The burden on the State Budget of Ukraine in the implementation of the proposed financial model is reduced. Until 2015, the State Agency for Investment and Development was allocated funds that were fully used to finance investment projects (i.e., 100% of the budget went to cover the needs of project costs). In the proposed model, only the funds needed to cover the difference in the bank's interest (between the effective and preferential interest rates) will be allocated from the budget. The economy of the state budget can be confirmed by the example shown in Fig. 2.

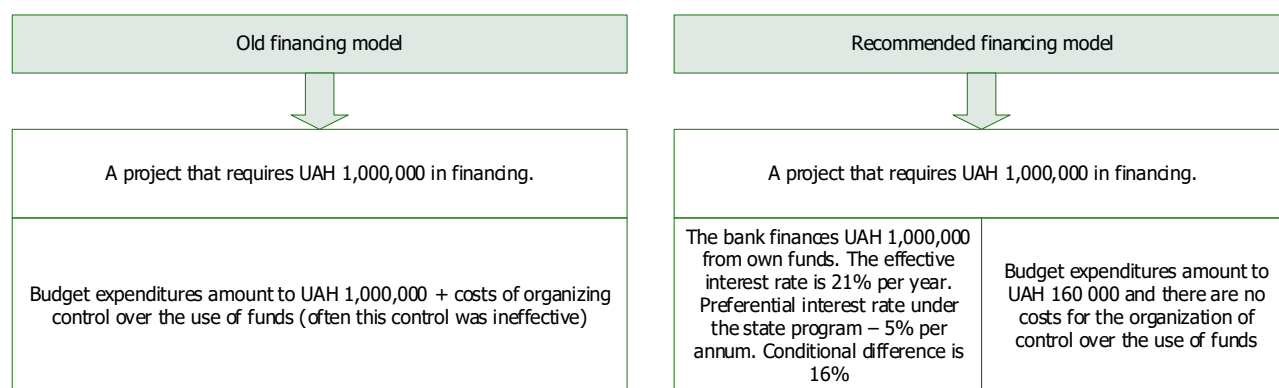


Figure 2. Structural and logical interpretation of the economy of the state budget from the implementation of the recommended model of the financial support for the investment activity of agricultural producers.

This scheme of financial support for farmers is based on the classical principle of macroeconomic regulation (J.M. Keynes' model), taking into account the theoretical foundations of neo-Keynesian and institutional theories (the concept is based not only on the saving of private capital in the economic system but also on the extensive system of state institutions and mechanisms of control over the expenditure of state budget resources) [30].

As it can be seen from Fig. 2, the proposed model of financial support for the investment development of farmers makes it possible to reduce budget expenditures by 84%, on the one hand, and on the other hand – to significantly strengthen the level of control over the use of financial resources. For this model to be formalized into an effective mechanism of state support, it is expedient to use a state bank for its implementation. In Ukraine, such banks are PJSC "Oschadbank" or PJSC "Privatbank". This will help ensure the return of funds (the amount of the difference in interest) to the state budget. At the same time, the amount of compensation of the state bank in the difference of interest affects the increase of its capital and the growth of profits, which is directed to the state budget. As a result of the implementation of the proposed model, the number of expenditures for the state budget will be minimized. In addition, the control over the use of resources will be strengthened and an investment project will be implemented, which will create GDP growth.

Having considered the main directions of the implementation of the state strategy of investment support of agricultural producers, it is possible to determine the conditional economic effect that the economy of Ukraine will be able to obtain in the form of additional GDP growth. For this purpose, it is necessary to apply the method of correlation-regression analysis. The implementation of the forecast should be ensured by building a multi-criteria function of Ukraine's GDP dependence on the factors of investment development in agriculture. For this purpose, a correlation-regression model was built, which has the following variables (Table 1):

Table 1. Variables used to build a regression model of GDP dependence on investment factors.

Variable name	Variables	Economic content of the variable
Ukraine's GDP in agriculture, million USD	y	this indicator expresses the total amount of goods that were produced in agriculture in Ukraine
The volume of investments in agriculture, million USD	x_1	this indicator characterizes the financial aspect of the dynamics of investment processes and capital inflows to the agricultural sector of Ukraine
Expenditures to support state regulators of the agricultural sector, million USD	x_2	the growth of expenditures in support of state regulators of the agricultural sector hypothetically should affect GDP growth in agriculture

Ukraine's GDP will be a dependent variable that needs to be forecasted. Indicators x_1 - x_2 are factor signs that have their influence on Variable y . The primary data for the formation of the regression model are given in Table 2.

Table 2. Primary data for building a regression model of Ukraine's GDP dependence on indicators of state support for investment in agriculture. (Source: based on [31])

Year	Ukraine's GDP in agriculture, million USD	The volume of investments in agriculture, million USD	Expenditures to support state regulators of the agricultural sector, million USD
	y	x_1	x_2
2010	10 150	2 066.0	10.5
2011	13 403	2 790.7	12.2
2012	13 706	3 082.8	16.5
2013	15 777	2 995.7	8.5
2014	13 542	2 356.4	6.8
2015	9 670	1 832.9	4.9
2016	10 676	2 429.1	6.0
2017	11 346	2 974.4	8.4
2018	13 578	2 929.4	7.4
2019	14 042	2 708.9	7.6
2020	14 669	2 125.0	6.9

To run the regression model, the data in Table 2 were used to form a statistical sample, which is a continuous range of data that is presented in a standard panel form. Upon the completion of the input of statistical information, the Stata software was used to obtain data on the parameters of the regression dependence (Fig. 3).

Source	SS	df	MS			
Model	22272651.3	2	11136396.5	Number of obs =	9	
Residual	9464316.72	6	1577382.30	F(2, 6) =	7.02	
Total	31736968	8	3967121	Prob > F =	0.0264	
				R-squared =	0.7011	
				Adj R-squared =	0.6182	
				Root MSE =	1257.2	

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
y						
x_1	2.827314	.9441961	2.51	0.047	.0470908	4.667537
x_2	4.089261	1.917329	2.41	0.053	-.0732748	9.31182
_cons	-6435.973	5909.046	-1.10	0.318	-23846.52	8080.57

Figure 3. Results of obtaining data on the parameters of multiple regression dependence.

That is, based on the calculations, the model of the relationship between Ukraine's GDP and the factors of investment activity in agriculture can be interpreted as follows:

$$y = -6435.973 + 2.827314 \times x_1 + 4.089261 \times x_2 \quad (2)$$

The results describing the parameters of the multiple regression model are given in Table 3.

It is advisable to pay attention to the probability of error, which is set for the constant. Since the error for the constant exceeds the critical level (it is 0.32; the critical level is 0.05), it can be argued that the use of the constant in the construction of a multi-criteria function requires additional testing and adjustment.

Table 3. Main results of launching a multiple regression model.

Indicator	Description of the indicator and its impact on regression results
Multiple correlation coefficient (R-squared)	The value is 0.7011, which indicates that the model determines a significant relationship between the individual parameters
Fisher criterion (F-criterion)	The value of the indicator is 7.02, which is more than the minimum value of 2.6. According to the results of the Fisher criterion
Test for the heteroskedasticity of the model's remains (t-statistics)	The results obtained indicate the adequacy of the model. Therefore, the results of the construction of the multiple functions can be used to forecast Ukraine's GDP under the forecast change in factor indicators
Probability of error P(t)	The probability of error for variables x_1 and x_2 does not exceed 5%, which indicates the adequacy of the obtained values of correlation coefficients. For the constant, the probability of error is significant, which requires re-launching the model based on the test for multicollinearity.

For this purpose, a regression model was launched using the robust function, the results of which are shown in Fig. 4.

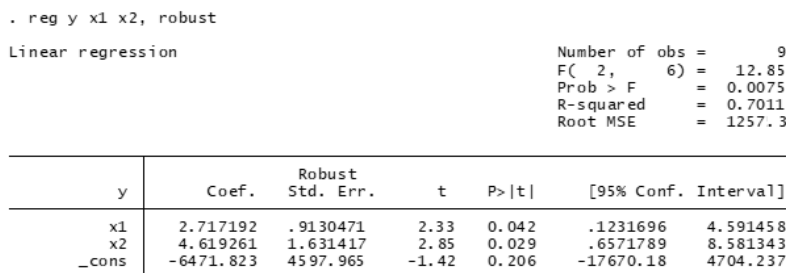


Figure 4. Results of obtaining data on the parameters of regression dependence using the test of model adequacy.

As a result of the calculations, it can be concluded that the model defined in Equation 2, despite the high error in the value of the constant, can be used to make a forecast. Therefore, based on the above results of the multiple regression, the indicators of change in the GDP of Ukraine were predicted on the condition of the implementation of the proposed directions of increasing the efficiency of state regulation of the investment activity in agriculture. The forecast results are given in Table 4.

Table 4. The results of forecasting changes in Ukraine's GDP under the conditions of regulating the parameters of investment development in agriculture. Note: * forecast.

Years	Without implementing an investment strategy			With the implementation of the investment strategy			The economic effect, million dollars
	Ukraine's GDP in agriculture, million USD	The volume of investments in agriculture, million USD	Expenditures to support state regulators of the agricultural sector, million USD	Ukraine's GDP in agriculture, million USD	The volume of investments in agriculture, million USD	Expenditures to support state regulators of the agricultural sector, million USD	
	y	x_1	x_2	y	x_1	x_2	
2020	14 668.9	2 125.0	6.9	14 668.9	2 125.0	6.9	-
2021*	15 712.4	2 189.9	6.7	16 527.7	2 299.4	7.5	815
2022*	16 202.2	2 256.9	6.4	17 918.1	2 488.2	7.6	1 716
2023*	16 707.3	2 325.8	6.2	19 422.5	2 692.4	7.7	2 715
2024*	17 227.9	2 396.9	6.0	21 050.4	2 913.5	7.8	3 823

The forecast results give grounds to conclude the prospects of obtaining an economic effect in the form of GDP growth in agriculture from the implementation of the proposed areas of investment strategy. In 2021, the possible effect could make

up 815 million dollars. In the following years, the effect would accumulate to the level of 1,716 million dollars in 2022, 2,715 million dollars in 2023, and 3,823 million dollars in 2024. That is, the improvement of state regulation of the investment activity in agriculture within the proposed models can increase the GDP of the industry by a third within 5 years of the current investment strategy.

DISCUSSION

Today, Ukraine's agricultural sector is not attractive to investors. The problem of attracting investment remains extremely important, and its solution can be one of the main factors in restoring agro-industrial production and ensuring the competitiveness of its products. Enterprises in fixed assets will provide the systematic renewal and development of the material and technical base of agricultural enterprises and improve rural infrastructure. Investments in fixed capital will help ensure the revival and development of rural infrastructure. Therefore, the issue of attracting investment in agriculture remains relevant and one of the critical issues of economic growth.

The development of agriculture in Ukraine faces many different problems, not only the issues of investment and financing the renewal of fixed assets. That is why, as in our study and the scientific works of many scientists, the question of the need for state support for the stabilization and effective development of agriculture and the agricultural market is raised. The theory and practice of the market economy demonstrate the situation in which the farm sector is most sensitive to negative exogenous impact, making government regulation of this sector inevitable [13; 32; 33]. We agree with N. Svytnov [34] that the leading role in stimulating investment activity in agriculture is the state, which forms investment policy, the order of its implementation, market and production infrastructure, investment culture, and other levers that include the model of investment stimulation. Improving the efficiency of agricultural production in Ukraine is a strategic task of the ongoing agrarian reform, the aim of which is the stability of the country's food security.

As a limitation, it should be noted that in addition to the volume of investment in agriculture and expenditures to support state regulators of the agricultural sector, the formation of Ukraine's GDP in agriculture may have a significant impact on other factors. In particular, scientists focus on such factors as the level of depreciation of fixed assets [6; 7; 9] and their dynamics, service life and profitability [35], enterprise life cycle, product range structure, financial efficiency indicators, the size of operating and economic lever [34], the effects of the COVID-19 pandemic [8].

Among the limitations is the hard-to-predict negative impact on the significance of the studied indicators of hostilities conducted in Ukraine as a result of the military invasion of the Russian Federation on February 24, 2022.

According to scientists Lysa O. et al. [32], subsidies as one of the sources of investment support for agricultural development by the state may lead to the fact that farmers will not seek maximum profits, and their efforts will be aimed at obtaining total subsidies. Therefore, in our opinion, it is necessary to combine the levers of state regulation with financial support, which involves attracting private (bank) capital to the scheme of financing projects in agriculture.

CONCLUSIONS

The purpose of implementing the state investment strategy in agricultural development is to form an effective policy of state promotion of investment in the agricultural sector, which will increase the level of investment attractiveness of the agricultural industry. It can be concluded that the theoretical and methodological justification of state regulation of investment in agriculture is designed to define an updated system of such law, the main elements of which, in addition to the development strategy, should include legal, administrative, and economic mechanisms with their separate tools to influence investment in this area. For example, the success of the administrative agency in the development of investment activities in agriculture is demonstrated by disclosing the importance of the information function through the provision of advisory services by the executive branch. And among the instruments of the economic mechanism, the emphasis is on combining the levers of state regulation with the financial instruments of banking institutions, which makes the investment activity of agricultural producers more flexible and efficient.

The proposed economic mechanism and tools for implementing the main strategic guidelines for further development of investment activities of agricultural production in Ukraine is a prerequisite for identifying aids to promote this process at the local level by local governments and civil society organizations. The critical provision of improving the state regulation of investment activity in agriculture is to reveal the need for its theoretical and methodological justification with the definition of strategic directions of development in this area and highlighting the main mechanisms of their practical implementation.

In the current context of public administration and the implementation of decentralization reform, critical promising areas of further research are the development of regional investment initiatives in agriculture and public administration tools for their effective implementation.

REFERENCES / ЛІТЕРАТУРА

1. *Pro vnesennia zmin do deiakykh zakonodavchykh aktiv Ukrainy shchodo umov obihu zemel silskohospodarskoho pryznachennia*: Zakon Ukrainy [On Amendments to Certain Legislative Acts of Ukraine Concerning the Conditions of Circulation of Agricultural Lands: Law of Ukraine], 31 March, 2020. No 552-IX. Retrieved from <https://zakon.rada.gov.ua/laws/show/552-20> [in Ukrainian].
2. Rusan, V. M., & Zhurakovska, L. A. (2020). Shchodo Zakonu Ukrainy «Pro vnesennia zmin do deiakykh zakonodavchykh aktiv Ukrainy shchodo obihu zemel silskohospodarskoho pryznachennia» pryiniatoho Verkhovnoiu Radoiu Ukrainy 31 bereznia 2020 roku (reistr. # 2178-10) [On the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on the Circulation of Agricultural Land" adopted by the Verkhovna Rada of Ukraine on March 31, 2020 (Reg. № 2178-10)]. Retrieved from <https://niss.gov.ua/sites/default/files/2020-04/zakon-pro-zemlyu.pdf> [in Ukrainian].
3. Levandivskiy, O. T., & Tsyryl, T. V. (2020). Investytsiina pryvablyvist silskohospodarskykh pidpriemstv rehionu [Investment attractiveness of agricultural enterprises in the region]. *Aktualni problemy rozvytku ekonomiky rehionu – Current problems of economic development of the region*, 16(2), 188-199. DOI: <https://doi.org/10.15330/apred.2.16.188-199> [in Ukrainian].
4. Shust, O. A., Grynchuk, Ju. S., Paska, I. M., & Tkachenko K. V. (2021). Investytsijna pryvablyvist v systemi menedzhmentu ta dilovoi reputacii silskohospodarskykh pidpriemstv [Investytsijna pryvablyvist 'v systemi menedzhmentu ta dilovoi' reputacii 'sil'skogospodars'kyh pidpriemstv]. *Ekonomika ta upravlinnja APK – Economics and Management APK*, 1, 125–138 [in Ukrainian].
5. Matsyhora, T. V. (2019). Otsinka investytsiinoi pryvablyvosti produktsii silskohospodarskykh pidpriemstv [Estimation of investment attractiveness of agricultural products]. *Ekonomika APK – Economics of agro-industrial complex*, 1, 50-55. DOI: <https://doi.org/10.32317/2221-1055.201901050> [in Ukrainian].
6. Bunda, O. M., & Yakymenko, A. I. (2019). Analiz efektyvnosti vykorystannia osnovnykh zasobiv silskohospodarskoho pidpriemstva [Analysis of the efficiency of fixed assets of agricultural enterprises]. *Problemy innovatsiino-investytsiinoho rozvytku – Problems of innovation and investment development*, 21, 65-72. DOI: <https://doi.org/10.33813/2224-1213.21.2019.8> [in Ukrainian].
7. Zakharchuk, O. V. (2019). Suchasnyi stan ta perspektyvy rozvytku osnovnykh vyrobnychykh zasobiv silskoho hospodarstva [Current state and prospects of development of basic means of production of agriculture]. *Ekonomika APK – Economics of agro-industrial complex*, 11, 49-57. DOI: <https://doi.org/10.32317/2221-1055.201911049> [in Ukrainian].
8. Podolchak, N., Tsygylyk, N., Martyniuk, V., & Sokil, O. (2021). Predicting Human Resource Losses due to the COVID-19 Pandemic in the Context of Personnel Security of Organizations. In: *Proceedings of the 11th International Conference on Advanced Computer Information Technologies (ACIT)*, 333-336. DOI: <https://doi.org/10.1109/ACIT52158.2021.9548361>.
9. Zwolak, J. (2016). The relationship between newly introduced fixed assets and final output in Polish agriculture. *Actual Problems of Economics*, 179(5), 86-94.
10. Omarkhanova, Z., Tleuzhanova, D., Berstembayeva, R., Mukhambetova, Z., Matayeva, B., & Alina, G. (2017). Features and problems of attracting investments into agriculture of Kazakhstan. *Journal of Advanced Research in Law and Economics*, 8(4), 1255-1259. DOI: [https://doi.org/10.14505/jarle.v8.4\(26\).24](https://doi.org/10.14505/jarle.v8.4(26).24)
11. Burliai, A. P., & Revutska, A. O. (2020). Osnovni napriamy derzhavnoi pidtrymky ekolohizatsii silskoho hospodarstva [The main directions of state support for greening of agriculture]. *Aktualni problemy rozvytku ekonomiky rehionu – Current problems of economic development of the region*, 16(2), 178-188. DOI: <https://doi.org/10.15330/apred.2.16.178-188> [in Ukrainian].
12. Khomitov, K. Z., Mardanova, A. T., Ugli, A. B. M., & Adilchaev, R. T. (2020). Factors of increasing investment attractiveness in agriculture. *Journal of Advanced Research in Dynamical and Control*

- Systems*, 12 (7), 18-24. DOI: <https://doi.org/10.5373/JARDCS/V12SP7/20202077>
13. Aimurzina, B., Gulzhan, A., Dauletova, A., Kamenova, M., Omarova, A., & Beisengaliyev, B. (2017). State regulation of the agro-industrial complex as the most important component for sustainable development. *Journal of Environmental Management and Tourism*, 8 (5), 1085-1091. DOI: [https://doi.org/10.14505/jemt.v8.5\(21\).12](https://doi.org/10.14505/jemt.v8.5(21).12)
 14. Belhadi, A., Kamble, S. S., Mani, V., Benkhathi, I., & Touriki, F. E. (2021). An ensemble machine learning approach for forecasting credit risk of agricultural SMEs' investments in agriculture 4.0 through supply chain finance. *Annals of Operations Research*. Retrieved from <https://link.springer.com/article/10.1007/s10479-021-04366-9>. doi:10.1007/s10479-021-04366-9
 15. Mamatzakis, E. C., & Staikouras, C. (2020). Testing for the effects of credit crunch on agriculture investment in the EU. *Bulletin of Economic Research*, 72 (4), 434-450. DOI: <https://doi.org/10.1111/boer.12229>
 16. Ohinok, S. (2016). State Regulation of Franchising in the EU Member Countries. *Baltic Journal of Economic Studies*, 1 (1), 137-140. DOI: <https://doi.org/10.30525/2256-0742/2015-1-1-137-140>.
 17. Starodubtsev, A., & Bakaj, Y. (2021). Credit guarantees in Ukraine's agriculture: A development mechanism based on international practices. *Economic Annals-XXI*, 188 (3-4), 85-97. DOI: <https://doi.org/10.21003/ea.V188-10>
 18. Rukovodstvo k svodu znanyi po upravleniyu proektam (rukovodstvo PMBOK) [Project Management Body of Knowledge Guide]. Project Management Institute, Inc., 2017 [in Russian].
 19. Karyy, O., & Panas, Y. (2016). Preconditions for volunteers' participation in social and economic development of communities. *Marketing and management of innovations*, 2, 156-169.
 20. Howaniec, H. (2012). The Importance of Innovation for Investment Attractiveness for Business. In: *Proceedings of the Conference: Current Issues in Corporate Sector*, 137-142.
 21. Sorochak, O., Kvak, S., & Gvozd, M. (2020). The Model for Selection of Innovation and Investment Strategy of Machine-Building Enterprises: Practical Aspect. *Marketing and Management of Innovations*, 2, 68-84. DOI: <https://doi.org/10.21272/mmi.2020.2-05>.
 22. Kabmin peredav Minekonomiky povnovazhennia Derzhinvestproektu [The Cabinet of Ministers transferred the powers of the State Investment Project to the Ministry of Economy] (2015). *Ukrainski natsionalni novyny [Ukrainian national news]*. Retrieved from <https://www.unn.com.ua/uk/news/1512568-kabmin-peredav-minekonomiki-povnovazhennya-derzhinvestproektu> [in Ukrainian].
 23. Baranova, V., Kulinich, T., Dutchak, O., Zvonar, V., & Denyshchenko, L. (2021). Development of Corporate Social Responsibility in Business as a Factor of Fiscal Decentralization. *Journal of Eastern European and Central Asian Research (JEECAR)*, 8 (3), 411-424. DOI: <https://doi.org/10.15549/jeeecar.v8i3.760>.
 24. Shpak, N., Naychuk-Khrushch, M., Kohut, U., Honchar, M., & Sroka, W. (2020). The Usage of Modern Instruments of Business Planning Administration for Small Enterprises: A Case Study Analysis. *Central European Business Review*, 9 (1), 20-42. DOI: <https://doi.org/10.18267/j.cebr.227>.
 25. Vovchak, O., Kulyniak, I., Halkiv, L., Pavlyshyn, M., & Horbenko, T. (2021). Development of Crisis Diagnostic at the Enterprise: Financial and Economic Breakdown. *Financial and Credit Activity: Problems of Theory and Practice*, 3 (38), 292-303. DOI: <https://doi.org/10.18371/fcaptop.v3i38.237459> [in Ukrainian].
 26. Martyniuk, V., Dluhopolskyi, O., Kniaz, S., Podolchak, N., Muravska, Y., Martyniuk, B. (2020). The Fiscal Policy Impact on Indicators of the State's Economic Growth. In: *Proceedings of the 10th International Conference on Advanced Computer Information Technologies (ACIT)*, 695-698. DOI: <https://doi.org/10.1109/ACIT49673.2020.9208903>.
 27. Vykliuk, M., Mikhailishin, R., Kundytyskyj, O., Senyshyn, O., Prokopenko, N., Olikhovskiy, V. (2020). Conceptual basis of the state's tax security model. *Management Theory and Studies for Rural Business and Infrastructure Development*, 42 (3), 303-315. DOI: <https://doi.org/10.15544/mts.2020.30>.
 28. Kalyayev, A., Kozłowski, R., Woźniak-Krakowian, A., Podolchak, N., & Dziurakh, Y. (2019). Collective Identity and Multiculturalism in Modern Society and Governance: European Context. In: *Proceedings of the 34th International Business Information Management Association (IBIMA)*, 9762-9771.
 29. Prokopenko, O., Toktosunova, C., Sharsheeva, N., Zablotska, R., Mazurenko, V., & Halaz, L. (2021). Prospects for the Reorientation of Investment Flows for Sustainable Development under the Influence of

- the COVID-19 Pandemic. *Problemy Ekorozwoju*, 16 (2), 7-17. DOI: <https://doi.org/10.35784/pe.2021.2.01>.
30. Sharko, V., & Andrusenko, N. (2016). Algorithm for estimating factors influencing intensification of production of industrial enterprises. *Economic Annals-XXI*, 162 (11-12), 68-72. DOI: <https://doi.org/10.21003/ea.V162-14>.
31. Derzhavna sluzhba statystyky Ukrainy. (n. d.). *Ofitsiyni sait [Official site]*. Retrieved from <https://ukrstat.gov.ua> [in Ukrainian].
32. Lysa, O., Oleksenko, R., Azhazha, M., Venger, O., & Sergiienko, T. (2022). State regulation of investment in agriculture. In: *IOP Conf. Series: Earth and Environmental Science* 949, 012009. DOI: <https://doi.org/10.1088/1755-1315/949/1/012009>.
33. Pronko, L., Furman, I., Kucher, A., & Gontaruk, Y. (2020). Formation of a state support program for agricultural producers in Ukraine considering world experience. *European Journal of Sustainable Development*, 9 (1), 364-379. DOI: <https://doi.org/10.14207/ejsd.2020.v9n1p364>.
34. Svyynous, N. (2020). The organizational and economic components of investment support in agricultural enterprises activity. *Ekonomika ta upravlinnja APK*, 2, 134-144. DOI: <https://doi.org/10.33245/2310-9262-2020-159-2-134-144>.
35. Voytsekhovska, Yu., Kucher, L., & Morozova, H. (2022). Management of production potential considering factors of fixed assets renewal on the basis of modeling. *Financial and Credit Activity Problems of Theory and Practice*, 2 (43), 202-212. DOI: <https://doi.org/10.55643/fcaptp.2.43.2022.3605>.

Вовчак О. Д., Дзюрах Ю. М., Кулиняк І. Я., Гальків Л. І., Рачинська Г. В.

ЕКОНОМІЧНИЙ МЕХАНІЗМ ДЕРЖАВНОГО РЕГУЛЮВАННЯ ІНВЕСТИЦІЙНОЇ ДІЯЛЬНОСТІ В СІЛЬСЬКОМУ ГОСПОДАРСТВІ

Основним завданням реалізації інвестиційної стратегії держави в розвитку сільського господарства є формування ефективної політики державного сприяння розвитку інвестицій у агросекторі, що дасть змогу підвищити рівень інвестиційної привабливості сільськогосподарської сфери. Ураховуючи актуальність дослідження, метою статті є обґрунтування доцільності впровадження економічного механізму державного регулювання інвестиційної діяльності в сільському господарстві шляхом поєднання важелів державного регулювання з фінансовими інструментами банківських установ. Поставлені в дослідженні цілі були досягнуті за допомогою таких загальнонаукових методів: синтезу та аналізу, фінансової статистики, систематизації, теоретичного узагальнення та абстракції. Інформаційною базою послужили праці вітчизняних і зарубіжних науковців, аналітиків, практиків та статистичні дані Державної служби статистики України. У статті авторами запропоновано модель фінансування інвестиційної діяльності, що ґрунтується на засадах залучення приватного (банківського) капіталу. Наведено структурно-логічну інтерпретацію економії державного бюджету від упровадження рекомендованої моделі фінансової підтримки інвестиційної діяльності сільгоспвиробників. На основі вибірки значень показників за 2010-2020 рр. побудовано багатофакторну регресійну модель залежності обсягу ВВП України в сільському господарстві від факторів розвитку інвестиційної активності в сільському господарстві («обсяг інвестицій у сільське господарство» та «видатки на підтримку органів державного регулювання агросектора»). Для перевірки якості побудованої моделі визначено коефіцієнт множинної кореляції (R-squared), проаналізовано тест на гетероскедастичність залишків моделі (t-статистика), імовірність помилки P(t). Для оцінювання статистичної значущості коефіцієнта кореляції розраховано t-критерій Стьюдента, а для перевірки значущості моделі регресії – F-критерій Фішера. Спрогнозовано зміну ВВП України в сільському господарстві на 2021-2024 роки за умов державного регулювання параметрів інвестиційного розвитку в сільському господарстві. Запропонований економічний механізм та інструменти реалізації основних стратегічних орієнтирів подальшого розвитку інвестиційної діяльності в сільському господарстві України є передумовою визначення допоміжних засобів сприяння вказаному процесу на місцевому рівні з боку місцевого самоврядування та організацій громадянського суспільства.

Ключові слова: механізм державного регулювання, інвестування, Державне агентство з інвестицій та розвитку, фінансування інвестиційної діяльності, сільське господарство, кореляційно-регресійний аналіз, ВВП України в сільському господарстві

JEL Класифікація: E22, G38, H81, O13, Q14