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Dear participants of the 2023 13th International Conference on Advanced Computer Information Technologies ACIT'2023!

In times of global challenges, dynamic changes and rapid innovation development, the international scientific community is uniting its efforts to ensure high quality and efficient work in the field of computer information technologies.

It is gratifying that scientists attend the conference from 54 countries. They are ready to share their experience and present their work, produce innovative ideas and improve mathematical modelling, computational intelligence, cybersecurity, specialised information, computer systems, artificial intelligence, cognitive systems, information in economics and management, and information technology in education.

Scientists from West Ukrainian National University are actively integrating into the global scientific space, studying new experience, analysing data and creating new software products. The scientists from the higher education institutions are actively engaged in the development and implementation of information and analytical systems, conducting information warfare and protecting against the cyber threats.

This year ACIT'2023 is organised by the Faculty of Computer Information Technologies of West Ukrainian National University (Ukraine), Wrocław University of Economics and Business (Poland), University of South Bohemia (Czech Republic), Deggendorf Institute of Technology (Germany) and Catholic University in Ružomberok (Slovakia). The conference will be held at Wrocław University of Economics and Business in a hybrid format.

We express our gratitude to our partners for the opportunity to work together and establish communication between participants from different fields of computer science and information technology.

Wrocław University of Economics and Business is one from the best economic higher education institutions in Poland and an important centre of education, science and research. Its activities are aimed at preserving and improving the image of the university at the regional, national, European and international levels, enhancing its competitive advantage and shaping the image of a modern institution, open and friendly to employees, students and the environment.

I wish all participants fruitful discussions, scientific research, interesting discoveries and the realisation of all their plans. May your achievements and plans become a driving force in the development of advanced computer information technologies!

Sincerely yours,

Oksana DESYATNYUK
Rector of West Ukrainian National University

Dear scientists of the 2023 13th International Conference on Advanced Computer Information Technologies ACIT'2023!

Dear scientists of the 2023 13th International Conference on Advanced Computer Information Technologies ACIT'2023!

I welcome you to the 13th International Conference on Advanced Computer Information Technologies ACIT'2023! This event is the result of cooperation between scientists and specialists from different countries who have a common interest in the development of information technologies. It is gratifying that over the years the international scientific community has been working hard to contribute to the development of science and technology by implementing the latest systems and techniques.

The first annual All-Ukrainian School-Seminar for young scientists and students "Advanced Computer Information Technologies" was held in May 2011. It was organised by the Faculty of Computer Information Technologies of West Ukrainian National University and the Association of Computer Information Technology Specialists. In 2017, the 7th ACIT'2017 became an international conference for the first time, bringing together many scientists from around the world.

Last year, ACIT'2022 was made possible by the cooperation of the Faculty of Computer Information Technology of WUNU (Ukraine), Catholic University in Ruzomberok (Slovakia), Wrocław University of Economics and Business (Poland), Institute of Applied Informatics (Deggendorf Institute of Technology, Germany), Institute of Applied Informatics (University of South Bohemia, Czech Republic), and the Czech IEEE Section on Computer Science (C). Researchers from 40 different countries have submitted papers for the 12th ACIT'2022 International Conference.

This year, the world's scientific elite continues to unite for common goals and progress in various fields of science, expanding research horizons and discussing new approaches and important issues. ACIT'2023 is a scientific platform for discussions and innovative solutions. Therefore, I am convinced that the 13th International Conference on Advanced Computer Information Technologies ACIT'2023 is a great opportunity for researchers to exchange experience and knowledge in the field of computer science and establish professional contacts.

I wish all participants fruitful work and constructive international dialogue!

Let's work to change the world because the horizons of knowledge are endless!

Sincerely yours,

Andrii KRYSOVATYI
Chairman of the Academic Council
West Ukrainian National University

Message from ACIT’2023 Co-Chairmen

Dear participants of the “2023 13th International Conference on Advanced Computer Information Technologies” ACIT’2023!

The first annual All-Ukrainian School-Workshop for Young Scientists and Students “Advanced Computer Information Technologies” was held in May 2011. It was organized by the Faculty of Computer Information Technologies (Ternopil National Economic University, Ukraine), the Association of Computer Information Technologies Specialists. In 2017, the 7th ACIT’2017 has firstly became International Conference.

Last year, ACIT’2022 is made possible through collaboration of Faculty of Computer Information Technologies (West Ukrainian National University, Ukraine), Catholic University in Ružomberok (Slovakia), Wroclaw University of Economics and Business (Poland), Institute of Applied Informatics (Deggendorf Institute of Technology, Germany), Institute of Applied Informatics (University of South Bohemia, Czech Republic) and Czechoslovakia Section of IEEE / Computer (C) Society Chapter. Scientists from 40 different countries submitted the papers for participation in the 12th International Conference ACIT’2022.

The 2023 13th International Conference on Advanced Computer Information Technologies (ACIT'2023) organized by the West Ukrainian National University (Ukraine), Wroclaw University of Economics and Business (Poland), University of South Bohemia (Czech Republic), Deggendorf Institute of Technology (Germany) and Catholic University in Ružomberok (Slovakia). Technical support is offered by IEEE Poland Section \ System Man and Cybernetics Society SMC-28 (Poland). ACIT'2023 will be hosted by Wroclaw University of Economics and Business in hybrid format. Scientists from more than 54 different countries submitted the applications for participation in the 13th International Conference ACIT’2023.

The Conference will be held in Wroclaw, which is the main city of Lower Silesia, a voivodship situated in south-western Poland near the German and Czech territories. Its population of over 700,000 makes it the fourth largest city in Poland. Wrocław is an energetic metropolis, its rich history with various traditions, cultures and religions is combined with the present day dynamically developing city. It is also a place of many important culture events, conferences, congresses and other international events. The Wrocław University of Economics and Business, which will be hosted ACIT 2023 Conference, is an important center of education, science, and research. Its activities are aimed at maintaining and strengthening the position of the University on regional, national, European, and international levels, improving competitive advantage and shaping its image of a modern institution, open and friendly to its employees, students, and the environment.

The topics for the 2023 13th International Conference on Advanced Computer Information Technologies conference include: Computational Intelligence and Mathematical Modelling; Cyber Security; Specialized Information and Computer Systems; Artificial Intelligence and Cognitive Systems; Information in Economy and Management; Information Technology in Education.

We would like to sincerely thank to all of the reviewers of more than 255 submitted papers. Their names are listed in the conference proceedings. Almost second of submitted papers has been rejected. In totally 139 articles has been accepted. We hope that the spirit of the ACIT'2023 International Conference will be present at the plenary and sectional meetings and will ensure a high level of scientific discussions.

Dear participants! We wish you to have productive discussions and hope that the conference will give you good inspiration for further developments in the field of Advanced Computer and Information Technologies!

Best regards,

Mykola DYVAK and Artur ROT
Co-Chairmen of the 22023 13th International
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Simulation and Forecasting of Agricultural Land Market Development

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***Abstract*–The article deals with forecast scenarios for the development of agricultural land market. The dynamics of the areas of land plots transferred on the land market were considered, and the indicators of forecast values of the agricultural land market development were calculated. A vector autoregression model (VAR) was built to calculate the value of the land plot.**

***Keywords*–agricultural land, land market, land relations, model, forecasting.**

I. Introduction

One of the main tasks of the state bodies in the field of agrarian land use remains the improvement of land relations, so that make it possible to ensure the rational use and protection of productive lands thanks to environmentalization, preserving and protection of land as a component of the natural environment; saving, increasing and regaining its productive power as a natural resource.

Some issues remain unresolved to full extend, in particular, those caused by the formation and functioning of agricultural land market, as well as its regulation in the conditions of modern economy. The main attention should be paid to solving the problem of forecasting the development of agricultural land market. Modeling should be noted as the most effective method of research, which makes it possible to formalize indicators of this development in an economic and mathematical interpretation.

II. Statement of the problem

Modern needs in the regulation of land relations are determined by a qualitatively new approach to the development of the processes of land use, ownership and disposal, and the conditions under which a free land market should be formed.

Scientific developments of researchers are of high theoretical and practical significance in the conditions of transformation of land relations. Meanwhile, despite the wide range of papers in this area, their study revealed certain contradictions in the interpretation of basic issues, methodical

Taking into account the free circulation of agricultural land and taking into account the market situation, we propose to consider three main scenarios of the development of the agricultural land market in Ukraine for the future: realistic – preserving the modern trends in the agricultural land market, under conditions of moderate development and formation of an appropriate institutional environment for the introduction of land market; optimistic – active development of the market under the condition of lifting the moratorium and introducing free circulation of agricultural land with a number of institutional restrictions; pessimistic – the opening of a free land market and concentration of significant land areas in the ownership of oligarchic groups.

Estimated component of the study

The forecasting method is an important component in modeling the development of the agricultural land market, it is worth considering different options for land transaction scenarios. In recent years, there has been a tendency to increase such indicators, which proves the development of the market. It is worth noting that the majority of such transactions (92-98%) relate to land leases and inheritance.

In Ukraine, in recent years, there has been a tendency for the dynamics of the number of transactions that occur with a change of owner or user of agricultural land plots to increase (Fig. 1).

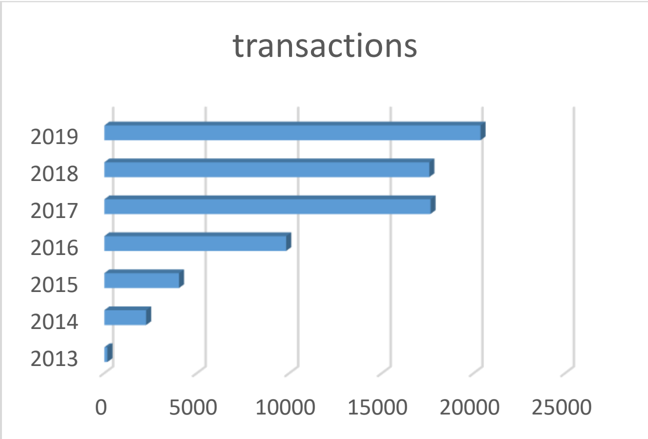


Fig. 1. Dynamics of the number of agricultural land transactions

In order to determine the priority and the level of significance of the elements of the market circulation of agricultural land, we will make a comparative analysis of a separate element. The elements of market circulation include rent, sale, inheritance, exchange, emphytheusis and mortgage. The elements of the market circulation of agricultural land are given in the Table I. The largest number of transactions with agricultural land was carried out precisely in relation to lease.

TABLE I. TABLE I. DYNAMICS OF THE AREAS OF LAND PLOTS WHICH WERE TRANSACTED ACCORDING TO THE ELEMENTS OF THE MARKET CIRCULATION OF AGRICULTURAL LAND IN UKRAINE, 2019–2021.

Elements of market circulation	2019	%	2020	%	2021	%
Lease	13852.1	78.54	15632.6	88.96	18236	89.52
Inheritance	1642	9.31	1796	10.22	1964	9.64
Purchase/ selling	46.4	0.26	52.3	0.30	68.1	0.33
Mien	35.3	0.20	41.6	0.24	47.3	0.23
Emphyteusis	42	0.24	49	0.28	53	0.26
Mortgage	1.2	0.01	1.6	0.01	2.1	0.01
Total	17636	100	17573.1	100	20370.5	100

Let's develop a forecast of development of agricultural land market according to options based on the specified scenarios with different transactions growth rates by elements of the market circulation of agricultural land.

Based on the method of exponential smoothing [1], we will calculate the forecast values of some indicators of the agricultural land market in Ukraine, in particular the area of land plots, in relation to which transactions were made, by elements of the market circulation as of 2023, depending on the scenarios of the development of the land market (Table II).

TABLE II. FORECAST VALUES OF AGRICULTURAL LAND MARKET DEVELOPMENT INDICATORS (AREA OF LAND PLOTS WHICH WERE TRANSACTED) FOR 2023, THOUSAND HECTARES

Elements of market circulation	Realisic	Optimistic	Pessimistic
Lease	25305.3	26890.4	23720.2
Inheritance	2670.8	3144.4	2197.3
Purchase/ selling	90.3	94.3	86.2
Mien	66.5	71.8	61.2
Emphyteusis	75.1	85.4	64.7
Mortgage	2.8	3.1	2.5
Total	28210.8	30289.4	26132.1

According to a realistic development scenario, which depends on the current trends in the agricultural land market, a moderate increase in the number of land transactions is predicted, which is due to the increase in demand for domestic products in foreign markets, as well as the conclusion of forward contracts for future harvests. In general, according to the scenario of realistic development, the area of land plots with which transactions will take place will increase to 28,210.8 thousand hectares in 2023.

According to the optimistic scenario, the preference will be given to the increase in transactions for the purchase and sale of agricultural land, as well as to mortgage lending secured by land. Therefore, the conditions of appropriate financial support and investment attraction for the development of small and medium-sized agribusiness, formation of the land market will acquire the status of a basic unit, which will contribute to the growth of the productivity of agricultural production, renewal of the material and technical base, reduction of unemployment, urbanization, and migration processes within the boundaries of rural settlements.

Under a pessimistic development scenario, the demand and price of land will decrease, which will affect the elements of agricultural land circulation: in the case of increase in emphytheusis agreements and the purchase and sale of land, transactions regarding land plots in the field of lease and inheritance will remain at a high level (except for the short-term period).

For more objective assessment and formation of the agricultural land market model, we selected four most significant elements of the market circulation of land: purchase and sale, lease, inheritance and emphytheusis. A multiple regression model is proposed for planning indicators of agricultural land market development. Adequacy of the model is substantiated on the basis of Fisher's test scores. In the classic form, the multiple regression model can be represented as follows [2]:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_m X_m + \varepsilon, \qquad (1)$$

where Y is a dependent (outcome) variable;

$X = X(X_1, X_2, ..., X_m)$ is a vector of independent explanatory (factor) variables; β are the parameters of the multiple regression equation to be determined; ε is a random error (deviation); β_0 is a free coefficient that determines the value of Y, if all explanatory variables X_j are equal to 0.

To build a multiple regression model, we will introduce conditional designations of variables, the dependent variable, the area of land in market circulation will be denoted by Y; independent variables: X_1 is the area of land leased; X_2 is the area of inherited lands; X_3 is the area of sold land; X_4 is the area of land for which the right of emphytheusis was registered.

The value of the coefficient (index) of multiple correlation $R = 0,99$ indicates a close relationship between the factors of the model and the dependent variable Y. In particular, the coefficient of determination R^2 has a value of $0,98$. The significance of the multiple regression model is assessed using Fisher's F-test. Since the actual value of the criterion is greater than the critical value, $F > F\kappa p$, the multiple regression equation is recognized as statistically significant [2; 3].

According to the results of the calculations using the software product, the multiple regression equation was obtained:

$$Y = 0.262 + 0.006 X_1 + 0.01 X_2 + 0.145 X_3 + 0.437 X_4 - \\ -0.547 X_5 - 6.45 X_6 \qquad (2)$$

Based on the regression model, we calculate the forecast value of the land area in market circulation for the next period until 2025 (Fig. 2).

We will give an economic and mathematical interpretation of the parameters of the multiple regression model: an increase in the area of land leased (based on 1 thousand ha) will lead to an increase in the total area of land plots with which transactions took place by 0.006 thousand ha, an increase in the area of land transferred into inheritance to increase the total area of land plots by 0.01 thousand ha, increase the area of land for purchase and sale to increase the total area of land plots by 0.145 thousand ha, increase the area of land for exchange to increase the total area of land plots by 0.437 thousand ha, for changes in other variables, in particular emphyteussis and mortgages, will lead to an increase in the total area of land plots in market circulation. In our study, 93% of the variability of land areas in market circulation is explained by changes in the factors introduced into the model.

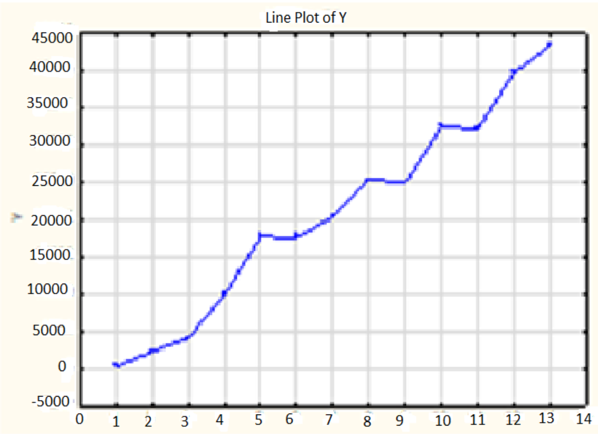


Fig. 2. Forecast value of land area in market circulation

Let us consider more thoroughly, on a specific example, the practical aspects of applying mathematical methods when conducting an expert monetary valuation of land plots, in particular, the method based on comparing the sale prices of similar land plots. Methods of statistical analysis of the land market can be used to determine the value of a land plot by comparing sales prices, if there is a sufficient number of sales of similar plots. The essence of this method is the application of economic-mathematical and statistical models to determine the value of a land plot based on data on sales prices and quantitative characteristics of similar land plots. One of the important mathematical mechanisms is correlation-regression analysis.

The study of forecasting the price of similar land plots is closely related to the use of the basic toolkit of vector autoregression models.

Building a vector autoregression model (VAR) is one of the most effective methods of analyzing the impact of indicators on the main macroeconomic parameters, as the VAR model makes it possible to investigate the relationship between the current values of each of the variables in the model and the current and past (lag) values of all variables that are included in the model.

The mathematical formalization of VAR is a system of econometric equations, each of which is an autoregressive distributed lag (ADL). Suppose that the j-th time series ADL (p, p) is the model for the i-th lag can be written as follows:

$$j_t^i = \alpha_0^i + \sum_{j=1}^{k} a_{1j}^i y_{t-1}^j + \sum_{j=1}^{k} a_{2j}^i y_{t-2}^j + \ldots + \sum_{j=1}^{k} a_{pj}^i y_{t-p}^j + \varepsilon_t^i \cdot \qquad (3)$$

Let us present model (3) in vector-matrix form, which is more convenient and compact. For this, we introduce a vector of time series. Then the above equations for each time series can be written in vector form:

$$y_t = a_0 + A_1 y_{t-1} + A_2 y_{t-2} + \ldots + A_p y_{t-p} + \varepsilon_t = a_0 + \sum_{m=1}^{p} A_m y_{t-m} + \varepsilon_t, \qquad (4)$$

The peculiarity and advantage of the vector autoregression (VAR-models) approach is that it makes it possible to study a system of interconnected time series without building a deterministic structural model, and to study each endogenous variable as a function of all endogenous variables of the system simultaneously and including lag values [4, p. 96].

Pre-model preparation of time series data involves the following components:

1. Deprivation of time series properties caused by the seasonal nature of the data. Mostly, the seasonality of economic data is expressed in time series that have a monthly or quarterly dimension.

2. Checking the initial indicators of dynamic series for stationarity based on the Dickey-Fuller test.

3. Carrying out correlation analysis as an important preparatory stage of modeling.

4. Analysis of causal relationships, which is implemented on the basis of the Granger test and provides additional criteria for the selection of initial data.

5. Calculation of forecast values of the model.

Correlation analysis, as an important preparatory stage of modeling, should:

- identify the indicators that have the greatest correlation dependence within their own block of indicators. This makes it possible to select the best (among similar) indicators for building a model;

- identify the indicators that have the greatest correlation dependence with the indicators of other blocks, to take into account the detected dependencies in the construction of cross-connection models.

The analysis of cause and effect relationships provides the possibility of additional selection of the criteria of the initial data and is carried out on the basis of the Granger test, according to which the cause and effect relationships between pairs of time series can be estimated by the following equations:

$$\begin{aligned} Y_t &= a_0 + a_1 y_{t-1} + a_2 y_{t-2} + \ldots + a_N y_{t-N} + b_1 x_{t-1} + \ldots + b_N x_{t-N}, \\ X_t &= a_0 + a_1 x_{t-1} + a_2 x_{t-2} + \ldots + a_N x_{t-N} + b_1 y_{t-1} + \ldots + b_N y_{t-N}, \end{aligned} \qquad (5)$$

where $a_0, a_1, \ldots, a_N$, $b_0, b_1, \ldots, b_N$ are the parameters of the equations.

The parameters of the equation are tested using the null hypothesis: $H_0 : x$ is not the cause of change y by Granger in the first equation; y is not the cause of change x by Granger in the second equation. The null hypothesis is rejected when the inequalities $F \geq F_t$ are satisfied, where F is a calculated value, F is a Fisher's test, F_t is a tabular value.

The calculated and forecasted VAR model is calculated in the econometric package EViews 11.

To build a VAR model for predicting the price of a land plot, 7 factors that significantly affect the value of a land plot were selected:

x_1 is a land area (ha);

x_2 is location (distance to the center, km);

x_3 is credit rating;

x_4 is ecological condition of the region;

x_5 is fertility of the land;

x_6 is configuration (the degree of approximation of the shape of the land plot to square or rectangular, which is close to square);

x_7 is distance to transport (km).

To build the model, you first need to check all time series for stationarity, using the advanced Dickey-Fuller test (ADF test). To bring non-stationary series to a stationary state, the difference operator method was tested.

The selected time series $Y(t)$ should be evaluated for seasonality using the standard tools of the EViews program. If necessary, seasonal fluctuations should be corrected using the SA (seasonal adjustment) procedure. Then, for the time series $Y(t)$ the extended Dickey-Fuller test is performed to check the series for stationarity. If the series turns out to be non-stationary, instead of the time series $Y(t)$ its first differences $\Delta 2Y_t = \Delta Y_t - \Delta Y_{t-1}$ or the second are used, and so on until the new series of differences turns out to be stationary.

After applying the stationarity algorithm for the selected time series, descriptive statistics (Table III.) of the time series are first provided and a correlation matrix is compiled (Table IV) to identify the most significant relationships and the subsequent selection of variables that should be included in the VAR model.

TABLE III. DESCRIPTIVE STATISTICS OF TIME SERIES

	Y	X1	X2	X3	X4	X5	X6	X7
Mean	123092	4.0520	24.940	76.300	3.1000	71.200	2.9000	3.1660
Median	128361	3.9900	17.550	79.000	3.0000	77.000	3.0000	1.950
Maximum	214321	6.5200	61.700	93.00	5.000	87.000	5.000	8.200
Minimum	49365.00	2.040000	7.200000	45.00000	1.000000	39.00000	1.000000	0.600000
Std. Dev.	52104	1.5846	18.301	14.437	1.3703	16.651	1.5951	2.7332
Skewness	0.240	0.2694	1.062	0.873	0.087	-0.87	-0.003	0.9872
Kurtosis	2.1354	1.7875	2.7677	3.1699	1.7932	2.4722	1.5555	2.4987

For calculations, we will randomly select several plots of land with different characteristics. The sources of these data are the Public Cadastral Map of Ukraine, as well as online maps of soils and the ecological situation.

In the next step, the Granger test was applied to the selected variables to identify cause-and-effect relationships between the variables and verify the correspondence of the identified relationships with the results of the correlation analysis and the economic content. We also use the Granger test to check indicators for probable exogeneity.

TABLE IV. CORRELATION MATRIX

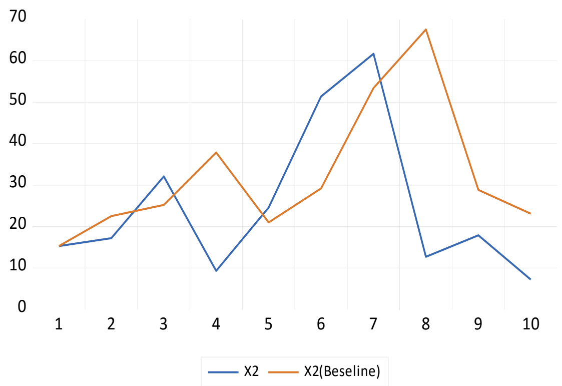
	Y	X1	X2	X3	X4	X5	X6	X7
Y	1.000	0.8757	-0.062	0.1175	0.120	0.503	0.362	0.017
X1	0.8757	1.000	0.206	-0.25	0.331	0.192	0.332	0.327
X2	-0.063	0.206	1.00	-0.694	-0.173	-0.799	0.015	0.976
X3	0.117	-0.250	-0.694	1.000	-0.3112	0.683	-0.196	-0.762
X4	0.120	0.331	-0.173	-0.310	1.000	0.062	-0.096	-0.084
X5	0.504	0.192	-0.798	0.683	0.063	1.000	-0.032	-0.778
X6	0.363	0.332	0.014	-0.196	-0.097	-0.033	1.000	0.126
X7	0.0176	0.328	0.977	-0.758	-0.083	-0.778	0.126	1.000

The basic idea of VAR is that each of the variables in the model affects each other. Differently, we can forecast the time series with its past values along with other time series in the model.

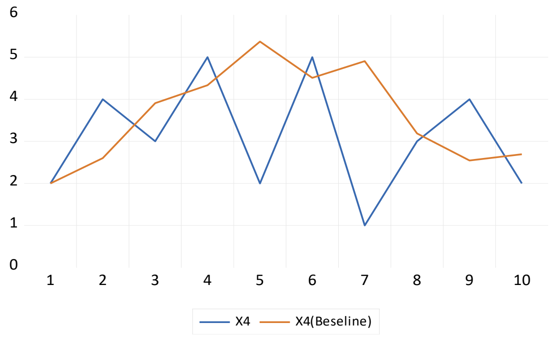
If the p-value is below the level of significance, then the corresponding x-variables reflect Y. Considering the p-value from Table 5, we can say that all the variables in the model produce each other. From the above, it can be concluded that the proposed time series and variables are important for estimation and forecasting using the VAR model.

The model for calculating forecast values can be represented by two simulation types: a dynamic simulation of the deterministic type and a stochastic method, the first method is used to compare actual (actual) and calculated (forecast) values, and the second method is to display the forecast value for the next period.

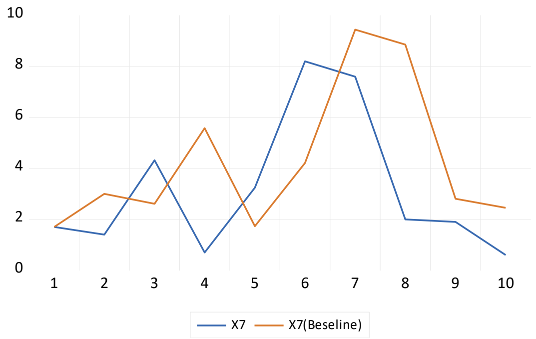
Thus, by choosing one of the simulation types, you can compare the actual (valid) and calculated (forecast) values based on the simulation of the constructed VAR model. For the convenience of data analysis in the E.Views package, the actual and calculated (forecast) values are displayed on the graphs (Figs. 3 - 4).



(a)



(b)



(c)

Fig. 3. Graphic display of actual and forecast data included in the VAR model: a - location (distance to the center, km); b - ecological condition of the region; c- distance to transport (km)

Based on the obtained graphs, it can be concluded that since our forecast is dynamic and long-term, over time, the forecasted values differ significantly from the historical (actual) values. Therefore, the model begins to reproduce the long-term averaged trend.

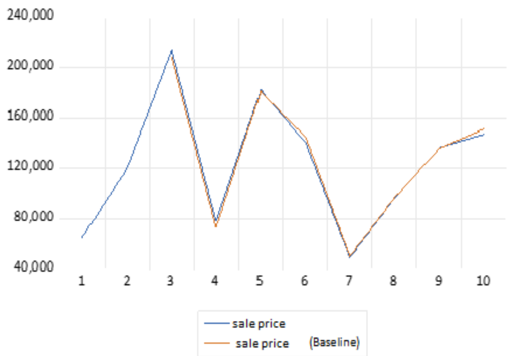


Fig. 4. Graphic display of actual and forecast data, calculated price according to the VAR model

Fig. 4 shows the solution graph of the model, which simulates the dynamics of changes in the price of agricultural land. This result is explained by the fact that after the opening of the market, more than 4 million hectares of land will be put up for sale. A large amount of supply under the condition that the majority of potential buyers are not ready to invest in the purchase of land at the first stage of the market formation will create a surplus that will exceed demand. Therefore, prices will fall during this period. The estimated cost of 1 hectare of land will be $1,500 - $1,800. In the following years, the market will gradually level out, the supply will decrease, and the price of land will rise accordingly.

III. Conclusions

A forecast of agricultural land market development indicators has been developed based on defined scenarios with different growth rates of transactions by elements of the market circulation of these lands. If we consider the optimistic scenario, it is worth noting that operations related to the sale of agricultural land and mortgage lending secured by agricultural land will have an advantage, which will have a positive effect on the growth of the productivity of agricultural production, the reduction of the unemployment rate, as well as the reduction of migration processes in rural settlements.

With the help of a vector autoregression model (VAR), forecasting for agricultural land plots was studied. It has been studied that with the opening of the land market, the majority of potential buyers will not be ready to invest in the purchase of land plots, this will lead to the creation of a surplus in the land market. Therefore, prices will fall during this period. In the following years, the market will gradually level out, the supply will decrease, and the price of land will rise accordingly.

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