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При сравнении сведений об оцениваемых товарах с соответствующими сведениями об однородных им товарах может оказаться, что отличается только количество товаров, а коммерческий уровень продажи является тем же, либо отличается только коммерческий уровень продажи, а количество товаров является тем же, либо отличаются и коммерческий уровень, и количество товаров одновременно. То есть, если одновременно будет иметься информация по каждому из указанных случаев, то приоритет выбора, какие из имеющихся данных использовать для таможенной оценки, остается за декларантом.

При применении метода 3, как и во втором методе, необходимо учитывать, что по третьему методу определяется таможенная стоимость именно ввозимых товаров – товаров, фактически пересекших таможенную границу ЕАЭС при ввозе на таможенную территорию ЕАЭС, но не помещенных ни под один из таможенных процедур, установленных таможенным законодательством Евразийского экономического союза.

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ECONOMIC AND MATHEMATICAL MODELING OF THE DEVELOPMENT OF FARMS OF THE POLTAVA REGION IN THE CONTEXT OF UKRAINE

Abstract. The article analyzes the dynamics of the development of farms in the Poltava region in the context of Ukraine. There was made an optimistic forecast of the number of farms and land use area using the trend lines.

Key words: farms, land use area, modeling, trend model, optimistic forecast.

Introduction

The strategic direction of transforming the agro-industrial complex into a competitive sector of the state's economy that is able to integrate into the international agrarian market necessitates the formation and development of those agrarian groups that would most suit the requirements of the market system.

The development of farming as one of the promising forms of farming in the countryside is an objective process that is carried out on the basis of systematic coordination of social, organizational and economic, natural, technological and technological factors of the development of market relations. Adoption of a number of normative acts on land and property, legislatively defined the status of farms as equal entities of management. The purpose of their activity is to obtain a stable profit at the expense of rational agricultural production, providing consumers of all levels with agricultural products in accordance with the quality and the range of products.

Issues of improving the efficiency of farm development and rational land use at different stages of the development of market relations are devoted to the work of scientists B. E. Grabovetsky, T. F. Dobrunik, T. V. Mazana, P. M. Makarenko, V. Ya. Mesel-Veselyak, P. T. Sableku and others.

Problem statement

The need for functioning and further effective development of farms is due to the fact that they provide replenishment of the volume and range of agricultural products; rational use of material and labor resources; saving of investments in agriculture; increase in the efficiency and productivity of land use; reduction of losses of agricultural products; the upbringing of the young generation in the spirit of diligence and morality; replenishment of the local budget, etc.

Presentation of the main research material

In the structure of agricultural enterprises, more than 70,0 % are occupied by farms. It was this form of management during the analyzed period had a clear tendency to increase in quantitative terms. The question arises why?

Firstly, the farmer is the owner and owner of the production, which carries out the function of business management. And the farmer does not have to be the owner of all means of production. Some of them, or even everything, can be obtained for use and possession in the form of lease, lease, or on any other legitimate grounds.

From the standpoint of ownership of farmers' production resources, they can be divided into the following groups:

the farmer owns all means of production, and he works on his own land;

the farmer leases a part of the land and other means of labor, and in some cases the entire land and even the entire farm.

Secondly, the farmer-entrepreneur enjoys economic sovereignty. Economic freedom, independence, freedom of action and freedom of choice are the basic and indispensable conditions for free enterprise.

The farm, both in Ukraine and in the Poltava region, is an analogue of large economic entities, although it is characterized by comparatively lower volumes of economic activity. They are characterized by all the characteristic features of agricultural production, due to complexity, diversity, unpredictability and certain risks in the processes of production, processing and marketing of products.

However, during the formation of most farms, they faced considerable difficulties:

weak orientation in the requirements of a market economy;

insufficient material and technical equipment of production (without the use of advanced technologies);

– lack of sufficiently powerful sources of funding;

lack of economic relations with partners;

– psychological and organizational failure to work in conditions of market relations [4, p. 73].

Although farms are unpreparedness a new organizational and legal form, they still have an economic link in the agricultural sector of Ukraine, along with other forms of management.

A characteristic feature of the decline in the number of farms in the current conditions can be considered insufficient price competitiveness of most types of agricultural products, which is due to the increasing technical and technological backwardness, ineffective use of production and resource potential.

To assess the efficiency of the combination and use of resources in the production process, it is necessary to analyze the final results of the activities of farms. The evidence of a certain amount of profit and the rate of profitability indicate the potential of the development of farms in the future, as well as the effectiveness of their activities. Farming continues to progress in Ukraine, despite the existence of various kinds of difficulties. Analysis of statistical data shows that the reduction of farms is on a qualitative level. The amount of agricultural land per farm is increasing. On average, one farm operates 109,2 hectares, which is twice as much as in the EU [5, p. 23].

The adaptation of farmers to a changeable, modern market environment and the overwhelming loss of stockbreeding leads to the production orientation and economic feasibility of growing crop production, which provides farmers with profit. Therefore, in the structure of farms of Ukraine and Poltava region more than 90,0 % are allocated to crop production, and only 10,0 % for livestock production.

To find out the assessment of the economic formation and development of farms, the implementation of their productive and potential activities and the search for the main ways

of their future effective development, we will analyze and analyze some calculations in the table 1.

Table 1

Dynamics of development of farms

Indicators	2012 year		2016 year		2016 p. to 2012 p., %	
	Ukraine	Poltava region	Ukraine	Poltava region	Ukraine	Poltava region
Number of farms, units	40676	1770	33682	1804	82,8	101,9
The total number of employees, persons	100243	5514	96702	5698	96,5	103,3
of them hired workers, persons	59192	3256	61361	3620	103,7	111,2
Area of agricultural land, ths. ha	4389,4	218,5	4437,9	242,8	101,1	111,1
of them arable land	4260,7	214,5	4375,2	238,6	102,7	111,2
Gross output, total, UAH million	14111,1	824,9	17234,6	1425,3	122,1	172,8
incl. in crop production	12843,1	782,4	15814,2	1312,7	123,1	167,8
in stockbreeding	1268	42,5	1420,4	112,6	112,0	save in 2,7 times
Net income, UAH million	26728,4	1562,5	89330,8	7387,6	save in 3,3 times	save in 4,7 times
incl. in crop production	24326,6	1482,0	81968,5	6804,0	save in 3,4 times	save in 4,6 times
in stockbreeding	2401,8	80,5	7362,3	583,6	save in 3,1 times	save in 7,3 times
Profitability level, %	16,3	38,6	24,9	52,4	x	x
Calculated on 1 farms						
agricultural land, ha	107,9	123,4	131,8	134,6	122,1	109,0
arable land, ha	104,7	121,2	129,9	132,3	124,0	109,1
gross output, UAH million	346,9	466,0	511,7	790,1	147,5	169,5
incl. in crop production	315,7	442,0	469,5	727,7	148,7	164,6
in stockbreeding	31,2	24,0	42,2	62,4	135,3	save in 2,6 times
Net income, UAH million	657,1	882,8	2652,2	4095,1	save in 4,0 times	save in 4,6 times
incl. in crop production	598,1	837,3	2433,6	3771,6	save in 4,1 times	save in 4,5 times
in stockbreeding	59,0	45,5	218,6	323,5	save in 3,6 times	save in 7,1 times

Source: calculated by the author according to [1; 2]

Analyzing the development of farms in table 1, it should be noted that in all indicators Poltava region has only positive dynamics. As for Ukraine, the reduction of the number of farms by 6994 units (17,2 %) did not affect the indicators of efficiency and effectiveness of agricultural activity of farms. Growth of net income by UAH 62602,4 million (in 3,3 times) in Ukraine and UAH 5825,2 million (in 4,7 times) in the Poltava region caused in an increase of profitability rate by 8,6 percentage points and 13,8 percentage points in accordance.

As should be noted that the increase in the profitability of farms in Ukraine and the Poltava region occurs in isolation from lower production costs, that is, due to the increase in selling prices for the main types of agricultural products. The agrarian sector of the economy operates a costly management mechanism. The increase in the cost price of agricultural products is driven not so much by the increase in resource intensity, but by the significant rise in material and technical and fuel and energy resources.

To further increase the profitability and profitability of production for farms is necessary to use internal capabilities to ensure and in the future to effectively use the existing production-resource potential and to carry out successful marketing activities. After all, the main source of income for most farms is the sale of manufactured products, then there is a need to develop an optimal program of agricultural production in accordance with all requirements of the market and consumers, taking into account the existing resource potential, which will optimize the profits earned per unit used in the production of all resources.

As already noted, farms favor more crop production than cattle breeding. As in the context of intensified competition, farms, both Ukraine and the Poltava region, focus on the production of products that are most profitable and in demand. Poltava region is a region of Ukraine with a well-developed production of agricultural products. In the sectoral structure of gross production in 2016, the leading place also belongs to crop production, the share – 92,1 %, the specific weight of stockbreeding is only 7,9 %.

With a detailed consideration of the development of farms in the Poltava region, there is a need for forecasting structural changes, in particular their number and average area of land use. To this end, we carried out a forecast by 2019 using an analysis of the trend lines of the number and average land use of farms in the Poltava region. The choice of the forecast for 2019 is due to the fact that forecasting is expedient to carry out for a period of no more than 3 years.

We used the state statistics of farms of the Poltava region for 1995-2016 to analyze the trend lines by the number of farms and the average area of land. In the analysis, statistical

methods were used for the analytical alignment of the series of dynamics. On the basis of establishing the general tendency of the dynamics of a series (approximating function), for the search of predictive values, functions were used: linear ($y=a_1 \cdot x+a_0$), exponential ($y=a_1 \cdot e^{(a_0 \cdot x)}$), power ($y=a_1 \cdot x^{a_0}$), logarithmic ($y=a_1 \cdot \ln(x)+a_0$) and polynomial ($y=a_1 \cdot x^2+a_1 \cdot x+a_0$), where «x» is the years of dynamics, and y is the magnitude of the predicted index.

An optimistic forecast can take place provided that further development of farms is carried out with proper credit support, state agricultural policy, reduction of tax pressure, enhanced scientific and advisory service, etc.

We have been forecasting the number of farms in the Poltava region until 2019 (Fig. 1).

As seen from the resulting graph (Fig. 1), an optimistic forecast will be achieved using all the functions, namely: exponential – 1977 units farms of the Poltava region with the accuracy of approximation $R^2 = 0,8637$, linear – 1955 units with the accuracy of approximation $R^2 = 0,8741$, power – 1896 units with the accuracy of approximation $R^2 = 0,9383$, logarithmic – 1885 units with the accuracy of approximation $R^2 = 0,9258$. And the most realistic value, though the least of the predicted ones, will be achieved due to the closest approximation $R^2 = 0,9600$ due to polynomial function – 1863 units farms of the Poltava region in 2019.

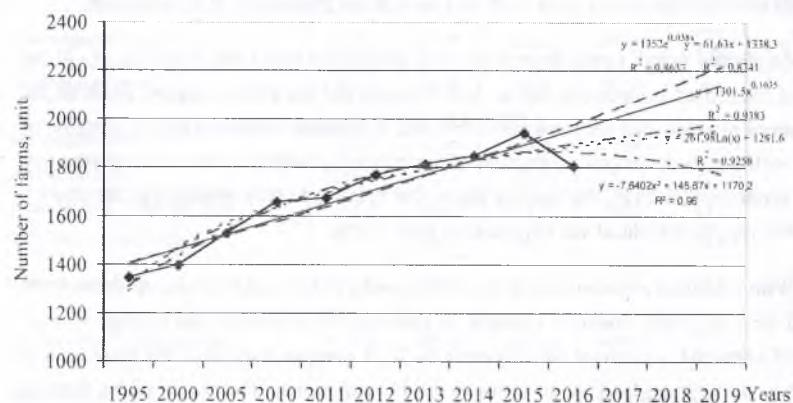


Fig. 1. The forecast of the number of farms in the Poltava region until 2019

Source: calculated by the author according to [1; 2; 3]

As to the forecast of the average area of land use, we used a similar method of forecasting using trend series. The obtained results are shown in the graph (Fig. 2).

As seen from the resulting graph (Fig. 2), the optimistic forecast of the average area of land use will also be achieved using all the functions, namely: exponential – 912 hectares with the accuracy of approximation $R^2 = 0,7084$, power – 755 hectares with the accuracy of approximation $R^2 = 0,9011$, linear – 674 hectares with the accuracy of approximation $R^2 = 0,8007$, logarithmic – 629 hectares with the accuracy of approximation $R^2 = 0,8784$. And the most realistic value, though the least of the predicted ones, will be achieved due to the closest approximation $R^2 = 0,9334$ at the expense of polynomial function – 556 ha – the average area of land use of farms in the Poltava region in 2019.

Conducted forecast shows that farms of the Poltava region until 2019 will remain the dominant form of agribusiness for the middle level of agricultural producers, with the number of farms and the average area of land use will increase. However, the average area of agricultural land will not exceed 1000 hectares, and will be assigned to the third group in the range of 100,1 hectares to 1000,0 hectares.

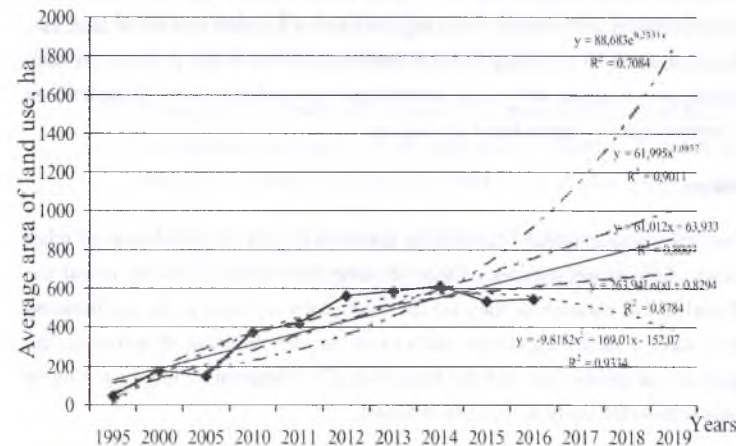


Fig. 2.

Forecast of the average area of land use of farms in the Poltava region until 2019

Source: calculated by the author according to [1; 2; 3]

More than 90,0 % of agricultural land of farms in the Poltava region is arable land. From a practical point of view, this indicates that in analyzing the effectiveness of land resources, it is advisable to focus on assessing the use of land in cultivation (arable land), which includes three components: total sown area, perlip and pairs.

There is a need to increase land, since, as already noted earlier, more than 90,0 % was allocated in farms, both in the country and in the studied area, for the production of crop production, therefore land parcels are the main basis for the effective functioning and further development of farms. Increasing the efficiency of using farmland requires the completion of land management by an organization of the territory, which requires the involvement of farmers themselves.

Problems of land management are complicated by the fact that most of the land in use – these are leased land and those used in oral arrangement. Since the rent allows farmers to optimize land use, in particular by combining part of land shares into large production facilities, but short-term lease terms affect the effectiveness of their use.

The conducted studies indicate that most farms in the Poltava region are dominated by short-term lease terms up to 5 years. For the organization of efficient and stable land use, this is a significant obstacle to investing in land improvements. It is not possible on such massifs to introduce crop rotation, and to use scientifically grounded systems of agriculture with innovative technologies of agricultural production.

Conclusions

Therefore, farms have already confidently taken their place in the context of other agrarian enterprises, but certain features of their development do not allow to reveal the production potential in full measure as they are the least protected units in the agribusiness environment, they have a rather significant analysis of the development of activities, the evaluation of agricultural production and the formation of a competitive, highly profitable structure of production on the basis of the data obtained.

As for the situation on the land market, it is characterized as unstable. The main reason for the instability of this market lies in the abolition of the state. Moreover, this attitude is observed since the beginning of land reforms. Meanwhile, as the experience of countries shows, in any agreement with the land the state must be invisible present. In this issue, it is

necessary to proceed from the necessity of creating a mechanism for the transfer of land from owners who inefficiently use agricultural land, to others that can more efficiently produce production.

Successful implementation of the land mortgage mechanism will help stabilize employment, reduce the size of the labor market in rural areas, and increase real incomes of the employed population. With regard to land relations, at first their improvement should be directed, to the formation of a mechanism for market turnover of land, the creation and consolidation of farms by combining the land shares of the members of these enterprises.

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