TOTAL PRODUCTION OF FARMS " HOLT WINTER SEASONAL " FORECASTING THROUGH THE MODEL FOR 2022-2026

Mamatkulov Bakhtiyor Khalmuradovich
Tashkent Institute of Finance Professor of the Department of "Statistics and Econometrics " , candidate of economic sciences
phone: +99890-910-74-28
email: bmamatkulov@gmail.com
https://doi.org/10.5281/zenodo.7543267

Annotatsiya. Maqolada fermer xo‘jaliklarining yalpi ishlab chiqarish hajmini “Holt Winter Seasonal” modeli orqali 2022-2026 yillarga prognozlashtirish ko‘rsatkichlari bayon etilgan. Jumaladan, mamlakatimiz hududlari kesimida fermer xo‘jaliklari yalpi ishlab chiqarish hajmini oshirish bo‘yicha xulosalar qilinib, taklif va tavsiyalar berilgan.

Аннотатsiя. В статье описаны показатели прогнозирования объема валовой продукции фермерских хозяйств на 2022-2026 годы с использованием модели «Holt Winter Seasonal». В частности, сделаны выводы по увеличению объема валовой продукции фермерских хозяйств в регионах нашей страны, даны предложения и рекомендации.

Abstract. The article describes the indicators of forecasting the gross production volume of farms for 2022-2026 using the "Holt Winter Seasonal" model. In particular, conclusions were made on increasing the gross production volume of farms in the regions of our country; suggestions and recommendations were made.

Kalit so‘zlar: Qishloq xo‘jaligi, fermer xo‘jaliklari, yalpi ishlab chiqarish, “Holt Winter Seasonal” modeli, prognozlashtirish.

Ключевые слова: Сельское хозяйство, фермерские хозяйства, валовое производство, модель "Holt Winter Seasonal", прогнозирование

Keywords: Agriculture , Farms , Gross Production , Holt Winter Seasonal Model , Forecasting

INTRODUCTION

In the economic development of our country, the economy of agriculture, forestry and fisheries are becoming important. Our country is rapidly implementing economic reforms in the fields of agriculture, forestry and fisheries. The organizational and legal basis of the Farmer economy was strengthened by the Law of the Republic of Uzbekistan "On the Farmer economy" (Appeal 30, 1998). Based on these laws, a number of government decisions on the further development of the agricultural sector have been adopted and is being implemented. According to the new law of the Oliy Majlis of the Republic of Uzbekistan on August 26, 2004, "Farmer farm is engaged in the development of agricultural crops using the cultivated land." It was started to be shortened as a growing independent economic uniting entity" [pages 2, 4].

Quantitative assessment of the dynamics of the efficiency of farm activities on farms in the Republic of Uzbekistan and Comprehensive measures are being taken to radically improve the environment, increase the quality and reliability of statistical data. "Improvement of methodological bases and management principles used within the framework of the entire national statistical system of the country for the purpose of production, distribution and

coordination of official statistics" [1][pages 2, 3] is defined as one of the priority areas of improvement of the national statistical system.

2021 No. O'RQ-707 - "The multi-year statistical program will be developed for the national statistical system as a whole and the directions of strategic development of official statistics" defines.

The long-term statistical program consists of the concept, strategic goals and priorities of the development of the national statistical system, as well as mechanisms for the implementation of programmatic measures for the development of official statistics" [2][1, 2 pages].

Increasing the efficiency of the farm by quantitative assessment of the production of products, as well as the production of food products through the processing of the grown products, provides an opportunity to determine the market demand for ready-made food products. Therefore, the topic chosen for the article is relevant.

LITERATURE ANALYSIS AND METHODS

Farmer in the field of agriculture, forestry and fisheries, scientific-theoretical, methodological and practical aspects of improving the methods of statistical evaluation of the efficiency of economic support mechanisms of farms have always been in the focus of attention of scientists and practitioners. The farmer efficiency of economic support mechanisms of farms made a great contribution to the formation, adaptation and development of the theory. Farmer statistical evaluation of the effectiveness of economic support mechanisms of farms , econometric modeling and quantitative study issues have been of priority importance in scientific developments and practical applications. This problem was addressed by M.V. Braslaves, M. S. Krass, N. M. Xarchenko, V. A. Kundius, I. N. Chuyev. From the CIS scientists Dubina and other economists have paid special attention to their research work.

Farmers in the field of agriculture, forestry and fisheries in the Republic of Uzbekistan scientists A. Abdugafurov, B. Ataniyazov, B. B. Berkinov, N. M. Makhmudov, Yo. Abdullayev, B. A. Begalov, B. K. G'ayibnazarov , K. S. Safayeva, B. T. Salimov, B. Yu. Khodiyev, T. F. Farmonov, R. Khusanov, Sh. R. Kholmuminov, T.Sh. Shodiyev, Kh. Shodiyev, S. S. Gulomov and others made a significant contribution. The scientific research work of these scientists, farmer in the field of agriculture, forestry and fisheries is of great theoretical and practical importance in finding the most effective ways to increase the efficiency of farm activities, improve the effective use of production resources, and reduce production costs. However, it should be emphasized that the scientific researches and methodological developments carried out by these scientists has not been studied in terms of improving the methods of statistical evaluation of the efficiency of economic support mechanisms of farms . Taking into account this, farmer as economic entities that have a place in the field of agriculture, forestry and fisheries economy of farms. The topic of this doctoral thesis, based on the development trends of support mechanisms , the factors affecting the gross production volume, their incomes, and the econometric methods of increasing the effectiveness of their activities on this basis, is relevant at the current stage of reforms.

RESULTS

[1]"Decree of the President of the Republic of Uzbekistan dated August 3, 2020 Resolution No. PQ-4796 " On measures to further improve and develop the national statistics system ".

[2] Law of the Republic of Uzbekistan "On Official Statistics" No. ORQ-707. 2021 year. August 11.

Modernization of the economy in the agricultural sector of our republic requires the introduction of market principles, ensuring the compatibility of production and sales processes. The main task today is to increase the competitiveness of economic entities by creating a competitive environment in the network , to achieve a balance of demand and supply in product production, and to widely introduce effective mechanisms for selling it in the domestic and foreign markets.

Smoothing methods are defined based on levels, with levels ranging from 0 to 1. Three types of smoothing are widely used in scientific research: exponential smoothing, double exponential smoothing , and Holt Winter seasonal smoothing .

In the exponential smoothing method, it only αparticipates and determines the smoothing level of the method, which is expressed as follows:

$$\hat{x} = \alpha x_t + \alpha(1-\alpha)x_{t-1} + \alpha(1-\alpha)^2 x_{t-2} + .. ()$$

Double exponential smoothing , Holt Winter seasonal smoothing types are expressed in the same way.

equation (2) as (t-1) and multiply both sides by (1- α), the following equation is formed:

$$(1-\widehat{\alpha})x_{t-1} = \alpha(1-\alpha)x_{t-1} + \alpha(1-\alpha)^2 x_{t-2} + \alpha(1-\alpha)^3 x_{t-3} + .. ()$$

By subtracting the second equation from equation (3), we get the following equation:

$$\widehat{x_t} = (1-\widehat{\alpha})x_{t-1} + \alpha x_t \; 0 < \alpha < 1$$

This equation is the final equation of exponential smoothing, and the $\widehat{x_t}$predicted values are the $x_t$true level.

Double exponential smoothing In the method, the trend level is added along with the smoothing level. It is appropriate to use the Double Exponential Smoothing method when the indicator you are forecasting tends to trend .

$$\hat{x}_t = (1-\alpha)(\hat{x}_{t-1} + T_{t-1}) + \alpha x_t \quad (0 < \alpha < 1)$$
$$T_t = (1-\beta)T_{t-1} + \beta(\hat{x}_t - \hat{x}_{t-1}) \quad (0 < \beta < 1)$$

Holt Winter seasonal grinding method is defined as follows.

$$\hat{x}_t = (1-\alpha)(\hat{x}_{t-1} + T_{t-1}) + \alpha\frac{x_t}{F_{t-s}} \quad (0 < \alpha < 1)$$
$$T_t = (1-\beta)T_{t-1} + \beta(\hat{x}_t - \hat{x}_{t-1}) \quad (0 < \beta < 1)$$
$$F_t = (1-\gamma)F_{t-s} + \gamma\frac{x_t}{\hat{x}_t} \quad (0 < \gamma < 1)$$

In thisα trend level, means βtrend level, γseasonality level. If there is a trend and seasonality in the researched indicator, the Holt Winter seasonal smoothing method is the most appropriate, even so, as we mentioned earlier, we used three trend methods and one smoothing method and compared their errors by MAPE, MAD and MSD. , we select the most optimal model and develop forecast values based on this model according to the data of Table 1.

Table 1

Gross production of farms based on forecast scenarios Forecast for 2022-2026 through [3]Holt Winter seasonal program

Years	Pessimistic forecast billion soums	Average forecast billion soums	An optimistic forecast billion soums
2022	84391	92277	100163
2023	101419	110109	118798
2024	104699	114358	124016
2025	122894	133640	144387
2026	124516	136438	148360

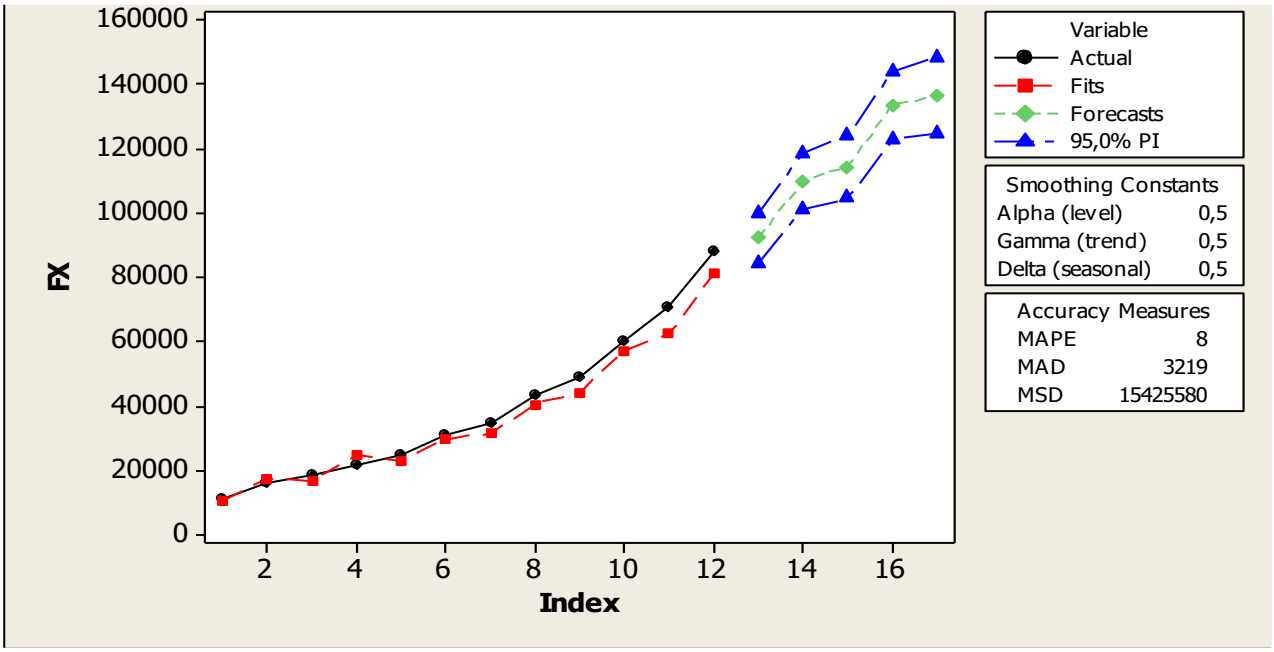

Diagram 2. Gross production of farms " Holt Winter seasonal " forecast for 2022-2026 through the tuberculosis program[4]

Gross production volume of farms "Holt Winter seasonal" as a result of forecasting for 2022-2026 using the method, several forecasting scenarios were developed based on the factors affecting it. Based on the forecast scenarios, the gross production of farms in 2026 is 124,516 billion soums according to the pessimistic forecast, 136,438 billion soums according to the average forecast, and 148,360 billion soums according to the optimistic forecast. it was determined that it was formed. (diagram 2)

In the conditions of modernization of the economy, the tasks of the state in the formation and development of the competitive environment are to adopt legal and regulatory documents, to improve the mechanisms for the implementation of organizational-economic, social-ecological and other measures, to develop infrastructure entities serving farms. is to serve development.

[3] Calculations of scientific and research results of the author.
[4] Calculations of scientific and research results of the author.

The stage of modernization of the country, the main indicator in the production of agricultural products is to sell them at high prices, and on this basis, the production of products according to market (buyer) demand is gaining special importance. Farmers are increasingly realizing that during the transition to a market economy, the main focus should be on the development of product marketing. This, in turn, requires an increase in product competitiveness.

DISCUSSION

It is known that the agriculture, forestry and fisheries industry plays an important role in providing the population with food products and raw materials for industry, and the results of the economic reforms carried out in this area in recent years and the effectiveness of the measures stable economic growth is being ensured as a result of its successful implementation.

This situation requires the development of production of raw materials, food products and consumer goods in the republic. In order to solve these problems, first of all, it is necessary to ensure the proportional development of agricultural production and services and processing industries that are integrally connected with it, and then the production of ready-made food products and their it is necessary to ensure organizational, technical, technological, economic and social connection of networks that deliver to consumers. It can be seen that for the sustainable development of agriculture, to increase its efficiency, it needs new agricultural machines, techniques, transport and chemical means, mineral fertilizers, fuel and lubricants, construction materials, foodstuffs. It is necessary to provide fully and proportionally with it and build a solid material and technical base. Therefore, the future development of agriculture is directly related to the activity of industries that produce the means of production necessary for it, as well as the development of the agrarian sector that serves it, that is, agricultural enterprises with means of production. It also depends on the activities of the industries that repair mining, machine-tractor and other equipment in the network, construct economic facilities, provide irrigation-melioration and chemical, transport services.

Our country takes a leading place among the CIS countries in the production of agricultural products. However, the lack of enterprises engaged in the storage, processing, and packaging of agricultural products is an obstacle to increasing the employment of rural workers. Therefore, in order to increase the demand for labor, create jobs in processing, storage, purchase of agricultural products, agroservice, agrochemical service, expand and renovate existing enterprises for people who are temporarily out of work in the agricultural sector, and the creation of new jobs is a targeted way to stimulate the growth of domestic and foreign direct investment.

The results achieved by farms confirm that they are one of the most effective forms of production organization in the agricultural sector. However, our experience gained over the past period required solving a number of important tasks for the rapid development of farms, including issues related to increasing their financial stability, competitiveness and economic efficiency.

At present, life itself confirms that farms are the most effective form of organizing the production of agricultural products. In our country , reliable systems and mechanisms for material and technical provision and financing of farms that fully meet the principles of economic modernization have been formed and are successfully operating.

It is necessary to determine the indicators and factors affecting the formation and development of the competitive environment in the farm, and to consider the degree and possibility of each indicator and factor influencing the formation of this environment.

Imperfection of regulations related to the formation of a competitive environment in the farm is considered one of the main factors that negatively affect the competition between producers. Although the law "On restriction of monopolistic activities and competition in commodity markets" adopted in the republic is considered a legal document that ensures the development of competition processes in industries, but it does not take into account the competition processes related to the characteristics of agriculture.

CONCLUSION

- It is appropriate to implement suggestions and recommendations for improving the activities of farms based on the application of statistical evaluation and forecasting;
- it is necessary to create the principles of quantitative measurement of production efficiency in the objective assessment of economic activity and the conceptual basis of managing total, average and marginal costs in the statistical assessment of the gross production volume of farms;
- it is necessary to include symmetric, asymmetric, empirical distribution functions, recursive dynamic models, calculation methodology of production functions according to efficiency indicators of farms;
- it is necessary to implement the exponential method in order to predict the stable and competitive economic development of farms;
- it is necessary to introduce a statistical evaluation algorithm of allocative efficiency through the value of the final product and a multi-level functional system of management of operating costs in agriculture;
- it is necessary to widely use econometric models of marginal income, marginal cost, marginal profit indicators in the distribution of resources, in order to increase the efficiency of the farms of our republic, to draw up development programs in the agrarian sector, to determine the efficiency of gross production;
- on the basis of the practical implementation of the marginal approach, it is necessary to improve the forecasts obtained from the results of statistical evaluation of the efficiency of farm activities, economic development, and positive trends on the basis of scenarios.

Today, in the Republic of Uzbekistan, by improving the methods of statistical evaluation of the effectiveness of mechanisms of economic support for farms, identifying the positive and negative factors that affect the gross production of farms, their income, and the level of efficiency of their activities, in some regions of our republic elimination of emerging problematic situations and statistical and econometric assessment of economic activity should remain one of the main directions of the reform strategy.

References:

1.Law of the Republic of Uzbekistan "On Official Statistics" No. ORQ-707. 2021 year. August 11 . www.lex.uz

2.The new law of the Oliy Majlis of the Republic of Uzbekistan on August 26, 2004 on "Fepmep economy". www.lex.uz

3.Uzbekistan dated August 3, 2020 Resolution No. PQ-4796 " On measures to further improve and develop the national statistics system ". www.lex.uz. _

4.BX Mamatkulov. Statistical analysis of factors affecting the volume of grooming p roduction of farms // South A sian J ournal of M arketing & M anagement R esearch (SAJMMR)SSN: 2249-877X Vol. 11, Issue 1, January 2021, Impact Factor: SJIF 2021= 7.642 https: //saarj.com DOI NUMBER: 10.5958/2249-877X.2021.00005.9
5.Shodiyev H. and Khabibullayev I. Statistics: Textbook//. - T.: "ECONOMY-FINANCE" , 2019 - 454 pages
6.Hudayberdiyev U. Statistics. Study guide. // Samarkand, SamISI, 2019, 245 pages
7.Saidakhmedov OA Improvement of the economic mechanism of agricultural sector management. "Dissertation". -T.: 2012.12 b et.
8.Soatov NM, Tillakhojayeva GN Statistics. Textbook. T: - TDIU. 2011, 535 pp .
9.Korolyov B.Yu. i.dr. Management v APK. Textbook. Russia.: 2007. 51 s tr.
10.www. stat.uz - The official website of the State Statistics Committee of the Republic of Uzbekistan .