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CONTACTS

Phone: **+998 50 737 87 88**

Website: https://ist-journal.uz

Email: innovationist2025@gmail.com

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CONTENTS

USE OF ECONOMETRIC FORECAST INDICATORS IN MANAGING THE COMPETITIVENESS OF FOOD INDUSTRY ENTERPRISES

Xusanova Gavhar
Shahrisabz State Pedagogical Institute
Deputy Dean, Faculty of Pedagogy
ORCID: 0009-0008-7894-1851
Email: xusanovagavhar27@gmail.com

Abstract: The article examines the use of econometric forecast indicators in managing the competitiveness of food industry enterprises. The study highlights the importance of econometric methods in determining market positions, analyzing the competitive environment, and making strategic decisions. It also explores ways to improve production efficiency, set pricing policies, and optimize resource utilization based on forecast indicators. The findings are of practical significance for enhancing the competitiveness of food industry enterprises and scientifically improving management processes.

Key words: food industry, management, control mechanism, control object, influencing factors.

Annotatsiya: Mazkur maqolada oziq-ovqat sanoati korxonalarining raqobatbardoshligini boshqarishda ekonometriya prognoz ko‘rsatkichlaridan foydalanish masalalari tadqiq qilingan. Tadqiqotda korxonalarning bozor pozitsiyasini aniqlash, raqobat sharoitlarini tahlil qilish va strategik qarorlar qabul qilish jarayonida ekonometriya usullarining ahamiyati yoritilgan. Shuningdek, prognoz ko‘rsatkichlar asosida ishlab chiqarish samaradorligini oshirish, narx siyosatini belgilash va resurslardan optimal foydalanish yo‘llari ko‘rib chiqilgan. Maqola natijalari oziq-ovqat sanoati korxonalarining raqobatbardoshligini oshirish va boshqaruv jarayonlarini ilmiy asosda takomillashtirishda amaliy ahamiyat kasb etadi.

Kalit so‘zlar: oziq-ovqat sanoati, boshqaruv, boshqarish mexanizmi, boshqaruv obyekti, ta’sir etuvchi omillar.

Аннотация: В статье рассматриваются вопросы использования эконометрических прогностических показателей при управлении конкурентоспособностью предприятий пищевой промышленности. Исследуется значение эконометрических методов для определения рыночных позиций предприятий, анализа конкурентной среды и принятия стратегических решений. Также рассматриваются способы повышения эффективности производства, формирования ценовой политики и оптимального использования ресурсов на основе прогностических показателей. Полученные результаты имеют практическое значение для повышения конкурентоспособности предприятий пищевой промышленности и совершенствования управленческих процессов на научной основе.

Ключевые слова: пищевая промышленност, менеджмент, механизм управления, объект управления, влияющие факторы.

INTRODUCTION

It is necessary to acknowledge the positive transformations taking place in our national economy and the resulting improvement in the living standards of our population. Economic policy, through the implementation of large-scale socio-economic programs, is creating a solid foundation for the development of industrial sectors. In particular, during the years of independence, the food industry has entered a stage of genuine development in our country. Today, this sector has evolved into a high-technology industry. As a result, the provision of high-quality food products to the population has been steadily increasing, ensuring food security for our society.

Various food industry enterprises are designed to meet the population’s demand for essential food products. At present, the food industry holds significant socio-economic importance, and its condition reflects the standard of living in different countries around the world. The current global situation is characterized, on the one hand, by the presence of hundreds of millions of hungry people in developing countries and, on the

other hand, by overproduction of food in developed countries. This situation creates diverse challenges in managing and developing food-producing enterprises. Therefore, studying the methods and mechanisms for managing the activities of food industry enterprises is of considerable scientific and practical importance for the modern economy.

In addition to regional structural factors, scientific and technological progress also has a significant impact on industrial development. This influence is evident throughout the entire chain of production and management within industrial enterprises. Comprehensive automation of production processes not only preserves the quality of food products but also enhances enterprise management and overall production performance. Scientific and technological advancement facilitates the transition of industrial enterprises to an innovative development path and supports the creation and implementation of managerial and technological innovations.

REVIEW OF LITERATURE ON THE SUBJECT

Today, scientific research is being conducted in our country to develop the food industry and improve its management mechanisms. Within the framework of the ongoing research, local scholar N.M. Ziyavitdinova has examined issues related to the formation of market strategies in food industry enterprises, the development of directions for their growth, and the improvement of the organizational structure of sectoral management[1].

In the studies of I.Yu. Umarov, methodological approaches for assessing the economic potential of food industry enterprises have been developed and analyzed. The financial and economic potential of food industry enterprises in the regions has also been evaluated from a practical perspective[2].

Among foreign researchers, Bitner H., Drucker P.F., McKean D., Mann D., Sfaim R., Stevenson V.J., Thompson A.A., Webster F., and others have conducted studies on improving management mechanisms in the industrial sector, including the food industry, as well as on developing the sector based on vertical and horizontal cluster approaches[3].

In our view, assessing the impact of various factors on the competitiveness and risk management processes of food industry enterprises, evaluating the influence of seasonality on their operations, and improving management mechanisms in the food industry will shorten the sector's development cycle and increase economic efficiency indicators.

RESEARCH METHODOLOGY

The study comprehensively examined the performance indicators of food industry enterprises on the basis of monographic research, both theoretically and practically. Using official statistical data and the EViews 10 software package, an econometric model was developed based on time series data, including key indicators such as the number of management personnel, management costs, capital investments, and related influencing factors. Trends in the main parameter were assessed, and short-term forecast indicators were determined. In conducting the research, scientific abstraction, correlation-regression analysis, as well as methods of analysis and synthesis were applied as the core methodological tools.

ANALYSIS AND RESULTS

As of the end of 2024, Uzbekistan's foreign trade turnover amounted to 65.9 billion US dollars, representing a 3.8% increase compared to 2023. Within this figure, exports totaled 26.9 billion dollars, while imports reached 39.0 billion dollars, and the negative trade balance decreased compared to the previous year. This growth serves as an important statistical indicator demonstrating the effectiveness of the economic and foreign trade reforms being implemented in the country.

All of these statistical data further highlight the relevance of developing effective management mechanisms for food industry enterprises, encouraging scientific and practical interest in studying methods for the efficient use of their resource base, as well as identifying promising directions and institutional features of sectoral transformation. This area remains insufficiently explored in domestic academic research and practice, which underscores the relevance of the present study.

In food industry enterprises, the volume of net profit was defined as the peak of the production function, that is, as the resultative factor. Based on expert assessments, the following indicators were selected as explanatory variables influencing net profit:

1 Ziyavitdinova N.M. Oziq-ovqat sanoati korxonalari faoliyatin iqtisodiy samaradorligini oshirish. Diss. i.f.n. Bux oz.ov YeSTI 155 b. B. – 2006.
2 Umarov I.Yu. Oziq-ovqat sanoatida tadbirkorlik faoliyatini rivojlantirish (Andijon viloyati misolida). Diss. i.f.n. AMII 149 b. A. – 2009
3 Полухин А.А. Организатсионно-экономический механизм модернизатсии селского хозяйства России/ А.А. Полухин// Аграрная Россия. – 2012 - №5 с. 23-29

X1 – volume of produced output;
X2 – fixed costs;
X3 – value of working capital.

Modeling net profit in enterprises operating in Uzbekistan's food industry can be carried out using models that reflect production trends, tendencies, and time series patterns observed in the sector. In the course of the study, the trends in net profit and selected influencing indicators for three food industry enterprises operating in the Fergana region were analyzed for the period 2017–2024 (Table 1).

Table 1. Net profit and influencing factor indicators at "Madad Fayz" LLC (million UZS)[4]

Years	Net profit, mln UZS (Y)	Output volume, mln UZS (X1)	Fixed costs, mln UZS (X2)	Working capital value, mln UZS (X3)
2017	285.2	1124.0	164.4	250
2018	350.4	1397.5	208.6	350
2017	402.5	1568.0	224.7	410
2018	521.6	1951.0	258.8	480
2019	603.7	2313.5	321.7	300
2020	680.6	2553.5	340.8	460
2021	718.4	2717.2	368.5	500
2022	896.2	3304.7	425.7	550
2023	754.3	2688.7	321.2	650
2024	920.5	3458.2	462.8	700

In the econometric model, net profit (Y) was selected as the dependent variable, while output volume (X1), fixed costs (X2), and working capital value (X3) were chosen as exogenous explanatory variables.

For this enterprise, both the resultative and influencing factors exhibited certain fluctuations during 2017–2024, shaped by market conditions and the impact of the pandemic that began in 2020. From an analytical perspective, the relationship between the endogenous variable and its exogenous determinants—namely output volume, fixed costs, and working capital value—demonstrates a functional form close to the Cobb-Douglas production model. Based on the interaction between the selected endogenous and exogenous variables, the time series data presented above were analyzed using the EViews 10 software package in order to identify trends in net profit at "Madad Fayz" LLC.

Correlation and regression analysis of the factor parameters presented in the above table, as well as the development of multifactor models for the growth of net profit for each enterprise, were carried out separately for individual enterprises.

In the case of "Madad Fayz" LLC, the degree of pairwise correlation between net profit and its influencing factors was examined through correlation analysis. The results show that the density of the relationship between the dependent variable and the explanatory variables satisfies the necessary condition:

ryx1 = 0.9815, ryx2 = 0.9777, and ryx3 = 0.8291.

In all three cases, the pairwise correlation coefficients indicate a strong relationship, confirming that the selected explanatory variables were appropriately chosen in relation to the dependent variable (Table 2).

Table 2. Correlation matrix of selected variables at "Madad Fayz" LLC[5]

	y	x1	x2	x3
y	1			
x1	0.981516	1		
x2	0.977721	0.938672	1	
x3	0.829093	0.843622	0.759304	1

Since the measurement units of the selected dependent and explanatory variables are not identical—that is, the variables are heterogeneous—the main trend model was specified in the form of a linear logarithmic relationship. For this purpose, all variables were transformed into their natural logarithmic values (Table 3).

4 Source: Author's own development.
5 Source: Author's own development.

Table 3. Logarithmic values of net profit and influencing factors at "Madad Fayz" LLC[6]

Year	LnY	LnX1	LnX2	LnX3
2017	5.65	1.95	5.10	5.52
2018	5.86	2.08	5.34	5.86
2017	6.00	2.20	5.41	6.02
2018	6.26	2.64	5.56	6.17
2019	6.40	2.77	5.77	5.70
2020	6.52	3.00	5.83	6.13
2021	6.58	3.09	5.91	6.21
2022	6.80	3.18	6.05	6.31
2023	6.63	3.18	5.77	6.48
2024	6.82	3.26	6.14	6.55

Using the EViews 10 software package, the regression analysis identified the model parameters, and the significance of the model was evaluated based on the main statistical indicators calculated by the program.

Based on the regression analysis results, the estimated coefficients of the regression model were extracted and used to construct the logarithmic trend model for the case under consideration.

Using the identified data, a multifactor econometric model describing the change in net profit at "Madad Fayz" LLC under the influence of the selected factors was constructed. Accordingly, a regression equation representing this process was estimated (Table 4).

$$LnY = 0,413 \cdot LnX_1 + 0,539 \cdot LnX_2 + 0,082 \cdot LnX_3 + 1,657$$

Table 4. Main indicators characterizing the relationship among selected factors and the quality of the constructed model for "Madad Fayz" LLC[7]

Dependent Variable: Net Profit (LnY),
LnY
Method: Least Squares
Date: 10/12/25 Time: 19:26
Sample: 2017 2024
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Output volume, LnX1	0.413030	0.091581	4.509989	0.0041
Fixed costs, LnX2	0.538545	0.126091	4.271088	0.0053
Working capital value, LnX3	0.082349	0.063527	1.296282	0.2425
Constant term (ε)	1.657205	0.591479	2.801801	0.0311

R-squared	0.994343	Mean dependent var	6.352000
Adjusted R-squared	0.991515	S.D. dependent var	0.400938
S.E. of regression	0.036933	Akaike info criterion	-3.470259
Sum squared resid	0.008184	Schwarz criterion	-3.349225
Log likelihood	21.35129	Hannan-Quinn criter.	-3.603033
F-statistic	351.5499	Durbin-Watson stat	2.166102
Prob(F-statistic)	0.000015		

After exponentiating the estimated linear logarithmic model, the econometric model of net profit for the enterprise was obtained in multiplicative form.

$$Y = X_1^{0,413} \cdot X_2^{0,539} \cdot X_3^{0,082} \cdot e^{1,657} Y = X_1^{0,413} \cdot X_2^{0,539} \cdot X_3^{0,082} \cdot e^{1,657}$$

The reliability and adequacy of the constructed model and its parameters were verified using several statistical criteria to ensure the accuracy of the results.

The calculated Fisher criterion (F-statistic) for the endogenous variable equals 351.55, with a significance level of 0.00015. This indicates that the constructed trend model is statistically significant and can be applied in practice.

6 Source: Author's own development.
7 Developed by the author based on calculations performed in the EViews 10 software package.

The quality of the model was also assessed using the Akaike Information Criterion (−3.47), Schwarz Criterion (−3.35), and Hannan-Quinn Criterion (−3.60). The obtained values confirm the suitability of the trend model.

The Durbin-Watson (DW) statistic equals 2.17. Considering that the optimal value is approximately 2.0, this suggests a relatively high-quality model with a low level of autocorrelation.

Using the EViews 10 software package, the trend of net profit at "Madad Fayz" LLC for the period 2012–2021 was constructed within ±2 statistical error bounds, and the corresponding forecast accuracy indicators were evaluated. In particular, the Theil inequality coefficient equals 0.0022, Theil U2 coefficient equals 0.16, Bias proportion equals 0, Variance proportion equals 0.0014, Covariance proportion equals 0.9986, and symmetric MAPE equals 0.3925. These values indicate that the model lies within the required confidence intervals.

Specifically, considering that the acceptable threshold for symmetric MAPE is up to 10, the forecasting error remains well below the limit, since 0.3925 < 10.

When evaluating the model describing changes in net profit at "Madad Fayz" LLC under the influence of selected factors, it is also advisable to use a graph of residuals, actual values, and fitted model values (Table 5).

Table 5. Forecasts of net profit and management performance indicators at "Madad Fayz" LLC for 2025–2029[8]

Years	Net profit, mln UZS (Y)	Output volume, mln UZS (X1)	Fixed costs, mln UZS (X2)	Working capital value, mln UZS (X3)
2025	1001.0	3683.2	470.6	701
2026	1061.6	3933.4	499.8	744
2027	1142.8	4183.5	529.1	786
2028	1210.3	4433.6	558.3	829
2029	1279.2	4683.7	587.6	872

Based on the regression coefficients of the multifactor model constructed for "Madad Fayz" LLC, it is possible to assess the degree of influence of each variable on the dependent variable. The increase in output volume, fixed costs, and working capital value demonstrates a direct relationship with changes in net profit.

In managing its operations, this food production enterprise should rely on the developed multifactor model and focus on the following:

· It may increase the number of management personnel up to a certain level without increasing management costs. According to the model, an increase in the number of management personnel contributes to the growth of net profit; however, an increase in management expenses leads to a decline in the resulting indicator.

· Attracting additional investments based on the existing resource base also leads to further growth in net profit. However, the magnitude of this additional growth is not substantial, indicating that within the existing production capacity, the enterprise's production cycles have reached the investment saturation phase.

When applying the constructed trend model, it is important from a managerial perspective to determine the volume of introduced resources (exogenous factors) by taking into account the marginal return obtained from each additional unit of resource. This approach allows for optimal resource efficiency and ensures balanced and sustainable enterprise development.

CONCLUSIONS AND SUGGESTIONS

Based on econometric forecasting of the factors influencing the management mechanism of food industry enterprises and their specific characteristics, the following conclusions can be drawn:

· Demand for food products has consistently remained high and is expected to continue increasing. Therefore, considering resource and other influencing factors based on econometric forecasting, it is necessary to further develop entrepreneurial activity in this sector.

· In agriculture, which serves as the raw material base for food enterprises, state support for small industrial enterprises should be determined in advance based on forecast indicators, along with the provision of additional incentives and assistance.

· The system for improving the production capacity, knowledge, and qualifications of food industry enterprises should be updated and enhanced.

The technical and economic modernization of the national economy, further development of all branches of the food industry, and improvement of production efficiency require increasing the volume of competitive

8 Source: Author's own development.

products that meet the demands of both domestic and foreign markets. Therefore, greater attention is being paid to managing the growth of food production volumes based on forecast indicators.

According to statistical data, the share of food product exports in total national exports amounted to 8.3% in 2021. Considering that the country produces large quantities of horticultural and melon products, this share remains relatively low compared to its export potential. In this regard, it is necessary to conduct analytical research into the challenges hindering the rapid development of the food industry.

Based on the analysis of the research results, it can be emphasized that the most important condition for managing any system is its stability, ensured by the existence of a system operating under defined rules and decisions. Managing food industry enterprises based on forecasting enables the maintenance of price equilibrium stability and ensures the uninterrupted operation of enterprises. As a result, the continuous demand of the population for food products can be effectively satisfied.

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