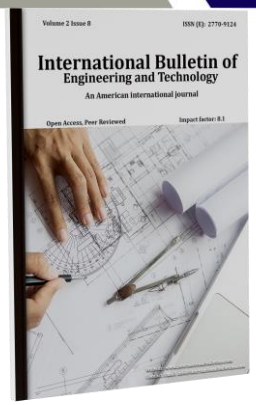

INDUSTRY ECONOMIC MODEL AS THE BASIS OF FORECAST CALCULATIONS

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Annotation. The paper proposes a methodology for analytical forecasting and planning, which, according to the authors, contributes to the improvement of the modeling of the production process of the grape and wine sector of the economy.

Keywords. Modeling, forecasting, model, analytical calculation

In recent years, in the economic strategy of the Republic of Uzbekistan, more and more importance is attached to the development of industries related to agriculture. Farmers and dekhkan farms are provided with more opportunities to independently control their own development, thereby ensuring the availability of basic food products, in the domestic market, observing the country's food security. The achievement of the set goals is facilitated by the Decree of the President of 03.03.2018 UE No. 3573 “On measures to radically improve the wine industry and the sale of alcoholic products”, which provides for reforming the cultivation, processing and sale of the grape and wine sector of the economy. The subjects of the industry have been set strategic innovative goals for the development of the industry, the implementation of which requires the development of the current existing model of the production chain "planning - growing - production - sales"

Certain conclusions about the prospects for the development of the viticulture and wine sector of the economy and its impact on the economy of the republic can only be obtained on the basis of an analysis of a large amount of data taken from enterprises and the agricultural sector. Together, the joint coordinated activities of enterprises and representatives of the agricultural sector are the objects of study of the links existing in the economy.

A scientifically based forecast for the development of the grape and wine sector of the economy of the Republic of Uzbekistan requires a study of the regional characteristics of growing and processing grapes, the study of factors affecting the development of the industry and the improvement of financial, infrastructural, and technological development parameters. In each region, a separately developed model takes into account its own characteristics, but differs in forecast data.

Consequently, a comprehensive forecast for the economic development of the Republic of Uzbekistan implies the presence of a significant structural component. To achieve the maximum level of consistency and interpretability of calculations in forecasting, it is necessary to take into account the equilibrium value of the dynamic and structural characteristics of economic development.

Table 1

Characteristics of the cultivation of technical varieties of grapes in the Republic of Uzbekistan

Name of areas	Vineyard area (ha)	Share of Technical grades (%)	Gross yield (Ton)	Share of Technical grades (%)	The number of grapes accepted by enterprises (ton)	Share of Technical grades (%)
Karakalpak Republic	1181	-	8957		375	-
Andijan	2586	26.9	38485	27.1	10441	100
Bukhara	6433	21.1	103061	26.3	48842	55.5
Jizzakh	2766	34.2	22900	26.7	6115	100
Kashkadarya	10584	22	87933	25.1	32000	69
Navoi	4162	6.8	56834	6.6	10140	36.8
Namangan	9533	26.2	99216	27.1	33070	81.2
Samarkand	30412	13.6	384699	9.7	95400	39.3
Surkhandarya	12954	34.5	151582	34.5	56478	92.5
Syrdarya	396	36.4	4294	38.3	1647	100
Tashkent	13851	46.1	141579	49	82120	84.5
Fergana	1605	49.9	19203	33.5	8065	79.7
Khorezm	994		15622	-	4017	-
TOTAL	97457	24.5	1134366	23.2	388711	67.8

Source: data received from Uzsharobsanoat JSC

In a comprehensive economic forecast that substantiates the parameters of economic development policy at the global level, it is impossible to do without using the analytical capabilities of tables in one form or another. The development of an intersectoral development model is a laborious process that requires constant attention to many details. In this regard, the formation of a dynamic industry model makes sense if it becomes the basis for a complex of economic calculations and is systematically supplemented with functional features that justify various directions of the economic development policy of the industry and the state as a whole.

The use of a comprehensive forecasting methodology will allow foreseeing and analyzing situations, expected long-term and current results, as well as the trend of the industry in the future. It is advisable in the production cycle "growing-processing-sale" to comprehensively use forecasting methods using the achievements of scientific and technical progress, which will improve the quality of the forecast and prevent unforeseen problems in production, affect product quality. At the same time, it is necessary to compare the results of the obtained forecast in solving the problem at the given stage of the production process under consideration.

In the system of predictive and analytical calculations in the vineyard and wine industry, the functional purpose of the industry model is to harmonize economic and industry

indicators at each stage of the production process. It is based on a step-by-step calculation of the key input-output tables (IRB) based on data provided by reporting organizations. In our case, this includes enterprises of the agricultural industry, enterprises of the wine industry and trade organizations.

On the basis of the compiled models of functioning of the sectors of the raw material complex, output volumes in the corresponding industry are formed. For the purposes of analyzing indicators of economic dynamics, the choice of composite models of the MOB involves the use of official information published by the State Statistics Committee of the Republic of Uzbekistan as the initial statistical base for calculating.

The proposed model is based on three main stages consisting of their characteristic tasks:

1. Definition of a wine in good demand in the market;

- Determination of demand in the domestic market;
- Determination of demand in the foreign market;
- Finding out the reasons for the good demand for wine;

2. Determination of the plant of the manufacturer of wine products;

- Forecasting and planning the production of wine products;
- Determining the possibility of product differentiation on the basis of supplied high-quality raw materials;
- Assessment of production and modernization of the production process;

3. Determination of grape varieties and its supplier;

- Forecasting and planning the cultivation of grapes by variety;
- Studying the characteristics of the region where grapes of the desired variety and quality are grown.

When forming and improving the model of functioning of the subjects of the viticulture and wine industry, emphasis should be placed on predictive calculations.

The complex composition of grapes, the presence of various methods of its processing, the quality management of finished wine products, make it possible to predict the release of the type and name of finished wine products, their properties corresponding to the quality and characteristics of each grape variety. In order to simplify the forecasting, we divided all cultivated grape varieties into V groups. The division took place on the basis of the quality of the wine obtained from this grape variety and its characteristics.

I includes grape varieties that predetermine the high quality of the finished product: Aleatico, Muscat Hungarian, Muscat pink, Pinot black and Tavkveri .

The varieties Kuldzhinsky, Maysky black, Morastel, Riesling, Rkatsiteli, Saperavi, Khindogny.

Group III includes: Soyaki , Parkent pink , Bakht .

IV - background varieties: Tarnau , Bishty , Bakhtiori, Bayan shirey .

TO Group V includes a mixture of technical and table grape varieties: Rangdor , Nimrang , Pink Tayfi , Husayne , Oltinday , Muscat orzu . [3]

Predictive calculations are carried out on the basis of iterative procedures by solving a modified static model of the IEP:

$$x = (E - A)-1 y , [1]$$

where x is the vector of gross output; y is the final demand vector; E is the identity matrix; A is a matrix of cost factors.

Forecast of obtaining high-quality grapes by varieties

$$\alpha_{ij} = \alpha_{1j} + \alpha_{2j} + \alpha_{3j} + \ldots\ldots \alpha_{nj}$$

α - indicator of grape assortment of group I

i – number of farms growing wine grape varieties (i = 1, 2, … n)

j - grape variety

$$\beta_{ij} = \beta_{1j} + \beta_{2j} + \beta_{3j} + \ldots\ldots\beta_{nj}$$

β - indicator of the assortment of grapes of group II

i – number of farms growing wine grape varieties (i = 1, 2, … n)

j - grape variety

$$\rho_{ij} = \rho_{1j} + \rho_{2j} + \rho_{3j} + \ldots\ldots\rho_{nj}$$

ρ - indicator of the assortment of grapes of group III

i – number of farms growing wine grape varieties (i = 1, 2, … n)

j - grape variety

$$\sigma_{ij} = \sigma_{1j} + \sigma_{2j} + \sigma_{3j} + \ldots\ldots\sigma_{nj}$$

σ - indicator of grape assortment of IV group

i – number of farms growing wine grape varieties (i = 1, 2, … n)

j - grape variety

$$\tau_{ij} = \tau_{1j} + \tau_{2j} + \tau_{3j} + \ldots\ldots\tau_{nj}$$

τ - indicator of the assortment of grapes of group V

i – number of farms growing wine grape varieties (i = 1, 2, … n)

j - grape variety

The total volume of wine grape varieties of all groups grown in the region is obtained by the following formula:

Total volume of grapes grown by region

$$V = \sum(\alpha + \beta + \rho + \sigma + \tau)_{ij}$$

Planning at the initial stage in the grape -wine industry is based on predictive estimates, especially for the seasonal period (August - October) when the volume of the harvested grapes is not known in advance. In the general system for solving a complex of interrelated tasks, when planning the functioning of the industry, forecasting the volumes of raw materials, single-factor and multi-factor regression models are used. A one-way regression model is expressed by the following equation.

$$y = f(x)[2]$$

Where: x is a variable, the value of which is determined by the amount of grapes accepted for processing;

y- there is a dependent function showing the volume of produced wine material;

Next, we use the least squares method, when the requirement for the best agreement between the theoretical dependence [2] and the experimental points is reduced to the fact that the sum of the squared deviations of the experimental points becomes a minimum.

The variable y is a function of the argument x and the parameters a , b , c .:

$$y = f(a, b, c),\text{Where:}$$

a - the number of grape varieties

b - number of grapes

c - group composition of grape varieties consisting of the following 5 groups (I , II , III , IV , V)

Parameter values a , b , c fulfill the following condition:

$$\sum_{k=1}^{m} [y_k - f(x_k; a, b, c \ldots)]^2 \quad (3)$$

Here k (k =1,2, …. m) is the number of observations

Y_k is the actual value of the dependent variable at point k ;

f (x_k ; a , b , c , ...) - the calculated value of the variable at the point x_j .

Then, multifactorial regression models take into account the influence of all parameters and factors on the dependent variable Y , and as a result, it becomes possible to predict the quality and range of finished products [3].

$$y = a_0 + \sum_{j=1}^{N} a_j x_j \quad (4)$$

j = 1, 2, 3 . . . N

Therefore, having the above information, it is possible to form an optimal high-quality assortment of wine products. [4]

The experience of a number of practical forecasting calculations shows that such a construction makes it possible to increase the overall validity and interpretability of the final results of the forecast, which contribute to planning the long-term activity of the enterprise.

The forecast at various planning intervals in the wine industry is the basis for calculating and adjusting output.

An analysis of the models for the development of viticulture and winemaking in the Republic of Uzbekistan shows that the most effective is the innovative scenario, which allows, at an acceptable cost, to solve the problems of the industry and achieve better results.

The complexity of the industry development model is unthinkable without the use of modern achievements in information technology. Creating a management model using modern communication capabilities is possible when using an ERP system (eng. Enterprise resource Planning , enterprise resource planning) .

ERP-systems are a set of integrated applications that allow you to create a single environment for an automated system for planning, accounting, control and analysis of all major business operations across the enterprise. Among them are the optimization of planning, cultivation, processing, implementation and operational management of production plans, accounting and analysis of the process for the production and sale of wine products.

All planning and analysis operations are divided in ERP into separate functional modules: resource planning (financial, human, material) for the production of goods or services, operational control over the implementation of plans (supply, storage, production, marketing), the implementation of contracts, all types of accounting, analysis of the results of economic activity. All information is stored in a single database of the enterprise, and can be obtained at any time upon request. This system is very convenient, as it ensures the performance of accounting and control functions not only at the level of one enterprise, but also at the level of the corporate board. [5]

The formulation of an econometric model for the development of a region consists of a number of successive stages that we have considered above: the purpose and nature of functional relationships, forecasting and planning the volume of material and labor resources, analysis of the organizational structure of production, analysis of specific properties of the modeled object, analysis of the production units of the object in modeling, construction of an econometric models, designing information links of a complex of tasks.

The specificity of the development of the region's viticulture and wine industry is due to its socio-economic and climatic features. Consideration of quality competitive grape varieties, the use of management systems based on the latest information technologies and the

achievement of goals on this basis guarantees the establishment of the production of quality wines of a wide range that satisfies market demand. The systematization of the use of information models should be divided into the regional level and the state level.

In general, the automated planning system being developed, based on the use of a complex of planning models for the production of wine products, is a development of the currently functioning system. It meets the modern requirements of the theory and practice of management using modern information technologies. The methodology and complexes of models can serve as the basis for the development and formation of automated production at each stage of the production chain.

In the processes of sectoral development, the mechanisms of state regulation of the development of the sector and the market play an important role. This is evidenced by the positive results obtained as a result of economic reforms carried out in our country aimed at supporting the development of sectors of the country's economy.

References:

1.Kasimov S.M. Sapaev D. Kh. The basic directions of development of viticulture in the Republic of Uzbekistan. Scientific journal “Iktisodiyot va talim” №5 TSUE, 2018

2.Kasimov S.M. Sapaev D. Kh. Research of marketing activity in the vinicultural industry . Scientific journal “Iktisodiyot va talim” №1 p. 73-76 TSUE, 2018

3.Grishin I.I, Panfilova E.E. Information technology in professional activity.- M.:FORUM: INFRA-M, 2005. - p. 8-9

4.A.V. Glichev. Quality management basics. Standards and quality. M. 2001

5.T.S. Khachaturov. Monograph " Investment policy of environmental management" M. Publishing house: Science,1989

6.Good G.H., McCall R.E. Systems engineering. Introduction to designing of large systems M.: Soviet radio, 1962.

7. Ilxomovna H. N. Bayes method in statistical study of sustainable development of territories in the digital economy //Web of Scientist: International Scientific Research Journal. – 2022. – T. 3. – №. 4. – C. 636-641.

8. Urunov R. BAYES METHOD IN STATISTICAL STUDY OF SUSTAINABLE DEVELOPMENT OF REGIONS //Eurasian Journal of Law, Finance and Applied Sciences. – 2022. – T. 2. – №. 6. – C. 33-37.

9. Sadullaevich, U. R. W eb of scientist: international scientific research journal. Volume, 3, 575-578.

10. Urunov R. S. STATISTICAL ANALYSIS OF SUSTAINABLE DEVELOPMENT OF TERRITORIES IN THE DIGITAL ECONOMY (ON THE EXAMPLE OF KHOREZM REGION) //Eurasian Journal of Law, Finance and Applied Sciences. – 2022. – T. 2. – №. 4. – C. 60-66.

11. Zh K. H., Urunov R. S. OBJECTIVE NECESSITY AND MAIN DIRECTIONS OF TRANSITION TO DIGITAL ECONOMY IN AGRICULTURE OF THE REPUBLIC OF UZBEKISTAN //Galaxy International Interdisciplinary Research Journal. – 2022. – T. 10. – №. 1. – C. 388-391.

12. Nigora X., Ravshan U. System of Statistic Indicators of Regional Sustainable Development in Conditions of Digital Econemy //JournalNX. – 2021. – T. 7. – №. 04. – C. 383-387.

13. Urunov R. et al. Digital Economy as A Highest Stage Development of Infocommunication Technologies //Ilkogretim Online. – 2021. – T. 20. – №. 3.

14. Ayupov R. X. Urunov RS O'zbekistonda raqamli iqtisod va 4.0 Industriyaning rivojlanish tendentsiyalari //Iqtisodioytning tarmoqlarini innovatsion rivojlanishida AKT ning axamiyati, Respublika ilmiy-texnik anjumanining ma'ruzalar to'plami, 3-qism, 2019 yil. 14-15 mart, 399-401 betlar.
15.Ilxomovna H. N. DIGITAL CONDITIONS OF SERVICES DEVELOPMENT AND ITS STATISTICAL ANALYSIS //Galaxy International Interdisciplinary Research Journal. – 2022. – T. 10. – №. 12. – C. 1983-1987.
16. Kuvondikovich U. B. et al. Econometric Modeling The Impact Of Multi-Discipliniary Farms On The Development Of Agriculture, Forestry And Fisheries Using The Cobb-Douglas Production Function //Turkish Online Journal of Qualitative Inquiry. – 2021. – T. 12. – №. 7.
17.Ilxomovna H. N. Bayes method in statistical study of sustainable development of territories in the digital economy //Web of Scientist: International Scientific Research Journal. – 2022. – T. 3. – №. 4. – C. 636-641.
18. Kuvondikovich U. B. et al. Econometric Modeling The Impact Of Multi-Discipliniary Farms On The Development Of Agriculture, Forestry And Fisheries Using The Cobb-Douglas Production Function //Turkish Online Journal of Qualitative Inquiry. – 2021. – T. 12. – №. 7.
19. Ilxomovna H. N. Bayes method in statistical study of sustainable development of territories in the digital economy. – 2022.
20.Yani A.V. Formation of organizational-economic mechanism of management of technological processes of reproduction in viticulture-winemaking sub-complex of AIC (on materials of farms of Anapa-Taman zone of Krasnodar territory (krai)) Extended abstract of dissertation for candidate degree of economic sciences. Moscow – 2012
21.https://www. vinsanoat.uz
22.V. Dragnev. Development strategy of the wine industry of the Republic of Moldova, based on agro-industrial integration. Thesis for a candidate degree in Economy science. Technical University of Moldova. 2006
23.www.faostat.org.