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FINANCIAL-STATISTICAL ASSESSMENT OF AGRICULTURAL PRODUCTS PRODUCTION IN THE REGION

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Abstract:

In this article, proposals and conclusions have been developed for the analysis of financial-statistical evaluation of agricultural production in the region based on empirical modeling.

Keywords: Financial-statistical evaluation, Econometric model, Empirical modeling, Digital economy, transformation, product production.

1. INTRODUCTION.

In the context of the digital economy in the region, it requires the sustainable development of the agriculture and food industry in the future and new approaches to production in the field. Economy in agriculture, new approaches to linking production costs with product quality and production efficiency can be achieved in many ways by using digital technology, new forms and methods of econometric and statistical accounting.

The purpose of this article is to fundamentally improve the state policy and develop a transparent system of network statistics in deepening the reforms aimed at increasing the competitiveness of the food industry and the monetary assessment of agricultural production, and covers the following priority areas:

statistics on food security of the population;

statistics on creating a favorable agribusiness environment and value added chain;

statistics on reducing state participation in industry management and increasing investment attractiveness;

statistics of rational use of natural resources and provision of environmental protection;

statistics of the development of modern systems of state administration;

statistics of gradual diversification of state expenditures aimed at supporting the network;

statistics on the development of the system of science, education, information and consulting services in agriculture;

development of a transparent system of rural development statistics.

In our opinion, in order to achieve this goal, it is necessary to fulfill the following tasks:

improvement of the mechanisms of providing food to the population in need of social protection, as well as integration of producers of agricultural products with social objects;

introduction of the system of state intervention purchases in the cultivation of spiked grain, gradual abandonment of the mechanism of state regulation of prices of agricultural and food products, and introduction of the mechanism of purchase of spiked grain at market prices based on quota;

developing a strategy for increasing exports based on the results of the evaluation of the fruit and vegetable and animal husbandry sectors (first, based on the analysis of long-term data and market trends, on the main 10-15 types of exported products);

assessment of opportunities to expand the use of the "Made in Uzbekistan" brand to release local food products to target export markets;

it is necessary to introduce a food safety assessment system based on internationally recognized methodologies and best practices and to carry out continuous monitoring.

As the main component of the food security system, the issue of ensuring the stability of the agricultural food system with the help of building dynamic models of the cyclical development of agriculture, in determining the prospective directions of the development of the industry, the information of the indicators of the existing systematic laws the problem of multifactor modeling based on the processing of resources, the problem of evaluating the production potential and determining the potential using comparison methods using multivariate econometric models of agricultural development are distinguished.

Also, there is no independent monitoring of the evaluation of investment management effectiveness, and there is no evaluation structure, system and mechanisms.

Conditions should be created to encourage

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agricultural producers to follow good agricultural and environmental practices (GAEP), good manufacturing practices (GMP) and other standards.

2. ANALYSIS OF LITERATURE ON THE TOPIC.

In the world experience, a number of issues have been systematically studied in the process of econometric modeling of the development and management of agricultural production [1]. In this case, the issue of optimization related to reducing resource consumption, increasing production volume, efficient use of land, ensuring product quality, building dynamic models of cyclical development of agriculture as the main component of the food security system - the issue of ensuring the stability of the food system, the issue of multi-factor modeling based on the processing of information sources of the indicators of the existing systemic laws in determining the prospective directions of the development of the industry, among the methods of comparison using multivariate econometric models of agricultural development using, the issue of evaluating the production potential and determining the potential is different.

Time series consists of components, the main component of which is the trend. The concept of a trend is a continuous trend in a time series without usually hidden fluctuations, and in the interpretation of the Russian economist and econometrician I.I. Yeliseevoy, it is a stable trend to a certain extent freed from random deviations in the time series [2].

It has been emphasized by foreign scientists that the Cobb-Douglas production function (as a special case of the Cobb-Douglas function) is the main function representing the modern production state of the economic network [3].

Econometrician Guan Zhengfei [4], in his scientific research, gives his scientific conclusions on the importance and necessity of econometric modeling in the agricultural sector. According to him, agriculture is an economic branch and, of course, its development is closely related to econometric modeling. Also, by the scientists of our country, the efficiency of land use[5] and the use of econometric modeling in the evaluation of the value of land resources were considered.

In econometrics, the concept of a relative model depends on the gross product (Y) consumption of resources in the enterprise (x_1, x_2, ..., x_n) and it is written in the form $Y=F(x_1,...,x_n)$[6]. Here (x_1, x_2, ..., x_n) factors are called free variables or exogenous. If in the relative model the influencing factors are selected according to the consumption of resources, and the structure of the model is multiplicative, then this represents the production function. But the factors affecting economic growth are not limited to resource consumption. There are sectors of the economy in which it is necessary to give a relative model with a wide range of factors.

Researching the dynamics of the production process in agriculture makes it possible to determine its unique, significant aspects and laws, and to evaluate them quantitatively based on the past and present conditions. To analyze the change of the components involved in the economic process in a certain period of time, explanatory indicators and methods are used. In this case, the concept of time series is often used in practice. In different sources, the concept of time series is given basically the same short definitions. In the works of econometrician B.B. Berkinov, this concept is expressed as follows: "A time series is a series of numerical indicators located sequentially over time, which describe the state and degree of change of an event or process" [7]. The system of development and management of the production of agricultural products must be built on the basis of the smallest element in its composition, that is, the correct organization of the activity of the production entity, optimal planning of its production. In other words, increasing the efficiency of farming and animal husbandry activities and reducing production costs depends first of all on skillful management of the farm, effective use of land, means of production and labor resources [8].

3. RESEARCH METHODOLOGY.

In this article, the econometric models of the development of agricultural production in Uzbekistan in the conditions of the digital economy are mainly based on the empirical modeling of the production function and multifactor types, as well as on the agricultural and livestock sectors separately. in the process of product development, the Cobb-Douglas function of the production function was used to create a model of the factors affecting the final indicator, depending on the consumption of resources.

4. ANALYZES AND MAIN RESULTS.

In rural areas, the level of public services, as well as transport and information-communication connections, remains low. The results of the assessment of production volume and labor productivity do not correspond to the actual situation on the ground. The lack of accurate and reliable information does not allow for an objective assessment of the development of new regulatory legal documents, as well as their impact on the industry. The lack of accurate and reliable

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information does not allow for the development of new regulatory legal documents, as well as an objective assessment of their impact on the industry. It is required to study complex influencing factors based on a detailed assessment of regional needs and taking into account competitive advantages. We conditionally divide the group of factors affecting the production process of agricultural products into 8 parts:

Group 1. Natural factors
Group 2. Contributing factors
Group 3. Science and innovation factors
Group 4. Social factors
Group 5. Supply factors
Group 6. Service factors
Group 7. Legal and regulatory factors
Group 8. Random factors

Among the natural factors, we include the change of the land area, land reclamation, geographical location, weather, specialization of the farm, the location of the farm land in relation to the settlement, product yield, environmental pollution. However, today there is insufficient econometric analysis based on statistical information on these factors. Cropland and pasture land area, salinity level of the land used for the production of agricultural products, climate change, product yield, statistical sources of pollutants released into the atmosphere feel the need for internal grouping when creating an econometric model. Because one of the main requirements in building a multifactor econometric model is that there should not be a strong correlation between the selected independent factors.

In this case, the cadastral system of accounting for agricultural lands of our country was improved. A single information system was combined with the real estate ownership accounting system for land use and property rights accounting. A system for determining the cadastral value of agricultural land was developed. Modern methods of forest resource assessment and monitoring were introduced. A system of criteria and indicators was developed to ensure accounting of forest resources at the market price.

The process of development of KXMICH has its own laws and they distinguish the component of econometric models of development of KXMICH from relative models of economic processes of other sectors. These laws are expressed on the basis of the interaction of agricultural economic indicators. The volume of production - the gross product depends not only on the consumption of resources in the production process, but also the participation of many factors. So, the relative model can be expressed as: $Y = F(X_1, X_2, ..., X_k)$ (10)

where X_i is a set of i-different factors.

In the modern theory of building econometric models of the development of QXMICH, in order to increase the practical value of equation (10), that is, to ensure the exit from the situation of extreme complexity, Xi is selected from the point of view of the interdependence of the elements of the set of factors.

$$Y = F(X = \{ x_j^{(i)}, j = \overline{1,n}; i \le k \}) \quad (11)$$

Here n is the number of selected factors.

A large number of factors affecting the process of economic development are distinguished by the fact that they are random compared to other sectors of the economy. Therefore, equation (11) is written in the following form:

$$Y = F(X) + \varepsilon \quad (12)$$

Here ε - the quantity that represents the change of the result index under the influence of random factors.

In the empirical models developed for the production process of agricultural products, one of the main tasks is to determine their structural variables. For this:

conduct a detailed assessment of real needs for the development of rural areas;

it is necessary to have information on the functional assessment of the Ministry of Agriculture (Management Functional Assessment Model - MFAM) and its results, and to carry out a systematic analysis.

We will separately improve the econometric models of the evaluation of the production of agricultural products by the production function and multifactor types, as well as by the farming and livestock sectors. In the process of developing agricultural products, we use the production function to create a resource consumption model of the factors affecting the final indicator. When applying the production function to the regional production process in a separate area of the economy, we use the consumption of other types of resources used in the development of agricultural products, along with capital and labor resources. We will develop a Cobb-Douglas type production function for the agricultural sector of the region based on the data of 2003-2022 (Table 1).

Table 1
Indicators on the logarithmic scale of the volume of agricultural products produced in the region and

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the factors influencing its change [9]

Years	ln(Y) The volume of production of products in the livestock sector of regional agriculture (billion soums)	ln(Lch) the number of livestock per 1 worker in the region (in general)	ln(Kch) share of income directed to working capital (percentage)	ln(Mch) area of fodder cultivation (thousand ha)	ln(Sch) the average cost of feeding per 100 head of livestock in the region (million soums)	Ln(Ech) Volume of veterinary services in the region (billion soums)
2001	4,54965748	2,6441464	3,09104	3,04452	0,43683	-1,2513
2002	5,04664573	2,71504059	3,13549	3,04769	0,90927	-0,7112
2003	5,16706908	2,78830444	3,157	3,0696	0,9395	-0,537
2004	5,28776185	2,81293322	3,18221	3,09407	1,07038	-0,364
2005	5,5020742	2,87514929	3,17388	3,10009	1,20459	-0,104
2006	5,58799744	2,96774392	3,19867	3,00898	1,27195	0,05668
2007	5,9388546	3,11207387	3,2068	3,054	1,37478	0,5894
2008	6,21580738	3,14592461	3,22287	3,07577	1,58871	0,91918
2009	6,35940084	3,17788961	3,21487	3,13839	1,71222	1,0957
2010	7,23302211	3,20611171	3,25037	3,17527	0,40547	2,05585
2011	7,71984038	3,22361685	3,25424	3,25037	2,93096	2,59261
2012	8,00112049	3,21764969	3,29584	3,26321	3,15753	2,9271
2013	8,15309073	3,28081566	3,31419	3,32504	3,20201	3,18976
2014	8,39721525	3,29616918	3,33577	3,17527	3,36277	3,51725
2015	8,52545894	3,33975901	3,37759	3,20003	3,408	3,73087
2016	8,75231274	3,45639314	3,39115	3,22949	3,49591	4,0943
2017	8,95617044	3,53756604	3,41773	3,24519	3,62458	4,37971
2018	9,23504274	3,71576861	3,44138	3,27084	3,85132	4,70435
2019	9,38890488	3,70534742	3,4797	3,33458	4,01633	4,84706
2020	9,57167942	3,68845418	3,51809	3,3673	4,18471	5,04424

According to the results of regression analysis, we got the following model.

$$Y_d = e^{-26,34} * L_d^{-0,46} * K_d^{-1,94} * M_d^{5,58} * S_d^{2,06} * E_d^{0,64} \quad (13)$$

Here, Ld is the number of workers (people) per 1 hectare of land planted with agricultural products of the region; Kd - the amount of capital investment

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allocated to agriculture (billion soums); Md - non-saline land area planted with agricultural crops (thousand hectares); Sd - indicator of saving water consumption for the area of agricultural arable land in the region (in percent); Ed - the cost of electricity in the regional agriculture (billion soums), Yd - the volume of production of agricultural products of the regional agriculture (billion soums).

To justify the adequacy of the developed model, we will focus on its results obtained on the basis of the Ewievs 10 program (Table 2).

Table 2

The results of the regression analysis for the construction of the Cobb-Douglas type production function for the regional agricultural network

Dependent Variable: LNY				
Method: Least Squares				
Date: 12/05/21 Time: 21:22				
Sample: 2001 2020				
Included observations: 20				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-26.33688	8.603508	-3.061179	0.0085
LNLD	-0.469001	0.226338	-2.772126	0.0572
LNKD	-1.942852	0.963138	-2.017210	0.0633
LNMD	5.589227	1.564865	3.571698	0.0031
LNSD	2.057153	0.468520	4.390751	0.0006
LNED	0.641375	0.192350	3.334423	0.0049
R-squared	0.988347	Mean dependent var		7.077194
Adjusted R-squared	0.984185	S.D. dependent var		1.510812
S.E. of regression	0.189998	Akaike info criterion		-0.240285
Sum squared resid	0.505387	Schwarz criterion		0.058434
Log likelihood	8.402853	Hannan-Quinn criter.		-0.181972
F-statistic	237.4746	Durbin-Watson stat		1.992077
Prob(F-statistic)	0.000000			

It can be seen from the data in this table that the main criteria for evaluating the quality of the model, that is, the value of the coefficient of determination (R^2) is 0.99, the value of the multiple correlation coefficient is 0.98, the standard error of regression $(R_{Y,X})$ is 0.189, the residuals are the value of the sum of squares is 0.505, and the value of the maximum similarity function is 8.40. This means that the built model is of good quality.

Fisher's criterion value is equal to 237.47, and the approximation error is 9.4 percent. It can be seen that the constructed econometric model can be applied in practice in terms of significance. It was also evaluated using Akaike information criterion (-0.24), Schwarz criterion (0.058) and Hannan-Quinn criterion (-0.182) using Eviews 10 software package. The value of these criteria also indicates the applicability of the econometric model.

For the established econometric model, the Durbin-Watson (DW) criterion of "least squares" is valid, that is, the value here is equal to 1.99, and there is an autocorrelation around 2.0 belongs to the non-interval. The model satisfies the adequacy requirements.

Here we consider the coefficient of elasticity of production. The sum of indices from the formula (3.3.1) is equal to A=5.88 (5.88>1). This means that a k-fold increase in the cost of production of agricultural products in the region means a k-fold increase in the amount of manufactured products, that is, an k-fold increase in the economic growth of agricultural products in the region shows. Let's look at the elasticity coefficients for the model Table 3.

Table 3.

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The coefficient of elasticity of the empirical model based on the relationship between the production volume and resource consumption of the development of the agricultural network of Kashkadarya region

Variables	Regression coefficients	Standardized coefficients	Coefficients of elasticity
X1	-1,94286135	-0,149555	-0,143990
X2	-0,46900098	-0,489542	-0,412271
X3	5,58921861	0,398153	4,335545
X4	2,05715298	0,618310	0,547935
X5	0,64137529	0,398070	0,394146
C	-26,3368255	NA	-3,721366

According to the index of elasticity of factors, a 1% change (increase) in the labor force leads to a 0.14% decrease in the volume of production, so these factors change (increase) by 1%, that is, 0.41% in relation to capital we can say that it will decrease, it will increase by 4.33% compared to the change of quality arable land, it will increase by 0.54% compared to the saving of water resources, and it will increase by 0.39% compared to the consumption of electricity. Therefore, the increase of quality land in the region has the highest impact on the volume of production. Also, the efficiency of water saving with the use of intensive methods in the irrigation system has a greater impact on the increase in production volume compared to other factors.

We write the production function of the Cobb-Douglas type for the livestock sector of regional agriculture as follows:

$$Y_{ch} = e^{5,76} * L_{ch}^{-0,40} * K_{ch}^{-0,23} * M_{ch}^{0,55} * S_{ch}^{0,01} * E_{ch}^{0,84} \quad (14)$$

Here Lch is the number of livestock per 1 worker in the region (in general); Kch - share of income directed to working capital (percentage); Mch - the area of fodder cultivation (thousand ha); Sch - the average cost of feeding per 100 head of livestock in the region (million soums); Ech - the volume of veterinary services in the region (billion soums), - the volume of production of livestock products of the regional agriculture (billion soums).

The indicators used for the development of the model are given in Appendix 21. The criteria justifying the adequacy of the model are listed in Table 3 below. In this table, the indicators for the criteria analyzed above are given, and it can be observed that all of them are at the level of the established standards. We can see that the coefficients representing the influence of the share of income directed to working capital and the average cost of feeding per 100 head of livestock in the region are not adequate according to the Student's criterion. Taking into account that the results of the regression analysis performed excluding these factors did not cause significant changes in the coefficients of the remaining indicators and that the model is highly adequate in terms of other criteria, we found it appropriate to use the above model.

Table 4

The results of the regression analysis of the production function of the Cobb-Douglas type for the regional livestock network

Dependent Variable: LNY				
Method: Least Squares				
Date: 12/05/21 Time: 22:04				
Sample: 2001 2020				
Included observations: 20				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.759006	1.192818	4.828067	0.0003
LNLCH	-0.404071	0.125818	-3.211567	0.0063
LNKCH	-0.225086	0.350169	-0.642794	0.5307
LNMCH	0.550746	0.196766	2.798984	0.0142
LNSCH	-0.007150	0.020654	-0.346183	0.7344
LNECH	0.843257	0.025765	32.72902	0.0000

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R-squared	0.999600	Mean dependent var	7.179456	
Adjusted R-squared	0.999457	S.D. dependent var	1.674146	
S.E. of regression	0.039017	Akaike info criterion	-3.406295	
Sum squared resid	0.021313	Schwarz criterion	-3.107576	
Log likelihood	40.06295	Hannan-Quinn criter.	-3.347982	
F-statistic	6993.279	Durbin-Watson stat	1.646421	
Prob(F-statistic)	0.000000			

Here we consider the coefficient of elasticity of production. In the formula (3.3.2), the sum of indices is equal to A=0.99 (0.99<1). This shows that the rate of growth of production costs of agricultural products in the region is slightly different from the rate of production growth, i.e. it is higher. Let's consider the coefficients of elasticity (table 33 in the appendix).

The indicator (Ych.t.1) representing the production volume of the development of the regional livestock industry, according to the elasticity index of the factors, if the number of livestock per labor unit increases by 1%, it decreases by 0.18% , if the area of fodder cultivation increases by 1%, it will increase by 0.24%, and if the volume of veterinary services increases by 1%, it will increase by 0.24%.

Table 5.
The coefficient of elasticity of the empirical model based on the relationship between the production volume and resource consumption of the development of the livestock industry of the Kashkadarya region

Variables	Regression coefficients	Standardized coefficients	Coefficients of elasticity
X1	-0,40409188	-0,078498	-0,179848
X3	0,550731351	0,035875	0,243436
X5	0,843254068	1,063848	0,239468
C	5,758708541	NA	0,802109

We construct a joint generalized nonlinear model of the agricultural farming and livestock industries as a production function. It is known that the Cobb-Douglas production function is constructed for macroeconomic processes. Since we constructed the production function here in terms of territory, we included other variables in addition to the main variables in the model, and as a result, we got a production function of the Cobb-Douglas type at the regional scale. We write the regional agricultural production function as follows.

$$Y = e^{2,86} * L^{3,75} * K^{0,71} * M^{-2,86} \quad (15)$$

Here L is the number of employees in agriculture (thousands of people); K - the amount of capital investment allocated to agriculture (billion soums); M - land area planted with agricultural crops (thousand hectares);

The above input factors used for the model were obtained with satisfactory correlation analysis results. (3.3.3) calculation results in the Eviews10 package, conducted to check the adequacy of the model, are presented in the table (Table 3.3.5). It can be seen that the level of adequacy of the model is not high. This shows that it is possible to use the Cobb-Douglas type models created only for the private sector of agriculture, and the forecast indicators of the main indicator of the production of agricultural products of the Kashkadarya region can be obtained by summarizing the results of the private sector models. Therefore, with the help of private network models, forecast indicators for the next period were developed in order to study the future indicators of agriculture, especially its sectors, in Kashkadarya region.

Table 6
Results of regression analysis for the empirical model of the development of agriculture in Kashkadarya region based on the relationship between production volume and resource consumption

Dependent Variable: LNY		
Method: Least Squares		
Date: 12/05/21 Time: 22:37		

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Sample: 2001 2020				
Included observations: 20				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.857412	1.386924	3.044271	0.0093
LNL	3.748641	1.051749	3.564198	0.0024
LNK	0.715581	0.074573	9.595716	0.0000
LNM	-2.861920	0.903968	-3.165954	0.0056
R-squared	0.964147	Mean dependent var		7.828756
Adjusted R-squared	0.959929	S.D. dependent var		1.594725
S.E. of regression	0.319227	Akaike info criterion		0.691651
Sum squared resid	1.732398	Schwarz criterion		0.841011
Log likelihood	-3.916512	Hannan-Quinn criter.		0.720808
Durbin-Watson stat	1.046412			

In the course of research, along with Cobb-Douglas type models, multi-factor linear econometric models were also developed. In this process, it was observed that the existence of a close relationship between the selected factors affecting the resulting factor limits the possibility of including them in one model. Therefore, according to the results of our research, we determined that the most appropriate way is to use the ARIMA model, which is widely used in time series, in order to ensure the multivariate development of forecast indicators.

Data from 2001-2020 were used to develop the model. These data were transferred to real values based on the consumer price index and the following models were obtained based on regression analysis (Table 7).

Table 7
Models created for calculating forecast indicators of agricultural production in Kashkadarya region in real values

№	Model	z-statistics	Coefficient of determination
1	$(1-L)Ydr_t = 0{,}96(1-L)Ydr_{t-1} - 0.84\varepsilon_{t-1}$	b_1 =5,78 b_2=-2.42	0.95
2	$(1-L)Ych_t = 128{,}49 + 0.48(1-L)Ydr_{t-1}$	b_0 =44,32 b_2=-2.44	0.99
3	$(1-L)Yjr_t = 208{,}89 + 0.42(1-L)Yjr_{t-1}$	b_0 =2,83 b_2=-2.1	0.98

It can be seen that all three developed models are adequate according to the mentioned criteria, that is, the results of z-statistics and coefficient of determination. In addition, a number of criteria representing the adequacy of our model have been mentioned. Based on these results, we found it appropriate to use the developed models in the formation of forecast values. Using the models, we developed forecast indicators of real values of the total agricultural, farming and livestock products grown in the region for 2022-2026 (Table 8).

According to the obtained results, agricultural products in the region will increase by 1.17 times in the next 5 years, resulting in an average annual growth rate of 3.2 percent. Forecast indicators of the real value of livestock production show that high growth rates will be ensured in the next period, in particular, by 2027, the real volume of production will be 3403.98 billion soums, increasing by 1.24 times compared to 2021. growth is ensured. Accordingly, the average annual growth rate is high, making 4.25 percent.

Table 8.
Forecast indicators of production of agricultural products in real values in Kashkadarya region

Years	Agricultural products	livestock products	Total agricultural product

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2022	1724,12	2751,08	4463,46
Forecast indicators			
2023	1783,06	2881,85	4661,54
2024	1839,67	3011,42	4865,93
2025	1894,03	3140,43	5072,95
2026	1946,24	3269,17	5281,06
2027	2023,75	3403,98	5479,02
Change compared to 2022	1,17	1,24	1,23
growth rate	3,22	4,25	4,12

The real value of total agricultural products has increased by 1.23 times, and its average annual growth rate is 4.12 percent. As a result, in the next 5 years, the share of cattle breeding will increase compared to agriculture. It can be seen that the development of livestock breeding in the region has a high impact on the increase in the production of agricultural products.

According to the obtained results, the use of factors in the production of agricultural products in the region is at an average level, and we believe that it is appropriate to intensify the sector. In particular, the analysis shows that the coefficient of elasticity between the use of labor and capital and the production of the total agricultural product has low indicators.

To increase the effectiveness of modeling results, it is necessary to quantitatively determine a large number of factors that strongly influence the resulting factor. This can be achieved by improving the classification of influence factors. In order to improve the econometric models of the development and management of agricultural production, first of all, it is necessary to determine the factors with a statistical source, as well as to focus on expanding the statistical information base for the proposed group of factors.

5. CONCLUSIONS AND SUGGESTIONS.

In conclusion, it can be said that the production and management of agricultural products in the changing competitive environment and market conditions, forecasting with the help of econometric methods and models in the in-depth analysis of their nature and laws, alternative solutions from multiple options Econometric modeling is of great importance in studying the theoretical and practical aspects of a number of issues such as selection, risk and optimal management decision-making under conditions of uncertainty.

Taking into account the regional scale of production of regional agricultural products, it was found to be effective to use the cluster analysis method to evaluate the efficiency of using the production potential of the region. Based on the results of cluster analysis, econometric models representing practical results were developed on the example of the province

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