International Journal Of Management And Economics Fundamental
(ISSN – 2771-2257)
VOLUME 04 ISSUE 05 PAGES: 19-31
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 7. 448) (2024: 8.202)
OCLC – 1121105677

Publisher: Oscar Publishing Services

Journal Website: https://theusajournals.com/index.php/ijmef

Research Article

FACTORS AFFECTING THE FINANCIAL EFFICIENCY OF AGROCLUSTERS AND IMPROVEMENT OF THEIR EVALUATION METHODOLOGY

Submission Date: May 11, 2024, Accepted Date: May 16, 2024,
Published Date: May 21, 2024
Crossref doi: https://doi.org/10.37547/ijmef/Volume04Issue05-04

Ochilov Ilhom Sayitkulovich
Associate Professor, Tashkent State Agrarian University, Candidate Of Economics, Uzbekistan

ABSTRACT

In this article, the factors influencing the financial efficiency of agroclusters and the improvement of their evaluation methodology are studied. An econometric analysis of the factors influencing the financial efficiency of agroclusters has been carried out, and forecast indicators of efficiency have been recommended.

KEYWORDS

Financial efficiency, econometric analysis, econometric model. assessment methodology, efficiency factors, forecast indicators.

INTRODUCTION

Depending on the nature of the data, an econometric model is created, that is, if the data are cross-sectional, a model that fits exactly this data, or a model that fully represents it is selected, in the case of time series data. First of all, we will analyze the differences and characteristics of these data.

Cross-sectional data refers to the occurrence of the same indicator in different regions at the same time. In a cross-sectional data system, selective observation plays an important role. In sample observation, we know that there may be representative errors between the population and the sample. If the data are to be aggregated from the data of relevant organizations

International Journal Of Management And Economics Fundamental
(ISSN – 2771-2257)
VOLUME 04 ISSUE 05 PAGES: 19-31
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 7. 448) (2024: 8.202)
OCLC – 1121105677
Publisher: Oscar Publishing Services

rather than through selective observation, it is required that there be specific areas of relevance.

Series ordered by time are called time series. In economics, many financial and economic indicators are time series. The most commonly used statistical series in econometrics is time series data, also referred to as time series in some literature.

Working with time series in econometrics can sometimes be challenging. There are a lot of factors that influence the change of time series, and before describing them in the model state, their properties should be thoroughly analyzed, that is, seasonality, autocorrelation, and stationarity should be put into the model after being fully checked.

Statistical research and econometric modeling of the financial activity of cotton-textile clusters increase their gross yield and average productivity.

Literary analysis. Issues of assessing the financial activity of the agricultural sector and the factors affecting financial indicators from foreign scientists Al-Haboby A., Beckman J., Brodersen C., Bruggeman A., Dreesman A., David L., Ferto I., Bartolini F., Countryman , A., Barath L., Ferto I., Giannakis E., Raihan A., Tuspekova A., JHStock, Watson M., Elliott, T.J.Rothenberg, Stock J., PCPhillips, P. Perron; MS Meo and others have been widely studied in research [1-5]. A.V.Afanaseva, A.N.Seredkin, B.I.Smagin, G.L.Vinogradova, I.I.Lenkov, N.A. from the researchers of the countries of the Commonwealth of Independent States. Degtyareva, T.M. Researched by Yarkova and others [6-9].

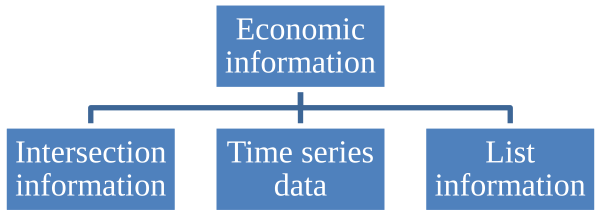
Study of the economy of the agricultural sector in the Republic of Uzbekistan, socio-economic organization of farms, evaluation of the effectiveness of financial activity indicators T.Sh.Shodiev, B.B.Berkinov, A.Abdug'aniev, Kh.D. Khujakulov, M.Kh.Mamatkulov, N It was studied and researched by H.Rashitova, B.K.Utanov and other scientists [10-16].

Relevant scientific innovations were developed in these studies, but the financial activity of clusters, in particular, the evaluation of the interdependence of indicators in the conditions of a certain structural change, was not studied.

In the textbook Econometrics written by Bruce E.Hansen [17], it is stated that "Much economic data is compiled and formed based on statistical observations, while social and scientific data are collected empirically".

Data is divided into quantitative and qualitative data . While quantitative data is given in units of measurement, qualitative data has no unit. We use dummy variables to enter qualitative data into the model.

In various scientific literature, economic data are divided into several groups. Bruce E. Hansen's textbook Econometrics divides economic data into five groups, including cross-sectional, tabular, time, group, and special series. In the textbook "Econometrics" written by Russian scientists Ya.R.Magnus, P.K.Katyshev, AA.Peresetsky [18], the data group is divided into cross-sectional and time series. In the manual "Principles of Econometrics" written by econometricians R. Carter Hill, William E. Griffiths, Guay C. Lim, economic data is divided into three groups [19] (Figure 1).



1 - picture. Types of data in econometrics

Research methodology. We will briefly touch on the ARIMA method. This method was introduced to science in the 1970s by scientists George Box & Jillian Jenkins, who were awarded the Nobel Prize for their invention. Trend, seasonality, randomness, cycle components in time series are taken into account in forecasting using ARIMA method. The essence of the ARIMA method is reflected in its name: AR – autoregression, I – integrated, MA – moving average.The model was determined based on the Least Squares method. Typically, we check the reliability of the model through Gaussian Markov conditions. The first two conditions of the Least Squares method are that for each value of X ethe residual is normally distributed around the zero value. It is assumed that ei is a continuous quantity, symmetrically distributed around the mean, and its distribution is defined by means of two dimensions, mean and variance.

Analysis and results. The following two hypotheses were formulated for scientific research:

H1 : gross output of cotton-textile clustersland area , the funds spent on agriculture depend more on the funds spent on industry .

H2 : productivity of cotton-textile clustersincreases due to the volume of investments spent on the purchase of equipment , introduction of water-saving technologies, land use and development .

To prove these hypotheses , a multifactor regression model was developed using the "Least Squares" method and checked for Gaussian Markov conditions. For the analysis of the models, the financial data of 136 cotton-textile clusters in our republic were compiled and analyzed.

According to the descriptive statistics of the first model indicators, in 2021, the average gross harvest for all clusters was 22570.8 tons.

Table 1

Statistical analysis of cotton-textile clusters operating in the Republic

International Journal Of Management And Economics Fundamental (ISSN – 2771-2257)
VOLUME 04 ISSUE 05 PAGES: 19-31
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 7. 448) (2024: 8.202)
OCLC – 1121105677
Publisher: Oscar Publishing Services

Indicators	Autun	Average	Std. Dev.	Min	Max
Cotton raw material grown in 2021, tons	136	22570.851	12179.475	1219	71596
Land area, hectares	136	6767.414	3326.293	540	17900
Investments in agriculture, million soums	136	55982.317	88178.846	0	744184
Investments in the industry, mln. soum	136	119362.63	116123.14	0	718264

According to the analysis, some clusters did not invest in agriculture and industry, and some did.

the land area and the funds invested in agriculture and industry.

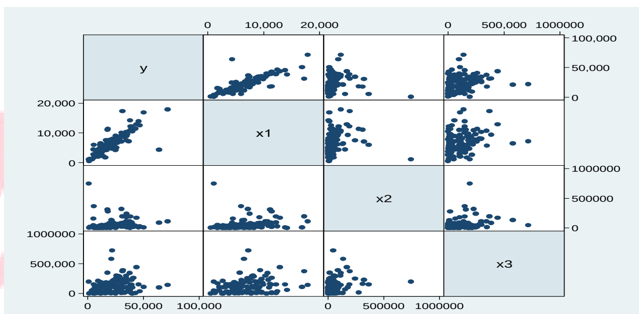


Figure 2. Cross-correlation plot of cultivated cotton raw material and land area and input funds

It is observed that there is a strong linear relationship between the area planted with cotton and the yield. There is a weaker direct linear correlation between investment in agriculture and investment in industry and gross output. It is not possible to determine the correlation coefficient through a correlogram.

Table 2

Correlation of cultivated cotton raw material with land area and input funds

Variables	(1)	(2)	(3)	(4)
Cotton raw material grown in 2021, tons	1.000			
Land area, hectares	0.847	1.000		
Investments in agriculture, mln. soum	0.191	0.255	1.000	
Funds invested in the industry, mln. soum	0.219	0.190	0.181	1.000

The correlation between land area and cotton raw material grown is 0.84. According to the theory, a correlation coefficient close to one represents a strong positive association. Therefore, land area is the most important factor for cotton production. This is also logically justified, as the large area of land affects the production of large quantities of cotton by the extensive method.

Table 3

Regression model of land area and inputs of cultivated cotton raw material

Cotton raw material grown in 2021, tons	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Land area, hectares	.782	.059	16.68	0	.872	1.106	***
Investments in agriculture, mln. soum	.108	.044	2.70	.0	.066	.091	***
Funds invested in the industry, mln. soum	.110	.045	2.41	.0	.017	.085	***
Constant	1.07	.539	1.98	. 0	.003	2.137	***

There is a mean dependent	9,893	SD dependent	0.629
R-squared	0.722	Number of obs	123
F-test	103.001	Prob> F	0.000
Akaike crit. (AIC)	84,646	Bayesian crit. (BIC)	95,895

*** *p<.01, ** p<.05, * p<.1*

$$\ln Y_1 = 1.07 + 0.782 \ln X_1 + 0.108 \ln X_2 + 0.110 X_3 \quad (1)$$

If the area of cotton land increases by one percent, the cotton raw material grown in the republic will increase by an additional 0.782% on average. An additional one percent increase in agricultural investment leads to an additional 0.108 percent increase in cotton yield.

So, the first assumption : ei is normally distributed.

The second assumption : E(ei)=0 - the average residual is zero.

In fact, we can view each value of the stochastic residual as the result of many causes, each causing the dependent variable to imperceptibly deviate from its deterministic value. In this view, the measurement error and the distributional error are similar, and so the assumptions about the normality of the mean error and the nullity are similar.

Usually, if the Least Squares condition is not met, heteroscedasticity is created. Heteroscedasticity affects the efficiency of regression equation parameters.

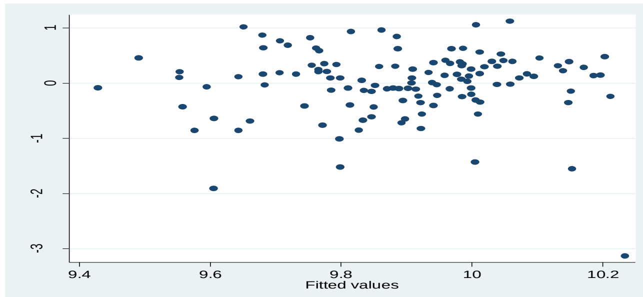


Figure 3. Correlation between model fit values and residuals

The fourth assumption is related to autocorrelation in the residual. It is assumed that there is no autocorrelation between the errors, that is, there is no autocorrelation: $Cov(\varepsilon_i, \varepsilon_j) = 0$ $(i \neq j)$ (2)

This assumption means that if today's output is higher than expected, it is not necessary to conclude that tomorrow's output will be higher (or lower). The first and fourth assumptions together make it possible to say that the errors of the distribution are uncorrelated. Therefore, variables e1 and e2 can be considered as similar and freely distributed.

Since $E(\varepsilon_i)=0$ (3).

$$Var(\varepsilon_i) = \sigma^2 \quad (4)$$

From

$$Var(\varepsilon_i) = E(\varepsilon)^2 \quad (5) \quad Cov(\varepsilon_i, \varepsilon_j) = E(\varepsilon_i, \varepsilon_j).$$

The third approximation of "least squares". refers to homoscedasticity , which means that for each X the variance of the residual is the same. This assumption is consistent with the assertion that, for example, the residual variance for large values of X is the same as for small values.

Taking this into consideration, we evaluate the value of the product volume change model developed in the regional agricultural network of the region and the quality of the model parameters.

The analysis carried out on the basis of the software package shows that the multiple correlation of the resulting factor with influencing factors is r=0.72 , and the coefficient of determination is equal to R 2 =0.72 . This shows that the influencing factors and the resulting factor have a high correlation, and the residuals, as the difference between the calculated indicators and the real indicators, are also densely connected. The significance and quality of the parameters of the econometric model constructed using the value of the indicated indicators are evaluated.

Fisher's criterion value for the endogenous factor in the identified model is 103, with a significance level of 0.000. It can be seen that the constructed trend model can be applied in practice in terms of significance.

Model quality was evaluated using Akiake's information criterion, Schwartz's criterion, and Hannan-Quinn's criterion using the software package.

The value of these criteria also indicates the applicability of the Trend model.

DW criterion, which allows determining the presence of autocorrelation or multicollinearity in the constructed econometric model, is equal to 1.98, and considering that the optimal limit is around 2.0, it can be seen that the quality of the model is relatively high, that is, the level of autocorrelation is low.

For the second model, the average annual yield was selected as the outcome indicator, investment, in particular, the purchase of machinery, the introduction of water-saving technologies, and the use and development of land.

Table 4

Statistical analysis of investments in cotton-textile clusters operating in the republic

Variable	Obs	Mean	Std. Dev.	Min	Max
Technical procurement (million soms)	136	34596.278	56112.644	0	297697.13
Waterthriftytechnologiescurrentto do (million som)	136	13026.688	16123.798	0	100000
From the grounduseandto be absorbed (million soums)	136	1649.127	4361.781	0	41580

In clusters, the annual average is 13026 mln. Soums were invested in the introduction of water-saving technologies. 1649.1 mln. on average for land use and development. investment funds of soums were spent.

A correlogram was developed to determine the relationship between the selected indicators.

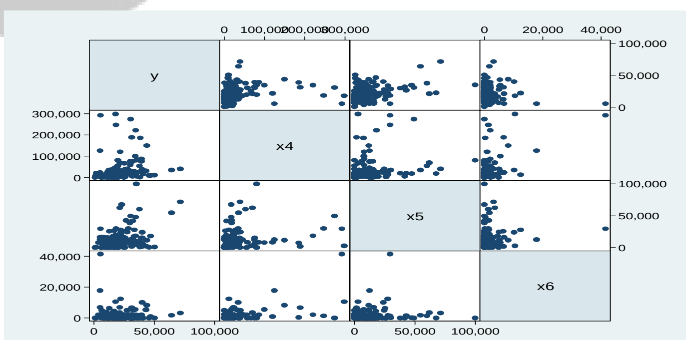


Figure 4 . Correlogram of productivity with investment in cotton-textile clusters

In this case, the presence of a straight line connection between the indicators is shown. Investments in water-saving technologies were found to have a greater impact on average productivity than the other two factors. It was based on the correlation coefficient equal to 0.375.

International Journal Of Management And Economics Fundamental
(ISSN – 2771-2257)
VOLUME 04 ISSUE 05 PAGES: 19-31
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 7. 448) (2024: 8.202)
OCLC – 1121105677
Publisher: Oscar Publishing Services

Table 5

Correlation of investment with average productivity

Variables	(1)	(2)	(3)	(4)
(1) y	1.000			
Technical procurementto do(million soums)	0.170	1.000		
Waterthriftytechnologiescurrentt o do (million som)	0.375	0.206	1.000	
From the grounduseandto be absorbed (million soms)	-0.071	0.508	0.120	1.000

Average productivity was found to be inversely related to investment in land use and development. The correlation coefficient is -0.071.

Table 6

Regression analysis of investments with average yield

y	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
x4	.045	.02	2.24	.027	.005	.084	**
x5	.27	.06	4.47	0	.151	.39	***
x6	-.61	.254	-2.40	.018	-1.112	-.108	**
Constant	18224.247	1300.848	14.01	0	15651.041	20797.453	***

There is a mean dependent	22290.936	SD dependent	12141.106
R-squared	0.186	Number of obs	136
F-test	10.026	Prob> F	0.000
Akaike crit. (AIC)	2923.014	Bayesian crit. (BIC)	2934.665

**** p<.01, ** p<.05, * p<.1*

$$Y = 0,045 * X_4 + 0,27 * X_5 - 0,61 * X_6 + 18224,24 \quad (6)$$

A one percent increase in investment in the purchase of equipment leads to an increase in average productivity of 0.045%. A one percent increase in investment to implement water-saving technologies provides an additional increase in average annual productivity of 0.375 percent.

The model was tested for all required tests and statistical significance was determined. In a multifactorial relationship, the factors should not be multicollinear with each other.

Table 7

Variables in the model are multicollinearity VIF test

International Journal Of Management And Economics Fundamental
(ISSN – 2771-2257)
VOLUME 04 ISSUE 05 PAGES: 19-31
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 7. 448) (2024: 8.202)
OCLC – 1121105677
Publisher: Oscar Publishing Services

	VIF	1/VIF
x4	1.387	.721
x6	1.347	.742
x5	1.045	.957
Mean VIF	1.26	.

The ARIMA method, we develop the forecast values of the average yield in four clusters of "Navbahor Tekstil" LLC, "Baht-Textile" LLC, "Marokand Sifat Tekstil" LLC, and "Samarkand Kamalak Invest Textile" LLC according to the resulting models.

Table 8

Average yield data for 2018-2022 , ts/ha

Years	"Navbahor Textile" LLC	"Baht-Textile" LLC	"Maroqand Sifat Tekstil" LLC	"Samarkand Kamalak Invest Textile" LLC
2018	23	26	26	26
2019	24	27	27	27
2020	26	28	28	30
2021	30	29	32	34
2022	32	32	36	36

"Navbahor Textile" LLC, the average yield in 2022 was 32 t/ha and in "Baht-Textile" LLC 32 t/ha, in "Marokand Sifat Tekstil" LLC 36 t/ha and in "Samarkand Kamalak Invest Tekstil" LLC 36 t/ha /ha productivity was observed.

ARIMA The method is not performed by the "Least Squares" method , but by the Maximoom likelihood method. The maximum likelihood method was first observed in the scientific researches of Karl Friedrich Gauss, Pierre Simon Laplace, Thorvard Tillar [20].

Maximoom likelihood estimation method, indicators are found using the probability function (log likelihood estimation) .

For the log likelihood $y_i$it looks like this:

$P(y_i = 1)^{y_i} P(y_i = 0)^{1-y_i}(7)$

, $P(y_i = 1)^1 P(y_i = 0)^{1-1} = P(y_i = 1)$if $y_i = 1$ b dies , $y_i = 0$b dies if $P(y_i = 1)^0 P(y_i = 0)^{1-0} = P(y_i = 0)$b dies .

In general, the log likelihood function is :

$$\sum_{i=1}^{n} (y_i * logP(y_i = 1) + (1 - y_i) * logP(y_i = 0)) \quad (8)$$

The statistical significance of the coefficient based on the maximoom likelihood estimation method is checked with β the Wald test, likelihood ratio test .

The ARIMA model includes three stages, and in the first stage, the values of p, d, q are determined. At the second stage, the optimal one is selected from several models and its reliability is checked. At the third stage, forecast values are developed.

It was found that there is a second-order stationarity in the average yield data of "Navbahor Textile", "Baht-Textile", "Marokand Sifat Tekstil" and "Samarkand Kamalak Invest Textile" LLC .

```
. dfuller Navbahor_Textile

Dickey-Fuller test for unit root                    Number of obs   =         4

                               ---------- Interpolated Dickey-Fuller ----------
                  Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value             Value
------------------------------------------------------------------------------
 Z(t)           -0.198            -3.750            -3.000            -2.630
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.9388
```

Figure 5 . Unit root test of cluster productivity data of "Navbahor Tekstil" LLC

A probability value of 0.93 confirms that the series is non-stationary. After second-order differentiation, the series is found to be stationary with probability equal to 0.003.
This situation was also observed for the next three clusters. Therefore, we decide that d is equal to one for all clusters. When checking for residual stationarity, p and q values were also found to be equal to one. From this, we accept ARIMA (1,1,1) as the most optimal model.

```
ARIMA regression

Sample:  2019 - 2022                            Number of obs     =          4
                                                Wald chi2(2)      =       0.22
Log likelihood = -12.55962                      Prob > chi2       =     0.8946

------------------------------------------------------------------------------
D.           |                 OPG
Navbahor_Textile |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
Navbahor_Textile |
       _cons |   1.856056          .        .       .            .           .
-------------+----------------------------------------------------------------
ARMA         |
          ar |
         L1. |  -.0753978   2.138442    -0.04   0.972    -4.266666    4.115871
             |
          ma |
         L1. |   .4798156   2.459624     0.20   0.845    -4.340959     5.30059
-------------+----------------------------------------------------------------
      /sigma |   5.456574   3.267821     1.67   0.047            0    11.86138
------------------------------------------------------------------------------
Note: The test of the variance against zero is one sided, and the two-sided
      confidence interval is truncated at zero.
```

Figure 6. ARIMA(1,1,1) model of cluster yield data of "Navbahor Tekstil" LLC

Using the "Stata" program, using the ARIMA method, reliable forecast values for the ears 2024-2030 were determined.

International Journal Of Management And Economics Fundamental (ISSN – 2771-2257)
VOLUME 04 ISSUE 05 PAGES: 19-31
SJIF IMPACT FACTOR (2022: 5.705) (2023: 7.448) (2024: 8.202)
OCLC – 1121105677
Publisher: Oscar Publishing Services

Table 9
Forecast data on average yield in 2024-2030[13] , ts/ha

Years	"Navbahor Textile" LLC	"Baht-Textile" LLC	"Maroqand Sifat Tekstil" LLC	"Samarkand Kamalak Invest Textile" LLC
2024	39.0	36.7	36.9	36.8
20 25	40.1	37.8	37.4	37 .1
20 26	41.5	38.1	39.1	3 7 .8
20 27	41.9	39.6	41.8	3 7 .9
20 28	42.6	41.2	43.5	38 . 1
2029	45.0	43.6	44.1	38.3
2030	46.5	45.4	45.7	41.8

By 2030, when applying the results of the model developed in clusters, it was determined that the average yield will be equal to 45.7 ts/ha.

Conclusions and offers. The following conclusions and proposals were formed as a result of the scientific research conducted on the data of 136 clusters in order to develop factors and forecasts affecting cotton yield and gross yield in the Republic of Uzbekistan:

1. As a result of our econometric analysis using the "Stata" program, the gross area of cotton grown by agroclusters, the amount of land spent on agriculture and industry , respectively, is 0.84; 0.19; With a correlation of 0.21, it was found that these three factors influence 72% of the gross yield variation .

2. The effect of the three selected factors on the gross yield was modeled by the "Least Squares" method and all conditions of Gauss Markov were met and a reliable model was created. As a result, it was proved that the change of the gross yield of cotton is highly dependent on the area of land planted with cotton . That is, an increase in land area by 1% ensures an increase in gross yield by 0.78% . A 1% increase in industrial expenditure increases gross output by 0.11% , and a 1% increase in agricultural expenditure provides an increase in gross output by 0.108%.

3. It has been proved on the basis of scientific research that it is possible to further increase the annual average yield of the cotton crop grown by the clusters through the involved investments. In this case, the average yield increases by 0.27% as a result of greater investment in the introduction of water-saving technologies . Less investment in land use and development is desirable. Because there is an inverse correlation between average productivity and land use and development.

4. Using the indicators of the developed models and the ARIMA model, when forecasting the average productivity of the clusters of "Navbahor Textile" LLC, "Baht-Textile" LLC, "Marokand Sifat Tekstil" LLC and "Samarkand Kamalak Invest Textile" LLC in 2024-2030 , in 2030 each was predicted to reach an average yield of 45.7 t/ha.

REFERENCES

1. Al-Haboby A., 2021. Agriculture for development in Iraq? Estimating the impacts of achieving the economic growth.

International Journal Of Management And Economics Fundamental (ISSN – 2771-2257)
VOLUME 04 ISSUE 05 PAGES: 19-31
SJIF IMPACT FACTOR (2022: 5.705) (2023: 7.448) (2024: 8.202)
OCLC – 1121105677
Publisher: Oscar Publishing Services

2. Beckman, J., Countryman, A., 2021. The Importance of Agriculture in the Economy: Impacts from COVID-19. Am. J. Agric. Econ. 103 (5), 1595–1611. https://doi.org/10.1111/ajae.12212
3. David L. Debertin. Agricultural Production Economics (Second Edition, Amazon Createspace 2012) is a revised edition of the Textbook. 431 p.
4. Alexandri, C., Luca, L., 2014. Implications of agrarian structures upon the agricultural supply in Romania. 1st International Conference 'Economic scientific research – theoretical, empirical and practical approaches' ESPERA 2013, 8, 17–24.
5. Meo M.S., Khan V.J., Ibrahim T.O., Khan S., Ali S., Noor K., Asymmetric impact of inflation and unemployment on poverty in Pakistan : new evidence from asymmetric ARDL cointegration, Asia Pacific, J. Soc. WorkDev. 00 (2020) 1–16.
6. Afanaseva A.V., Statisticheskaya otsenka dynamics of proizvodstva selskohozyaystvennoy produktsii v sisteme gosudarstvennogo regulirovaniya prodovolstvennogo rynka. Autoref. d iss. nor sois. cand. economy science - Samara. 2008. -26 s.
7. Smagin B.I. Economic analysis and statisticheskoe modelirovanie agrarnogo proizvodstva. Monograph./ – Michurinsk: Izd-vo M ichGAU, 2007. – p. 15 3.
8. Degtyareva N.A., Ekonometricheskie modeli analiza i prognozirovaniya: monograph / - Chelyabinsk: Tsitsero, 2017.-170 p .
9. Lenkov I.I. "Modelirovanie prognozirovanie ekonomiki agropromyshlennogo komplexa" - Monograph. Minsk: BGATU -2011. 228 p.
10. Shadiev T.Sh. Problemy modelirovanie razvitiya selskogo hozyaystva (na primere Uzbekistana). Diss. dok. ek. nauk. - M.: 1988. – 380 p.
11. Berkinov B.B., Amirov L.F. Metodicheskie aspekty analiza i otsenka effektivnosti finansovo-ekonomicheskih pokazateley otrasley agrarnogo sektor Uzbekistana / Journal of Economics. - 2022. No.2.
12. Abdug'aniev A. Agricultural economy. - T.:Literary Fund. 2007. 340 p.
13. Khujakulov Kh.D. and others. Development of effective ways of structural changes in the context of modernization and diversification of the economy based on statistical methods. Monograph.– T.: ECONOMY-FINANCE, 2018. - 152 p..;
14. Mamatkulov B.Kh. Improvement of the methods of statistical evaluation of the efficiency of economic support mechanisms of farms (in the example of farms of the Republic of Uzbekistan). Diss. to be written for DSc. - T.; TDIU, 2023.-185 p.
15. Rashitova N.Kh. Methods of statistical study of structural shifts in the agricultural sector. Iqt. science. name science write to get dar. diss. -T.: TDIU, 2010.-159 p.
16. Utanov B.K. Econometric modeling of the efficiency of multi-sectoral farms. Enrolled to get a PhD. diss. -T.: Own stat. under KMOVSTI, 2020.-136 p.
17. Bruce E. Hansen// Econometrics // University of Wisconsin Department of Economics , 2018, p 18.
18. Magnus Ya.R., Katyshev P.K., Peresetsky A.A. "Econometrics" // Academy of National Economy of the Russian Federation , 2004, st-25
19. Carter Hill R., William E. Griffiths, Guy C. Lim "Principle of Econometrics"// John Wiley & Sons, Inc. //2011//34 r.

20. Edgeworth, Francis Y. (Sep 1908). "On the probable errors of frequency-constants" . Journal of the Royal Statistical Society. 71 (3): 499–512. doi : 10.2307/2339293 . JSTOR 2339293 .
21. Ochilov I.S. Improving the analysis of the mezzanine financing in Uzbekistan clusters. The American Journal of Management and Economics Innovations. ISSN: 2693-0811. OCLC – 1176275019. September, 2023. Volume 05. Issue 09. pp.25-29. SJIF 2023=7.442.
22. Ochilov I.S. Methodology for assessing the financial efficiency of agro clusters. The American Journal of Social Science and Education Innovations. ISSN: 2689-100X. OCLC – 1121105668. September, 2023. Volume 05. Issue 09. pp.81-85. SJIF 2023=7.223.
23. Ochilov I.S. Methodology for Practical Analysis of Economic Efficiency Indicators of Clusters. International Journal of Multicultural and Multireligious Understanding. ISSN: 2364-5369. Volume 10, Issue 10. October, 2023. pp. 302-308. SJIF 2023=7.56.
24. Ochilov I.S. Analysis of foreign experiences of evaluating the efficiency of organizational and economic mechanisms of agroclusters. Frontline marketing management and economics journal. ISSN: 2752-700X. Volume 03, Issue 11. November, 2023. pp.28-40. SJIF 2023=6.834.
25. Ochilov I.S. Issues of improving financing of agricultural clusters. BIO Web of Conferences 82, 02035 (2024). MSNBAS 2023. eISSN: 2117-4458. Scopus, – 03 January 2024. - pp. 1-7.
26. Ochilov I.S. Issues of financing of agricultural complexes
27. and their economic analysis. E3S Web of Conferences, Volume 497, 03047 (2024). ICECAE 2024. Scopus, 07 March 2024. - pp. 1-11.
28. Очилов И.С. Трансформация ва рақамли иқтисодиёт шароитида агрокластерлар самарадорлиги таҳлилини такомиллаштириш. Монография. - 2022. -Т: “O`zkitob savdo nashriyot matbaa ijodiy uyi” нашриёти.– Б172.
29. Очилов И.С. Агрокластерларнинг ташкилий-иқтисодий ва молиявий таҳлили. Бизнес-Эксперт. - 2023. – №4. – Б 12-15.
30. Ochilov I., Khalikov S., Turdibaev A. Methodology For Evaluating The Organizational And Economic Efficiency Of Agroclusters. Educational Administration: Theory and Practice,Research Article. 30(4), ISSN: 2148-2403. Scopus, SJR 0,19. Doi: 10.53555/kuey.v30i4.248. pp. 6822–6827.
31. Saidov M., Ochilov I. Theoretical analysis of agricultural clusters in
32. innovative economy //BIO Web of Conferences 65, 03006. EDP Sciences. ISSN: 2117-4458. 04 September 2023. pp. 1-9. SJR 2020=0,115.
33. Saidov M., Ochilov I. Financial Analysis of Agrocluster in Digital Economy//AFE: Fundamental and Applied Scientific Research in the Development of Agriculture in the Far East. Lecture Notes in Networks and Systems, vol 733. Springer, Cham. pp. 739–747. ISSN: 2367-3389. 10 February 2024. Springer Link.