IMPROVING THE ANALYSIS OF BUSINESS PROCESSES IN DIGITAL ERA

Shayzak Kholmuminov*
DSc., professor at Tashkent State University of Economics
sh.kholmuminov@tsue.uz

Bobir Tursunov
DSc., associate professor, Head of the "Economic security" Department, Tashkent State University of Economics
tursunov-bobir@mail.ru

Markhabo Saidova
PhD, senior teacher at "Economic security" Department, Tashkent State University of Economics
marhabo.uzb@mail.ru

Laylo Abduhalilova
PhD, associate professor "Marketing" Department, Tashkent State University of Economics
abduhalilova@tsue.uz

Nigora Sadriddinova
PhD student at Tashkent University of World Economy and Diplomacy
nigfrance@mail.ru

ABSTRACT

The purpose of this research paper is to determine the main directions and methods for assessing the state of a business, organize the collection of statistical data on small businesses, the main indicators for the collection of statistical data on small businesses, the main criteria for determining a small business to collect statistical data, as well as the use of world rankings data as a tool for analysis of the state of business in digital Era. Based on the results of the study, econometric research methods were generalized, the main directions and methods of collecting statistical information on small businesses to assess the state of small businesses in the country in the era of digitalization were determined.

CCS CONCEPTS

• small business; **• interaction between government and business**; **• small business research methods**; **• digitalization**; **• regression**; **• correlation**;

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INTRODUCTION

After the global crisis, which arose under the influence of the COVID-19 pandemic, it has become an urgent issue to conduct business activities, to observe and predict statistics, to statistically assess the impact of the pandemic on business entities, to improve business processes of statistical analysis of the pandemic and its subsequent development processes.

A small business is an industry that is able to respond to rapidly adapting and changing trends in any conditions, leading to the creation and application of innovations and innovations, having its place in the economy. The relevant legal framework has been created in this area. However, adequate research has not been carried out on the methods of statistical analysis of business development processes, the development of concrete recommendations for modeling and the creation of scientific and theoretical bases of forecasting. These situations actuate the issue of modeling small business activities and the development of scientific and theoretical bases of forecasting on their basis.

1 LITERATURE REVIEW

The study of methods and methodological bases of analysis of business development processes is also reflected in research, scientific works, brochures and articles conducted by foreign and National Economists. In particular, theoretical aspects of business development from foreign scientists R. Drogendijk [1], M. Oscar, N. Dotta [2], R.S. Sobel, E.F.Brigham., B.R.Schiller [6], K.Gebhardt, D.M.Levine [7], D.F.Stephan, K.A.Szebet, S.P.Robbins [8], T.A.Judge, K.Anordstrom [9], J.It is illuminated in the scientific work of Ridderstrail and others.

In the specific direction of theoretical and practical aspects of business processes and models from scientists of the countries of the Commonwealth of Independent States (CIS) V.V. Repin, Zarova, E.V. [11], M. Ribakov, V.G. Eliferov, Andersen Byorn, M.C.Ebryutine, A.I.Belov, C.V.Zire " Lost In Test MatchN.Merenkova, A.N.Nasov, A.I.Panteleeva, D.Sepik, G.N.Dabrin, E.E.Kerlik, M.I.Buhalkov, V.N.Vasilyev, A.V.Sheer, G.Scientists, like Kalyanov, conducted scientific research.

In the development of business, along with its organizational aspects, the theoretical and methodological aspects of the analysis and forecasting of its development also occupy an extremely important place, and its further improvement requires the modern itself.In this regard, citing the scientific work of the following economists of our country: B.Khodiev, Burkhanov A.[4], Bakhodirovna B.D.[3], Eshov M. [5], Abdurakhmanova, G.K. [10], Sh.Khalmuminov [12],

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H.O.Rahmonov and others studied the scientific-practical basis and issues of small business development, as well as the theoretical and methodological aspects of the analysis and forecasting of Small Business Development.

Although the above research provides a general overview of the topic in the context of the bakrqar development of the economy, but the issue of improving the methods of analysis of business development processes with a focus on unsustainable conditions has not been studied in a special way as an object of research. This situation determines the need for scientific research in this direction.

2 METHODOLOGY

Modeling of business processes has always been considered one of the important issues in the research carried out in this area. Currently, there are more than 20 methods of modeling business processes, which are selected mainly based on data types (Figure 1).

1-as can be seen from the picture, the models used in the analysis of business processes are mainly six, they are regression models, error correction(ECM) model, autoregressive lag (ADLM, AIDS), vector autoregressive, cointegration (CI), time variation (TVP) models.

The occurrence and development of the business process depends on many factors, variables, it is regarded as a complex system: in scientific research, such systems are studied on the basis of systematic bias, that is, they are studied on the basis of systematic analysis and synthesis methods. [11]

In economics, such complex systems are modeled using econometric models, which are based on a multi-factor correlation-regression analysis. When researching the process of business development on the scale of the country, on the scale of sectors and sectors, or in the sectors of MXT, a set of factors affecting it are taken into account. Therefore, no matter to what extent the study is based on the multi-factor regression of its econometric model. Based on this, it is proposed to use the theory of constructing multi-factor regression econometric models to model the process of business development.

Based on the theory of correlation-regression analysis, the indicators that characterize the development of business are divided into causal and factor-Blinders. In the analyzed economic process, the indicator of the share of business in the economy is taken as a resultant indicator (sign) and the share of business in the network, sphere and economic entities that affect its change are Factor indicators (signs). The fact that the number of indicators is equal to the number of business entities should not be ignored.

If the general view of the multi-factor regression equation, which reflects the formation of the share of business in the GDP, is as follows:

$$Y = a + b_1 y_1 + b_2 y_2 + \ldots + b_n y_n + \varepsilon. \quad (1)$$

Taking into account the selected factors, this equation is expressed as follows:

$$\hat{Y}_x = a + b_1 y_1 + b_2 y_2 + \ldots + b_m y_m + \varepsilon, \quad (2)$$

In this equation omillarni is M<n if the secondary factors as a result of sorting are excluded, m>n if an additional factor is included. In this equation I -the percentage of business in the network, - regression coefficients. They indicate how much the total amount of business will change if the amount of business receipts in each network, respectively, changes in one unit, while the amount of business receipts in other networks does not change. and the option A is equal to the percentage of business in sectors that are not yet noticed in the total amount of business. ϵ is a random error that can be avoided.

The values of the parameters of the equation are determined either by supporting the "least squares method"that we use to solve the system of equations, or by using a special "regression" command of the software product MS EXCEL, STATA, EVIEWS, SPSS, GRETL, or other software products.

In order for the calculations to be accessible to all, it is also possible to use the software product MS EXCEL, STATA, EVIEWS, SPSS, GRETL when compiling a regression equation, assessing the statistical significance of the structured equation and its parameters.

The next issue of econometric modeling consists in assessing the autonomy of the structured regression equation and the statistical significance of its parameters.

Fisher's F-criterion of the significance of the structured multi-factor regression equation rated using.

$$F = \frac{D_{fact}}{D_{eq}} = \frac{R^2}{1 - R^2} \cdot \frac{n - m - 1}{m}, \quad (3)$$

here: - the sum of squares by one degree of freedom of a factor, ;
- the sum of the squares of the remainder by one degree of freedom, ;
– Multiple Factor determination coefficient;
–x number of parameters before the variable;
number of observations.

According to Fisher's F –criterion, if the value of F, calculated by the above formula, is greater than the table value of F, that is, the regression equation will have a statistical meaning.

In multi-factor regression, neither only the statistical significance of the regression equation, but the significance of each factor included in the regression model is assessed.

In general, the private F-criterion of the xi factor is determined,

$$F_{x_i} = \frac{R^2_{yx_1 \ldots x_i \ldots x_p} - R^2_{yx_1 \ldots x_{i-1} x_{i+1} \ldots x_p}}{1 - R^2_{yx_1 x_2 \ldots x_i \ldots . x_p}} \cdot \frac{n - m - 1}{1} \quad (4)$$

Each of them is evaluated statistically meaningful by comparing the values in the tables, and the question of the sequence of inclusion of each factor in the model is solved.

When assessing the significance of the coefficient of private regression in multi –factor regression with the criterion Styudent t -, the following formula is used for each factor:

$$t_{b_i} = \sqrt{F_{x_i}}, \quad (5)$$

Here -xi private F-criterion of factor.

If the true value of is greater than its Tabular value, the bi factor is called a statistical significance, and the regression equation is recommended to solve the problem of forecasting.

The econometric models that reflect the processes of the structured and past periods are now used to solve the problems of forecasting, that is, the question of what changes can be made in the

process in the values that the factor can accept in the future of the signs is solved.

In order to improve the basic models used in the analysis of business processes, the model analyzing business processes was developed on the basis of data while cointegration and error correction (esm) models were used together.

Engl and Greyncer believe that if a pair of non-linear variables belong to a single economic system such as xt vaytbiznec and income, there must be a cointegration connection that prevents them from moving away from each other. So, there is such a balancing power that the xt weightlifters move together in the long term. Against this background, the mathematical expression of the equilibrium model, which occurs as a result of the simultaneous movement of xt Weit in the long term, is written as follows:

$$y_t = \beta_0 + \beta_1 x_t \tag{6}$$

$$\varepsilon_t = y_t - \beta_0 - \beta_1 x_t \tag{7}$$

According to Engl and Greyncer, (6) if there is a long-term balanced link in the formula, (7) if there is an imbalance error in the formula, it is rarely far from zero. This means that the model remains stationary and oscillates around zero over time.

In the scientific literature, non-traditional lines are also referred to as" integrated process". The degree of integration of the array is determined by how many times it needs to be differentiated in order to make it stationary. Thus, the stationary rows will be "zero-level integrated" and will be briefly expressed as I(0). If the array becomes stationary after one differentiation, it is called a first-degree integrative and is denoted as I(1). In general, davriy if the array is stationary after the time d is differentiated, the degree d is called integrative and is determined in the style of I(d): davriy rows with the same degree of integration are called cointegrated davriy rows. If, XT Weit variables are D-level cointegrated and there is vektori equality(d-b) (here, b>0) which provides degree integration (β_(0,) β_1), then xt Weit (d-b) is called degree cointegrated and is written in the form of (xt,yt) ~ CI(d-b). Here () is called vektori – cointegration vektori. Although this definition applies to two variable States, in this way, the state of the k – variable cointegration system can also be cited.

Engl and Greyncer indicate that the cointegrated variables can always be transformed into error correction mexanizm and vice versa error correction mechanism cointegrated variables. The mathematical expression of the esm model in the Greiner theorem will have the following appearance:

$$\begin{cases} \Delta X_t = \alpha_1 \ (Y_{t-1} - \vartheta - \beta X_{t-1}) + \sum\limits_{j=1}^{m-1} \beta_{1j}^* \Delta X_{t-j} + \sum\limits_{j=1}^{m} \delta_{1j}^* \Delta Y_{t-j} + \varepsilon_{1t} \\ \Delta Y_t = \alpha_2 \ (Y_{t-1} - \vartheta - \beta X_{t-1}) + \sum\limits_{j=1}^{m-1} \beta_{2j}^* \Delta X_{t-j} + \sum\limits_{j=1}^{m} \delta_{2j}^* \Delta Y_{t-j} + \varepsilon_{2t} \end{cases} \tag{8}$$

Here, Yt and X t – I(1) are integrated level, while and are independent and mean "0" and equally distributed with constant dispersion. Also, the value of at least one of the coefficients α_(1) vaa_(2)must necessarily be different from zero. Both equations are balanced because both sides of the equation have the same degree of integration. If, Yt and Xt determine the long-term correlation between the variableslasa,the difference indicates the degree of deviation from the equilibrium state, and the coefficients indicate the strength of the economic system in pursuit of equilibrium.

There are several advantages of the Esm model over the simple qat Series models, among which, the ability to distinguish between short and long-term characteristics of reality, as well as the problem of multicollinearity, it is permissible to emphasize that it does not come out. Despite such advantages of cointegration tests, it is necessary to check with several tests that their application is expedient, on the contrary, erroneous results can be obtained.

In general, in order to calculate the cointegration equation, first of all, with the help of unit tests, the degree of integration of variables is determined, and then the cointegration tests are performed. If these tests confirm that the variables are cointegrated, the esm model will be evaluated at a later stage. All the tests shown are carried out in software packages such as EVIEWS or STATA.

Given the theoretical framework of the cointegration model, the linkage between economic growth and the volume of products produced by small businesses represents:

Here, Ln – natural logarifm, RGDP - Real YAIM, kb-means the volume of products produced by small businesses.

Since the verification of the cointegration relationship requires the degree of integration of variables, the degree of integration is determined for each variable before the tests of cointegration. For this, the Dickey-Fuller (DF) test is used [24]. This test was developed by Dickkey and Fuller and is based on (8) equality and is used under the name" unit Root Test:

The variable of the volume of products(Lnkbt) produced by small businesses is also checked in the same way to the stationary one. Bunda said that if LnRGDPt valnkbt is non-linear and has the same degree of integration, then at a later stage the cointegration relationship between these variables is checked by means of tests such asadorlik binoculars Watson Cointegration, Johansen Cointegration.

Finally, in the last edition, a Granger Causality (Granger relationadorlik) test is used to determine the direction of the relationadorlik between variables. Whether the volume of products produced by small scale business in this testing instrument stimulates economic growth or vice versa.

In examining the relevance of business and economic growth indicators, many scientists have recommended the esm model. Required variables for the application of the grader connectiontest must be characterized by stationary stochastic communication. If it is determined that the variables in the unit Root Test (extended Dickey-Fuller, Phillips-Perron) are not stationary, the yield is obtained d times until the variable becomes stationary. In the short term, although variables move away from each other, in the long term, they may have been cointegrated due to their general equilibrium. A cointegration test is used to check the hypothesis that denies cointegration. Here, most researchers use the Johansen cointegration test. After the cointegration relationship is evaluated, esm and Greyncer relationshiptests are used to check the short-and long-term dynamics.

3 ANALYSIS AND RESULTS

Using the data of the State Statistics Office of the Republic of Uzbekistan for an empirical examination of the relationship between the volume of products produced by small businesses and economic growth in Uzbekistan, the volume of products produced by small

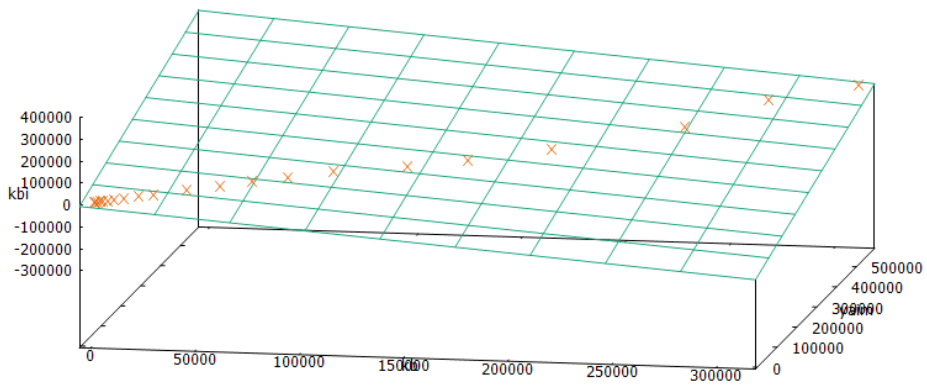

Figure 1: Dependence of the volume of products produced by GDP and small businesses

businesses in the years 2000-2020, the volume of investments directed to small businesses and the database with the rows. In the period analyzed in Figure 1 below, there is a trend in the volume of products produced by Naim and small businesses, while there is no growth trend in the volume of investments directed at small businesses. In general, the volume of investments aimed at small businesses has a tendency to grow but, in some years to the next, its volume has sharply decreased:

To model these indicators, it is necessary to logarify them. In this regard, the above indicators were logarified in the dissertation. YAIM said that the volume of products produced by small businesses,the volume of investments directed at small businesses were investigated using the stationary ADF-test, and the linkage between them was assessed through the Johansen cointegration test. In addition, a grainer connectionadorlik test was used to determine the direction of cointegration. The esm model was used to check the short-term correlation between the parameters studied.

Periodic one of the important steps in the empirical analysis of series is to determine the degree of integration of variables. This was checked by means of the ADF test of the zero hypothesis that "unit Root does not exist" in relation to all variables. The data presented in Table 2 showed that the hypothesis that the volume of products produced by YAIM and small business does not have a unit root "in relation to variables was rejected in the range of 1%, 5%, 10% reliability, but in the volume of investments directed to small business, the hypothesis that the" unit Root does not exist "is confirmed to exist with The results of these ADF tests are presented in Table 1.

As a logical continuation of the analysis, the hypothesis that variables "have first - degree roots" was investigated and it was concluded that the volume of products produced by GDP and small scale business did not have variable 1st degree integrations. In the next raid, a Johansen trace test (Johansen Trace Test) was performed to determine the presence of cointegration between non-linear variables, and the following results were obtained.

According to the results of the observation test, there are two cointegration equations between the indicators Lnyaim and Lnkb. In the same way, it was determined that there are two cointegration equations between the lnkb and Lnkbi indicators. The sign of the normalized coefficients of cointegration in Table 2, as well as the results of the t – test, was confirmed in accordance with the investigated hypothesis, as well as the positive impact of the volume of products produced by YAIM business, the volume of products produced by small businesses on the volume of investments directed to the business.

The presence of cointegration dependencies between variables indicates that they are striving for each other in the long term. The coefficients of the cointegration equation obtained on the basis of the Test results are as follows:

We use the esm model so that we can see the short-term correlation between the variables. To evaluate the Esm model, a suitable lag value should be selected using the criteria Akayke (Akaike AIC) and Schwars (Schwarz SC). In the case under consideration, the optimal lag value is three. DLYAIM by Naim is 0,15; 0,14, and the products produced by small businesses are volmidlkb -1,63; equal to 1,19.

Hence the coefficient of error correction – the value is negative and statistically significant. Such a result means that in the long term the variables are striving for balance, and in Uzbekistan, the aim of the Naim to balance is corrected by about 7% every year.

The mathematical expression of these results is written as follows:

$$D(LGDP) = 0,07*(LGDPt - 1 + 0,78 * LSBt - 1 + 3,72) - 0,15 (DLGDPt - 1) - 0,64DLGDPt - 2 + 0,31DLSBt - 2 + 1,07 \quad (3.13)$$

$$D(LSB) = -0,15*(LSBt - 1 + 0,53 * LSBIt - 1 + 3,72) + 0,53* (DLSBt - 1) + 0,31DLGDPt - 2 + 0,18DLGDPt - 2 - 3,57 \quad (14)$$

Statistical, mathematical analysis of the relationship between the volume of products produced by small businesses and economic growth shows that the strongest factor affecting business growth in

Table 1: ADF test results

Variable	ADF statistics	Critical values	Probability	Decision
LnGDP	-3,879	In 1% -3,75	0,0022	Probability decision
		In 5% -3,00		
		In 10% -2,63		
LnSB	-5,153	In 1% -3,75	0,0000	Probability decision
		In 5% -3,00		
		In 10% -2,63		
LnSBI	-0,779	In 1% -3,75	0,8251	Probability decision
		In 5% -3,00		
		In 10% -2,63		
Variable level subtraction	ADF statistics	Critic value	Probability	Decision
LnGDP	-1,924	In 1% -3,75	0,3210	Probability decision
		In 5% -3,00		
		In 10% -2,63		
LnSB	-2,329	In 1% -3,75	0,1628	Probability decision
		In 5% -3,00		
		In 10% -2,63		
LnSBI	-0,543	In 1% -3,75	0,030	Probability decision
		In 5% -3,00		
		In 10% -2,63		

Table 2: Johansen observation test results

Number of cointegration equations according to the hypothesis	Private value	Observation statistic	Critical value	Probability
		LnGDP and LnSB		
No	0,346	7,66	18,63	0,02
Maximum 1	0,211	4,28	6,65	0,03
	Conclusion: there are two cointegration equations with 5% accuracy			
		LnGDP and LnSB		
No	0,68	42,54	18,63	0,01
Maximum 1	0,44	10,69	6,65	0,05
Maximum 2	0,25	5,26	4,62	0,24
	Conclusion: there are two cointegration equations with 5% accuracy			

Table 3: Cointegration of coefficient

Variables	Normalized cointegration coefficients	Standard error
LnGDP	1	
LnSB	0,78	0,17
Variables	Normalized cointegration coefficients	Standard error
LnSB	1	
LnSBI	0,53	0,04

the conditions of Uzbekistan is the volume of investments directed at small businesses.

Thus, economic growth in the Republic of Uzbekistan the volume of products produced by small businesses, the volume of products produced by small businesses and the volume of investments directed to small businesses were proved on the basis of the Johansen test for the existence of bilateral relations.

Table 4: ESM of the coefficient model

Result character DLGDP		
Independent variable	Coefficient	t-statistics
ECt-1	0,07	2,40
DLt-1	-0,15	-2,29
DLt-2	-0,64	-2,25
DLt-1	0,14	2,49
DLt-2	0,31	1,89
	1,07	2,79
Result character DLSB		
Independent variable	Coefficient	t-statistics
ECt-1	-1,42	-2,68
DLt-1	-1,63	-2,06
DLt-2	-0,68	-1,07
DLt-1	1,19	2,23
DLt-2	0,81	1,78
Free variable	-3,57	-2,42

Table 5: Multi-factor regression indicators of small business development processes in Uzbekistan

№	Conditional designation	Expression in relation to the total volumemga	Content of selected male and female variables
1	Yt	%	Business volume in gross domestic product
2	X1	%	Share of business in employment
3	X2	%	Business share in agriculture, forestry and Fisheries
4	X3	%	Share of business in export volume
5	X4	%	Share of business in industry
6	X5	%	Share of business in investment
7	X6	%	Share of business in construction
8	X7	%	Share of business in sales
9	X8	%	Share of business in paid services
10	X9	%	Share of business in total services
11	X10	%	Share of business in cargo transportation
12	X11	%	Share of business in cargo turnover
13	X12	%	Share of business in passenger transportation
14	X13	%	Share of business in passenger turnover
15	X14	%	Share of business in import volume

4 DISCUSSION OF RESULTS

Determining the level of interrelationships and interaction between the factors involved in the process of increasing the share of business in the structure of the country's economy, which directly and indirectly affect them, as well as the factors interacting with each other, improving the methods of statistical analysis of business development processes in Uzbekistan, forecasting trends in business development, determining the need to, the design and evaluation of a business development trends model makes it possible to establish and choose the direction of business development.

The resultant character and factor characterization in the study were selected as the variable factors that can positively and negatively affect the small scale business in the NPM, the business volume in the NPM and the 14 factor characterization affecting it: the volume of business in the industry, the volume of business in the construction, the volume of general employment in the economy in 5.

Here cited the relative variability indicators of the factors affecting the business volume in the ICJ over the years 2000-2020. This variable is selected as a dependent variable and is influenced by the variables remaining in its formation, that is, the volume of business in the industry, the volume of business in construction, the volume of business in the economy, the volume of business in the economy, the volume of exports and imports, and other exemptions. According to the"law of large numbers", 14 factors were chosen to ensure that the greater the coverage, the more accurate the result was.

Table 6: Indicators of indirect sorted factors

Description of factors	Volume of products produced in small business mlrd.UZS	Export volume of small business entitiesmlrd.UZS	Service in the subjects of small businessmlrd.UZS	Number of occupations in small business
Years	Yt	X1	X8	X14
2000	1009,236	244	46,8	22,8
2005	6082,739	1104,8	156,8	33,7
2010	38872,05	10132,9	255,2	35,8
2015	132205,2	39643,5	472,8	44,5
2020	301254,2	89234,2	662	61,4

Table 7: Matrix of correlation coefficients of factor and result parameters by indirect scenario

	Yt	X1	X8	X14
Yt	1	0,993281303	0,922159605	0,939785711
X1	0,993281303	1	0,714759434	0,63215715
X8	0,922159605	0,714759434	1	0,762034756
X14	0,939785711	0,63215715	0,762034756	1

The composition of the indicators according to the current trends for the formation of a multi-factor regression dynamic model is presented in the table below:

For our study, two selected factors from a set of factors affecting product production in small business activities were separated into a group of factors affecting indirectly and directly according to the scenario.

Their algorithm was developed by dividing the selected factors into the direct and indirect factors that affect the development of the business, even though these factors were analyzed on the basis of hypotheses on the extent to which they affect the development of the business.

As a result, among these indirect factors, the volume of exports of small business entities - X1, the provision of services in small business entities - X8 and the number of items in the field - X14 were selected, only three of the six factors were selected at the beginning.

The factors affecting them on the basis of the sorted indirect scenario, as well as the resulting factor, are shown in Table 8 of the coefficients of double correlation with respect to the volume of products produced in small business-Yt.

Analysis of the coefficients of double correlationng if we pay attention to the results of the analysis, the export volume of small business entities (rYt,1=0,9933) and the provision of services in small business entities (rYt,1=0,9222) as well as the provision of services in small business entities-X8 and the number of items in the field (rYt,14=0,9398), strongly correlated in density, we will continue to determine the regression equation between the observed correlation because there is no multicolenarity between the selected factors by r1,2<0,8 condition through the EVIEWS program. To do this, due to the variety of units of measurement of factors, we take the indicators e log according to the basis, and the result is presented in the Table 8 below.

From the results of the analysis, we can see that the actual values of the Fisher's criterion are equal to = 3530,3 and its critical values from the table (Ftabl. 8,683)since it is greater, the equation has meaning and gives an understanding of its possible changes in it.

To check the autocorrelation in the residues of the causal factor by Model, we use the criterion Darbin-Watson (DW) [11]:

$$DW = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2} = \frac{\sum_{t=2}^{T} e_t^2 + \sum_{t=2}^{T} e_{t-1}^2 - 2\sum_{t=2}^{T} e_t e_{t-1}}{\sum_{t=1}^{T} e_t^2} =$$

$$= 2 - 2\frac{\sum_{t=2}^{T} e_t e_{t-1}}{\sum_{t=1}^{T} e_t^2} \approx 2(1 - \rho_1),$$

here, ρ_1 ρ_1 – correlation coefficient of the first order.

If there is no autocorrelation among the remnants of the resultant factor, it seeks to zero in positive autocorrelation , and to 4 in negative autocorrelation.

The calculated DW is compared with the DW in the table. According to the result of the multivariate regression equation of Yt and its criteria examination on the indirect scenario, ,048704 showed that there was no autocorrelation among the residues of the causal factor.

Based on the values of the coefficients listed in the table data, the following equation is generated:

$$LnY = 0,72LnX1 + 0,43LnX8 + 0,17LnX14 + 0,9154916 \quad (16)$$

If we pay attention to the significance of the parameters of the 16-regression equation determined by the t-statistical criteria, then only the significance of the parameter X14 (tITS=0.9465<tjad=2,10982)came from the equation tjad=2,10982 with α =17 and df=2,10982, which, in fact, indicates its immaturity or significance retrospektiv quality criteria MAPE (mean Absolute inquality coefficient – teyl requires verification with an alternative measure of forecast accuracy) (Figure 2).

Table 8: The result of Yt 's multi-factor regression equation and its criterion check on the indirect scenario

Dependent Variable: LNYT				
Method: Least Squares				
Date: 07/05/21 Time: 11:50				
Sample: 2000 2020				
Included observations: 21			tjad= 2,10982	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNX1	0.721478	0.030474	23.67486	0.0000
LNX8	0.433292	0.073641	5.883867	0.0000
LNX14	0.171473	0.181162	0.946517	0.0571
C	0.837233	0.430274	1.945813	0.0284
R-squared	0.998397	Mean dependent var		10.22780
Adjusted R-squared	0.998115	S.D. dependent var		1.813243
S.E. of regression	0.078733	Akaike info criterion		-2.075864
Sum squared resid	0.105381	Schwarz criterion		-1.876907
Log likelihood	25.79657	Hannan-Quinn criter.		-2.032685
F-statistic	3530.289	Durbin-Watson stat		2.048704
Prob(F-statistic)	0.000000	Fjad= 8,683		

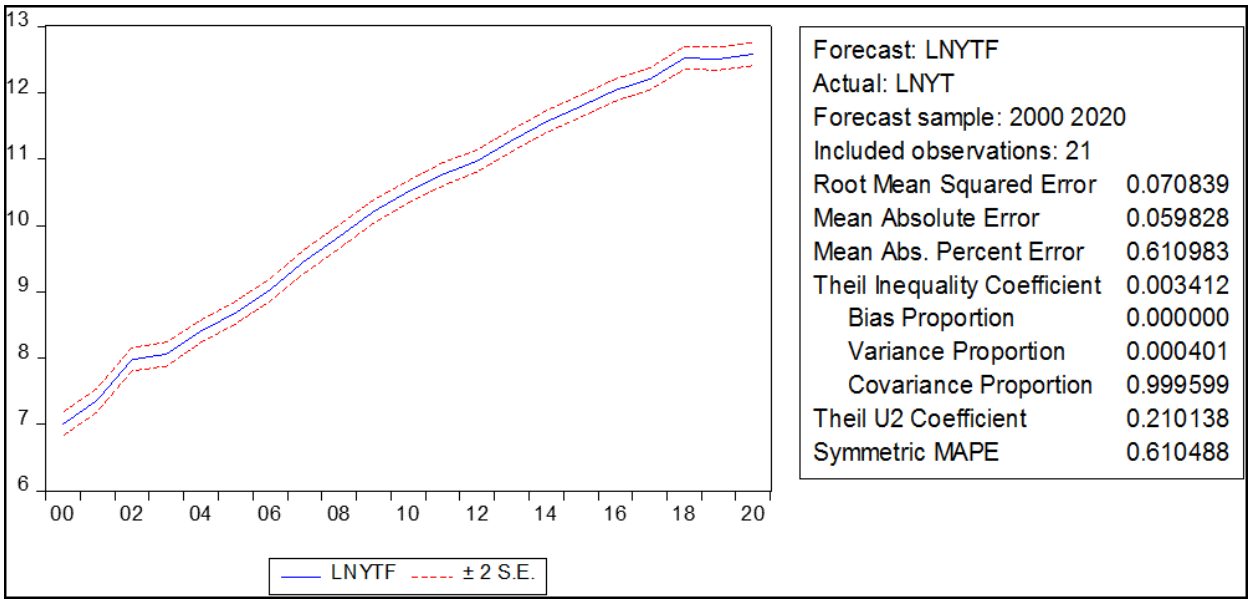

Figure 2: 17-retrospective quality criteria result of regression parameters

Based on the data presented in Figure 2, it can be noted that MAPE=0,61, which in turn is MAPE=0,419<10% forecast accuracy is high, and the higher the tic=0,0034<1 forecast accuracy, the greater the coefficient, the more significant all of the parameters of the 3.22-regression equation from the pursuit of such a zero.

In order to facilitate the rules of mathematics and computational processes, as well as to achieve the accuracy of the results, the above generated 3.22-regression equation is potentiated and according to which the following equation is generated:

$Yt = X1^{0,72} * X4^{0,45} * X14^{0,17} * e^{0,9154916} 17^*$

The Fisher value calculated by taking into account the fact that the generated 3.22*-regression equation is equal to α =0,05 and k1=17; when k2=3 is equal to Ftab= 8,683 Fcal =3530,3 Fcal<3.22*- the significance of the regression equation under the fhis condition, as well as DW=2,05, is due to the lack of autocorrelation.

If we give an economic explanation to the defined 3.22*-regression equation, then according to it, at present, if the volume of exports in small businesses is increased by 1%, then Yt will increase by an additional 0,72% and 1% of total services by an additional 0,45%, as well as an additional 0,17% increase in Yt if the number Bunda 3.22* - according to the regression equation, now the volume of exports and total services in small businesses is 1 billion. if the so is increased, the Yt would have added 2.5 billion, respectively. somga and 199.6 billion. if the number of items in the sector

Table 9: Indicators of direct sorted factors

Description of factors	Volume of products produced in small business mlrd.UZS	Smallshare of business in industrymlrd.UZS	Smallshare of business in construc-tionmlrd.UZS	Smallshare of business in salesmlrd.UZS	Smallshare of business in cargo turnovermlrd.UZS
Years	Yt	X2	X3	X4	X6
2000	1009,236	334,3	760,3	1021	10181,9
2005	6082,739	325,8	4918,9	5019,7	29971,5
2010	38872,05	1782,8	18616,1	31900,4	67874,1
2015	132205,2	3377,7	61972,3	101197,5	99872,8
2020	301254,2	4965,2	150214,7	226545,3	123544,5

Table 10: Matrix of correlation coefficients of factor and result indicators in a direct scenario

	Yt	X2	X3	X4	X6
Yt	1	0,885153448	0,999430428	0,998756274	0,896957115
X2	0,885153448	1	0,785758799	0,690976441	0,750979414
X3	0,999430428	0,785758799	1	0,697495362	0,795943141
X4	0,998756274	0,690976441	0,697495362	1	0,705389955
X6	0,896957115	0,750979414	0,795943141	0,705389955	1

increased by a thousand, 861.5 billion. it was determined that he would die.

In conclusion, at present, it is desirable to increase the number of small business entities in the service sector in the Republic and to develop measures to increase employment of the population in small business entities.

As a resultant factor in the immediate factors scenario, the volume of products produced in small scale business-Yt were selected and only four of the eight factors selected at the beginning were included due to collinearity. These were selected from X2 (the share of business in the industry), X3 (the share of business in construction), X4 (the share of business in sales) and X6 (the share of business in the cargo turnover), and the correlation coefficients between them were determined (table 10).

If we pay attention to the values of Table 11, then the share of small business entities in industry (rYt,X2=0,8851) and the share of small business entities in construction (rYt,X3=0,9994), as well as the share of small business in sales-X4 (rYt,X4=0,9987), as well as the share of cargo turnover in the industry (rYt, X14=0,8969), we will continue to determine the regression equation between the observed correlations since multicolenarity does not exist through the eviews program (table 11).

As a result of the values of the coefficients listed in the table data, the following equation was developed:

$Yt = -0,37{*}X2 + 1,28{*}X3 + 0,61{*}X4 - 0,21{*}X6 - 1431,8$ (18)

If we pay attention to the significance of the parameters of the defined 23-regression equation by t-statistical criteria, then the coefficients of the equation from the equality of tjad=2,12 with α =0,05 and df=2,10982 are derived from the immaturity of the parameter X2 (tITS=-0.339<tjad=2,10982) and X6 (tITS=-4.392<tjad=2,10982), mean absolute percentage error – average absolute percentage error) and Tic (tayl inquality coefficient – alternative measure of teyl forecast accuracy) are required to be checked (figure 3).

Based on the data presented in Figure 3, it can be noted that MAPE=10,25, which in turn is an average of 10% of the forecast accuracy, and the higher the tic=0,0077<1 forecast accuracy, the greater the coefficient will be due to the importance of all of the parameters of the 3.23-regression equation from the pursuit

The Fisher value calculated by taking into account the fact that the generated 3.23-regression equation is equal to α =0,05 and k1=17; when k2=3 is equal to Ftab = 5,844 Fcal = 9470,311 from the equation Ftab<Fcal the significance of the 3.23-regression equation under the condition as well as the DW=1,96.

As a result of indirect factors, it was found that a 1 percent increase in the share of a business in the industry and the share of a small business in the cargo turnover would lead to a decrease in the volume of a small business by 0,37 percent and 0,21 percent respectively. If the share of the small business entity in construction increased by 1 percent, then it was determined that the volume of gross products produced by small business entities has the possibility of an additional increase of 1,28 percent and 0,61 percent, respectively. According to these results, it is desirable to focus on the construction and trade spheres of activity of small business entities at present.

In the course of the study, our hypothesis was confirmed and the main factors affecting directly and indirectly for business development were studied, the scope of their impact was analyzed statistically, both dispersion and correlation and AR model, that is, the lagging of the factors were also analyzed.

Summarizing the results of the two models, we will develop a scenario situation of business development:

LnY=0,72LnX1+0,43LnX8+0,17LnX14+0,9154916 (17*)

$Yt = -0,37{*}X2 + 1,28{*}X3 + 0,61{*}X4 - 0,21{*}X6 - 1431,8$ (18)

We began our research directly with the development of X1 (the share of business in the rural, forest and Fisheries network) and X2

Table 11: The result of the multi-factor regression equation of Yt and its criterion test in a direct scenario

Dependent Variable: YT
Method: Least Squares
Date: 07/05/21 Time: 11:59
Sample: 2000 2020
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X2	-0.365604	1.080234	-0.33845	0.0224
X3	1.275156	0.156431	8.151556	0.0000
X4	0.611957	0.102402	5.976026	0.0001
X6	-0.207679	0.047283	-4.39226	0.0064
C	-1431.7493	1303.299	-10.9882	0.0164
			tjad= 2,12	
R-squared	0.999578	Mean dependent var		82635.72
Adjusted R-squared	0.999472	S.D. dependent var		98699.19
S.E. of regression	2267.383	Akaike info criterion		18.49490
Sum squared resid	82256376	Schwarz criterion		18.74359
Log likelihood	-189.1964	Hannan-Quinn criter.		18.54887
F-statistic	9470.311	Durbin-Watson stat		1.962729
Prob(F-statistic)	0.000000	Fjad=5,844		

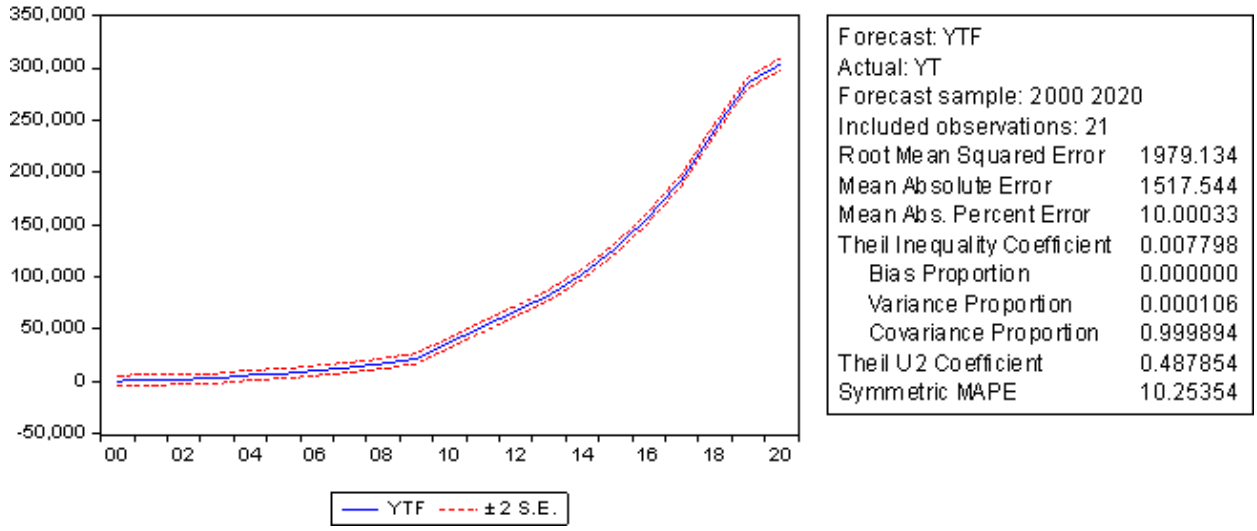

Figure 3: 18-Retrospectiv quality criteria result of regression parameters

(the share of business in the industry), X3 (the share of business in construction) factors X4 (the share of business in sales) forecasts.

In the course of the study, the analysis was made on the basis of direct and indirect factors affecting the business processes in sabali, through their developed models, forecasting options of business processes in the following years were developed. The assessment of the degree of change, trend, seasonality and random changes in the indicators that represent the business processes will be the basis for the forecast indicators.

Using the Minitab and Eviews software, we identify the best trend model for X1 (the percentage of business in the rural, forest and Fisheries network).

X1 = 8542,57 - 3390,42*t + 261,871*t**2

As can be seen from Figure 5, the change in the share of business in the network of rural, forest and Fisheries corresponds to normal distribution. The fact that the probability level p<0,05 on the Normal distribution chart represents the possibility of forecasting the values of this indicator. α =equal to 0,3, it turned out that the share of business in the rural, forest and Fisheries network is uneven, for β a value of 0,4 is put, the presence of trend deviation in other values represents the optimum of the same value in several identified variants.

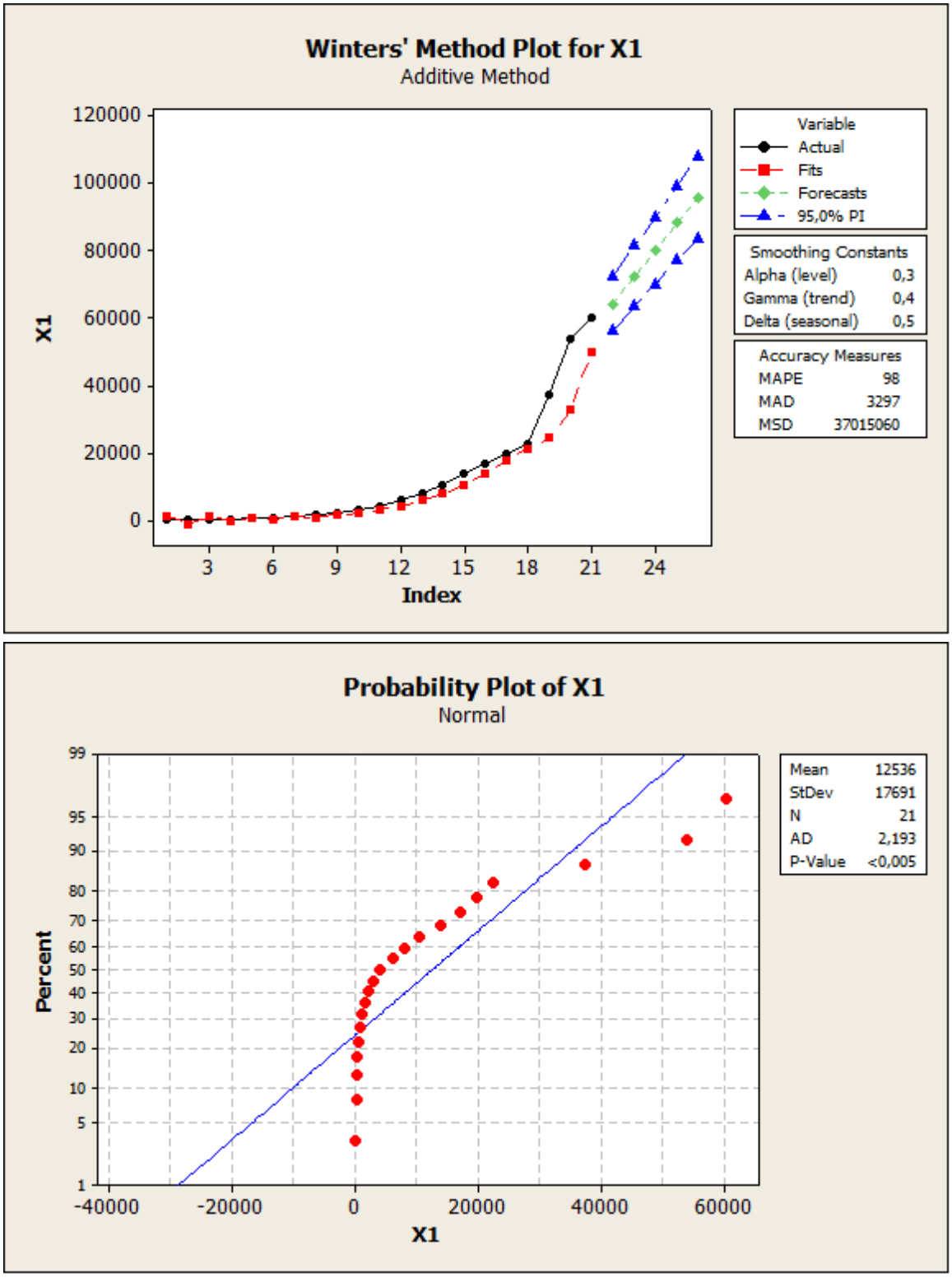

Figure 4: Changes in the share of business in the network of rural, forest and Fisheries

Table 12: Share of business in rural, forest and fisheries sector. Forecast option scenarios in 2021-2026 years

		2021	2022	2023	2024	2025	2026
1	Pessimistic	56096,9	63662,3	70138,6	77412,5	83676,5	90795,6
2	Average	64173,9	72562,6	80030,7	88419,5	95887,6	104276
3	Optimistic	72251	81463	89923	99427	108099	117757

Table 13: Trend models of indirect factors

		Trend models				MAPE
1	X2 (share of business in industry),	X2 = -219,272 + 150,097*t + 4,11507*t**2	0,7	0,2	0,3	25
2	X3 (share of business in construction)	X3 = 14606,4 - 6111,36*t + 592,901*t**2	0,7	0,2	0,3	96
3	X4 (share of business in sales)	X4 = 626,4 - 12,36*t + 52,01*t**2	0,7	0,2	0,3	55

Table 14: Share of business in employment. Forecast option scenarios in 2021-2026 years

		2021	2022	2023	2024	2025	2026
1	Pessimistic	56096,9	63662,3	70138,6	77412,5	83676,5	90795,6
2	Average	64173,9	72562,6	80030,7	88419,5	95887,6	104276
3	Optimistic	72251	81463	89923	99427	108099	117757

After determining the optimal values for α, β, γ, on the basis of the Winter method, forecast options were developed from 2021 year to 2026 year.

As can be seen from Table 13, in 2021 year in the network of rural, forest and Fisheries, the pessimistic option amounted to 56096,9 billion. if the SOM products are produced by the Tomney of business representatives, then on the optimistic option it is worth 72251 billion. Su Aniq was determined to be equal.

Based on the above analysis, factor projections of X2 (share of business in industry), X3 (share of business in construction) and X4 (share of business in sales) were developed and cited in the application.

In the course of the study, an indicator variation on the Winter method for business share indices in the industry was found to be equivalent to α with a corresponding value of 0.7, trend β with a corresponding value of 0.2 seasonal value equal to γ with a corresponding value of 0.3.

The table below shows the trend and α, β, γ values of the optimal variant identified for their forecast.

It was found that such values are optimal both for the indicators of business share in construction and in sales. After finding the Optimal trend and α, β, γ values, the forecast variants of the indicators for 2021-2025 years were produced according to the pessimistic, average and optimistic cases(listed in the applications).

Among the indirect influencers were also forecasted options for factors X1 (share of business in employment) and X2 (share of business in exports), X3 (share of business in investment) and X6 (share of business in imports). X1 (business share in employment) trend model as follows:

X1 = 9107,55 - 4286,78*t + 399,510*t**2

As can be seen from Figure 6, the change in business share in employment corresponds to normal distribution. The fact that the probability level p<0,05 on the Normal distribution chart represents the possibility of forecasting the values of this indicator. α =0,6, it was determined that the percentage change in employment was flat, for β 0,2 value was put, the presence of trend deviation in other values represents the optimum of the same value within a few defined options. After determining the optimal values for α, β, γ, on the basis of the Winter method, forecast options were developed from 2021 year to 2026 year:

As can be seen from the table, according to the pessimistic theory in 2026 year, 62,21% of people operate according to the optimistic theory, while 91,43% are employed in business.

Based on the above analysis, factor projections of X2 (share of business in exports), X3 (share of business in investment) and X6 (share of business in imports) were developed and cited in the application.

The table below shows the trend and α, β, γ values of the optimal variant identified for their progonosis.

In the course of the study, an indicator variation on the Winter method for business share indices in the industry was found to be equivalent to α with a corresponding value of 0.6, trend β with a corresponding value of 0.2 for seasonal value γ with a corresponding value of 0.4. It was found that such values are optimal for both investment and import business share indicators. After finding the Optimal trend and α, β, γ values, the forecast variants of the indicators for 2021-2026 years were produced according to the pessimistic, average and optimistic cases (listed in the applications).

In the previous sections, we will develop forecasting options of business processes based on our models developed on direct and indirect factors affecting the business.

According to the data of the table, according to the forecast options, by 2026 year, according to the I variant of the pessimistic

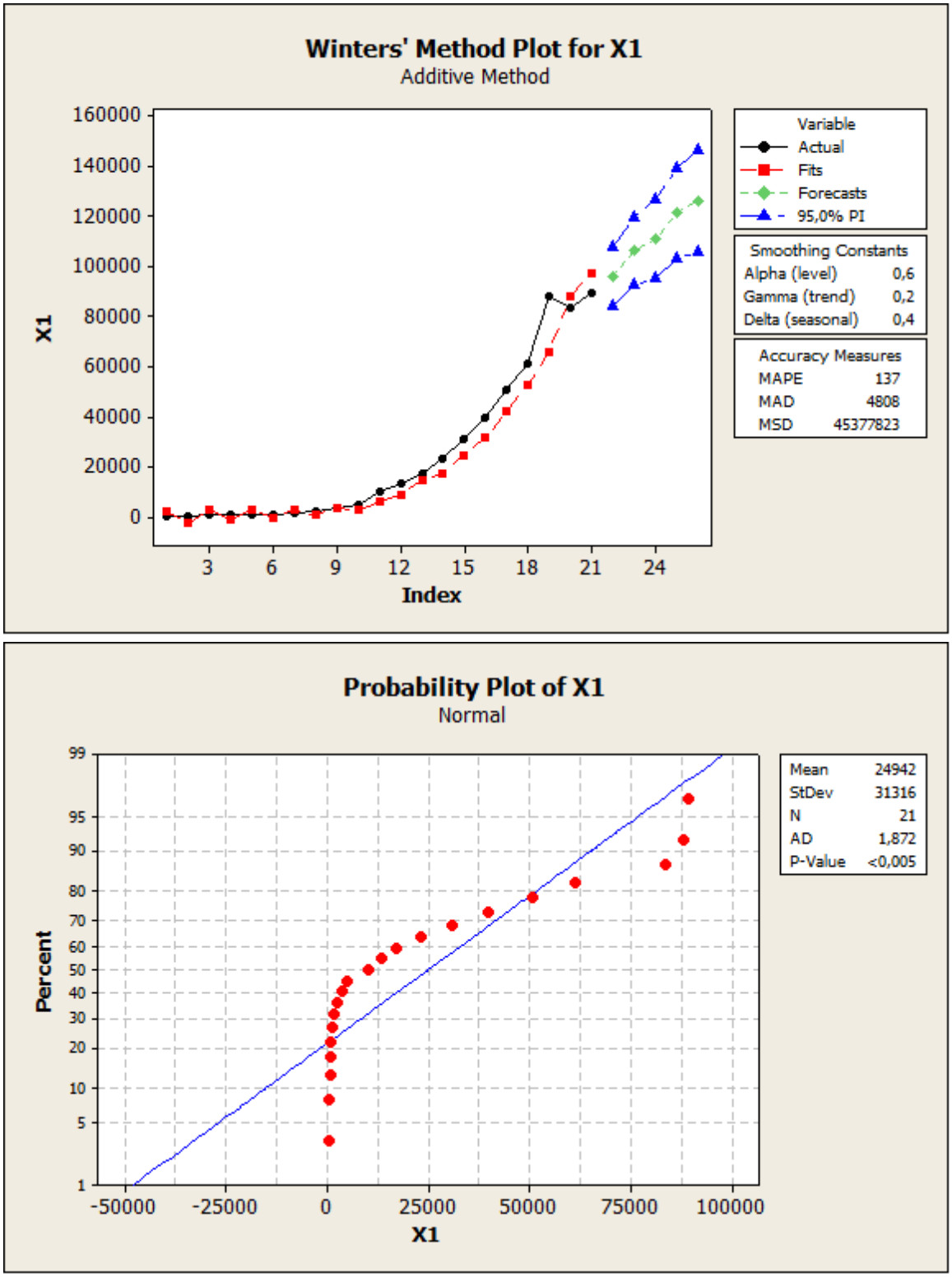

Figure 5: Change in business share in employment

Table 15: Trend models of indirect factors

		Trend models				MAPE
1	X2 (share of business in exports),	X2 = 3435,83 + 629,897*t - 13,7290*t**2	0,6	0,2	0,4	2,5
2	X3 (share of business in investment)	X3= 1639,94 - 336,470*t + 43,6675*t**2	0,6	0,2	0,4	20
3	X6 (share of business in imports)	X6 = 26,3728 + 0,413854*t + 0,0565604*t**2	0,6	0,2	0,4	8,2

Table 16: Development of business processes Forecast option scenarios in 2021-2026 years

			2021	2022	2023	2024	2025	2026
1	Pessimistic	I variant	282197,6	291341,7	3045064,7	354308,7	361242,3	368597,1
		II variant	278944,7	291068,2	303186,8	330117,4	354649,2	359642,8
2	Basic	I variant	30148,58	324150,2	376686,3	391586,6	444926,3	450326,2
		II variant	292278,5	311260,5	357525,0	396211,9	434359,4	446388,2
3	Optimistic	I variant	32869,45	388269,9	411148	432669,5	553596,7	560124,7
		II variant	305090,8	330345,4	412769,9	464279,9	515279,0	523104,9

theory, 368597.1 billion dollars was invested. in the case of production of total business products worth 359642.8 billion according to Option II. som products are produced. According to the optimistic scenario, in option I, 560124.7 billion. the production of SOM business products amounted to 523104.9 billion according to Option II. som products are produced.

Up to 2026, the projected accuracy of the business process development model was calculated based on the results of the MAPE benchmark test, and alternative scenarios based on the II variant in pessimistic, optimistic and Baseline methods. On the basis of these options, model building and forecasting will depend on the degree, forms and methods of preparing for the change in the pandemic and subsequent periods, the state support of the sector.

5 CONCLUSION

Modeling of business processes has always been considered one of the important issues in the research carried out in this area. Currently, there are more than 20 methods of modeling business processes, which are selected mainly based on data types. As a result of the study, we found that in most cases, the models used in the analysis of business processes are mainly six, and they include regression models, error correction(ECM) Model, time variation (TVP), cointegration (CI), vector autoregressive, autoregressive lag (ADLM, AIDS) models that give the results we expect.

When researching the process of business development on the scale of the country, on the scale of sectors and sectors, or in the sectors of MXT, a set of factors affecting it are taken into account. Therefore, no matter to what extent the study is based on the multi-factor regression of its econometric model. Based on this, it is proposed to use the theory of constructing multi-factor regression econometric models to model the process of business development.

In order for the calculations to be accessible to all, it is desirable to use the software product MS EXCEL, STATA, EVIEWS, SPSS, GRETL in the compilation of the regression equation, the evaluation of the statistical significance of the structured equation and its parameters.

In order to improve the basic models used in the analysis of business processes, the model analyzing business processes was developed on the basis of data while cointegration and error correction (esm) models were used together.

Using the data of the State Statistics Office of the Republic of Uzbekistan for an empirical examination of the relationship between the volume of products produced by small businesses and economic growth in Uzbekistan, the volume of products produced by small businesses in the years 2000-2020, the volume of investments directed to small businesses and the data base of the

Economic growth in the Republic of Uzbekistan has been proved on the basis of the Johansen test that there is a bilateral relationship between the volume of products produced by small businesses, the volume of products produced by small businesses and the volume of investments directed at small businesses.

Improving the methods of statistical analysis of business development processes in Uzbekistan, forecasting business development trends, determining on the basis of the results of the analysis the need to pay attention to a certain area, drawing up and evaluating the model of business development trends makes it possible to determine and choose the directions of business development.

There are several methods of statistical evaluation of business processes, in our study we statistically evaluated the state of business processes in the Republic by combining dispersion-correlation analysis and AR model analysis. Taking into account the formation of business indicators on the basis of time series, their analysis summarized the effect and current state of laglarini IE.

Since the data were a time series, we also included the liners for the model because of the unit root availability when we checked them through the ADF Dick ful Fuller test on the stationary.

They were divided into two groups by choosing the main ome for our study. By dividing the selected Omas into direct and indirect factors affecting the development of business, their algorithm was developed and analyzed on the basis of hypothesis on how these factors affect the development of business.

Forecasting for short and long periods of time helps to clarify the degree of justification and accuracy of the expected result by using

a data system on a number of years-long changes in the number of factors as much as possible, based on the parameters. In current conditions, multi-factor regression is one of the most commonly used methods in statistical research.

The main purpose of multi-factor regression is to build multidimensional models by studying the individual factors on each modeled indicator as well as their common joint effects.

Drawing up multi-factor regression equations begins with solving the problems of forming models. They take into account two issues: the first is the selection of the appearance of the regression equation, while the second is the selection of omillarni.

According to the forecast options, by 2025 year on the I variant of the pessimistic theory will be 361242,3 trillion. in the case of the production of total business products worth 354649,2 trillion according to Option II. som products are produced. In the i variant on an optimistic scenario, 553596,7 trillion. som chiarilsa produce business products, according to Option II 515279,0 trillion. som products are produced.

Up to 2025, the projected accuracy of the business process development model was calculated based on the results of the MAPE benchmark test and alternative scenarios based on the II variant in pessimistic, optimistic and basic methods. On the basis of these options, model building and forecasting will depend on the degree, forms and methods of preparing for the change in the pandemic and subsequent periods, the state support of the sector.

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