MODELING AND SHORT-TERM FORECASTING INDICATORS OF DEVELOPMENT BUSINESS IN UZBEKISTAN

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Abstract: The article is devoted to econometric modeling and forecasting of business development using correlation-regression analysis. And also, the model of business development of GDP is shown with taking into account the business share in the number of employees, in the volume of agricultural production, in the volume of exports in the Republic of Uzbekistan, and the forecasted share of business in GDP by 2017-2021.

Index terms: business, dependent factor, independent factor, regression equation, significance evaluation, multiple linear regression model, Fisher criterion, progres.

1 INTRODUCTION

Business is an integral part of the economy in most developed countries, fulfilling the most important socioeconomic functions to ensure employment, creating a competitive environment in business and contributing to the welfare of the population.

Business plays an important role in shaping and developing the economy of Uzbekistan. Since gaining independence by the Government of the Republic of Uzbekistan, huge economic changes have been carried out on the initiative of the first President of the Republic of Uzbekistan I A Karimov.

In order to make more opportunities for the development of private property and private entrepreneurship through the implementation of fundamental structural changes in the economy, the consistent continuation of the modernization and diversification processes is our priority. The opening speech of the first President was: "Business is now becoming not only the main link providing employment for the population and the source of its incomes, but also the most important factor of economic stability, the guarantor and support of the social and political stability of our society, the active driving force of the country's progress along the path of progress" (Karimov, 2012).

Regulatory legal acts are updated annually in specific areas in our country. Confirming certain conditions and opportunities of Uzbekistan, experts in the field of economics constantly conduct scientific and practical research on the modernization and development of the economic infrastructure in countries. In a market economy, business helps to achieve specific goals, and they are of great importance for overcoming poverty, accumulating human capital. The inherent flexibility of small businesses and high adaptability to the market conditions of variability contribute to the stabilization of macroeconomic processes in the country.

Proceeding from the above, studying the development of the business process and forecasting its future is a vital problem. One way to solve these problems is to econometrically model the process of business development at a specific place and time.

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2. LITERATURE REVIEW

Theoretical scientific problems for the creation and development of business have been studied by such foreign scientists as J. Schumpeter. S.Khachatryan is represented in the socio-economic process of modeling, basics and methods of business development. Scientifically practical bases and problems of research development of business in the Republic of Uzbekistan are presented in the works of S. Йoulomov and others. T. Shodiev studied methods and models of statistical analysis of the structure and dynamics of economic indicators in a market economy.

J. Schumpeter studied theoretical and practical problems of business. He studied business modeling, the fundamentals and methods of business development in socio-economic development. A.Vahobov studied the scientific and practical foundations and problems of entrepreneurship development in the Republic of Uzbekistan. In their scientific work were studied on the basis of the structure and dynamics of business, methods and models of doing business in a market economy.

Econometric modeling of business trends and development problems was studied by B. Khodiev. The approach to business management, business process modeling, regulation and business management was studied by V.Repin. He provided scientific and practical advice on how to organize a business, improve it and how to model business processes.

3. RESEARCH METHODOLOGY

The study of the dynamics of business in the whole country is very difficult, due to the lack of direct information. In this regard, we tried to model the development of business across the country using indirect data on business, i.e. share of business in the production activities of industries and in the whole country (in percent). The volumes of output and services rendered in the economy for a certain period at market prices are the volume of GDP. Hence the situation arises that the dynamics of the volume of GDP is directly influenced by the dynamics of the volume of output and services

rendered in the whole country.

When studying the dynamics of developed business shares in GDP to take into account all the influencing factors provides certain difficulties related to the methodological and practical point of view. In this regard, we were limited to factors that, in our opinion, have a significant influence on the dynamics of the share of business in GDP, such as the share of business in the number of employed in the economy, the share of business in the volume of agricultural production, the share of business in the volume of exports of goods and services, as well as the share of business in the volume of other sectors of the economy, although other factors could be taken methodologically.

4. ANALYSIS AND RESULTS

The objectives of the study in this case is to reveal the patterns of the dynamics of development of the share of business in the country's GDP in a certain period of time, taking into account the dynamics of development of the share of business in the above-mentioned sectors of the economy. This problem can be solved by econometric modeling using correlation-regression analysis. When studying the main indicators of business development, the share of business in GDP appears as a dependent factor, while the share of business in the number of employed in the economy, the share of business in the volume of agricultural production, the share of business in the volume of exports of goods and services, and other indicators are independent.

In what follows, we will use the following notation: Y-dependent variable; X are independent variables; Is the number of the trait under study.

As the initial information for the simulation, we use the actual data presented in Table 1. [2. 18, 24, 49, 72].

Table 1

The share of business in GDP and factors affecting it in the Republic of Uzbekistan (in percentages)

Years	Business share in GDP	Share of business in the number of employees	Share of business in the volume of production. products. agriculture.	Share of business in export volume
	Y	X_1	X_2	X_3
2000	31,0	49,7	73,6	10,2
2001	33,8	51,8	74,5	9,3
2002	34,6	53,5	74,9	7,5
2003	35,0	56,7	78,1	6,9
2004	35,6	60,3	81,1	7,3
2005	38,2	64,8	85,7	6,0
2006	42,1	69,1	94,0	10,7
2007	45,7	72,1	97,6	14,8
2008	48,2	73,1	97,7	12,3
2009	50,0	73,9	97,8	14,6
2010	52,5	74,3	97,8	13,6
2011	54,0	75,1	97,7	18,8
2012	54,6	75,6	97,8	15,7
2013	55,8	76,7	98,0	18,0
2014	56,1	77,6	98,3	26,0
2015	56,7	77,9	98,4	26,9
2016	56,9	78,1	98,5	28,5

Visual study of the dynamics of development of each factor makes it possible to formally record the dependence of the share of business in GDP on the factors affecting it as follows [3](1)

where: Y- the share of business in GDP; X_1- The share of business in the number of employed in the economy; X_2-the share of business in the volume of production of agricultural products; X_3-the share of business in the volume of exports of goods and services; a_i the required parameters (i=1,3), ε the share of business in the amount of factors not considered.

To compile the regression equation for the studied process, a multiple correlation-regression analysis was performed, the results of which are given in Table. 2.

Table 2

Results of calculation of correlation-regression analysis

№	Indicators	Y	X_1	X_2	X_3
1	Amount	780,8	1160,3	1541,5	247,1
2	Average value	45,9	68,3	90,7	14,5
3	P-Value	0,64	0,03	0,57	0,01
4	Multiple regression coefficients	R= 0,979			
5	Coefficient of determinism R2	0,959			
6	The normalized R-square	0,950			
7	Standard Error	2,121			
8	t-statistics	-0,5	2,4	-0,6	2,9
9	Multiple coefficients	a0 =-3,8	a1 = 0,9	a2 = -0,2	a3 = 0,44
10	Standard Error	8,1	0,4	0,3	0,1

Thus, based on the result of correlation-regression analysis, the regression equation has the following form:

$$Y = -3,8 + 0,9X_1 - 0,2X_2 + 0,4X_3 + \varepsilon \quad (2)$$

Significance The resulting multiple regression equation is estimated using Fisher's F-test:

$$F = \frac{D_{факт}}{D_{ост}} = \frac{R^2}{1 - R^2} \bullet \frac{n - m - 1}{m},$$

Where: $D_{факт}$ the factor sum of squares per degree of freedom;

$D_{ост}$ the residual sum of squares per degree of freedom;

R^2 coefficient of multiple determination;

m number of parameters for variables x;

n number of observations.

For m> 3 and 17-3 = 14, the degree of freedom F- the Fisher distribution is:

$$F = \frac{0,959^2}{1-0,959^2} \bullet \frac{17-3-1}{3} = 49,6$$

According to Fisher's criteria, the actual significance of the equation is greater than in the Fisher table (False 3.20). In addition, to determine the adequacy of the compiled model to the process under study, the theoretical values of the dependent factor are calculated, substituting the values of independent factors for the period under study into the regression obtained by the equation. The sum of the actual and the sum of the theoretical values of the dependent variable must be equal. The results of calculating the theoretical values of the dependent variable are given in Table.3.

Table. 3

The results of calculating the theoretical values of the share of business in GDP in the period under study

Years	Y	X_1	X_2	X_3	$Y = -3,8 + 0,9X_1 - 0,2X_2 + 0,44X_3$
2000	31,0	49,7	73,6	10,2	30,7
2001	33,8	51,8	74,5	9,3	32,4
2002	34,6	53,5	74,9	7,5	32,7
2003	35,0	56,7	78,1	6,9	34,6
2004	35,6	60,3	81,1	7,3	37,5
2005	38,2	64,8	85,7	6,0	40,2
2006	42,1	69,1	94,0	10,7	44,3
2007	45,7	72,1	97,6	14,8	48,1
2008	48,2	73,1	97,7	12,3	47,9
2009	50,0	73,9	97,8	14,6	49,6
2010	52,5	74,3	97,8	13,6	49,5
2011	54,0	75,1	97,7	18,8	52,5
2012	54,6	75,6	97,8	15,7	51,6
2013	55,8	76,7	98,0	18,0	53,6
2014	56,1	77,6	98,3	26,0	57,8
2015	56,7	77,9	98,4	26,9	58,5
2016	56,9	78,1	98,5	28,5	59,3
Σ	780,8				780,8

Fisher's criterion and the results obtained in Table. 3 confirm that the compiled model is significant, and it can be used to forecast the share of business in GDP under the influence of the above factors X1, X2, X3. To calculate the projected values, the share of business in GDP must have predictive values of independent factors for the relevant period. They can be determined by the method of analytical equalization of the initial series of independent factors by creating an equation describing the dynamics of the process. For the solution of the problem, a number of computational experiments were carried out to select the type of equations. The experimental results showed that the equation has the form Xi = a0 + a1t.

Thus, as a result of calculating the parameters a0 and a1, respectively, of the equations of independent factors X1, X2, X3, the time dependence of factors is obtained, ie: X t = a0 + a1t. Dependence of the first independent factor X1-share of business in the number of busy from time has the form: X1 = 77.1+ 0.95 * t; the second independent factor X2; X2 = 96.1 + 0.54 * t; third independent factor X3; X3 = 18.2 + 1.01 * t; Substituting its values into the place t, we obtain the predictive data of independent factors for the forthcoming periods.

Substituting the obtained values into equation (2), we determine the business shares in GDP for the following periods. Thus, summarizing all the results of calculations on the dynamics of the development of the share of business volume in GDP can be represented in the form of a table (Table 4).

Table 4

Forecasting the importance of the share of business in GDP

Years	Share of business in GDP	Share of business in the number of employees	Share of business in the volume of production products. agriculture.	Share of business in export volume
	Y	X_1	X_2	X_4
Actual				
2000	31,0	49,7	73,6	10,2
2001	33,8	51,8	74,5	9,3
2002	34,6	53,5	74,9	7,5
2003	35,0	56,7	78,1	6,9
2004	35,6	60,3	81,1	7,3
2005	38,2	64,8	85,7	6,0
2006	42,1	69,1	94,0	10,7
2007	45,7	72,1	97,6	14,8
2008	48,2	73,1	97,7	12,3
2009	50,0	73,9	97,8	14,6
2010	52,5	74,3	97,8	13,6
2011	54,0	75,1	97,7	18,8
2012	54,6	75,6	97,8	15,7
2013	55,8	76,7	98,0	18,0
2014	56,1	77,6	98,3	26,0
2015	56,7	77,9	98,4	26,9
2016	56,9	78,1	98,5	28,5
Prediction				
2017	60,3	84,9	98,7	38,0
2018	61,4	86,8	98,9	41,6
2019	62,6	88,7	99,1	45,7
2020	63,7	90,6	99,3	50,1
2021	64,9	92,4	99,5	53,7

The results of forecast calculations show an annual increase in the share of business, which is no more than 2% in relation to the previous one. At the same time, the share of business in GDP is closely related to the output of agricultural products, with the share of exports, shares of the number of employed. At the same time, the forecasted share of business in the number of employed in 2017 will be 87.6%, and by 2021 the figure will be 95.2%. The most important indicator that affects the share of business GDP is the share of business in the volume of agricultural production. The

share of business in the volume of exports, which in 2017 will be 29.3%, by 2021 will be 37.4%. With this growth in business performance in Uzbekistan, a positive trend in the development of the country's economy is foreseen.

5. CONCLUSION AND RECOMMENDATIONS

The introduction of business in Uzbekistan is a necessary and urgent problem. The resources of private enterprises, their experience, incentives and other advantages can ensure rapid progress in modernizing the social and economic infrastructure without burdening the budget with heavy operating costs and a substantial increase in public debt. Strategy for the five priority development directions of the Republic of Uzbekistan in 2017-2021 Continuation of institutional and structural reforms aimed at reducing the state's presence in the economy, further strengthening the protection of rights and the priority role of private property, stimulating the development of small businesses and private entrepreneurship: ensuring sound protection of rights and guarantees of private property, the removal of all barriers and restrictions, the provision of full freedom to develop private entrepreneurs and the implementation of the principle "If the people are rich, the state will be rich and strong" (Sh. Mirziyoyev, 2017)

At the same time, business is a very delicate tool, applying which requires experience, solving some legal and procedural issues, as well as profound professional analysis. In Uzbekistan at present, there are no legal, institutional, financial and human resources for successful business and in full scale, adequate to the needs of development of industrial and social infrastructure. In these conditions, it would be a mistake to press the pressing needs of the economy and budgetary constraints to immediately begin mass application of business in the country's infrastructure sectors.

In Uzbekistan, business should be in accordance with the program of economic reforms in the country, including privatization, improving the antimonopoly policy, decentralizing power, increasing the efficiency and targeting of social protection of the population.

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