Econometric Modeling And Forecast Of Net Revenues From Sales Of Products By Small Business: In Case Of Uzbekistan

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Abstract: **In this paper have been developed and forecasted an econometric model of the net sales of small businesses and private entrepreneurs operating in the Republic of Uzbekistan based on the multifactorial Cobb-Douglas production function.**

Keywords: Small business, entrepreneurship, production function, Cobb-Douglas model, net revenue, product, brand.

I. INTRODUCTION

As a result of high mobility of small business and private entrepreneurship, rapid adaptation to innovation and market changes in the world economy, its rapid development is observed. "In world practice, there are large organizations that conduct business and business economics statistics, which cover more than 3,000 statistical databases." In this regard, special attention is paid to statistical measures such as coordination of the statistical system between producers, the formation of complete data and monitoring. Therefore, improving the statistical analysis of small business and private entrepreneurship is one of the most pressing issues in global economic development.[10]

Due to the unique position of these industries in the world, special attention is paid to research in the field of effective development of small business and private entrepreneurship in the context of globalization and objective economic non-standards.[2] Priority is given to research in the areas of coordination of statistical systems between manufacturers, optimal formation of complete data and tracking methodology, ensuring efficient and uninterrupted operation of the industry in non-standard economic conditions.[4]

In the Republic of Uzbekistan, comprehensive measures are being taken to radically improve the business environment, increase the quality and reliability of statistics on small business and private entrepreneurship. One of the priorities in improving the national statistical system is to "improve the methodological framework and management principles applied within the entire national statistical system of the country in order to produce, disseminate and coordinate official statistics." In this regard, the development (improvement) of the system of statistical indicators and statistical database reflecting the activities of small business and private entrepreneurship to ensure provard results, selection of optimal options for statistical analysis, increase the accuracy of statistical methods and approaches in production forecasting) to further expand the scope of research in such areas.

II. LITERATURE REVIEW

In the study of small business and private entrepreneurship, foreign scholars D. Ricardo, A. Smith, J. Keynes, Von Der Lippe, J. Rowles, U. Petty, O.V. Voronkova, A. Tyurgo, R.S. Ronstadt, Y.Shumpeter, D.O.Grubenkova, R.Kantilson, Porter M.[1], T.Veblen and other economists conducted scientific research.

On the basis of the application of statistics of small business and private entrepreneurship in our national economy, scientists of our country have conducted scientific research. In their works, they scientifically substantiated the statistics of small enterprises, based on foreign experience of the factors influencing small enterprises. In this direction S.S.Gulomov, M.R.Boltaboev, M.S.Kasimova, Sh.J. Ergashkhodjaeva, A.N.Samadov, Sh.Otajonov, H.Khamroev, E. Egamberdiev, H.D.Khojakulov and other economists have done a lot of scientific research. R.Alimov, N.Soatov, K.H.Abdurahmonov, T.Sh.Shodiev, Y.Abdullaev, B..Goyibnazarov, A.Vahobov, H.Shodiev from local scientists on statistical modeling and forecasting of small business and private entrepreneurship, G.Saidova, Khodiev B. Y.[8], Yuldashev N.[9], A.Ayubjanov, Tursunov B.B. [3] and others conducted scientific researches.

Insufficient attention is paid to the issues of statistical reporting, system of indicators, extrapolation of their development using statistical methods, statistical evaluation and forecasting based on the multifactorial Cobb-Douglas production function, the introduction of clusters in the work of small business and private entrepreneurship.

The issues of ensuring, assessing and managing economic and financial security at the macro and micro levels were discussed by scientists of our country - N. Jumaev, D. Rakhmonov, A.Burkhanov [15,16], B.Tursunov [17]

and others.

III. ANALYSIS AND RESULTS

The process of forming directions of targeted use of factors of production in the economy of the Republic of Uzbekistan and increasing the effectiveness of ongoing reforms in this area is directly related to small business and private entrepreneurship. The development of small business and private entrepreneurship creates opportunities for intensive economic growth by increasing employment in the production process and increasing the efficiency of the use of material resources. All this serves not only as a solid legal basis for the modernization of our economy, but also as a guarantee of the consistency of ongoing market reforms. However, entrepreneurs are still not able to fully gain the trust of consumers without being able to take full advantage of the opportunities available to them. Consequently, the procedures for obtaining permits for small businesses and private entrepreneurship have been simplified and their terms have been reduced by an average of 2 times. Excessive checks, many restrictions on cash, currency and raw materials have been lifted. Also, as a result of these facilities and opportunities created for small business and private entrepreneurship, the number of new entities is growing rapidly, and the activities of existing ones are increasing. The role of small business and private entrepreneurship today under the influence of these reforms; GDP growth is reflected in the active participation of the population in the implementation of profound structural changes in the sectors and industries of the economy, along with the provision of employment. The complexity of socio-economic processes and the expansion of diversification of goods and services also require the improvement of methods of statistical calculation of indicators that represent the final results of small business and private entrepreneurship.

Problems arise in the construction of multifactorial Cobb-Douglas production function and in the calculation of elastic coefficients of factors and in the study of production function, the evaluation of the efficiency of certain factors of production, the substitution of the same factors for other factors.

If we take into account the most important factors involved in the production process by small business and private entrepreneurship, then we have the following production function:

$$Y = f(K, L) \tag{1}$$

The given function (1) can be written in the form of a traditional Cobb-Douglas production function as follows:

$$Y = AK^{\alpha} L^{\beta} \tag{2}$$

In this case, Y is the volume of production, A is the level of generalized technology (gross productivity of factors), K, L are the capital in production, respectively, and labor costs, and a, b are the coefficients of elasticity of production, capital, respectively.

Since it is not possible to directly estimate the parameters of the multiplicative function of Cobb-Douglas, we logarithm this function and make it as follows:

$$\ln Y = \ln A + \alpha \ln K + \beta \ln L \tag{3}$$

In the study we use the production function of Cobb-Douglas mentioned above to create economic-mathematical models of the future development of small business and private entrepreneurship, including the following definitions:

Table 1: Forecasting by small business and private entrepreneurship on the basis of factors affecting the volume of net sales of goods (goods, works and services)

Years,	Net income from sales of goods (goods, works and services) by small business and private entrepreneurship, bln. Soums (Y) (2020 in comparable prices)	Value of fixed assets at the beginning (recovery) value at the end of the year, billion soums (X1) (2020 in comparable prices)	Volume of industrial products (services) produced by small business and private entrepreneurship, bln. sum, (X2) (2020 in comparable prices)	The volume of construction work performed by small business and private entrepreneurship, bln. sum (X3) (2020 in comparable prices)	Number of people engaged in small business and private entrepreneurship, thousand people, (X4)
2005	107795,8	17551,0	44639,2	9169,4	6602,5
2006	115880,4	19183,3	47406,8	10544,8	7234,1
2007	126889,1	24132,6	50535,7	12233,0	7743,1

2008	138309,1	32361,8	53972,1	12904,7	8071,1
2009	149512,1	40387,5	56184,9	17318,2	8370,1
2010	160127,5	42083,8	59499,9	18201,4	8643,9
2011	172137,0	43178,0	62117,9	19621,1	8950,7
2012	184358,7	47754,8	65658,6	22309,2	9239,7
2013	197816,9	53151,1	70583,0	26146,4	9604
2014	211466,3	58360,0	73759,2	30748,1	9950,8
2015	226691,9	63845,8	77668,4	36528,8	10170,4
2016	240066,7	66463,5	81784,9	39158,7	10397,5
2017	250629,6	79357,4	86037,7	41508,4	10541,5
2018	264163,6	103085,2	95329,7	47444,1	10128,8
2019	279220,9	142360,7	100096,2	58308,8	10313,4
2020	283967,7	130687,1	100796,9	63614,9	9938,2

Y - net income from sales of goods (goods, works and services) by small business and private entrepreneurship, bln. sum;

X1 - the value of fixed assets at the end of the year at the initial (recoverable) value, billion soums;

X2 - volume of industrial products (services) produced by small business and private entrepreneurship, bln. sum;

X3 - the volume of construction work performed by small business and private entrepreneurship, bln. sum;

X4 - the number of people engaged in small business and private entrepreneurship, thousand people.

Based on the above Cobb-Douglas production function, we obtain the following regression analysis of the volume of production of goods (services) by small businesses and private entrepreneurs of the Republic of Uzbekistan and the factors influencing it (Table 2).

Table 2: Results of regression analysis

Indicators	**Coefficients of the regression equation**	**Default error**	**t - statistics**	**P is the probability**
Parameters of factors				
Y - ozod had	-0,58695	0,060860734	-9,644189231	1,06052E-06
X_1 - variable	-0,03462	0,012308814	-2,812213501	0,016901457
X_2 - variable	0,854554	0,125273367	6,821512845	2,87055E-05
X_3 - variable	0,082069	0,020398	4,02339959	0,002004448
X_4 - variable	0,652038	0,088407961	7,375332987	1,40274E-05
Parameters of the equation				
Number of observations	*R*- square	*F*- statistics	*DW*- statistics	
16	0.999	3428,76	1.89	

The results of the analysis showed that the regression model of production of goods (services) by small businesses and private entrepreneurship in the Republic of Uzbekistan was statistically significant in all additive parameters, not in multiplicative form, and its regression equation is derived from the following empirical model consisted of:

$$y = -0.586 - 0.034x_1 + 0.854x_2 + 0.082x_3 + 0.652x_4 \quad (4)$$

The results of the regression analysis show that the value of the multidimensional determination coefficient (R2 = 0.999) is 99.9 percent, and the p-probability value (probability < 0.05) by Fisher's F-criterion is much smaller than 0.05. It can be seen that 99.9% of the total variation in the volume of production of goods (services) by small businesses and private entrepreneurs of the Republic of Uzbekistan is formed due to factors included in the regression equation, the quality of this experimental model fully meets the requirements is calculated.

Also, for all regression coefficients, all of the regression coefficients are statistically significant with a probability of 5% (with a statistical significance level of a = 0.05) because the p-probability values on the Student's

t-value criterion are less than 0.05 as above (probability < 0.05).

The results show that the increase in the volume of industrial products produced by small businesses and private enterprises (X2) by 1 soum increases the volume of net income (Y) from the sale of products (goods, works and services) by small businesses and private entrepreneurs. The volume of construction work performed by small business and private entrepreneurship (X3) will increase by 0.082 soums, and the increase in the number of people engaged in small business and private entrepreneurship (X4) will increase by 0.652 soums. they have a positive impact on the net income from the sale of products (goods, works and services) by small business and private entrepreneurship.

However, an increase in the initial value of fixed assets (X1) by 1 soum by the end of the year will lead to a decrease in net income (Y) by 0.03 soums from the sale of products (goods, works and services) by small businesses and private entrepreneurs. It is obvious that the fixed assets of small business and private entrepreneurship are outdated and do not correspond to the current environment of innovative development. This requires the renewal of fixed assets and the acceleration of their modernization.

The regression model (4) of net income (Y) from sales of goods (goods, works and services) by small business and private entrepreneurship mentioned above provides a forecast of net income and is called econometric forecasting.

Using a correlation-regression model to determine the prognosis, the factor of the regression equation is to calculate the forecast values of the resultant sign or the reliable width at which they lie with a given probability, putting the expected values of the units in the forecast:

$$\hat{y}_0 - t_{1\ \alpha;n-2} S_{\hat{y}_0} \le y_0^* \le \hat{y}_0 + t_{1\ \alpha;n-2} S_{\hat{y}_0} \qquad (5)$$

here: $S_{\hat{y}_0} = \sqrt{s^2\left(1+\frac{1}{n}+\frac{(x_0-\bar{x})^2}{\sum_{i=1}^{n}(x_i-\bar{x})^2}\right)}$ ва $s^2 = \frac{\sum_{i=1}^{n}(\hat{y}_i - y_i)^2}{n-2}$.

It is generally recommended not to exceed one-third of the variance width (Vxi: 3) that has the initial information factor sign for both the largest value and the smallest value in determining the expected values when predicting factors.

The results of forecasting based on this econometric method are reflected in the table below (Table 3).

Table 3: Forecast results on net income from sales of goods (goods, works and services) by small business and private entrepreneurship until 2030

Forecast period (years)	**Lower limit of forecast (billion soums)**	**Forecast value (billion soums)**	**The upper limit of the forecast (billion soums)**
2020 (the truth)	**-**	**283967.7**	**-**
2021	275894.3	**312435.8**	335623.4
2022	327405.2	**345786.8**	358912.3
2023	369789.5	**378493.7**	395746.2
2024	387565.3	**401217.3**	425678.9
2025	401214.5	**439513.6**	478945.3
2026	475879.6	**495846.7**	524852.5
2027	497897.7	**526312.8**	567652.7
2028	548789.3	**575879.9**	601423.4
2029	597842.2	**615789.7**	627895.3
2030	675415.3	**697845.4**	723546.7

Source: Author`s calculations

The forecast (prospective degree) determined by placing the expected values of the factors in the regression equation is called a point forecast (forecast estimate). The probability that such a prospective assessment will take place is very small. Therefore, the assessment of the prospect should be accompanied by the determination of its average error or a sufficiently large probability of a reliable breadth (range) of the forecast.

IV. CONCLUSIONS

Thus, according to the results of the analysis, the forecast value of net sales of goods (goods, works and services) by small business and private entrepreneurship, estimated on the basis of econometric methods, is expected to increase 2.5 times by 2030 compared to 2020.

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