



## REGRESSION ANALYSIS OF FACTOR LEARNING INFLUENCE ON THE DEVELOPMENT OF SMALL BUSINESS IN NAMANGAN REGION.

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### ABSTRACT

*In the article, based on the data of small business entities operating in the Namangan region of our country from 2000 to 2021, a multifactor econometric model was created, this development was quantitatively assessed, as well as the volume of market services produced (provided) in small businesses, the volume of cargo transportation in road transport, the turnover of road transport, the volume of passenger traffic in road transport, the passenger turnover of road transport, the number of employees and other factors are modeled econometrically.*

**Research methodology.** Statistical, comparative analysis method and regression analysis, questionnaire and other methods are used to solve the research tasks set in the article.

All analyzes are based on factor analysis. In a broad sense, factor analysis shows the structural relationship of variable indicators and their classification. Based on factor analysis, it is possible to see the influence of known factors on general economic processes.

In our example, regression methods were used as an econometric analysis method.

Regression analysis consists of creating a model in the form of a regression equation that relates the dependent variable to the independent variable and contains unknown parameters consisting of regression coefficients.

**I. Introduction.** Creation of a multi-factor econometric model of small business development indicators and factors affecting it in the Namangan region, verification of the model using various tests and determination of its statistical significance allows us to develop directions for improving the economic mechanisms of small business management at the local level.

In the article, based on the data of small businesses operating in the Namangan region from 2000 to 2021, a multifactorial econometric model was created and a quantitative assessment of this development was given.

At this point, it should be said that the volume of market services produced (provided) in small business, the volume of cargo

transportation in automobile transport, the volume of automobile transport, the volume of passenger transportation in automobile transport, the number of passengers in automobile transport, the number of busy people and other factors were econometrically modeled by local researchers.

**II. Analysis of literature on the topic.** Foreign economists L.I. Abalkin, G.S. Seyalova, E.E. Vershigora, V.F. Fillipov, A.A. Kuhlman, B.Z. Milner and D.V. The Hodos have enlightened in their studies. Including L.I. According to Abalkin, the economic mechanism is a set of forms and methods of activity, it includes not only basic but also infrastructural elements influencing each other [2]. G.S. According to Seyalova, the economic mechanism is a system that shapes production relations as a method of organizing production, a form of economic management (plan, economic norms, price, profit, salary, finance, credit, decision-making), as well as it is not only production rather, it means organizing production forces and structure in relations [3]. E.E. Vershigora emphasizes that the planning of the economic mechanism, economic stimulation, market mechanism and organizational structure are the result of joint movement and coordination [4]. Taking into account the above, we can say that the economic mechanism is more specific to the macro level.

**III. Analysis and results.** In order to determine the exogenous factors affecting the development of small business entities operating in Namangan region, the following factors were selected: the resulting factor is the number of small business entities registered in the region ( $Y$ ), and as influencing factors - structure of capital investments in small business and private entrepreneurship financing sources (Received funds) (in percentage of total) ( $X_1$ ), composition of investments in fixed capital by sources of financing for small business and private entrepreneurship (own funds of enterprises and residents) ( $X_2$ ), composition of capital investments (foreign investments and loans) by sources of financing for small business and private entrepreneurship ( $X_3$ ), composition of capital investments (bank loans and other debt funds) by sources of financing for small business and private entrepreneurship ( $X_4$ ).

Here, it is aimed to check the following scientific assumptions (hypotheses):

$H_0$  - investments in fixed capital in terms of sources of financing for small business and private entrepreneurship, that is, the higher the received funds, the more small business will develop in the regions and new small business entities will be created. In small business, the joint effect of enterprises and residents with the introduction of their means in the form of investment is high. At the same time, foreign investments, foreign loans, loans from local commercial banks and other debt funds are all equally effective.

Also, the increase or decrease in the volume of industrial production in the region has a direct impact on the electrical engineering sector, significantly affecting the level of economic security of enterprises in this sector.

$H_1$  - investments in fixed capital in terms of sources of financing for small business and private entrepreneurship, that is, the higher the received funds, the more small business will develop in the regions and new small business entities will be created. However, in small business, it is the investments of enterprises and citizens that are more effective. Foreign investments, foreign loans and loans from local commercial banks do not have a high place in local government.

$H_2$  - foreign investments aimed at small business and private entrepreneurship, foreign loans and loans from local commercial banks have a high efficiency, and the role of capitalized

investments, that is, received funds, is not very high. Equal use of financial instruments does not produce synergy.

The calculated parameters of the multifactorial econometric model based on the data of small businesses operating in the Namangan region are presented in Table 7 below.

#### 7-table

#### Regression analysis of (lx<sub>1</sub>, lx<sub>4</sub>) factors influencing small business development in Namangan region<sup>1</sup>

Dependent Variable: LY  
Method: Least Squares  
Date: 02/10/23 Time: 16:26  
Sample: 2000 2021  
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LX1	0.116677	0.062389	1.870169	0.0769
LX4	0.244577	0.066148	3.697438	0.0015
C	8.683546	0.062227	139.5465	0.0000
R-squared	0.915213	Mean dependent var	9.439096	
Adjusted R-squared	0.906288	S.D. dependent var	0.329729	
S.E. of regression	0.100938	Akaike info criterion	-1.622501	
Sum squared resid	0.193580	Schwarz criterion	-1.473722	
Log likelihood	20.84751	Hannan-Quinn criter.	-1.587453	
F-statistic	102.5458	Durbin-Watson stat	1.155819	
Prob(F-statistic)	0.000000			

The equation of this regression model can be given as follows:

$$\ln y_1 = 0,116 \ln x_1 + 0,244 \ln x_4 + 8,68 \quad (1)$$

The calculated parameters of the multifactor econometric model based on the data of small business entities operating in Namangan region are presented in the following table 8.

#### 8- table

#### Regression analysis of (lx<sub>2</sub>, lx<sub>4</sub>) factors affecting small business development in Namangan region<sup>2</sup>

Dependent Variable: LY  
Method: Least Squares  
Date: 02/10/23 Time: 16:28  
Sample: 2000 2021  
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LX2	-0.226519	0.112675	-2.010379	0.0588
LX4	0.296871	0.039695	7.478735	0.0000
C	9.852786	0.554653	17.76386	0.0000
R-squared	0.917215	Mean dependent var	9.439096	
Adjusted R-squared	0.908501	S.D. dependent var	0.329729	
S.E. of regression	0.099739	Akaike info criterion	-1.646397	
Sum squared resid	0.189009	Schwarz criterion	-1.497619	
Log likelihood	21.11037	Hannan-Quinn criter.	-1.611350	
F-statistic	105.2556	Durbin-Watson stat	1.289097	
Prob(F-statistic)	0.000000			

The equation of this regression model can be given as follows:

$$\ln y_1 = -0,226 \ln x_2 + 0,296 \ln x_4 + 9,85 \quad (2)$$

In ceteris paribus conditions, an increase in fixed capital investments, i.e. own funds of enterprises and residents (X<sub>2</sub>) by one unit in terms of sources of financing for small business and private entrepreneurship, will lead to a decrease in the number of small business entities

<sup>1</sup> The author made calculations in the Eviews-10 program

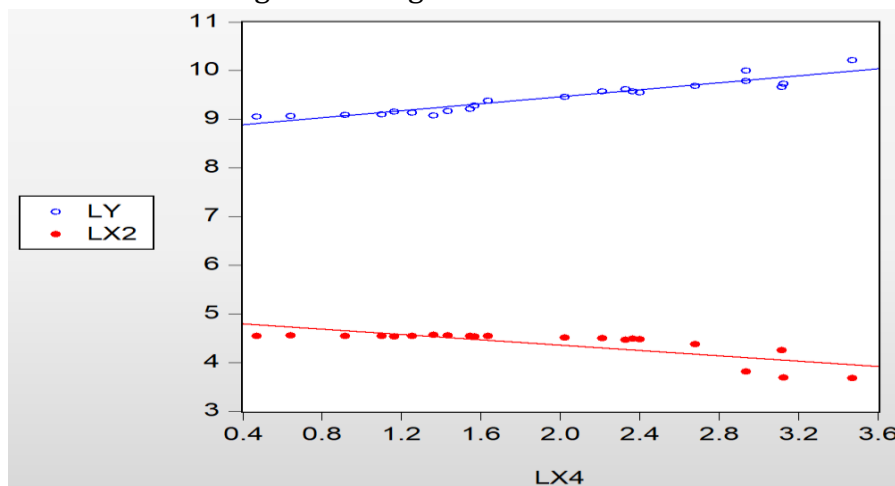
<sup>2</sup> The author made calculations in the Eviews-10 program

registered in Namangan region by 0.22 units, bank loans and other debt funds an increase of one unit leads to a decrease of 0.29 units in the number of registered small business entities in Namangan region.

Figure 4 shows the relationship between the resulting and influencing factors ( $ly_2$ ,  $lx_2$ ) on the development of small business in Namangan region.

The main issue here is the condition that the influencing factors are not closely related to each other.

That is, there should be no multicollinearity between influencing factors, and multicollinearity is considered present if the value of the pairwise correlation coefficient between two influencing factors is greater than 0.7.



**Figure 4. A diagram of the connection between the resulting and influencing factors ( $ly_2$ ,  $lx_2$ ) on the development of small business in Namangan region <sup>3</sup>**

The values of pairwise correlation coefficients between all influencing factors are less than 0.5. This indicates that there is no multicollinearity between the influencing factors.

It is necessary to analyze the correlations between the factors of the factor ( $Y_1$ ) whose activity indicators are being studied above.

The calculated parameters of the multifactor econometric model based on the data of small business entities operating in Namangan region are presented in Table 8 above.

The equation of this regression model can be given as follows:

$$Y_1 = -0,226X_1 + 0,009X_3 + 6303,9 \quad (2)$$

The number of small business entities registered in the cross-section of regions ( $Y$ ), ceteris paribus, the composition of investments in fixed capital by sources of financing for small business and private entrepreneurship, an increase of received funds by one unit, the number of small business entities registered in the cross-section of regions decreases by 0.22 units, the increase of foreign investments and loans by one unit served to increase the number of small business entities registered in Namangan region by 0.009 units.

**Conclusion:** According to econometric analysis, foreign investments aimed at small business and private entrepreneurship, foreign loans and loans from local commercial banks are highly effective, and the role of capital investments, i.e. received funds, is not very high. Equal use of financial instruments does not produce synergy.

<sup>3</sup> The author made calculations in the Eviews-10 program

According to the results of the econometric analysis of the factors influencing the development of small business in Namangan region, the main capital investments for the development of small business entities operating in the region in terms of sources of financing for small business and private entrepreneurship: received funds, enterprises and population's own funds, foreign investments and loans, and banks loans and other loan funds are affected. However, the local administration is required to use these financial instruments optimally.

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