RELATIVE IMPORTANCE OF FACTORS AFFECTING SUSTAINABLE DEVELOPMENT OF SMALL BUSINESS

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Annotasiya. *Ushbu tadqiqotda O‘zbekiston Respublikasidagi kichik biznes sohasini barqaror rivojlantirishga ta’sir etuvchi omillarga bog‘liqlik ahamiyatini ko‘rib chiqdik va bu sohani istiqbolli ko‘rsatkichlarini ifodaladik.Ekonometrik modellashtirishda keng foydalaniladigan korrelyasion-regression tahlil usulidan hamda prognozlashtirish jarayoni uchun ARIMA modelining tarkibiy qismidan foydalanildi. Tadqiqot ma’lumotlari O‘zbekiston Respublikasi statistika qo‘mitasi portalidan olindi va hisob-kitob jarayonida foydalanildi. Shuningdek, ma’lumotlar tahlili jarayonida determinasiya (R^2), korrelyasiya koyeffisiyentlari (ry/x), Darbin-Uotson testi (DW) va Fisher mezoni (F-distribution) testlardan foydalanildi.*

Kalit so‘zlar: *kichik biznes, model, tadbirkorlik, yalpi ichki mahsulot, Kobb-Duglas ishlab chiqarish funksiyasi, AR model.*

Аннотация. *В данном исследовании мы рассмотрели важность зависимости от факторов, влияющих на устойчивое развитие сектора малого бизнеса в Республике Узбекистан, и представили перспективные показатели этого сектора. Данные исследования были получены с портала Статистического комитета Республики Узбекистан и использованы в процессе расчетов. Кроме того, при анализе данных использовались критерии определения (R2), коэффициенты корреляции (ry/x), тест Дарбина-Ватсона (DW) и критерий Фишера (F-распределение).*

Ключевые слова: *малый бизнес, модель, предпринимательство, валовой внутренний продукт, производственная функция Кобба-Дугласа, AR-модель.*

Abstract. *In this study, we considered the importance of dependence on the factors affecting the sustainable development of the small business sector in the Republic of Uzbekistan and expressed the promising indicators of this sector. component was used. Research data were obtained from the portal of the Statistical Committee of the Republic of Uzbekistan and used in the calculation process. Also, determination (R2), correlation coefficients (ry/x), Darbin-Watson test (DW) and Fisher criterion (F-distribution) tests were used during data analysis.*

Keywords: *small business, model, entrepreneurship, gross domestic product, Cobb-Douglas production function, AR model.*

INTRODUCTION

Small business and entrepreneurship are becoming more and more important in the sustainable development of the economy of our country and in improving the well-being of the population. Today, small business and entrepreneurship account for 55% of the gross domestic product, and almost 75% of the population employed in economic sectors are engaged in business entities. However, in 2000, the share of this sector in the gross domestic product was 31 percent, and the corresponding share in employment was almost 1/3 less than the current rate.

The experience of developed countries shows that by supporting small business, they receive income from it in the form of taxes, development of innovations, employment of the

country's population. Statistical data reflect the high contribution of small business entities to the development of the economy of the world's leading countries. For example, there are about 17 million small businesses in the United States. Small business creates more than 50% of the gross national product.

Almost 97 percent of enterprises are small according to the standard of small business management in all sectors of the economy except agriculture. The statistical data of the European Business Association also show that small business is developing quite actively and operating efficiently in the EU countries. In Europe, it is 70% to 90% of all enterprises. More than half of the population of EU countries work in this field. Small business is developing most actively in Germany. The contribution of small business to the country's economy is almost 100 percent of the total gross domestic product. More than the population of working age is employed at the expense of small business entities. More than 1,000 small German enterprises have become world export leaders.

METHODOLOGY

During our research, we used the data obtained from the Statistical Committee of the Republic of Uzbekistan. Also, in the study, the classical linear regression model (CLRM) of the whole small business, determination ($R2$), correlation coefficients (ry/x), Darbin-Watson test (DW) and Fisher's criterion (F-distribution) estimates empirical probability We will look at the data.

The Cobb-Douglas production function is one of the widely used functions in economic forecasting. This function represents the relationship between the volume of practical factors of production (labor and capital) and the volume of output. In this case, the volume of production (Y) is determined by the available reserves of production factors and the efficiency of their use. Factors of production are determined by labor L and capital K. Efficiency of use of production factors with marginal productivity indicators with capital - m and with labor - (1 - m):

$$Y = A \times K^{m} \times L^{(1-m)} \qquad (1)$$

where A is the coefficient reflecting the effect of the volume of production on the product.

From the relative perspective of growth rates, the relationship between macroeconomic indicators looks very simple:

$$y = k \times m + l \times (1 - m) \qquad (2)$$

where k is the average annual capital growth rate; m is the elasticity coefficient of production volume by capital; l - the average annual growth rate of labor; (1 - m) is the coefficient of elasticity of production volume for labor.

J. Tinbergen is another scientist who improved the Cobb-Douglas production function, who suggested considering the impact of scientific and technical progress on economic change as an independent variable [1]. In this context, we use the model improved by J. Tinbergen.

ARIMA models are one of the most widely used methods for forecasting economic and social indicators. ARIMA The word ARIMA is an abbreviation of the English word "Autoregressive integrated moving average" and consists of three different components.

"Autoregressive" - the function of the autoregressive part reflects the influence of the values of this quantity in the past period in the current period. This is due to the specific nature of time series data, that is, quantities often have autocorrelation with their value in the past period[2].

The second component is represented by the word "integrated". Integration is the transformation of a time series into stationary data if it is non-stationary. If the time series data is

stationary, then the integration part is not needed. ARIMA models that do not need to find differences of the first or higher order are also called ARMA.

The third part is the "Moving average" part, which reflects the effect of the moving average part on the time series data. ARIMA models are an important econometric tool for short-term forecasting [3].

By comparing the dynamics of factors and the elasticity coefficients and relative indicators of production results, it is possible to perform a spectral analysis of the growth rate of production results due to various reasons. AR models are one of the most widely used methods for forecasting economic and social indicators [4].

To make forecasts, we make medium-term forecasts of capital (K) and labor (L) variables based on AR(1) and AR(2) models. In dynamic series, the value of variable K at time t is K_t, where the number of observations is T, i.e. t=1,2,...T. Within the sample, t and subsequent time t+1 represent the time interval of observations.

Dynamic arrays use special terminology when using previous values of a variable. Although K_(t-1) - semantically indicates the value of the variable K in the past time, it is the first lag of the variable K or K with the first lag, and K_(t-j) is the j - lag of the variable K or j is referred to as K with lag. The change of variable K between t and t-1 is called K_t-K_(t-1) and is defined as $\Delta K_t=K_t-K_{(t-1)}$.

ANALYSIS AND RESULTS

Based on the impact of several factors on the development of small business and private entrepreneurship in our country, we will analyze the results by creating econometric models and data analysis. In the course of the research, we used the total size of the total amount of GDP as the main factor, relative to GDP (billion soums) - Y, and the amount of GDP in the industry (billion soums) as the influencing factor - X_1, the amount in construction (billion soums) X_2, in investment amount (billion soums) - X_3, number of people employed in KBXT - X_4, amount of exports (thousands of US dollars) - X_5, amount of imports (thousands of US dollars) - X_6, amount of trade (billion soums) - X_7 is selected.

We performed data and econometric analysis of all variables on the basis of 2000-2021 data provided by the State Statistics Committee. As a result, in the period of 22 years, the total volume of KBXT was 104,729.6 billion soums on average and the highest amount was 403,288.6 billion soums compared to GDP.

However, as a result of pair correlation analysis, two influencing factors, i.e. the amount of investment (billion soums) - X_3 and the number of people employed in KBXT - X_4 are weakly connected with each other, and based on them, multifactorial linear regression we make a model.

```
. reg Y x3 x4
```

Source	SS	df	MS	Number of obs	=	22
				F(2, 19)	=	72.65
Model	2.8326e+11	2	1.4163e+11	Prob > F	=	0.0000
Residual	3.7040e+10	19	1.9495e+09	R-squared	=	0.8844
				Adj R-squared	=	0.8722
Total	3.2030e+11	21	1.5252e+10	Root MSE	=	44153

Y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
x3	1.457535	.1937174	7.52	0.000	1.05208	1.86299
x4	26.71429	5.255174	5.08	0.000	15.71508	37.7135
_cons	-155462.9	42334.05	-3.67	0.002	-244069	-66856.66

Figure 1. Regression analysis result

Based on the results of the regression analysis, the multifactor linear model was expressed in the following form:

$$Y = -155462.9 + 1.4575 * x3 + 26.7142 * x4 + \varepsilon$$

You can see that the shape of the constructed model is correct and significant when we conclude by Fisher's criterion. Based on the direct Fisher's p value, the coefficient of determination is significant and equal to R^2=0.884, which means that the model is close to the real value by 88 percent. Also, if we analyze the parameters of the model in the t-critical student value, you can see that all the coefficients are reliable. Alternatively, if you look at the factors involved in the model, you can see that it fits the Cobb-Douglas function.

Another scientist who improved Cobb-Douglas production function is J. Tinbergen, who proposed to take into account the impact of scientific and technical progress on economic change as an independent variable [5]. To this end, he supplemented the number of factors in the original Cobb-Douglas formula with an additional factor of the natural logarithmic base of *e* to the power of *g*.

```
. reg LY LL LK time
```

Source	SS	df	MS	Number of obs	=	22
				F(3, 18)	=	1053.28
Model	75.2065975	3	25.0688658	Prob > F	=	0.0000
Residual	.428414775	18	.023800821	R-squared	=	0.9943
				Adj R-squared	=	0.9934
Total	75.6350123	21	3.60166725	Root MSE	=	.15428

LY	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LL	2.322778	.3252648	7.14	0.000	1.639422	3.006134
LK	.1845332	.1626477	1.13	0.271	-.157177	.5262434
time	.1331291	.0541349	2.46	0.024	.0193958	.2468624
_cons	-13.54337	2.721465	-4.98	0.000	-19.26095	-7.82578

Figure 2. Regression analysis result

In this context, if we take the total size of the KGBT, the amount in relation to GDP - Y, the amount of investment (billion soums) - X_3 as K and the number of people employed in the KGBT - L - X_4, we will build the model improved by J. Tinbergen. However, if we look at the results of Figure 2, the investment amount (billion soums) K has an unreliable coefficient based on the t-student criterion. Taking this into account, we use the Cobb-

Douglas function improved by R. Solow.

```
. reg LY LL LK
```

Source	SS	df	MS	Number of obs	=	22
				F(2, 19)	=	1245.90
Model	75.0626571	2	37.5313285	Prob > F	=	0.0000
Residual	.572355208	19	.030123958	R-squared	=	0.9924
				Adj R-squared	=	0.9916
Total	75.6350123	21	3.60166725	Root MSE	=	.17356

LY	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LL	2.351587	.3656918	6.43	0.000	1.586186	3.116989
LK	.5713078	.0466381	12.25	0.000	.4736931	.6689224
_cons	-15.53331	2.923233	-5.31	0.000	-21.6517	-9.414909

Figure 3. Regression analysis result

As a result of the above regression analysis, our model was created in the following form:

$LY = B + \alpha * LnK + \beta * LnL$ (3)

Then

$$Y = (1{,}79461\text{E} - 07) * K^{0{,}5713078} * L^{2.351587} \quad (4)$$

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. reg LY LL LK
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Figure 4. Regression analysis result

If we analyze the constructed model, the coefficient of determination is equal to 0.99, the value of Fisher's criterion is 1245.9, which means that the selected model form is correct and significant, and all the coefficients found are t-student criterion. reliable on.

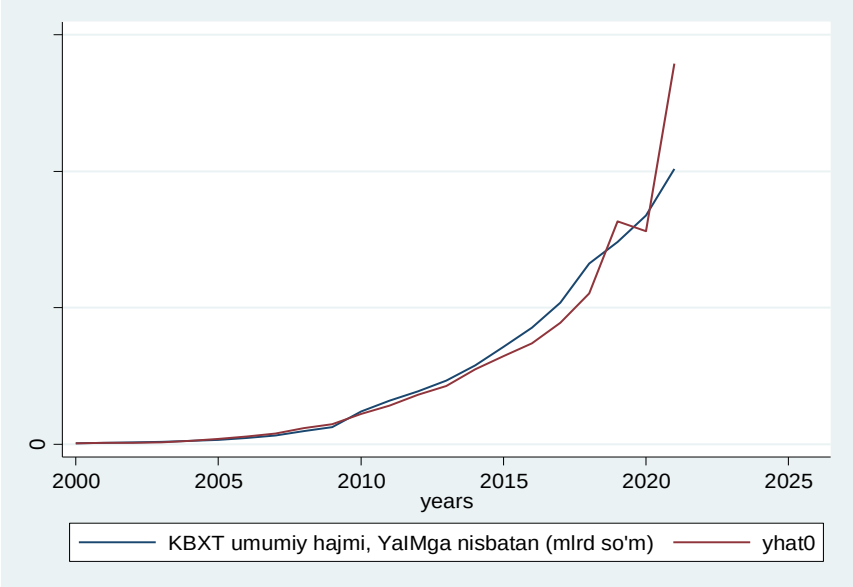


Figure 5. The total volume of GDP, the amount in relation to GDP and the estimated Y value of the constructed model

If we compare based on the graph, the calculated Y value of the model is 99 percent close to reality based on probability. Also, continuing the econometric modeling, we will find the future forecast values of the K and L variables involved in the model. In this case, we use n-order autoregression models (AR).

Based on the analysis result, all values of the AR(1) model are positive. Based on this, the form of the model was as follows:

$$AR(1) = 0{,}2944899 + 1{,}008556 * L1.LK \qquad (5)$$

If we pay attention to the result of the above regression analysis, the results of this model are also composed of positive values. When creating a lagged model, it had the following form.

$$AR(1) = 0{,}9391927 + 0{,}8996358 * L1.LL \qquad (6)$$

years	K	L	lb0	yhat2	ub0
2021	244962.7	10070.67	388510.8	557630.6	800368.7
2022	365681.8	10213.64	498271.5	724691.8	1054000
2023	547766.8	10344.01	637102	940515.8	1388428
2024	823359.4	10462.71	812452.6	1219373	1830101
2025	1241931	10570.65	1033696	1579802	2414419
2026	1879892	10668.72	1312644	2045921	3188826

Figure 6. Medium-term forecast values

Also, based on the above model 9, before finding the forecast value of the total volume of GDP, the amount compared to GDP, we can find the standard error of the forecast and the value of t-critical=1.7291328. Then we find the interval of change of forecast value. Based on the results of the analysis, the total size of the KBXT, compared to GDP, will most likely be 724,691.8 billion soums in 2022, and this figure will reach 2,045,921 billion soums by 2026.

CONCLUSIONS AND SUGGESTIONS

Based on the research of the trends and problems of sustainable development of small business and private entrepreneurship in Uzbekistan, the following conclusions were drawn:

During the years of independence, as a result of the reforms aimed at the development of small business and private entrepreneurship in our country, including increasing the investment attractiveness of this sector, today the share of small business and private entrepreneurship in GDP is higher than the indicators of most countries with developed market economies;

As a result of the implementation of targeted state programs aimed at further strengthening the participation of small business and private business entities in foreign economic activities and encouraging the supply of competitive products to the world market, more than half of product exports in regions such as Khorezm, Namangan, Syrdarya, Samarkand, Surkhandarya and Bukhara part corresponds to the share of small business and private entrepreneurship.

Also, based on the results of the research, the total investment amount of KBXT (billion soums) will be 365,681.8 billion soums in 2022, and this indicator will reach 1,879,892 billion soums by 2026. and if the number of people employed in KBXT equals 10,213 in 2022 and 10,668 in 2026, the total size of KBXT, its amount in relation to GDP, may increase to the above-mentioned amount. At the same time, there is a possibility that the total volume of GDP in relation to GDP will change from 498,271.5 billion soums to 1,054,000 billion soums in 2022. The forecast value in 2026 of the total volume of GDP in relation to GDP may fluctuate between 1,312,644 billion soums and 3,188,826 billion soums.

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