



ANALYSIS OF PRODUCTION INFRASTRUCTURE (On The Example of Navoi region)

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ABSTRACT

This article analyzes the industrial infrastructure of the Navoi region. When analyzing the industrial infrastructure of the Navoi region, data collected during a scientific study from enterprises related to industrial infrastructure facilities were used. The author used a regression model, while building regression models of processes, the author used the least squares method.

KEYWORDS: *gross regional product (GRP), Student-t criterion, regression model, regression coefficient, production infrastructure*

I. INTRODUCTION

The quality and volume of infrastructure has a positive effect on the attractiveness, competitiveness, sustainability and economic growth of countries and cities. Infrastructure opens up new business opportunities and promotes trade as well as the expansion of existing economic activity. It also improves the standard of living of the public by giving people access to essential resources, such as water and electricity, schools, hospitals and markets. This is even more true if the development of infrastructure is done in a sustainable way. Notwithstanding, around the world – in highly developed industrialised nations, highgrowth emerging economies and developing countries alike – there is a growing gap between the acute need for new or modernised infrastructure, maintenance and overhaul measures and the actual level of investment and current expenditure, as evidenced by crumbling bridges, broken highways and leaking water pipelines.

The creation and development of infrastructure adequate to the market today is one of the important conditions for the transformation of economic relations in Uzbekistan. The effectiveness of economic reform largely depends on the degree of infrastructure development. Infrastructure is an integral part of any integrated economic system and structure. The term "infrastructure" comes from the Latin words "infra" - from below, "structure" - structure, location. A group of scientists considers the function of infrastructure in the production and service of the population and defines it as an integrated service system.

Today, the industrial infrastructure is the main engine of the economic mechanism. Myself the production process, namely its efficiency, largely depends on its seemingly insignificant, auxiliary elements, one of which is the production infrastructure. Industrial infrastructure of the region is a key link in the development of the economy of any region and plays an important role in organizing and strengthening stable ties between business entities, notes the level of integration and modernization of production factors.

It is at the regional level that there is a need to study and analysis of the infrastructure, because the infrastructure serves consumers in a specific limited area.

II. METHODOLOGY

To determine whether the development of Navoi region under the influence of production infrastructure on the volume of gross regional product can be more positive, we need to know in advance the negative impact of these factors, scientifically substantiate the impact of these factors and draw appropriate conclusions. Therefore, in the analysis of production infrastructure of Navoi region, using the data collected during the regional engineering and communication organizations, statistical organizations and scientific research, we determine the regression equations of output in key areas of production infrastructure in the region.

The main indicators of the gross regional product (GRP) and production infrastructure in Navoi region are as follows:

Gross regional product (billion soums) - Y;

Industrial product - Y1

Electricity, mln. kWh, soum - X1;

Natural gas supply, thousand cubic meters - X2;

Water volume, thousand cubic meters - X3;

Freight turnover, mln. ton-km - X4.



$$m_b = \sqrt{\frac{\sum (y - y_x)^2 / (n - 2)}{\sum (x - \bar{x})^2}} \quad (3)$$

The random error of "a" parameter of the regression equation was determined by the following formula:

$$m_a = \sqrt{\frac{\sum (y - y_x)^2}{n - 2} \cdot \frac{\sum x^2}{n \cdot \sum (x - \bar{x})^2}} \quad (4)$$

The random error of the linear correlation coefficient was determined on the basis of the following formula:

$$m_r = \sqrt{\frac{1 - r^2}{n - 2}} \quad (5)$$

Assessment of the statistical significance of the parameters of the regression equation can also be done using the Student-t criterion (When the number of degrees of freedom is n-2 and $\alpha = 0,05$, the table values of the symbol t are found in the Student Distribution Table). It includes the following:¹

$$t_a = \frac{a}{m_a}, \quad t_b = \frac{b}{m_b}, \quad t_r = \frac{r_{xy}}{m_r} \quad (6)$$

If the found original values of the sign t are greater than its table value (i.e. $t_a > t_{tabl}$, $t_b > t_{tabl}$, $t_{rxy} > t_{tabl}$), the parameters "a" and "b" are statistically significant.

The volume of industrial production in Navoi region (together with the closed system) was defined as Y1, the values obtained as a result of observations were formed trend models by relating the time factor t.

In Navoi region, changes in the volume of industrial production were taken as factors influencing the production infrastructure: the volume of electricity, natural gas, water and freight traffic supplied to consumers. It makes sense to construct a multivariate regression model using these factors.

One of the basic rules of multivariate regression modeling is to determine the bond densities between the factors selected for the model, that is to investigate the problem of multicollinearity of the relationship between the selected factors.

A correlation matrix was calculated between the influencing factors for the outcome factor. We conduct a correlation analysis to determine if there is no multicollenity between these factors (Table 2).

Table 2
The correlation matrix between the volume of industrial output and factors of production infrastructure of Navoi region

	Y ₁	X ₁	X ₂	X ₃	X ₄
Y ₁	1,000				
X ₁	0,954	1,000			
X ₂	0,838	0,733	1,000		
X ₃	-0,566	-0,372	-0,704	1,000	
X ₄	0,806	0,735	0,697	-0,701	1,000

Source: Created by the author using MS Excel

In order to create a multifactorial empirical model of the basic supply of production infrastructure for the volume of industrial output in Navoi region, all the above factors are taken and how they behave in the model is examined.

¹Econometrics: Textbook./Edited by I.I.Eliseeva. -M.: Finance and statistics, 2003-p. 344.



IV. RESULTS

As a result of our analysis, when performing a correlation analysis between industrial output volume and production infrastructure indicators, it was found that there is no multicorrelation between factors, and there is a correlation between each factor and the outcome factor, and a factor 3 inverse relationship.

V. CONCLUSION

In conclusion, we can say that, as we know, the Navoi region is an industrial region of our country, and by establishing a developed industrial infrastructure in the Navoi region, we will create good conditions for powerful large-scale production, economic growth, thereby bringing the production of our region to a new level. After the analysis of the branches of the production infrastructure, it seems possible and necessary to form the basic principles for building an effective system of the production infrastructure of the region.

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