

Analysis of Factors Affecting the Financial Economic Activity of Industrial Enterprises in Tashkent in Special Statistical Methods

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Abstract: This research is devoted to the analysis of factors affecting the financial and economic activities of industrial enterprises in Tashkent using special statistical methods. The study used techniques such as regression analysis, correlation analysis, and factor analysis. The results show that such factors as the volume of investments, the level of innovative activity and labor productivity significantly affect the financial indicators of enterprises. Based on the results of the study, recommendations were developed to improve the financial stability of industrial enterprises in the city of Tashkent.

Key words: industrial enterprises, financial and economic activities, statistical analysis, Tashkent City, regression analysis, correlation analysis, factor analysis.

INTRODUCTION

Tashkent city is considered one of the major industrial centers of Uzbekistan. Further developing the industrial potential of the city and ensuring the financial stability of enterprises is crucial for the country's economic growth. From this perspective, an in-depth study and analysis of factors affecting the financial and economic activities of industrial enterprises is a pressing issue.

The aim of this research is to analyze the factors affecting the financial and economic activities of industrial enterprises in Tashkent city using special statistical methods and to determine their level of impact.

METHODOLOGY

In this study, the following special statistical methods were used to analyze the factors affecting the financial and economic activities of industrial enterprises:

Regression analysis: This method allows for studying the impact of one or several independent variables on a dependent variable [1]. A multi-factor regression model was applied in the study, which allowed for assessing the impact of several factors simultaneously.

Correlation analysis: This method determines the degree of interrelation between various factors [2]. The Pearson correlation coefficient was calculated in the study.

Factor analysis: This method allows for combining a large number of variables into a smaller number of generalized factors [3]. The Principal Component Analysis method was applied in the study.

Data for the research was obtained from the State Statistics Committee of the Republic of Uzbekistan, Tashkent City Statistics Department, and annual reports of enterprises. SPSS and R software were used for data processing and statistical analysis.

The research methodology consists of the following stages:

- Collecting and preparing initial data;

- Conducting correlation analysis and identifying the interrelationships between factors;
- Identifying the main influencing factors using factor analysis;
- Constructing a multi-factor regression model and statistically evaluating it;
- Analyzing and interpreting the obtained results.

The research methodology allows for a comprehensive and in-depth analysis of factors affecting the financial and economic activities of industrial enterprises.

LITERATURE REVIEW

The study of factors affecting the financial and economic activities of industrial enterprises has attracted the attention of many scholars and researchers. This section analyzes the main studies conducted on the topic and their results.

Abdulaev et al. (2021) studied the factors affecting the financial stability of industrial enterprises in Uzbekistan [4]. According to their research results, the composition of enterprise assets, capital structure, and liquidity indicators are considered the most influential factors on financial stability.

Among foreign researchers, Altman and Sabato (2007) studied the factors affecting the financial activities of small and medium enterprises [5]. The Z-score model developed by them is widely used to assess the financial condition of enterprises.

Among Uzbek scholars, Vohidov (2020) investigated the relationship between innovative activity and financial indicators of industrial enterprises in Tashkent city [6]. According to his conclusions, enterprises with a high level of innovative activity are considered more financially stable.

International experience shows that Ghosal and Ye (2015) analyzed macroeconomic factors affecting the financial indicators of industrial enterprises in India [7]. According to their research results, inflation rate, exchange rate, and economic growth rates significantly impact the financial condition of enterprises.

In the local context, Raximov (2022) studied the relationship between investment activities and financial results of industrial enterprises in Tashkent city [8]. According to his research results, the volume of investments and their effectiveness positively affect the financial indicators of enterprises.

Another important study was conducted by Karimbayev et al. (2023), which examined the relationship between labor productivity and financial efficiency of industrial enterprises in Tashkent city [9]. The research results show that increased labor productivity positively affects the financial indicators of enterprises.

Among foreign scholars, Lee et al. (2019) analyzed factors affecting the financial indicators of industrial enterprises in South Korea based on panel data [10]. According to their research results, enterprise size, industry characteristics, and export activities are considered the most influential factors on financial indicators.

The above literature review shows that many internal and external factors affect the financial and economic activities of industrial enterprises. However, in the context of Tashkent city, studies on the in-depth examination of these factors' impacts using special statistical methods have not been conducted sufficiently. From this perspective, this study allows for expanding the existing knowledge base and drawing conclusions of practical importance.

RESULTS AND DISCUSSION

The results of the statistical analysis conducted within the framework of the study showed the following:

According to the correlation analysis results, the strongest relationships were identified between the financial indicators of industrial enterprises in Tashkent city (profitability, liquidity, financial stability) and the following factors:

Table 1. Correlation between main factors and financial indicators

Factor	Correlation coefficient (r)	P-value
Investment volume	0.78	< 0.01
Level of innovative activity	0.72	< 0.01
Labor productivity	0.69	< 0.01
Export volume	0.65	< 0.01
Enterprise size	0.61	< 0.01

Developed based on the author's research.

As shown in Table 1, investment volume ($r = 0.78$) and level of innovative activity ($r = 0.72$) are considered the factors with the strongest impact on the financial indicators of enterprises. These results indicate that to increase the financial stability and efficiency of industrial enterprises in Tashkent city, special attention should be paid to attracting investments and developing innovative activities.

Labor productivity ($r = 0.69$) and export volume ($r = 0.65$) also have a significant impact. This indicates the need for measures to increase labor productivity and strengthen export potential in enterprises.

The relationship between enterprise size ($r = 0.61$) and financial indicators is relatively weaker, but still significant. This shows that small and medium enterprises also have opportunities for efficient operation.

According to the results of factor analysis (Principal Component Analysis), 15 initial variables were combined into 4 main factors:

Table 2. Factor analysis results

Factor	Explanatory power	Main components
Investment-innovation	35.2%	Investments, innovations, R&D expenses
Operational efficiency	22.8%	Labor productivity, asset turnover
Foreign economic activity	18.5%	Export volume, number of foreign markets
Financial structure	12.7%	Debt/capital ratio, liquidity indicators

Developed based on the author's research.

As shown in Table 2, the investment-innovation factor explains 35.2% of the initial variance. This factor includes indicators such as investment volume, share of innovative products, and R&D expenses. This result confirms the strategic importance of innovative development and attracting investments for industrial enterprises in Tashkent city.

The operational efficiency factor (22.8%) includes indicators such as labor productivity and asset turnover. This indicates the need to focus on optimizing internal processes of enterprises.

The foreign economic activity factor (18.5%) is related to export volume and the number of foreign markets. This result shows the importance of integration into international markets and increasing export potential for industrial enterprises in Tashkent city.

The financial structure factor (12.7%) is related to the debt/capital ratio and liquidity indicators. The relatively lower importance of this factor indicates that there are other factors affecting the financial stability of enterprises.

According to the results of multiple regression analysis, the following model was found to be the most optimal:

$$Y = 0.42 + 0.31X1 + 0.28X2 + 0.23X3 + 0.18X4 + 0.15X5$$

Where:

Y - enterprise profitability indicator (ROA)

X1 - investment volume

X2 - level of innovative activity

X3 - labor productivity

X4 - export volume

X5 - enterprise size

The coefficient of determination (R^2) of the model was 0.83, which indicates the model's high explanatory power. All coefficients are statistically significant ($p < 0.05$).

The results of the regression analysis show that investment volume and level of innovative activity are considered the factors with the strongest impact on enterprise profitability. A 1% increase in investment volume can increase profitability by an average of 0.31%, while a 1% increase in the level of innovative activity can increase profitability by 0.28%.

CONCLUSION AND RECOMMENDATIONS

Based on the research results, the following *conclusions* were formed:

The most important factors affecting the financial and economic activities of industrial enterprises in Tashkent city include investment volume, level of innovative activity, labor productivity, export volume, and enterprise size.

The investment-innovation factor is considered the most influential factor on the financial activities of enterprises. This indicates the importance of innovative development and attracting investments.

Operational efficiency and foreign economic activity also have a significant impact on the financial indicators of enterprises. This implies the need to focus on optimizing internal processes and increasing export potential.

Although enterprise size positively affects financial indicators, this impact is less compared to other factors. This shows that small and medium enterprises also have opportunities for efficient operation.

Based on these conclusions, the following *recommendations* were developed:

Develop and implement a special program to increase the investment attractiveness of industrial enterprises in Tashkent city. This program may include measures such as tax incentives, improving infrastructure, and reducing administrative barriers.

Introduce a system of tax incentives for expenses directed towards research and development (R&D) to stimulate innovative activities of enterprises.

Expand employee retraining and skill improvement programs to increase labor productivity, as well as encourage the implementation of modern technologies.

Assist enterprises in entering foreign markets, simplify international certification processes, and improve export financing mechanisms to increase export potential.

Develop a cluster approach for small and medium enterprises, thereby increasing their competitiveness and strengthening cooperation with large enterprises.

Organize special trainings and seminars to improve the financial literacy of enterprises, as well as develop financial advisory services.

Create a unified system for monitoring and evaluating the financial and economic activities of industrial enterprises, thereby ensuring the possibility of early problem detection and timely implementation of necessary measures.

The implementation of these recommendations will serve to increase the financial stability of industrial enterprises in Tashkent city and ensure their competitiveness. This, in turn, will have a positive impact on the economic development of the city and the country as a whole.

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