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THE ROLE OF TAXATION AND INSURANCE IN INCREASING THE INVESTMENT EFFICIENCY OF PROJECTS IMPLEMENTED ON THE BASIS OF PUBLIC-PRIVATE PARTNERSHIP

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Abstract:

In this article, the status of tax and insurance levers in increasing the investment efficiency of projects implemented on the basis of public-private partnership is studied. In addition, the researches of several scientists on the subject have been studied and generalized ideas have been highlighted. Mathematical-statistical formulas and correlation-regression analysis methods were also discussed during the research. Then the obtained results were analyzed using VIF, F-fisher, t-student criterion and p-value coefficients. Based on the results and analysis, scientific conclusions are presented at the end of the research proposal.

В данной статье изучено состояние налоговых и страховых рычагов повышения инвестиционной эффективности проектов, реализуемых на основе государственно-частного партнерства. Кроме того, были изучены исследования нескольких ученых по этому вопросу и выделены обобщенные идеи. В ходе исследования также обсуждались математико-статистические формулы и методы корреляционно-регрессионного анализа. Затем полученные результаты анализировали с использованием VIF, F-фишера, t-критерия Стьюдента и коэффициентов p-значения. На основании результатов и анализа научные выводы представлены в конце исследовательского предложения.

Keywords: investment projects, tax payments, insurance contributions, rate of change, public-private partnership (PPP), correlation, VIF coefficient, regression analysis.
инвестиционные проекты, налоговые платежи, страховые взносы, коэффициент изменения, государственно-частное партнерство (ГЧП), корреляция, коэффициент VIF, регрессионный анализ.

INTRODUCTION

Investment activity is carried out in a person in conditions of uncertainty, therefore, in such a situation, we must take into account the risk factor. When purchasing and adopting new equipment, it is usually a difficult process to determine the economic effect that will be achieved due to them in the future. Therefore, during the analysis of the investment project, many alternative investment projects are considered and a single investment decision is made.

In this case, several criteria and parameters are used when considering projects (investment volume, payback period, source of funds to be raised), after reviewing the projects according to all criteria, only one of them is accepted, therefore the permissible risk is high. Making investment decisions is an art, like making other management decisions. Here, the entrepreneur's experience, knowledge, expertise, and, of course, intuition play an important role.

The entrepreneur is greatly helped by the knowledge accumulated in the world management treasury, including the methods of evaluating investment projects that have been formed and used in management practice. Making investment decisions for investors is a very difficult task. The main criterion in this is the criteria for increasing the value of the enterprise. Its factors are the growth of the enterprise's income, the reduction of financial risk or production costs, and the increase in the level of efficiency of the enterprise's work.

To achieve such results in real investment projects, it is necessary to assess the effectiveness of any project. Thus, determining the effectiveness of investment projects is of great scientific and practical importance. Because from the level of assessment of the effectiveness of the project, it is possible to determine the return on invested capital, the pace of development of the enterprise, and other socio-economic problems.

LITERATURE ANALYSIS

As is known, design and research work, which involves the commissioning of a newly built or reconstructed facility, is carried out within the framework of the cost estimate for construction and installation works and services provided to the customer.

This involves the replenishment of budgets of various levels, including taxes and insurance premiums (S_{tsm}), which A.Y. Dobrin emphasized in the following formula:

$$S_{tsm} = S_{lti} + S_{qmi} + S_m + S_q$$

S_{lti} - tax payments and insurance premiums when carrying out design and research work;
S_{qmi} - tax payments and insurance premiums when performing construction and installation work;
S_m - tax payments and insurance premiums incurred by the client in the performance of its functions;
S_q - as well as organizations that provide materials, spare parts, structures, as well as machines, mechanisms, and transport for the object under construction (Dobrin, 2016).

Also, the problem of risks and their insurance in the implementation of large long-term investment projects in the infrastructure sector arose largely as a result of the financial crisis in the leading countries of the world at the beginning of the 21st century and the end of the 1990s and the decline in the stability of their national economies. If we take into account world practice, a prerequisite for concluding a PPP contract is insurance, which is an effective way to reduce their risks. Many developing countries have faced the problem of "crisis of confidence", which led to the outflow of capital and the deterioration of the investment climate in general[1].

Taking this into account, Y.M. Ilyinikh significantly increased the role of international development institutions and financial organizations in the segment of investment orientation and insurance of infrastructure projects, which offered various models and methods of creating a system of additional guarantees against crises and risk insurance. In 2010, an influx of foreign insurance companies entered the Russian market, as a result of which the quality of protection of the interests of insured persons increased (Ilyinykh, 2010).

T.V. Pirogova and Y.M. Ilyinykh play an important role in the implementation of infrastructure projects by imposing certain requirements on insurance and determining the minimum package of risks. The beneficiary of the contract may be the state itself in some cases, and sometimes a private partner. In a study conducted by the Expert RA rating agency, according to experts from insurance companies, the top three in terms of the effectiveness of insurance use are catastrophic risks (natural disasters, terrorism, etc.), construction and installation risks, and fire and other risks (fire, explosion, water movement). It follows that all three "record holders" are among the most common risks in PPP projects, which is why the private partner seeks to redistribute risks to contractors (Pirogova and Ilyinykh, 2016).

Currently, the task of insurers is not only to insure risks and guarantee insurance payments, but also to find the optimal scheme of risks and the probability of negative events (possible losses) of the project so that insurance costs do not burden investment costs. If we look at the practice of insurance of PPP facilities in the Russian state, we can see that the level of insurance is minimal compared to foreign insurance, which creates high risks for project investors.

Project risk assessment is the first step towards developing its structure and the financial and legal scheme of the project. A balanced distribution of risks minimizes the likelihood of premature completion of the project and, in fact, determines the procedure and obligations of the parties in the event of such risks. In particular, it seems appropriate to transfer to the private investor those risks that are directly related to the activities of the private investor (for example, failure to meet deadlines and exceeding the estimate at the construction/reconstruction stage, etc.).

The amount of tax payments and insurance premiums when performing design and research work (Slti) is determined by the following relationship:

$$S_{lti} = S_{ls} + S_{lj} + S_{lt} + S_{lm} + S_{ld} + S_{lq}$$

S_{ls} - insurance premiums to state extra-budgetary funds during the implementation of design and research work;
S_{lj} - taxes on the income of individuals (researchers and designers);
S_{lt} - transport tax of project and research organizations;
S_{lm} - property tax of project and research organizations;
S_{ld} - income tax from the development of project documentation;
S_{lq} - value added tax (VAT) for design and research work.

According to A.Y. Dobrin, insurance premiums consist of the following:

$$S_{ls} = K_s * F_{lti}$$

in this:

K_s - insurance premium rates for state non-budgetary funds;
F_{lti} - the wage fund (LTI) in the cost of design and research work (Dobrin, 2016).

During the design process, scientific and methodological foundations are developed for analyzing the cost structure of services provided by its participants (design and research work; construction and installation work; equipment, machines and mechanisms, materials and resources supplied for construction with the distribution of the share of imported materials, etc.). The above-mentioned work is carried out using actual materials from the analysis of implemented or considered projects for the development of public railway transport infrastructure.

METHODOLOGY

Taking into account the above, we analyze the tax payments and insurance premiums paid by Uzbekistan Railways JSC

[1] Развитие государственно-частного партнерства в России [Электронный ресурс]. – Режим доступа: http://ruskline.ru/analitika/2009/02/17/razvitie_gosudarstvenno-chastnogo_partnerstva_v_rossii/ (дата обращения: 17.12.16).

from projects implemented on the basis of public-private partnership. In this process, we use the method of statistical analysis of dynamic series. The most common and used indicator in the study of dynamics is the rate of change. The rate of change is the ratio of two terms of the series. This indicator is expressed in coefficient and percentage (%) and is determined by the following formulas[2]:

$$R_b = \frac{Y_i}{Y_{i-1}} \cdot 100$$

Also, the task of statistics is not to calculate the rates of change over years, but to assess the intensity of the development of a phenomenon for long periods. We solve this task by calculating the average annual rates of change. If the rates of change in the chain method are known, we determine the average annual rate of change using the following geometric mean formula[3]:

$$\bar{R} = \sqrt[n]{R_1 \cdot R_2 \cdot R_3 \cdot \ldots \cdot R_n}$$

We also study the interaction of tax payments and insurance premiums in increasing the efficiency of investment projects. In this case, we use the correlation analysis method used in the econometric modeling process.

Correlation analysis is a quantitative determination of the density of the relationship between two factors (in pairwise dependence) and between the resulting factors and many other factors (in multifactorial dependence) (Mustafakulov and Sabirov., 2022).

Kh. Sabirov, Abdullayeva et al. used the following correlation coefficient in their research:

$$r_{x/y} = \frac{\overline{x \cdot y} - \bar{x} \cdot \bar{y}}{\sigma_x \cdot \sigma_y}$$

$$\sigma_x = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}} \sigma_y = \sqrt{\frac{\sum_{i=1}^{n}(y_i - \bar{y})^2}{n}}$$

The correlation coefficient (r) ranges from -1 to +1. If r=0, there is no relationship between the factors, and if it is in the range $0 \le r \le 1$, there is a direct relationship. If $-1 \le r \le 0$, there is an inverse relationship, and r = 1 indicates that there is a functional relationship (Sabirov et al., 2022).

The close relationship between the correlation coefficients of the influencing factors creates the concept of multicollinearity, and the VIF criterion is used to determine it.

J.H. Stosk and M.W. Watson VIF (variance inflation factor) coefficients show how strongly the variables of the model are related to each other. To determine the VIF coefficient corresponding to the influencing factor, they calculated it using the following formula:

$$VIF = \frac{1}{1 - R^2}$$

Where: R^2 is the squared value of the correlation coefficient of the influencing factors (Stock and Watson et al., 2020). If the VIF coefficients for all variables are less than 10, this means that there is no significant multicollinearity in the model. Otherwise, it should be concluded that the model has multicollinearity.

ANALYSIS AND RESULTS

Tax payments from implemented projects recorded the highest rate in 2019 compared to 2020. Since 2021, the ratio has been decreasing, which in turn indicates a reduction in tax rates from investment projects being introduced into the sector and the attention paid to the sector. At the same time, direct insurance of investment projects being introduced into the sector to increase their implementation and viability gives positive results. Depending on the changes in the amounts of insurance premiums, it affects the increase or decrease in the volume of foreign and domestic investment projects being introduced into the country. You can see the percentage values of insurance premiums collected from projects implemented on the basis of public-private partnership of Uzbekistan Railways JSC by year in the graph below.

[2] https://staff.tiiame.uz/storage/users/55/presentations/tmmQ7tLYRCcOHOKA3Ykkm2C9H8l0cFwIf9oSYnzP.pdf
[3] https://staff.tiiame.uz/storage/users/55/presentations/tmmQ7tLYRCcOHOKA3Ykkm2C9H8l0cFwIf9oSYnzP.pdf

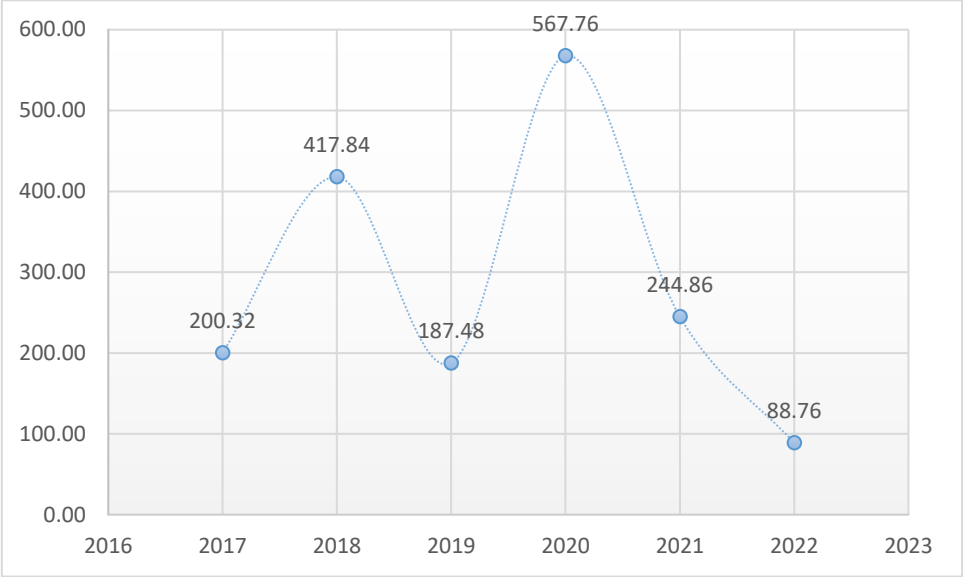

Figure 2.7. Rate of change in tax payments[4]

According to the results of the analysis, insurance premiums collected from projects implemented by Uzbekistan Railways JSC on the basis of public-private partnership had the highest rate in 2019 compared to 2018, which in turn increased by an additional 81% in 2019. By 2022, the ratio of insurance premiums was 113%, which indicates a decrease in insurance premiums for the ongoing design and research work.

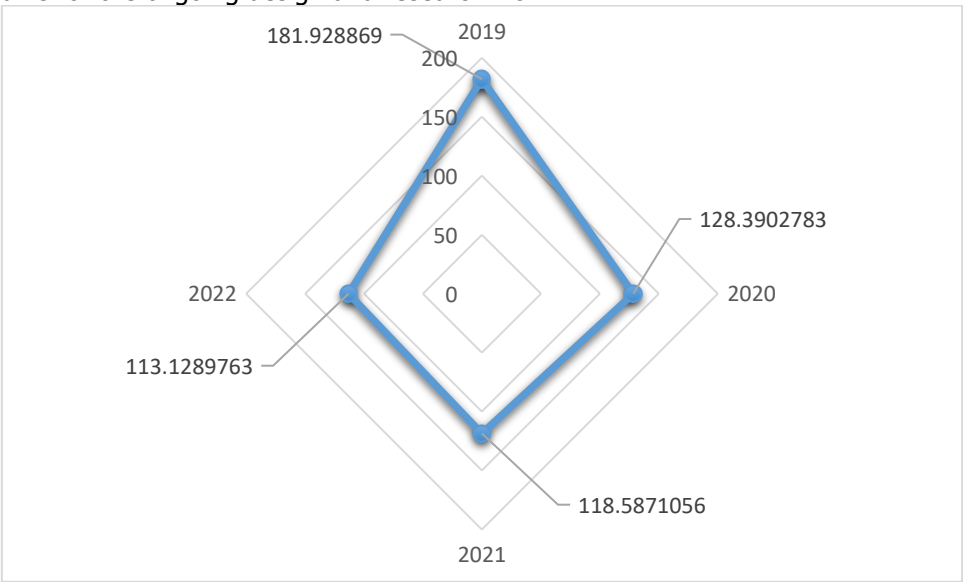

Figure 2.8. Percentage values of insurance premiums for design and research works over the years[5]

In the research process, we analyze the relationship between project research and tax payments and insurance premiums using the Stata14 application package.

	Y	X1	X2
Y	1.0000		
X1	-0.2466	1.0000	
X2	-0.2280	0.9019	1.0000

Figure 2.9. Result of correlation analysis[6]

As a result of the calculations, you can see that tax payments and insurance premiums are inversely and weakly related to the implemented design and research work. It also shows that there is a direct and close relationship between the influencing factors. This is a result of the reduction in tax rates and insurance premiums set for investment projects introduced into the sector, as noted above. In the process of our research, the following results were obtained:

[4] Author's development based on information provided by Uzbekistan Railways JSC
[5] Compiled by the researcher using the information provided by Uzbekistan Railways JSC
[6] Stata Author's calculation results obtained using the Stata15 application package

Variable	VIF	1/VIF
X1	5.36	0.186492
X2	5.36	0.186492
Mean VIF	5.36	

Figure 2.10. VIF coefficient results[7]

As a result of the correlation analysis, despite the close relationship between the influencing factors involved, there is no multicollinearity between them. The VIF coefficients of tax payments (X1) and insurance premiums (X2) are 5.36, which is less than 10. Since there is no multicollinearity between the influencing factors, the next step is regression analysis. In regression analysis, we build a linear multivariate regression model.

Source	SS	df	MS	Number of obs	=	5
				F(2, 2)	=	0.06
Model	557.09336	2	278.54668	Prob > F	=	0.9390
Residual	8579.49612	2	4289.74806	R-squared	=	0.0610
				Adj R-squared	=	-0.8781
Total	9136.58948	4	2284.14737	Root MSE	=	65.496

Y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
X1	-.0040213	.0290455	-0.14	0.903	-.1289939	.1209513
X2	-.0001062	.0056451	-0.02	0.987	-.0243952	.0241829
_cons	571.722	135.033	4.23	0.052	-9.278201	1152.722

Figure 2.11. Regression analysis result[8]

Based on the results of the regression analysis, the model was as follows:

$$Y = 571{,}722 - 0{,}004 * X1 - 0.0001 * X2$$

or

$$In.loy = 571{,}722 - 0{,}004 * S_{lti} - 0.0001 * S_{ls}$$

According to the model results, tax payments and insurance premiums have a negative impact on investment project work. This, in turn, leads to a decrease in investment project work. Based on the results obtained through the Stata15 application package, the coefficient of determination of the model was 0.061. This, in turn, indicates that the values of the constructed model are far from their real values. The F-criterion value is insignificant compared to the r-value, which means that the selected model form is not adequate.

CONCLUSIONS AND SUGGESTIONS.

Based on the results obtained during the research process, it is evident that the tax rates charged on investment projects being implemented in Uzbekistan Railways JSC are being reduced and the attention being paid to the sector is being paid. At the same time, direct insurance of investment projects being implemented in the sector in order to increase their viability and their implementation period gives positive results.

At the same time, it was found that tax payments and insurance premiums are inversely and weakly related to the implemented project research works. This, in turn, indicates the need to reduce tax payments and insurance premiums. Also, based on the results of the model, it was scientifically substantiated that tax payments and insurance premiums have a negative impact on investment project works. The student value of the model parameters found during the research process was insignificant based on the r-value and it was concluded that they are unreliable. The results mean that the constructed model was completely negative. Taking this into account, it was concluded that we need to increase the number of factors and observations included in the model.

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