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MODERN MODEL FOR ASSESSING THE EFFICIENCY OF INVESTMENTS ATTRACTED IN RAILWAY TRANSPORT

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Abstract. *The article analyzes the modern model for evaluating the improvement of investment activity efficiency and provides conclusions on the level of development of the current state of railway transport in the Republic of Uzbekistan.*

The economic effect of intensive investments is the equivalent of the costs and benefits of the difference between the result and the costs of achieving it.

The economic efficiency of intensive investments is defined as the ratio of investment costs to achieving a profitable result (economic effect).

The indicators characterizing the economic efficiency of intensive investments: the integrated effect, the need for additional financing, the internal rate of return, the intensive return on investment ratio, the intensive return on investment index, the innovation ratio, investment in human resources, and the effectiveness of modern corporate governance. will be included.

The multiplier effect in which a set of multipliers reflects changes in production volumes, investments and industry characteristics. Analysis of specific activities shows the impact of growth indicators, given its contribution to the dynamics of the economy.

An increase in investment costs will lead to an increase in production and income. This interaction is explained by the multiplier effect. The concept of the multiplier means "multiplier". The essence of the multiplier effect is that an increase in investment will lead to greater growth in national income.

Key words: *railway, railway transport, investment, investment activity, investment activity efficiency.*

Currently, the assessment of the economic efficiency of investments involves the analysis of several performance indicators. Economic indicators determine how high the importance of attracted investments.

The effective implementation of processes in investment activities in the railway system requires the use of modern economic and econometric methods. These include lead, multiplier and investment accelerator.

The term "multiplier" was first introduced in 1931 by the British economist R.F. Kahn [1] was created to reduce unemployment and create social services to cope with the economic crisis. He noted that the creation of social services at the expense of government spending will not only create new jobs, but also lead to an increase in consumer demand and an increase in employment and production in the economy.

Later, R.F. Kan's teacher J.M. Keynes [2] developed a theory of the multiplier effect in the economy, emphasizing the multiplier of investment and income.

A multiplier is a coefficient that characterizes the return of a greater return on investment.If we subtract the growth of investments from the growth of national income (ΔY-ΔI), then we will have a secondary index or initial production costs.

The multiplicative effect describes not only changes in investments, but also the level of savings.The multiplier is a quantitative coefficient showing how many times changes in the final economic indicators led to an increase in production or investment in the analyzed activity. In macroeconomic analysis, we can distinguish the multipliers of production and investment.The multiplier effect is a set of multipliers that reflects changes in production volumes, investments

and industry characteristics. Analysis of specific activities shows the impact of growth indicators, given its contribution to the dynamics of the economy.

This means that the indicator of a large multiplier does not give a high multiplier effect. Sectors of the economy have common indicators of different weights, with the same dynamic changes in nominal growth rates in various types of activities. For example, the percentage increase in the nominal volume of production in oil production will be greater than in railway production and the service sector. It follows that there is a high multiplier coefficient by type of activity, but its role in the economy is small, but the multiplier effect is lower than in other sectors [3].

An increase in investment costs will lead to an increase in production and income. This interaction is explained by the multiplier effect. The concept of the multiplier means "multiplier". The essence of the multiplier effect is that an increase in investment will lead to greater growth in national income.

The multiplier effect is the ratio of the net national product to the change in investment costs:

$$\text{Multiplier effect} = \frac{\text{Change in real net national product}}{\text{Change in investment}}$$

Alternatively, the multiplier coefficient can be expressed as follows:

$$k = \frac{1}{1 - MPC} = \frac{1}{MPS},$$

Based on this:

Change in real net national product = multiplier coefficient * change in investment

In addition to changes in investment spending, changes in consumption, government procurement or exports also affect the multiplier effect.

The multiplier effect is based on two cases. First, in the economy, expenses of one organization are accepted as income of another. Secondly, any change in income leads to a change in consumption and savings in the same direction.

It should be noted that the level of savings and investments also has its borders, which differ in classical and Kane views. According to the classical theory, savings are a source of investment, and a high degree of resistance to the fund will inevitably lead to economic growth [4].

The "O'zbekiston Temir Yo'llari" JSC is interconnected and depends on changes in investments with changes in the national income of railways for the development of our economy. This is a classic investment cost multiplier.

Many economic indicators are used to determine the effectiveness of investment activity in our country. These include the Internal Rate of Return (IRR), the payback period of an investment project, the payback period that takes into account the discounted cash flow rate, the payback period that does not include the discounted cash flow rate, return on investment, return on investment index, discounted cash flow, such as discount rate, net present value (NPV) and internal rate of return. Taking into account and not excluding these indicators, we can see in this article the volume of investments in the country's railway industry using widely used

international indicators, but not yet widely used in domestic practice, such as the multiplier and accelerator of investments.

<div align="right">**Table 1**</div>

<div align="center">**The main indicators of JSC "O'zbekiston temir yo'llari"**</div>

Indicators	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total revenue is billions	1016,4	1733,7	1074,5	1459,3	1827,6	2298,5	2497,5	3365,7	3743,1	2799,9	6449,3	8015,8	13557,8	11320,4
Total revenue as a percentage of the base year	100,0	170,6	62,0	135,8	125,2	125,8	108,7	134,8	111,2	74,8	230,3	124,3	169,1	83,5
Investments in fixed capital of JSC "O'zbekiston temir yo'llari", billion	73,8	297,3	213,2	324,3	408,4	658,3	784,4	874,5	1088,8	1755,7	1460,0	2 660,6	3 843,8	5142,8
Total investment compared to the base year, in percent	100,0	402,6	71,7	152,1	125,9	161,2	119,2	111,5	124,5	161,2	83,2	182,2	144,5	133,8
Additional revenue growth, billion	-	717,3	-659,2	384,8	368,2	470,9	199,0	868,2	377,4	-943,2	3649,3	1 566,6	5 542,0	-2237,4
Additional investments in billion	-	223,4	-84,1	111,1	84,1	249,9	126,1	90,1	214,4	666,9	-295,7	1 200,6	1 183,2	1299,0
The average annual investment in billions	-	-	194,7	278,2	315,3	463,6	617,0	772,4	915,9	1239,7	1434,9	1 958,8	2 654,8	3 882,4

This table shows how much investment increased in 2018 compared to 2005. This indicator is 69.65 times equal; in percentage terms, the same indicator is 6965.2%. And in order to predict the annual growth of investments, as a percentage we take investments in 2018 compared to 2005, if we subtract from the logarithm of the 14th level, we get 3.35, which is the average projected percentage for the coming years. To determine the average annual investment, we find investments in 2018 in relation to 2005 to the average annual investment, which is 19.94 times.

To determine the average annual increase in investment as a percentage, we subtract 19.94 from the logarithm of the 12th level and find a deviation of 1.20%. As a result, we have the following indicators:

<div align="right">**Table 2**</div>

<div align="center">**Key investment indicators**</div>

|	
Investments in relation to 2018/2005, at times	69,65
Investments in relation to 2018/2005 as a percentage	6965,2

Annual investment growth for forecasting, as a percentage	3,35
The average annual investment, at times	19,94
Average annual investment growth, in percent	1,20

As a result of the above calculations, we can give a forecast of investments in the industry until 2030, which will ensure stable development of the railway system of the republic.

Table 3

Investments in fixed capital of JSC "O'zbekiston temir yo'llari", billion sums (forecast)

№	Years	Investments, billion sums (forecast)
1	2019	5315,2
2	2020	5493,4
3	2021	5677,6
4	2022	5868,0
5	2023	6064,7
6	2024	6268,1
7	2025	6478,2
8	2026	6695,4
9	2027	6919,9
10	2028	7152,0
11	2029	7391,8
12	2030	7639,6
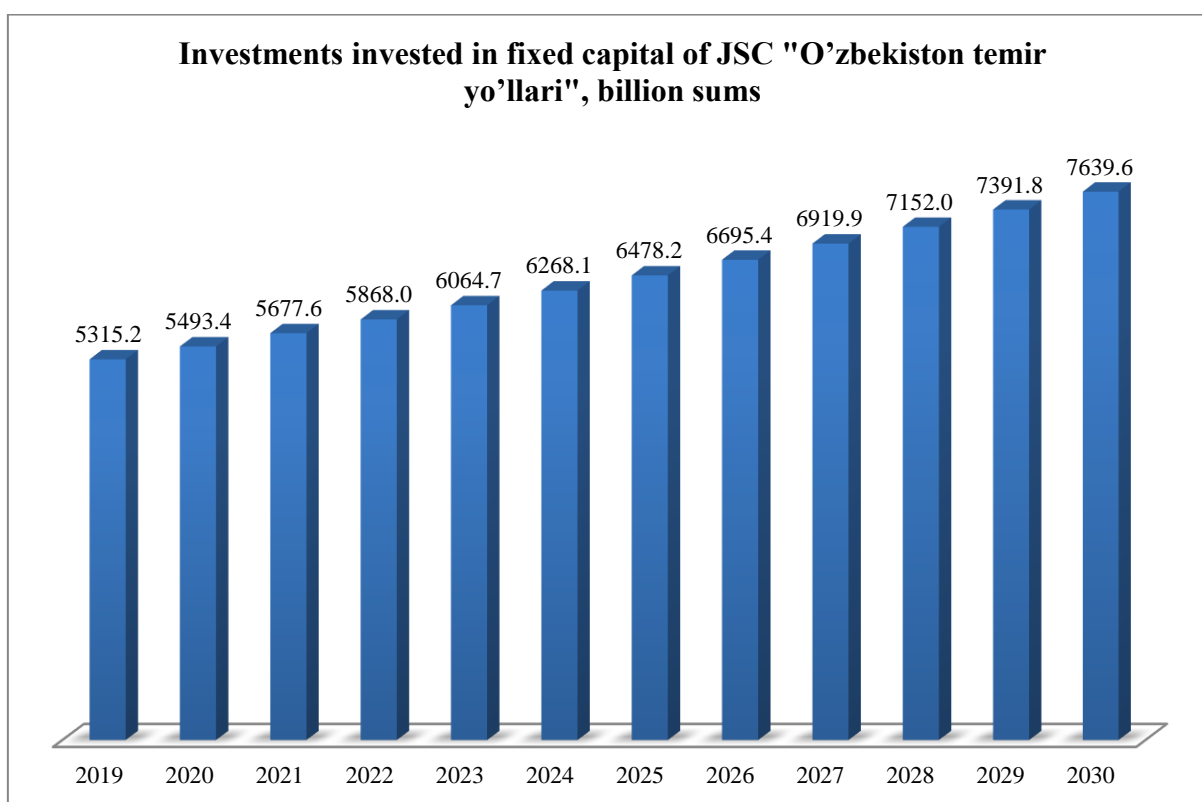
Fig. 1. Investments invested in fixed capital of JSC "O'zbekiston temir yo'llari", billion sums

Our next economic indicator is the investment advance rate. It calculates the cost of investments in the base year by subtracting the investments of the current year and the income of

the current year from the base volume. This determines additional growth in investment and income over the years. To determine the coefficient of progress, you can find the ratio of additional income to the growth of additional investments.

Table 4

Advance ratio determination table

№	Years	Additional revenue growth (ΔY)	Additional investment growth (ΔI)	Advance rate
1	2005	0	0	-
2	2006	717,3	223,4	3,21
3	2007	-659,2	-84,1	7,84
4	2008	384,8	111,1	3,46
5	2009	368,2	84,1	4,38
6	2010	470,9	249,9	1,88
7	2011	199,0	126,1	1,58
8	2012	868,2	90,1	9,64
9	2013	377,4	214,4	1,76
10	2014	-943,2	666,9	-1,41
11	2015	3649,3	-295,7	-12,34
12	2016	1566,6	1200,6	1,30
13	2017	5542,0	1183,2	4,68
14	2018	-2237,4	1299,0	-1,72

As can be seen from the table, the lead coefficient in 2012 was 9.64, which means that an additional increase in investment by 1 unit led to an additional increase of 9.64 units. The lowest rate was recorded in 2015 with a coefficient of -12.34.

The basis of our article is the definition of investment multipliers and accelerators and draw the appropriate conclusions. To do this, we will increase the additional income of the current year by multiplying the base income by 100 and bring it to the table by year. Then we add additional investment growth this year to the ratio of additional investments in the base year, multiply them by 100 and place them at the bottom of the table.

Table 5

Necessary indicators for the investment multiplier

Indaca-tors	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
The average additional income as a percent-tage (ΔY)	-91,9	-58,4	95,7	127,9	42,3	436,3	43,5	-249,9	-386,9	42,9	353,8	-40,4
Average investment growth in percent (ΔI)	-37,6	-132,1	75,7	297,1	50,5	71,5	238,0	311,1	-44,3	-406	98,6	109,8

We can find the investment multiplier through the indicators in the table above. For this, we calculate the average additional return on investment (ΔI) in relation to the income to the average additional interest rate (ΔY).

Table 6

Investment multiplier table

Indacators	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Investment multiplier	2,44	0,44	1,26	0,43	0,84	6,11	0,18	-0,80	8,73	-0,11	3,59	-0,37

|	20 07	20 08	20 09	20 10	20 11	20 12	20 13	20 14	20 15	20 16	20 17	20 18
Investment multiplier	2.44	0.44	1.26	0.43	0.84	6.11	0.18	-0.8	8.73	-0.1	3.59	-0.3
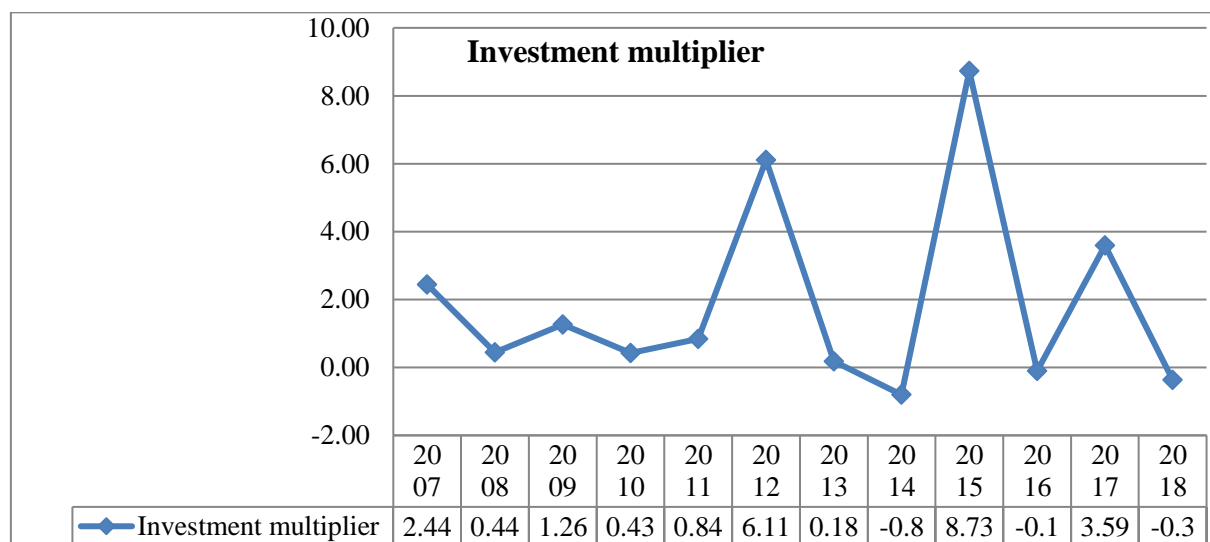
Fig. 2. Investment multiplier model

As can be seen from this diagram, a positive indicator of the investment multiplier was achieved in 2015, which amounted to 8.73. In this case, an investment of 1 sum brought 8.73 soums. However, it should be noted that in 2014 the indicator was - 0.8 due to improper use of investments. In other words, in 2014, investment activity was low, and the invested 1 soum caused a loss of - 0.8 soums. Its influence has been felt in recent years.

Table 7

Investment accelerator table

Indacators	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Investment Accelerator	0,41	2,26	0,79	2,32	1,19	0,16	5,47	-1,24	0,11	-9,46	0,28	-2,72

In the above table, we determined the performance of the accelerator investment. The highest rate was observed in 2013 and amounted to 5.47. The lowest threshold in 2016 was - 9.46.
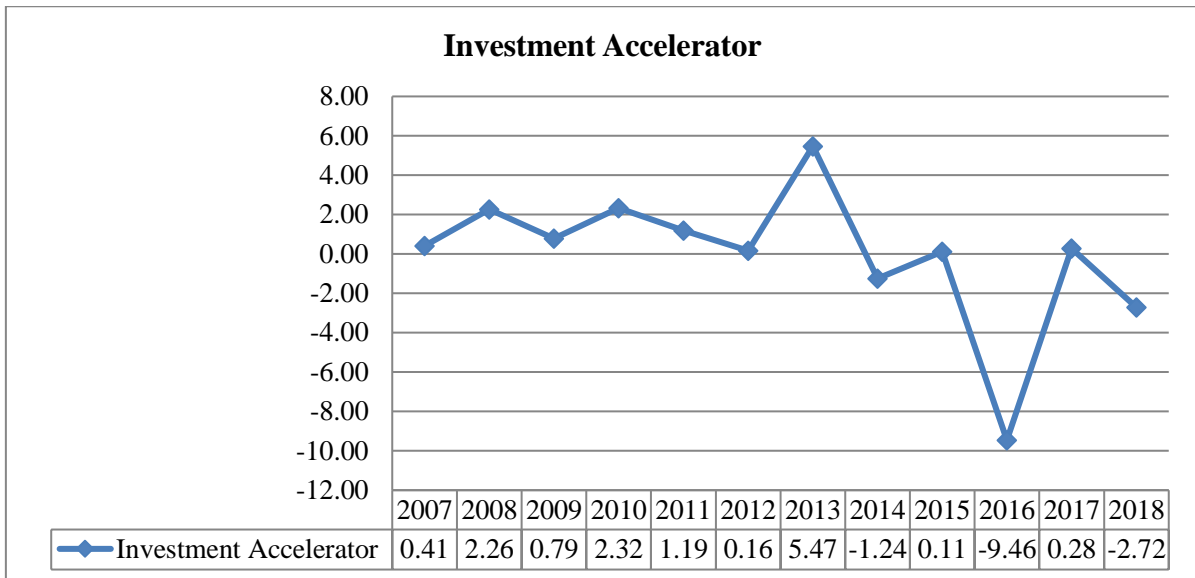
Fig. 3. Investment accelerator model

The indicators presented in this plan are new to our practice of determining the effectiveness of investment activity in the railway system. Having defined these indicators, we can see more realistic indicators of increasing return on investment and the effective use of investments in general.

From the point of view of investments, the concepts of multiplier and accelerator are different. In simple terms, the multiplier shows how the level of income depends on the initial investment, and the accelerator shows the growth of income from the effect caused by the consumer chain.

Accelerator allows you to take into account the impact of consumer spending in the calculations. An increase in spending and a decrease in the level of savings "accelerates" the economy, while a reduction, on the contrary, reduces supply and demand.

To calculate the effect of the multiplier for investments, acceleration must be taken into account. Its decrease entails a decrease in profits and investment. Therefore, the lower the acceleration, the less significant is the size of the multiplier.

It's best to show how the multiplier works with specific examples. To begin with, it is necessary to note a number of points:

On the value of the investment multiplier, the factors of consumption and savings have the greatest impact;

With an increase in income, people begin to save more as a percentage, which entails a reduction in costs;

Cost reduction reduces economic growth - therefore, the more people save, the lower the multiplier and accelerator.

Economists have introduced a special concept for the digital designation of this phenomenon - the marginal propensity to save. J. Keynes, analyzing the cost and investment multiplier, noted that there are 3 motives for saving funds:

Transaction - for firms this is the cash balance, for households - funds from paycheck to paycheck;

Caution - the desire to maintain the purchasing power of money in a crisis or "just in case", for this, subjects acquire assets (including bank deposits);

Speculation is the desire to make money.

To increase the effect of the multiplier, it is necessary to reduce the influence of these three factors to a minimum or to offer the population such tools for saving funds that will allow "money to work," essentially serve as an object of expenditure. For example, federal bonds.

Thus, the investment multiplier allows us to evaluate the effectiveness of certain investments through the use of the neo-Keynesian model of the economy, which is based on the

theory of uniform consumption and expenditure. According to the concept, the more funds are used for spending by economic entities, the higher the return on initial investment. Economists use Keynes's theory and formula to identify the most profitable areas. Investing in enterprises and industries with high multiplier and accelerator values allow the economy to grow and at the same time increase the well-being of the population.

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