Improvement of economic methods to ensure the reproductive process and the joint-stock company "Uzbekistan railways"

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Abstract:

Transformation of the country's economy towards the real market economy poses enormous challenges for all sectors as a whole, and user satisfaction towards the quality of services provided, quick response to market changes, maximization of capitalization and company profits and increasing labor productivity. Joint-stock company "Uzbek Railways" is the largest transport company in the country and in some segments of the transport market works in conditions of tough competition. With the development of market relations and economic growth, as well as competitive pressure from other participants in the transport market, reliable condition, efficient use and intensive reproduction of fixed assets are becoming increasingly important. In this regard, the research and development of effective methods of the reproductive process of the railway company.

Keywords

deterioration, fixed assets, reproduction, economic methods, railway company

1. Introduction

In the transition to a real market economy, such concepts as capital and capitalization take on special significance. For improving the efficiency of a company, it becomes important to study similar and related concepts. The study of domestic and foreign researchers, legal documents and educational literature has shown that the economic category of capital is treated differently. For example, it is defined as a value characterizing the economic benefits of an economic entity at a certain point or an investment resource used for its simple and expanded reproduction, where the management of the reproduction process of a company or enterprise plays the most important role.

2. Analysis and results

In the last two decades of development of railway transport to replenish the share capital of the joint-stock company "Uzbekistan railways" (hereinafter UTY) is carried out at the expense of the company's own funds.

The analysis showed that the UTY depreciation and the profit are important sources of the reproduction process. The above sources form more than 95% of all investments, due to which simple and expanded reproduction of fixed production assets of fig. 1 is carried out.

From figure 1 it is clear that the reproduction of fixed capital is carried out in an expanded form. The analysis showed that the depreciation charges in the investment package occupy 35-55 percent of all invested funds. These proportions show the importance of depreciation deductions as the main source of simple and expanded reproduction of fixed capital, but it should be recognized that this source is not enough.

Under the influence of the time factor and inflation, the nominal value of depreciation of fixed capital, as a rule, differs from the investments made during the period of their acquisition.

Moreover, the depreciated funds are not always used for their intended purpose. So for example, in 2017 year over 50 percent (196 million US dollars) depreciation governmental funds were aimed at updating the instruments of labor [1].

The task of targeted use of accumulated depreciation funds is complemented by the task of finding additional resources for the reproductive processes of the means of labor of society. The solution in the interconnection of these tasks will allow us to identify and set the trend, as well as the amount of necessary funds for simple and advanced reproduction.
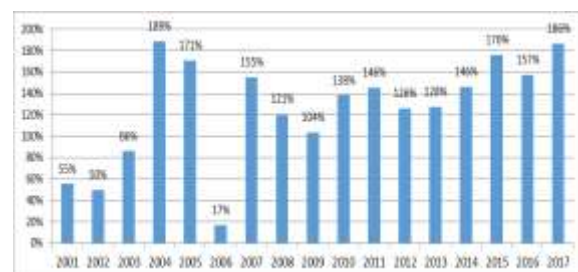
Fig. 1. Ratio of capital investments and incomes in the period 2001-2017, %. [2]

In modern literature, such concepts as "Fixed assets" and "Fixed capital" are identified. For example, in the Big Economic Dictionary [3] the following

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definition is given: "Fixed assets, fixed assets are fixed assets necessary for a company to carry out production activities with a depreciation period of more than one year".

The basis can be taken as an indicator of net present value (NPV) as the zero value of the total return of the used funds with the scientist temporarily and the inflation factor [4,5,6]:

$$NVP = -K_0 + \sum_{i=1}^{T_n} \frac{NV_t}{(1+E)^t} + \frac{K_l}{(1+E)^t}, (1)$$

where K_0 – investment in basic production assets;
T_n – standard term of use, years;
NV - part of the net income of the enterprise, reinvested in reproduction the property of fixed capital in the t year of the exploitation of funds;
K_l - liquidation cash flows at the end of the period of operation of the funds (T_n);
E - discount rate.

With regard to individual objects of fixed assets, the condition for self-reproduction of fixed capital will be written in the form:

$$F_0 = \sum_{i=1}^{T_n} \frac{NV_t}{(1+E)^t} + \frac{F_r}{(1+E)^{T_n}}, (2)$$

In this formula, the residual value is considered as the possible liquidation value. F_r object of funds with the initial cost of acquisition F_0.

According to the National Accounting Standard of the Republic of Uzbekistan, the linear method of writing off depreciation is determined by the following ratio:

$$T_n = \frac{1}{n_a}, (3)$$

where n_a - the rate of depreciation on the full restoration of fixed assets (in units of units).

Considering that by the end of the useful life of a fixed asset object its residual value will be zero, the condition for the simple reproduction of any inventory number of fixed assets can be expressed as:

$$F_0 = \sum_{i=1}^{T_n} \frac{NV_t}{(1+E)^t}, (4)$$

Own annual cash flows of the company, providing the current reimbursement of the initial investment in fixed assets, consist mainly of depreciation and that part of the profit paradise is sent to the

modernization, reconstruction, restoration and maintenance innovation of funds, i.e.

$$NV_t = A_t + P_t^f .(5)$$

where A_t - depreciation in the t-th year of operation of the object background;

P_t^f - part of the profit directed to the reproduction of fixed capital and distributed to the object of the main background.

With the linear method of depreciation its annual amount will be

$$A_t = n_a \cdot F_0 .(6)$$

Profit for the reproduction of fixed assets, distributed on the considered object of funds, can be expressed as

$$P_t^f = p_t \cdot F_0 .(7)$$

where p_t - reproductive profitability of the fixed assets in the t- th year.

Then, with uniform financing of the reproduction of fixed assets from the profits ($p_t=p=const$) the annual cash flow to recover the initial investment in the fixed asset is determined by the amount

$$NV_t = n_a \cdot F_0 + p \cdot F_0 = (n_a + p) \cdot F_0 , (8)$$

And the conditions for the self-reproduction of fixed assets will be recorded in the form

$$F_0 = \sum_{i=1}^{T_n} \frac{(n_a + p) \cdot F_0}{(1+E)^t}, (9)$$

Discounting a number of equal and uniform throughout the term of calculation of payments to their one-time value in the initial period, we get:

$$F_0 = (n_a + p) \cdot F_0 \cdot \left[\frac{(1+E)^{T_n} - 1}{E(1+E)^{T_n}} \right] = 1 .(10)$$

It is obvious that in the absence of reinvestment in the main capital from profit self-reproduction of fixed assets only at the expense of the use of depreciation is not achieved. Therefore, solving equation (10) with respect to the reproduction profitability index p of the funds object, we define its minimum required value reading

$$p_{\min} = \frac{E}{1 - \dfrac{1}{(1+E)^{T_n}}} - n_a .(11)$$

The minimum reproductive profitability of fixed assets determines the rate of reinvestment of profits in the fixed capital of enterprises necessary to ensure its self-reproduction (return based on the time factor). In tab. 1 shows the minimum reconstructions production profitability of fixed assets with different linear depreciation rates at a discount rate of E = 0.12.

Table 1. Minimal Reproductive Return on Funds.

Linear depreciation rate, n_a	0,02	0,05	0,077	0,10	0,20	0,25
Useful life period, T_n, years	50	20	13	10	5	4
Real reproduction profitability, p_{min}	0,100	0,084	0,079	0,077	0,077	0,079

The results are shown in table. 1, show that the rate of reinvestment from the profits necessary to ensure the self-reproduction of the company's fixed capital depends on the weighted average norm on his balance of funds. At the same time, when considering item by object fixed assets it is necessary to note the disproportionality of the relationship between their depreciation rates and the required reproduction profitability. So, for funds with terms useful over 10 years of use, the standard for the required reinvestment from profits begins to exceed the standard for deductions to the depreciation fund, substantially exceeding the latter in the passive part of fixed assets (buildings and structures).

In this regard, given that to date there are no uniform methodological principles for the allocation of effective productive assets in the composition of fixed assets of enterprises, we can recommend carry to them those objects in the structure of the reproductive potential of which depreciation begins to predominate.

This approach is based on an obvious ratio: the smaller the profit share intended for simple reproduction of fixed capital, the more net profit can be used by the enterprise for paying dividends to shareholders, material incentives for workers, maintaining their own social infrastructure facilities, as well as for the development of production.

Questions of methodological validity of the definition of efficient and high-tech production assets are relevant because the regulated NSBU of Uzbekistan No. 5 can be extended to these items of fixed assets.

The use of accelerated depreciation in the practice of accounting for fixed assets allows you to increase at the initial stage of operation of funds the size of the accumulated depreciation fund in comparison with the linear method of depreciation. Simultaneously, the cancellation in the early stages of the greater hour these initial cost of funds protects depreciation from the current inflation and increases as a result the reduced integral value of the total accrued depreciation, thereby reducing the required funding for the reproduction of fixed assets from the profits.

The minimum amount of reinvestment from the profits necessary for the self-reproduction of fixed capital also depends on the discount rate. Therefore, a reasonable choice of its value is of great importance when planning the investment resources of enterprises.

It should be borne in mind that with the growth of the accepted discount rate, the standard for financing the self-reproduction of fixed assets from profits increases. This is evidenced by the calculated data given in table. 2

Given in table. 2 the minimum reproductive profitability of objects of funds with a linear depreciation rate of 10% (na = 0.1), increases from 7.7% to 18% with an increase in the required rate of return on investment from 12% E = 0.12) to 25% (E = 0.25).

Table 2. Minimal Reproductive Return on Funds.

Depreciation rate, E	The rate of return on investment in the main fed					
	0,02	0,05	0,1	0,15	0,2	0,25
0,06	0,043	0,037	0,036	0,036	0,037	0,039
0,12	0,100	0,084	0,077	0,076	0,077	0,079
0,15	0,130	0,110	0,099	0,097	0,098	0,100
0,20	0,180	0,155	0,139	0,134	0,134	0,136
0,25	0,230	0,203	0,180	0,173	0,172	0,173

Providing the minimum required deductions from profit pmin the payback period for investments in the acquisition of funds will be determined by the duration of the useful life of fixed assets or the standard service life of fixed assets.

With a different reproductive profitability of fixed capital payback period $T_{ок}$ can be obtained from equation (10):

$$T_{ok} = -\frac{\ln[1 - E/(n_a + p)]}{\ln(1+E)} .(12)$$

This shows that to ensure the return of investments in fixed assets during the useful life of fixed assets It is necessary that the sum of the norms for the formation of their reproductive resources exceed the total efficiency ratio of the target capital investments, that is, should be the ratio

$n_a + p > E. (13)$

(at $\quad n_a + p \geq E$, $\quad n[1 - E/(n_a + p) \quad$ not determined).

In inequality (13) the sum of the depreciation rate and the reproductive profitability of fixed assets $n_a + p$ can be seen as a return of capital, the excess of which is above the reference price of money (E) L is a prerequisite to break-even capital forming investment. Thus deductions from the profit at the $p = p_{min}$ providing simple reproduction (self-reproduction) of capital, and when $p > p_{min}$ there are grounds for its expansion.

However, when analyzing the effectiveness of investments in fixed capital in the framework of specific investment projects, the break-even criterion will be implemented if the expected internal rate of return on investment (E_{ins}), calculated from net profit before over the minimum reproductive profitability of its new funds: $E_{ins} > p_{min}$.

If during any period of T in the period of operation of fixed assets with a standard duration of service life Tn along with the use of depreciation, there was a reinvestment of profits into the company's fixed capital, then, with respect to an item of fixed assets in the time remaining (T_n-T) before the write-off, the break-even principle of capital-forming investments is realized under the condition:

$$F_0 = (n_a + p_1) \cdot F_0 \cdot \left[\frac{(1+E)^T - 1}{E(1+E)^T} \right] + (n_a + p_2) \cdot F_0 \cdot \left[\frac{(1+E)^{T_n - T} - 1}{E(1+E)^{T_n}} \right], (14)$$

where p_1 - the reproductive profitability of the object of funds in the period T;

p_2 - the necessary reproductive profitability of the object of the funds for the period of operation remaining before it is written off.

After transformation, solving this equation is relatively unknown we get:

$$p_2 = \frac{n_a + p_1(1+E)^{T_n - T} - (n_a + p_1 - E) \cdot (1+E)^{T_n}}{(1+E)^{T_n - T} - 1}. (15)$$

Denote the ratio T/T_n determining accrued regulatory (accounting) depreciation of the assets of the object, through d. Then $T = Tn*d$ but

$$p_2 = \frac{n_a + p_1(1+T)^{T_n(1-d)} - (n_a + p_1 - E) \cdot (1+E)^{T_n}}{(1+E)^{T_n(1-d)-1} - 1}. (16)$$

For example, if investment resources for the reproduction of funds with annual depreciation of 10% (n_a=0.1), the standard service life of 10 years (T_n=10) and accounting wear of 50% ($d = 0.5$)

were formed in the ongoing operational period of depreciation and profits, which was refinanced at a rate of 5% (p_1=0.05) per year of the initial value of fixed assets against the mini the required value of 7.7% (Table 3.1) at a discount rate 12% (E=0.12), then for the remaining period until the funds are written off, this standard of investment returns must be increased to at least

$$p_2 = \frac{0,1 + 0,05(1+0,12)^{10(1-0,5)} - (0,1 + 0,05 - 0,12) \cdot (1+0,12)^{10}}{(1+0,12)^{10(1-0,5)-1}} = 0,125.$$

The obtained value makes it possible to estimate the required minimum reproductive profitability of funds, taking into account their depreciation and the reinvestment of profits into fixed assets.

The solution of such a task becomes especially relevant when shaping the investment policy at UTY, when for each type of fixed capital, renewal is carried out at different rates, thereby managing the company's investment processes, which will contribute to the correct redistribution of resources.

At the same time, questions of the necessary investment reimbursement of capital-forming costs arise in the case of an enterprise acquiring used assets.

In accordance with the NSBU No. 5 "Fixed Assets", the depreciation rates are set as a percentage of the book value of funds, which is understood as their initial or restoration new value. In this regard, the norms of depreciation charges are applied to the value of funds reflected in the accounts of the first acquirer of the asset. Expenditures for the purchase of used property will not reflect the original (or reinstated significant, given the results of revaluation), and its residual value the bridge

Therefore, the condition of the recoupment of investments spent on the acquisition of previously operated funds, for the remainder lifetime fixed assets can be written as

$$F_r = \sum_{i=T}^{T_n} \frac{(n_a + p_{min}) \cdot F_0}{(1+E)^t}. (17)$$

where F_r - residual value of the object of funds at the time T of its acquisition :

$$F_r = F_0(1-d). (18)$$

Then after the conversion we get

$$F_0(1-d) = (n_a + p_{min}) \cdot F_0 \cdot \left[\frac{(1+E)^{T_n - T} - 1}{E(1+E)^{T_n - T}} \right]. (19)$$

Hence, given that $T = T_n \cdot d$,

$$(n_a + p_{\min})\left[\frac{(1+E)^{T_n-T}-1}{E(1+E)^{T_n-T}}\right] = (1-d). (20)$$

Solving this equation for p_{min} we define the required minimum standard for the formation of a production development fund from the profits whether the company to ensure the return on investment in the acquisition the flow of fixed assets with varying degrees of wear:

$$p_{\min} = \frac{E(1-d)}{1-1/(1+E)^{T_n(1-d)}} - n_a. (21)$$

Included in the resulting formula (17, 21) indicators - the depreciation rate and the reproductive profitability of funds - are relative values applied to the initial book value of fixed assets.

We will use data on real investment resources of UTY and determine the possibilities reproduction of a fixed capital of the company from its own - financing sources.

So, in 2017, the value of the equity capital amounted to 13198.1 billion. sum with a weighted average degree of wear 40,3%. The amount of accrued depreciation on fixed assets was determined by the value of 838.7 billion sum. The company's income amounted to 746.6 billion sums.

On the basis of these data, we calculate the weighted average rate of depreciation and the required reproduction profitability of funds with the standard profit on investments in fixed assets of enterprises - E=0.12 (12%):

$$n_a = \frac{A}{F_0} = \frac{838.7}{13198.1} = 0.063 (6.3\%);$$

$$T_n = \frac{1}{n_a} = \frac{1}{0.063} = 16, years,$$

$$p_{\min} = \frac{E}{1-1/(1+E)^{T_n}} - n_a = \frac{0.12}{1-\dfrac{1}{(1+0.12)^{16}}} = 0.14339.$$

Thus, to ensure that only a simple reproduction of fixed capital of UTY is required, along with the targeted use of depreciation annually reinvest in fixed capital of the profit in the amount of 1 to 4,339% of its book value. And this composition amount of about 1892.4 billion sums, which is two and a half times higher than that received in society in 2017 year income.

3. Conclusion

The results of the research show that the task of reproduction of fixed capital at the expense of own

funds can be solved by the presented method when accumulating depreciation funds strictly in a certain account and using it for its intended purpose.

This method of accumulating the reproduction of fixed capital can be applied both to all enterprises that are part of UTY and individual groups or objects.

The overall need for identifying sources of financing with setting optimization parameters for investment and depreciation policies can also be calculated by this methodology.

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