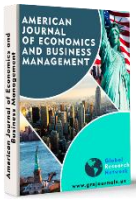

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Methods of Accounting and Valuation of Fixed Assets

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Abstract:
This article explores methods for improving fixed asset accounting processes within organizations. It examines the distribution of fixed assets based on functional purposes, their classification, types of evaluation, and analysis, considering factors such as time and asset condition. The effective management of fixed assets is vital for financial transparency, regulatory compliance, and informed decision-making. By categorizing fixed assets according to their roles within an organization, stakeholders can better understand asset utilization and depreciation patterns. The classification of fixed assets must align with organizational objectives and industry standards to streamline financial reporting and facilitate comparisons across asset portfolios. Evaluation methods and techniques are critical for accurate asset valuation, risk mitigation, and optimizing resource allocation.

Keywords: Capital stock, valuation, investment attractiveness, enterprise assets, relative weight, depreciation

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1. Introduction

As the basis of the material and technical base of the enterprises, the main funds constitute the largest comparative weight in the structure of the enterprise's assets. Therefore, their assessment has a significant impact on the financial statements of the enterprise and the investment attractiveness of the enterprise. The inconsistency of some rules of accounting and financial reporting does not allow for obtaining real information about the value of fixed assets, which leads to the loss of external and internal usefulness for users. The reasons for this situation are deficiencies in the methodological provision of accounting rules (standards) [1]. In this sense, it is appropriate to study the methodology of evaluation of the main benefits in depth.

The material form of the main capital of the enterprise is its main funds. The main funds of the enterprise are means of labour, which are used to perform socio-cultural and administrative functions for a long time in the process of production and delivery of products, and their value is gradually transferred to the value of the finished product, through depreciation deductions. Fixed assets do not change their shape and size, their value should not be less than the limit set by the state [2].

The main funds of enterprises are characterized by a long, more than one-year period of use. Fixed assets must be properly classified for accurate accounting and evaluation of efficiency of use. The most common and used is the distribution of fixed assets according to functional purposes (Figure 1).

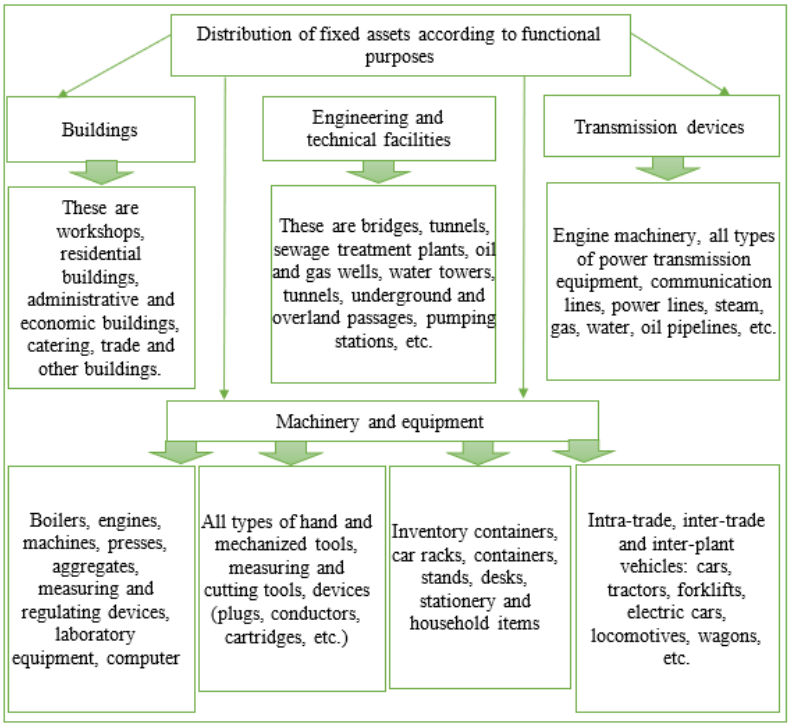

Figure 1. Distribution of fixed assets according to functional purposes

Source: Author development based on research results

In addition to the above classification of fixed assets, their ratio according to individual types, that is, their structure, is of great importance. The specific (technological) structure of fixed assets is the ratio of their active and passive parts [3].

The active part includes the main means that directly participate in the production process, determine the level of technical equipment of labour, and directly affect the amount of production capacity and production volume of the enterprise (working machines, equipment, computing tools and production equipment) [4].

1.1. Literature review

Despite the large volume of scientific work on the analysis of the economic essence of the main funds, answering questions about their nature, many studies have been conducted on the issue of the formation and circulation of the main funds in "lean production". In particular, I.O. Blank, R. Braily, Y. Brigham, R. Westfield, L. L. Ermolovich, J. K. Galbraith, G. Z. Susha, A. Marshall, D. North, S. M. Onisko, M. N. Kreinina, Kramarenko G. O. and others [5]. Scientists have long studied the issue of inventory management as part of the working capital system. There are scientific works in the field of studying the effectiveness of the inventory management system to ensure the uninterrupted supply of enterprises in all aspects of economic activity. Inventory management algorithms are based on classic inventory systems and their modifications. In the developed methods of inventory management in highly specialized areas, you can pay attention to taking into account parameters that are not typical for other areas of application.

2. Method

During this study, the recovery value of fixed assets was analyzed using revaluation, original cost, replacement value, fair value and other empirical methods [6].

3. Results and Discussion

The natural indicators of accounting for fixed assets are determined by the specificity of their elements and purpose. In particular, among them, you can distinguish the area (m^2), volume (m^3), power (kW), productivity of the equipment (pieces/shift), number of equipment, etc. The value form of accounting and valuation is necessary for determining the total amount of value of fixed assets, planning their reproduction, structure, depreciation and amortization amounts in general, and calculating production costs [7].

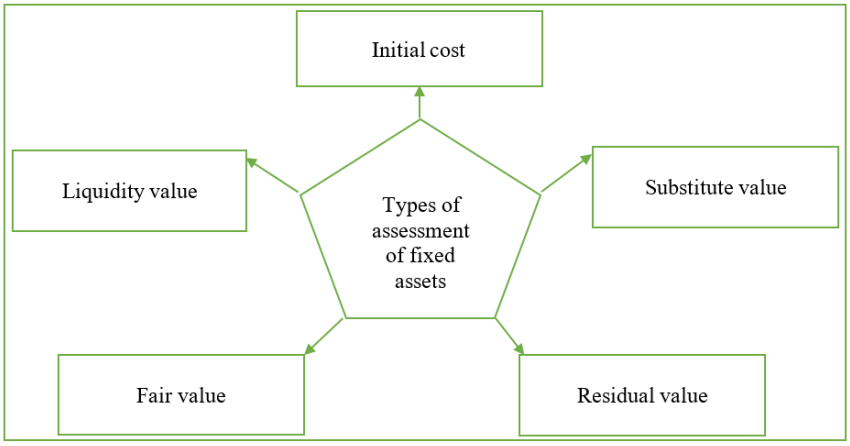

Figure 2. Depending on the time and condition of the assessment of the main funds, the types of **a**ssessment

Based on the information presented in Figure 2, if we carry out broader explanatory work, depending on the time and condition of the assessment of the main funds, the following types of assessment are distinguished [8].

3.1. Initial cost

The initial cost is the actual costs of the enterprise during the purchase of fixed assets and their balance sheet. This cost includes:

1) purchase price of basic funds and amount of import duty;
2) sums of indirect taxes in connection with the purchase (creation) of fixed assets (if they are not returned to the enterprise);
3) costs of insurance of risks of supply of basic funds;
4) costs of installation, installation, adjustment of the main funds;
5) other costs directly related to the maintenance of fixed assets [9].

The initial cost of fixed assets (AF_{dq}) can usually be expressed by the following formula:

$$AF_{dq} = AF_n + C_b + S + M \quad (1)$$

Where:

$\boldsymbol{AF_n}$ = price of basic funds;

$\boldsymbol{C_b}$ = fees, duties, indirect taxes;

$\boldsymbol{X_s}$ = risk insurance costs;

$\boldsymbol{M}$ = costs of installation, collection and commissioning of fixed assets.

If the enterprise is about putting new buildings into use, then the estimated value is its initial value. The initial value of fixed assets is always constant, regardless of changes

in the price of labour.

3.2. Replacement (re-evaluated) value

Replacement (re-evaluated) value is the cost of reproduction of fixed assets in modern conditions. It includes the same costs as the original cost, but at today's prices. Such evaluation is carried out to compare the value of fixed assets put into use in different years. The difference in the value of fixed assets is related to inflation, the consequences of scientific and technical progress, etc.

The cost of restoration of fixed assets is determined by revaluation, that is, by indexing their initial value. The indexation index of the main funds is calculated based on the inflation index of the year. If inflation does not exceed 10% during the year, indexation of fixed assets is not carried out. The replacement (revalued) value of fixed assets (AF_{qb}) can be determined by the following formula [10]:

$$AF_{qb} = \frac{AF_{aq}}{AF_{qq}} \quad (2)$$

Where:

$\boldsymbol{AF_{qb}}$ = the revaluation index of basic funds;

$\boldsymbol{AF_{aq}}$ = fair value of the main funds (in Uzbekistan *sums* or UZS);

$\boldsymbol{AF_{qq}}$ = the residual value of fixed assets (in UZS).

3.3. Residual value

Residual value (AF_{qq}) is the difference between the value (original or revalued) of fixed assets accepted in the balance sheet of the enterprise and the amount of depreciation. The residual value shows a part of the cost of fixed assets not transferred to the manufactured product and is calculated as [11]:

$$AF_{qq} = AF_{aq} - AF_E$$

or (3)

$$AF_{qq} = \frac{AF_{aq}}{AF_{qb}}$$

Where:

$\boldsymbol{AF_E}$ = the amount of depreciation of fixed assets.

3.4. Fair value

Fair value is the original value of the fixed assets received in the exchange. It is equal to the amount at which the object can be valued if there is an agreement between the interested parties. This value is the market (real) value of the underlying funds and is determined by professional appraisers. If such evaluation is not possible, fixed assets are replaced at replacement cost. Fair value can be determined by the following formula [12]:

$$AF_{qq} = AF_{qq} \times AF_{qb} \quad (4)$$

3.5. Liquidity (liquidation) value

Liquidity (liquidation) value (LQ) is residual value of fixed assets at the time of decommissioning due to wear and tear. At this value, the enterprise can sell fixed assets, write them off, and transfer them to the balance sheet of another enterprise [13].

$$LQ = A_{bq} - M_{bq} - N_a \quad (5)$$

Where:

$\boldsymbol{LQ}$ = the liquidity value;

$\boldsymbol{A_{bq}}$ = balance sheet value of fixed assets;

$\boldsymbol{M_{bq}}$ = balance sheet value of liabilities;

$\boldsymbol{N_a}$ = intangible assets

Comparing these tangible assets, the liquidity value formula is:

$$LQ = A_{tq} - M_{bq} \quad (6)$$

Where:

$\boldsymbol{A_{tq}}$ = liquidation value of assets;

$\boldsymbol{M_{tq}}$ = liquidation value of liabilities;

At the time of liquidation, the liquidation value of the liabilities is equal to the book value of the liabilities. Then the above formula becomes:

$$LQ = A_{tq} - M_{bq} \rightarrow A_{tq} = \Sigma_{i=1}^{n} A_{TDi} \times A_{bq} \quad (7)$$

Where:

$\boldsymbol{A_{TD}\text{-}i}$ = the recovery rate of the asset.

In this formula, we assume that the rate of recovery of intangible assets is 0%. It subtracts intangible assets from the liquidation value of assets. For other assets, the recovery rate is less than 100% and therefore the liquidation value of the assets is equal to the difference between the intangible assets from the book value of the assets.

It is worth noting that even if the liquidation value is lower than the tangible book value, it's a great tool for identifying stocks that are trading near (below) the liquidation value. Using the ratio of cost to tangible book value provides a relative valuation for making such comparisons [14].

3.6. Physical obsolescence

Physical obsolescence is the loss of the main funds of their consumer characteristics, as a result of which they cease to meet the demands placed on them [15]. Physical wear and tear can occur during the operation of the main means (operation of parts, nodes, blocks), as well as during their inactivity due to the influence of the external environment (atmospheric phenomena, corrosion). Physical wear and tear of fixed assets can be recoverable (eliminated by carrying out repairs of various complexity) and irreversible. The physical wear and tear of fixed assets can be estimated using the coefficient of physical wear and tear of fixed assets (k_{after}).

$$k_{after} = \frac{AF_{ktx}}{AF_{dq}}$$

or

$$k_{after} = \frac{\mathrm{A}}{AF_{dq}} \quad (8)$$

or

$$k_{after} = \frac{N_x}{N_x}$$

Where:

$\boldsymbol{AF_{tx}}$ = capital maintenance costs of fixed assets since the start of service;

$\boldsymbol{AF_{dq}}$ = the initial value of the main funds;

$\boldsymbol{A}$ = amount of depreciation (amortization) of fixed assets from the beginning

of service

N_x, N_x = actual and normative service life of the main funds for *x* selected years.

3.7. Moral obsolescence

Moral obsolescence is premature, before the end of the physical service life, the obsolescence of fixed assets, which leads to the loss of the expediency of their use. There is a difference between the moral obsolescence of fixed assets of the first and second types [16].

Type I moral obsolescence occurs as a result of the decrease in the cost of reproduction of fixed assets in modern conditions as a result of the increase in labour productivity in the industries that produce labour tools. Type I moral wear can be estimated by type I moral wear coefficient (k_{mei}).

$$k_{mei} = \frac{AF_{dq} - AF_{tq}}{AF_{dq}} \quad (9)$$

Where:

AF_{tq} = recovery value of fixed assets.

Type II moral obsolescence is the partial loss of basic assets as a result of the creation and introduction of more efficient and cost-effective means of labour. In this case, the old basic funds cease to meet the needs of consumers, their use becomes economically unprofitable. The same underlying funds may or may not meet the needs of specific consumers. Therefore, the amount of type II moral depreciation will be different for different consumers, so it is not practical to calculate it. In this case, the general depreciation coefficient of social funds (k_{ume}) is determined [17]:

$$k_{ume} = \mathrm{I} - (\mathrm{I} - k_{after}) \times (\mathrm{I} - k_{mei}) \quad (10)$$

3.8. Repair

By repairing and modernizing the main funds, it is possible to eliminate their physical and partly spiritual obsolescence. Repair of fixed assets consists of restoring the physical wear and tear of their structural elements and keeping the fixed assets in a serviceable condition throughout their service life. Repairs are divided into current, capital and restoration according to their economic content [18].

In practice, it is very difficult to distinguish repair work in terms of economic content, because there is no clear boundary between the repair itself and reproduction, maintenance costs of fixed assets and their restoration costs [19]. Therefore, repair is often divided according to organizational and technical characteristics into complexity, periodicity, scope of work, repair location and others. According to organizational and technical characteristics, repairs are divided into:

1) **Capital:** includes complete dismantling of aggregates, replacement of certain structural elements;
2) **Medium**: intermediate between capital and minor repairs, in which capital spends more often than repairs, and the allocation of capital funds is about a third;
3) **Small:** the smallest in terms of scope and complexity; involves only partial repairs and is carried out on site by key workers or repair workers, where no more than 15% of parts must be replaced.

The total time cost of repairing a certain type of equipment per year -*Q(T)* is calculated according to the following formula:

$$Q(T) = E_{tn} + Ih_{tx} \quad (11)$$

Where:

E_{tn} = the price of replaced elements for repair (in thousand UZS/year);

Ih_{tx} = expenses for wages during repair (in thousand UZS/year);

$$E_{tn} = E_{1N} \times S_t \times AF_{ich} \quad (12)$$

Where:

E_{1N} = weighted average value of the price of one replaced item (in thousand UZS);

S_t = the number of repairs during the year;

AF_{ich} = failure rate of fixed assets.

$$Ih_{tx} = t_{1t} \times I_{ts} \times S_t \quad (13)$$

Where:

t_{1t} = time spent on one repair (in hours);

I_t = average hourly rate of a repair worker (in thousand UZS/hour);

Salary expenses should also take into account all the calculations related to it. Modernization of fixed assets means making changes to the design of existing equipment that increases its technical level and improve its economic characteristics [20].

3.9. Depreciation

In the process of use, fixed assets are subject to depreciation [20,21,22]. Depreciation refers to the transfer of the value of fixed assets to the cost of a newly created product during the period of their effective use. Depreciation means writing off the book value of fixed assets over their useful life. Studies show that there are different methods and approaches for calculating the depreciation of fixed assets (Figure 3).

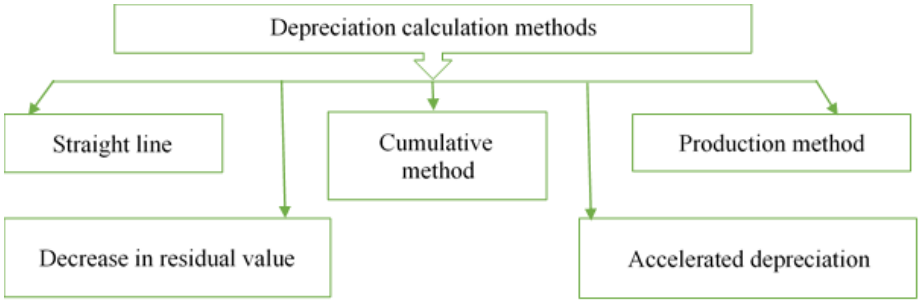

Figure 3. Depreciation calculation methods

1) **The straight-line (uniform) method** [19]: This method assumes the transfer of the same part of the cost of fixed assets to the cost of production every year throughout their service life. The amount of annual depreciation *(A)* is defined as the product of the initial (replacement) value of the object of fixed assets and the annual rate of depreciation *(N_a):*

$$A = \frac{AF_{dq}}{N_a} \times 100 \rightarrow N_a = \frac{1}{AF_{fd}} \times 100$$

or (14)

$$A = \frac{AF_{dq}}{AF_{fd}} \times 100$$

Where:

AF_{fd} = period of beneficial use of fixed assets (in years).

2) **Decrease in residual value** [24]**:** The amount of annual depreciation is defined as the multiplication of the residual value of fixed assets at the beginning of the reporting year or the initial value on the date of depreciation by the annual depreciation rate determined according to the following formula.

$$N_a = 1 - AF_{fd}\sqrt{\frac{\mathrm{LQ}}{AF_{dq}}} \quad (15)$$

3) **Rapid reduction of residual value:** The amount of annual depreciation is defined as the multiplication of the residual value of fixed assets at the beginning of the reporting year or the initial value on the date of depreciation by the annual depreciation rate. The annual rate of depreciation is twice the rate used in the straight-line method of calculating depreciation.

4) **Cumulative method:** The annual depreciation amount is calculated as the product of the sum of the depreciable value coefficient. The cumulative ratio is determined by the ratio of the number of years remaining until the end of the useful life of the main funds to the sum of the years of their service life.

5) **Method of production:** The monthly amount of depreciation is defined as the multiplication of the actual volume of the product produced in 1 month by the depreciation production rate. The production level of depreciation $N_a$the ratio of the depreciable value to the total volume of the product that the enterprise plans (expected) to produce using these fixed assets. It is defined by:

$$N_a = \frac{AF_{qb} \times AF_{dq}}{Qu} \quad (16)$$

Depreciation methods such as decreasing residual value, accelerated decreasing residual value and accumulation are methods of accelerated depreciation of fixed assets. They are used to revive the process of reproduction of fixed assets, as they allow to restoration of 60-70% of their value in the first half of their useful life.

4. Conclusion

In short, Amortization is calculated monthly. When determining the period of useful use of fixed assets, it is necessary to take into account the expected physical and moral wear and tear of the object, taking into account its capacity, productivity, and the use of legal and other restrictions on the conditions of use of fixed assets. Also, if the expected economic benefit from the use of fixed assets changes, their service life and the method of calculating depreciation will be revised. Depreciation is suspended for the period of decommissioning of the object due to reconstruction, modernization, re-equipment, conservation, etc. Depreciation of fixed assets ends only if their residual and liquidation values are equal (conditionally the liquidation value is zero).

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