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INDICATORS APPLIED IN EVALUATION OF THE USE OF FIXED ASSETS

The article discusses the main ratios of analysis of the use of fixed assets of companies, including indicators of their availability, movement and efficiency of usage. The article describes list of reserves for improvement of the usage of fixed assets. Authors propose using of additional indicators in fixed assets analysis and methodologically substantiate necessity of their impairment.

Keywords: fixed assets, production capacity, efficiency of the usage, updating coefficient, fixed assets turnover, fixed assets intensity, fixed assets provision, coefficient of depreciation

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**ПОКАЗАТЕЛИ, ПРИМЕНЯЕМЫЕ ПРИ ОЦЕНКЕ
ИСПОЛЬЗОВАНИЯ ОСНОВНЫХ СРЕДСТВ**

В статье рассматриваются основные показатели анализа использования средств компаний: наличие, движение и эффективность применения, приводится перечень основных резервов улучшения их использования, предлагается применение дополнительных показателей при анализе основных средств и методологически обосновывается необходимость процедур их обесценения.

Ключевые слова: основные средства, производственная мощность, эффективность использования, коэффициент обновления, фондоотдача, фондоемкость, фондовооруженность, коэффициент износа

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Introduction

Fixed assets are the most important part of all assets used by companies in production sphere. They determine the production capacity of these companies; characterize their technical equipment, directly related to labor productivity, automation of production, cost of manufacturing and profitability level. By their nature, fixed assets are involved in the production process for a long time, serve a large number of production cycles and, gradually wearing out in the production process, transfer their cost in parts to the manufactured products, while maintaining their natural shape [1; 2; 3].

Improving the efficiency of the usage of fixed assets is currently the issue of great importance. Companies should not only strive to properly maintain their condition and or modernize them, but also make necessary steps for the most effective usage of all available fixed assets they have, especially in the current conditions of the relative shortage of equity capital sources and investments. Companies, which demonstrate more efficiently usage of their fixed assets, as well enjoy a competitive advantage over their competitors from the point of view of potential investors.

Results and their discussion

The integrated analysis of fixed assets is traditionally carried out in the following main areas:

- analysis of the availability, structure and movement of fixed assets in the company;
- analysis of the key indicators of the usage of fixed assets;
- analysis of the provision of the enterprise with fixed assets [3; 4].

The analysis is performed over several years of the enterprise's activity in order to examine the activity of the enterprise for a specific period. One year (base) of the enterprise's activity is taken for the reporting year, while the remaining years of its activity are referred to as analyzed. The simultaneous analysis allows for a clear identification of the elements that influenced the work results and the identification of reserves for enhancing the main performance indicators.

Let's take a closer look at the process for analyzing fixed assets usage. The availability, structure, and movement of fixed assets in the enterprise are the starting points for a fixed asset usage analysis. All fixed assets should be separated into production and non-production fixed assets groups. In addition, the active and passive parts of the fixed assets are frequently separated. Such detail is required to identify reserves in order to improve the efficiency of fixed assets utilization based on the company structure's optimization.

One of the main indicators in the analysis of fixed assets is the Average Annual Value of Fixed Assets. This value can be calculated as follows:

$$FA_{avg} = FA_{bv} + \frac{FA_{in} \cdot Q_m}{12} - \frac{FA_{lv} \cdot (12 - M)}{12}, \quad (1)$$

where FA_{avg} – average annual value of fixed assets; FA_{bv} – book value of fixed assets; FA_{in} – the value of the introduced fixed assets; Q_m – the number of months of operation of the fixed assets; FA_{lv} – liquidation value; M – number of months of operation of disposed fixed assets.

Most often, the following formula is used to calculate the value of fixed assets (simple arithmetic mean):

$$FA_{avg} = \frac{FA_{op} + FA_{cl}}{2}, \quad (2)$$

where FA_{op} – the value of fixed assets at the beginning of the year; FA_{cl} – the value of fixed assets at the end of the year.

This section of the analysis also examines the movement and technical condition of the main production facilities. To do this, the following indicators are calculated.

One of the generalizing indicators characterizing the technical condition of fixed assets is the Updating Coefficient. It shows how much of the fixed assets available at the end of the reporting period are new fixed assets and is calculated by the formula:

$$C_{upd} = \frac{FA_{rec}}{FA_{cl}}, \quad (3)$$

where C_{upd} – is the updating coefficient; FA_{rec} – the value of received fixed assets.

Disposal Coefficient:

$$C_{disposal} = \frac{FA_{disposed}}{FA_{op}}, \quad (4)$$

where $C_{disposal}$ – is the disposal coefficient; $FA_{disposed}$ – the value of disposed fixed assets.

The next stage of the analysis is the analysis of the main indicators of the usage of fixed assets.

The main indicator of the usage of fixed assets is the Fixed Assets Turnover, calculated as the ratio of the volume of sales to the average annual cost of fixed assets:

$$FAT = \frac{S}{FA_{avg}}, \quad (5)$$

where FAT – is fixed assets turnover; S – the value of sales.

In addition, other indicators are calculated: the Fixed Assets Intensity, the inverse to formula (5):

$$FA_{intensity} = \frac{FA_{avg}}{S}, \quad (6)$$

where $FA_{intensity}$ – fixed assets intensity.

Return on Fixed Assets as the ratio of net profit to the average annual cost of fixed assets:

$$RFA = \frac{P_n}{FA_{avg}}, \quad (7)$$

where RFA – the return on fixed assets; P_n – net profit.

The next stage of the analysis is the analysis of provision (analysis of the availability of fixed assets of the enterprise). This indicator is defined as the ratio of the average annual cost of all fixed assets to the average number of employees at the enterprise:

$$FA_{provision} = \frac{FA_{avg}}{E_q}, \quad (8)$$

where $FA_{provision}$ – is the value showing the provision of fixed assets per employee; E_q – the number of employees.

Coefficient of Depreciation of Fixed Assets:

$$C_{depreciation} = \frac{FA_{bv} - FA_{residual}}{FA_{bv}}, \quad (9)$$

where $C_{depreciation}$ – is the coefficient of depreciation of fixed assets; $FA_{residual}$ – is the residual value of fixed assets.

Coefficient of Residual Value:

$$C_{residual} = \frac{FA_{residual}}{FA_{bv}}, \quad (10)$$

where $C_{residual}$ – is the coefficient of residual value.

In our opinion, the system of indicators applied in evaluation of the use of fixed assets can be supplemented by such an indicator as Repairs and Maintenance Expense Ratio [5; 6]. Its formula can be presented in the following way:

$$R\&M_{ratio} = \frac{R\&M_{expenses}}{FA_{bv}}, \quad (11)$$

where FA_{bv} – book value of fixed assets.

This ratio is useful for estimating the age of the collective group of fixed assets listed in the financial statements. If the ratio follows an increasing trend line, then the company is probably in need of some asset replacements. An increasing trend line may also be indicative of high asset-usage levels, which can prematurely require advanced levels of repair work. Of particular interest is an increasing ratio that suddenly drops with no corresponding increase in book value of fixed assets, this indicates that a company is running out of cash and cannot afford to repair its existing assets or purchase new ones.

If the expense is broken down into subcategories, such as between production equipment and facilities, then the ratio can be calculated for each category presented. It is better to calculate the ratio with the book value of fixed assets in the denominator, rather than net of depreciation, since the type of accelerated depreciation method would otherwise impact on the residual value of fixed assets used in the calculation.

For example, conditional confectionery factory is being examined by the due diligence team of another confectionery company, which may decide to make an acquisition offer. The due diligence team has collected information about the company as shown in Table 1. This table shows that sales of the target company are dropping, which may be the cause of a continuing decline in available cash and an increase

Table 1

Example of Repairs and maintenance expense ratio calculation, BYN

Indicator	20X0	20X1	20X2	20X3
Sales	25 000 000	24 500 000	23 000 000	21 500 000
Repairs and maintenance expense	450 000	475 000	500 000	125 000
Fixed assets	5 850 000	5 875 000	5 900 000	5 900 000
Repairs and maintenance expense ratio	8 %	8 %	8 %	2 %

Source: author's developed on the basis of [5].

in the amount of debt. Of particular concern is the sudden drop in the amount of repairs expense in 20X3, because there is no corresponding increase in the fixed assets account that would indicate that new assets have been purchased. The due diligence team should conclude that a purchase of this company would require a cash infusion to fix a backlog of equipment repairs.

This ratio can be manipulated by company management if it chooses to delay making expenditures on needed asset repairs. Also, a high ratio can yield misleading conclusions, because it can indicate that management is taking the best possible care of its equipment or that the equipment is so old that it is near the point of failure. Also, the amount of repairs and maintenance expense can be manipulated by shifting the salaries of the equipment repair staff to some other overhead category or outsourcing the work. Finally, this ratio may not change much from period to period in those situations where a company employs a repair team whose wages will be charged to the repairs account at all times, even if there are no repairs to be made.

We as well suggest to pay much more attention to such methodological accounting issue as fixed asset impairment because it influence the carrying amount of fixed assets and therefore has a direct impact on the calculation of the above mentioned indicators applied in evaluation of the use of fixed assets [7].

Impairment is most commonly used to describe a drastic reduction in the recoverable value of a fixed asset. The impairment may be caused by a change in the company's legal or economic circumstances or by a casualty loss from an unforeseeable disaster. Under requirements of International Accounting Standards, assets are considered to be impaired when their fair value falls below their book value. Any write-off due to an impairment loss can have adverse effects on a company's balance sheet and its resulting financial ratios. It is, therefore, important for a company to test its assets for impairment.

An impairment loss is recognised immediately in profit or loss (or in comprehensive income if it is a revaluation decrease under IAS 16 or IAS 38 [7]). The carrying amount of the asset (or cash-generating unit) is reduced. The depreciation (amortisation) charge is adjusted in future periods to allocate the asset's revised carrying amount over its remaining useful life.

Table 2 shows an example of impairment loss / profit calculation, we took one item from each group of fixed assets of the conditional company. The book value was taken from the reporting of the company's fixed assets, and the fair market value is presentational.

Table 2

Impairment loss / profit calculation example, BYN

Number	Fixed asset name	Book value	Fair (market) value	Impairment loss/ profit
1	Fixed asset ID number 1	547,47	602,21	54,74
2	Fixed asset ID number 2	4 109,12	4 520,03	410,91
3	Fixed asset ID number 3	211,33	232,46	21,13
4	Fixed asset ID number 4	10 292,98	9 263,682	–1 029,30
5	Fixed asset ID number 5	56 341,24	61 975,364	5 634,12

Source: author's developed.

Determining and utilization of reserves for improvement of the usage of fixed assets is special important part of analytical procedures disclosed by various authors [3; 4].

The improvement in the use of fixed assets is reflected in the financial results of the company due to: increased production output, reduced cost, improved product quality, reduced property tax and increased balance sheet profit.

Improvement of the usage of the fixed assets can be achieved by:

- exemption from excessive equipment, machinery and other fixed assets or leasing them;
- proper and high-quality scheduled preventive and major repairs;
- purchases of high-quality fixed assets;
- professional development of service personnel;
- timely updating, especially the active part, of fixed assets in order to prevent excessive moral and physical wear and tear of them;
- improving the quality of preparation of materials for the production and service process;
- increasing the level of mechanization and automation of production;
- ensuring the centralization of repair services;
- increasing the level of concentration, specialization and combination of production;
- introduction of new equipment and advanced technology – low-waste, waste-free, energy- and fuel-saving;
- improvement of the equipment operation schedule.

The provision of enterprises with fixed assets and the efficiency of their usage are important factors on which the company results of economic activity depend. In this regard, the search for reserves to increase the efficiency of the usage of fixed assets is of great importance.

The system of reserves for improvement of the usage of fixed assets of the company can be represented as follows.

Technical improvement of labor tools:

- technical re-equipment based on complex automation and flexible production systems;
- replacement of outdated equipment, modernization of available equipment;
- mechanization of auxiliary and service divisions;
- introduction of advanced technology of special equipment;
- development of invention and rationalization.

Increase the operating time of machinery and equipment:

- elimination of inactive / idle equipment (leasing, sale, etc.);
- reduction of equipment repair time.

Improving the organization and management of production:

- accelerating the achievement of the design performance of newly introduced products;
- introduction of scientific organization of labor and production;
- improvement of the provision of material and technical resources;
- improvement of computer-based production management;
- development of material incentives for employees that contribute to improving production efficiency.

Conclusions

The in-depth comprehensive analysis of fixed assets is conventionally carried out in the following main areas:

- analysis of the availability, structure and movement of fixed assets in the company;
- analysis of the key indicators of the usage of fixed assets;
- analysis of the provision of the enterprise with fixed assets.

Analyst should pay special attention to such methodological accounting issue as fixed asset impairment because it influence the carrying amount of fixed assets and therefore has a direct impact on the calculation of the above mentioned indicators applied in evaluation of the use of fixed assets.

Determining and implementation of reserves for improvement of the usage of fixed assets is treated as a special compulsory part of analytical procedures of fixed assets utilisation analysis.

Having a clear understanding of the role of fixed assets in the production process, the factors affecting the use of fixed assets, it is possible to identify methods, directions by which the efficiency of the use of fixed assets and production capacities of the enterprise increases, ensuring a reduction in production costs and an increase in labor productivity.

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