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METHODOLOGY OF COMPLEX ANALYSIS OF TANGIBLE FIXED ASSETS

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Abstract. Tangible fixed assets are used in production, provision of services, renting and for administrative purposes. Various internal and external information users are interested in this type of assets. With regards to the significance of such assets, it is very important to carry out their detailed analysis. The article recommends a methodology of complex analysis of tangible fixed assets that consists of the following stages: 1) compositional analysis; 2) structural and dynamic analysis; 3) change analysis; 4) technical condition analysis; 5) usage analysis; 6) profitability analysis. Application of this methodology allows one to objectively assess the condition of the tangible fixed assets and make management decisions in order to use them better and improve the enterprise's activity results.

Keywords: tangible fixed assets analysis; compositional analysis; structural and dynamic analysis; change analysis; technical condition analysis; usage analysis; profitability analysis

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1. Introduction

Tangible fixed assets are one of the most important financial indicators describing the financial state and activity results of an enterprise. Other financial indicators, continuity of the enterprise's activity, perspectives and even a possibility of a bankruptcy depend on tangible fixed assets usage effectiveness. Therefore not only managers and employees, but also many external information users, especially investors, banks, insurance companies, tax authorities, economics experts, etc., are very interested in their composition, structure, technical condition. With regards to the significance of tangible fixed assets, it is very important to carry out its analysis. However, there is a lack of literature on the tangible fixed assets analysis. Many foreign and Lithuanian authors have analysed the issues of tangible fixed assets valuation and accounting in detail. Special emphasis is put on determination of the tangible fixed assets acquisition (production) cost, accounting policy development and application of depreciation methods (Juočiūnienė and Stončiuvienė, 2008; Lakis, et al., 2009; Black, 2004; Jackson, Rodger and Tuttler, 2010; Mykolaitienė, et al., 2010; Subačienė and Jakubauskaitė, 2012; Stungurienė and Christauskas, 2013; Kamarauskienė and Subačienė, 2013; Zinkevičienė and Vaišnoraitė, 2014; Liapis and Kantianis, 2015; Del

Giudice, Manganelli and De Paola, 2016; Legenzova, Gaigalienė and Vilkaitė, 2016; Matei, Țole and Stroe, 2017; Kanapickienė, Stankevičiūtė and Grebliunė, 2019; Hilkevics and Semakina, 2019 and others). Whereas a methodology of complex analysis of tangible fixed assets has not been analysed profoundly enough. Savickaja (Savickaja, 2005), Plenborg and Petersen (2011), Subačienė and Senkus (2012), Gibson, (2012), Mackevičius, Subačienė and Senkus (2012), Kovalev (Kovaliov, 2013), Mackevičius, Giriūnas and Valkauskas (2014), Kanapickienė and Grundienė (2015), Bragg (2017) have some specific suggestions on such an analysis. Yet the aforementioned authors usually limit themselves to studying only a certain aspect of a tangible fixed assets analysis. Whereas a consistent, complex methodology for tangible fixed assets analysis has not been created yet.

The object of the research is the complex analysis of tangible fixed assets in business enterprises’.

The aim of the article is to prepare a methodology of complex analysis of tangible fixed assets which would help managers to make right decisions, to use the assets effectively and bring economic benefit to the enterprise.

The research methods are the analysis of scientific literature, collection, comparison, classification and generalization of information, secondary statistical analysis.

The sources of the research are scientific publications by Lithuanian and foreign authors, Business accounting standards, data from the Statistics Lithuania.

2. Significance, characteristics and structure of tangible fixed assets

Tangible fixed assets are a type of assets aimed at producing goods, providing services, renting and for administrative purposes and are intended to be used for a period longer than one year, and the acquisition (production) cost of which is equal to at least the minimum cost of tangible fixed assets set by the entity (12th Business Accounting Standard, 2016). All enterprises, regardless of their size and activity type, have and use tangible fixed assets. Most authors studying the issues of the tangible fixed assets note that this type of assets is very significant for the financial state of an enterprise and its activity results and even in predicting bankruptcy (Pāvāloaia, 2013; Bauer, 2014; Zinkevičienė, Stončiuvienė and Martirosianienė, 2016; Mert and Erkiran Dil, 2016 and others). Tangible fixed assets of different enterprises may vary significantly and their role in an enterprise may be active or passive. And some assets may be rented for other enterprises or not used at all, etc. However, most of tangible fixed assets have an active role in the creation of material wealth and have a direct impact on the enterprise's activity results.

Tangible fixed assets, compared with current assets, have certain unique characteristics: 1) acquirement of tangible fixed assets is always very significant since the price of a unit is usually high (it is very important to check acquirement of fixed assets, yet the larger a unit of this type of assets, the easier it is to check it); 2) an enterprise uses tangible fixed assets for several years and throughout this period they are registered in the enterprise's accounting documents (an error in the accounting documents and registers will remain for the future periods as well); 3) the turnover of tangible fixed assets is much slower than that of current assets (after checking the tangible fixed assets movement operations once, next time only some of the operations may need to be checked); 4) security systems of tangible fixed assets are not as strict as that of current assets (due to the physical characteristics, it is much more difficult or even impossible to steal fixed assets thus it is easier to check the presence of this type of assets); 5) estimation of the depreciation of tangible fixed assets using different methods influences the enterprise's activity results.

Tangible fixed assets usually represent the largest comparative part of all the assets of an enterprise. In 2017, tangible fixed assets of Lithuanian enterprises engaged in all economic activities (except for agriculture, financial

intermediation, public administration and defence) accounted for 29,033 million EUR and had increased by 2.53% compared with the year 2013 (see Table 1).

Table 1. The part of tangible fixed assets compared with all assets and fixed assets in the period from 2013 to 2017

Indicators	2013	2014	2015	2016	2017
1. Total number of enterprises	60,706	67,673	71,445	73,941	74,730
2. Assets, total (millions of EUR)	66,907	67,929	71,679	76,168	78,466
3. Fixed assets (millions of EUR)	42,785	42,701	44,720	47,371	46,819
4. Fixed tangible assets (millions of EUR)	28,317	27,735	28,997	30,188	29,033
5. The part of tangible fixed assets (%) compared to:					
a) all assets	42.3	40.8	40.5	39.6	37.0
b) fixed assets	66.2	65.0	64.8	63.7	62.0
6. The change rate of tangible fixed assets compared to 2013 (%)	0.0	-2.06	2.4	6.60	2.53
7. The average amount of tangible fixed assets for one enterprise (millions of EUR)	0.47	0.41	0.41	0.41	0.39

Source: compiled by the authors based on Verslo įmonių statistika 2017 [Business Statistics, 2017]. Vilnius: Statistics Lithuania, 2018, p. 18

Table 1 makes it clear that tangible fixed assets account for a rather large part of all assets (42.3% in 2013, 37.0% in 2017) and of fixed assets (respectively 66.2% and 62.0%). On average, every Lithuanian business enterprise has around 0.4 million EUR worth of tangible fixed assets.

Tangible fixed assets are registered and systematized in financial accounting based on the following categories: uncompleted construction, land, non-residential buildings, residential buildings, construction, machinery and equipment, vehicles and other means of transport, other equipment, instrumentation, tools and installations. In 2017, the following categories accounted for the largest comparative part: non-residential buildings (31.6%), construction (20.9%) as well as machinery and equipment (15.3%) (see Table 2). Yet it does not mean that other categories of tangible fixed assets are less significant: they also have an active role in the processes of production and service provision.

Table 2. Structure of tangible fixed assets, 2017

Types of tangible fixed assets	Percentage
1. Non-residential buildings	31.6
2. Construction	20.9
3. Machinery and equipment	15.3
4. Vehicles and other means of transport	11.5
5. Other equipment, instrumentation, tools and installations	7.6
6. Land	6.2
7. Uncompleted construction	5.3
8. Residential buildings	1.6
Total	100.0

Source: compiled by the authors based on Verslo įmonių statistika 2017 [Business Statistics, 2017]. Vilnius: Statistics Lithuania, 2018, p. 19

Tangible fixed assets are used in enterprises from all types of economic activities. In 2017, the largest part of this type of assets was used in real estate activities (6,538 million or 22.52%), transportation and storage (5,107 million or 17.59%) and manufacturing (4,535 million or 15.62%) (see Table 3). Even though tangible fixed assets accounted for a rather small part of such types of economic activities as education, repair of computers and personal and household goods, other personal service activities, arts, entertainment and recreation, human health

and social work activities, mining and quarrying, they were necessary for production of goods, provision of services, rent or administrative purposes.

Table 3. Tangible fixed assets by economic activity types, 2017

Economic activity	millions of EUR	Percentage
1. Real estate activities	6,538	22.5
2. Transportation and storage	5,107	17.6
3. Manufacturing	4,535	15.6
4. Electricity, gas, steam and air conditioning supply	3,564	12.3
5. Wholesale and retail trade, repair of motor vehicles and motorcycles	2,677	9.2
6. Water supply; sewerage, waste management and remediation activities	1,758	6.1
7. Administrative and support activities	1,099	3.8
8. Construction	1,068	3.7
9. Information and communication	673	2.3
10. Professional, scientific and technical activities	640	2.2
Other activities	1,374	4.7
Total	29,033	100.0

Source: compiled by the authors based on Verslo įmonių statistika 2017 [Business Statistics, 2017]. Vilnius: Statistics Lithuania, 2018, p. 19

In today's dynamic and very competitive business environment, managers raise reasonable concerns about how much and what type of tangible fixed assets they should have, what their technical condition should be, and how can they use these assets effectively in order to achieve good financial results for the enterprise, to continue its activities and to produce high-quality and competitive products. In order to answer these questions, a complex analysis of this type of assets is required. However, before carrying out a complex analysis of tangible fixed assets, first one needs to make sure whether certain assets were attribute to the category of tangible fixed assets reasonably.

Business Accounting Standard 12 on Tangible fixed assets lists five characteristics based on which tangible assets shall be attributed to the category of fixed assets: 1) the entity expects to use it for a period longer than a year; 2) the entity reasonably expects a flow of economic benefits from this type of assets in future periods; 3) the entity can reliably measure the acquisition (production) cost of the assets; 4) the acquisition (production) cost of the assets exceeds the minimum cost of a tangible fixed assets unit set by the entity for each category of assets; 5) the risk related to tangible assets has been transferred to the entity (12th Business Accounting Standard, 2016).

It must be noted that if an enterprise uses a unit of assets for more than a year yet its value is lower than the minimum threshold set by the enterprise for the category of assets or total amount of assets, then the assets should not be regarded as tangible fixed assets. Tangible assets that allow the enterprise to carry out its activities in future periods yet bring no direct economic benefits are regarded as fixed assets. After making sure that a certain type of assets has been reasonably assigned to the category of tangible assets, then the goals of the analysis have to be established, the right sources for the analysis have to be chosen and its consistency has to be ensured.

3. Recommended methodology for the tangible fixed assets complex analysis

The main sources of tangible fixed assets analysis are balance sheet, statement of profit and loss, other financial reports and information provided by the following ledger accounts: Land, Buildings and construction, Plant and machinery, Vehicles, etc. Also, when carrying out the analysis, the lists of tangible fixed assets based on their location, inventory descriptions, statements of depreciation estimation and primary and consolidated documents are used.

The complex analysis of tangible fixed assets has to be carried out consistently and in certain stages. However, before starting such an analysis, it is important to assess, whether certain assets were assigned to the category of tangible fixed assets correctly (see Fig. 1).

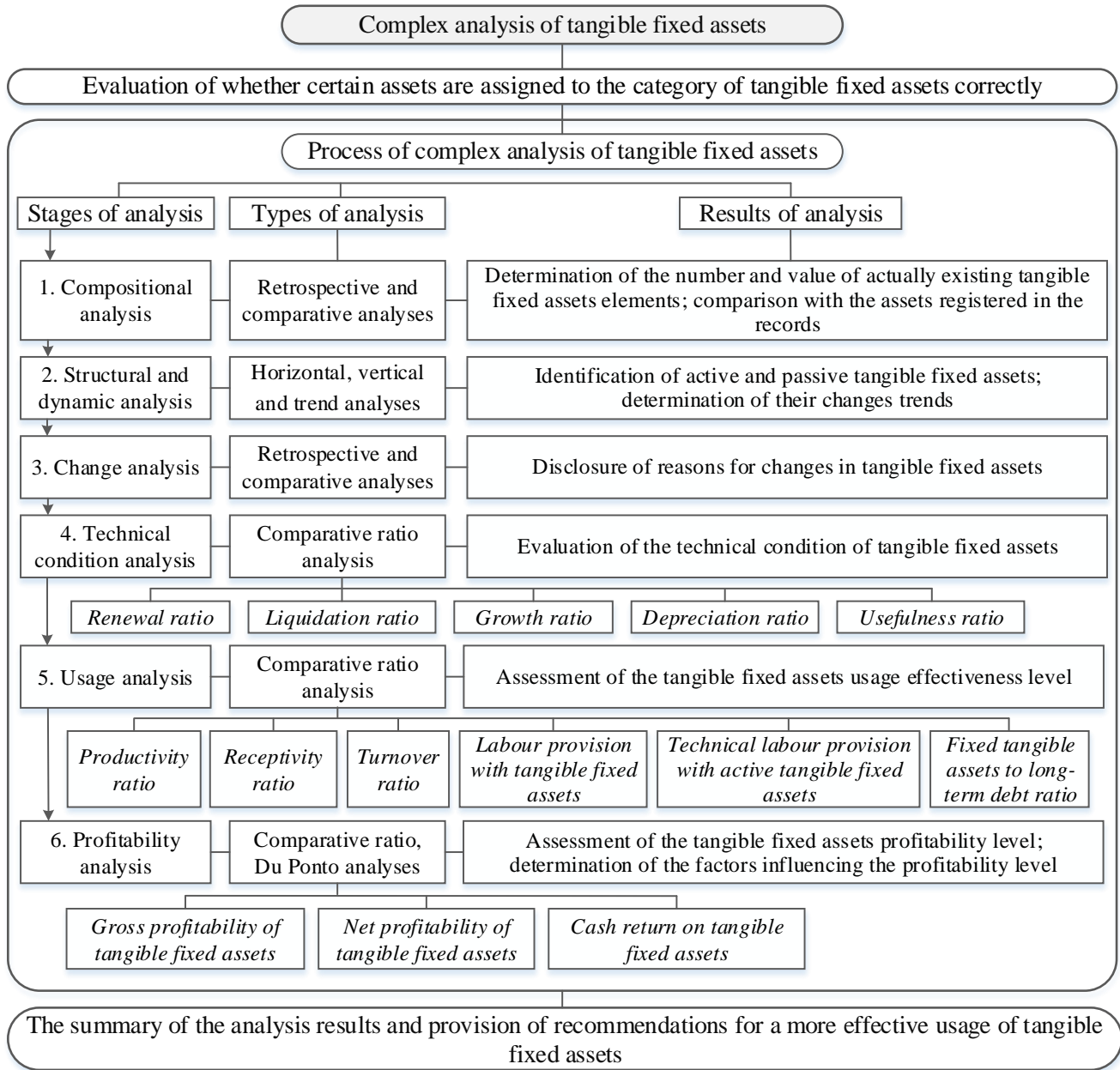


Figure 1. Methodology of complex analysis of tangible fixed assets

The Figure 1 makes it clear that 6 main stages of tangible fixed assets analysis are distinguished. It is important to choose the type of analysis at every stage of analysis and distinguish the most important things to focus on, i.e. to determine the results of analysis. The complex tangible fixed assets analysis is completed by summarizing the results and providing recommendations on how to use the assets more effectively.

Compositional analysis. When carrying out the compositional analysis of tangible fixed assets, it is important to establish whether the tangible assets with indicated composition actually exist and whether there are no unregistered assets. Accountants should apply the same classification for tangible fixed assets composition and not change it too often – this is very important. An analyst ought to make sure whether the enterprise owns the tangible fixed assets mentioned in the accounting documents and registers.

Tangible fixed assets may be very valuable, the price of a unit may be very high. Also, an enterprise might use the assets of this type for many years. Therefore it is important to determine whether management pays enough attention to maintain and protect such assets. An analyst, analysing the tangible fixed assets composition, must also analyse the enterprise's liabilities, i.e. to determine whether the enterprise is able to pay its debts for the bank and suppliers in tangible fixed assets.

Structural and dynamic analysis. When conducting a structural and dynamic analysis of tangible fixed assets, horizontal, vertical and trend analyses are used. During the analysis it is appropriate to estimate what part of all tangible fixed assets do active assets account for and to determine their development trends during a certain period. If in the presence of other constant factors the part of active assets is increasing, it can be concluded that the enterprise's production capacity is increasing as well. Yet it should be noted that the increase in the active part of the assets is not always an objective indicator of the increase in the enterprise's production capacity because of chosen assessment of such assets and depreciation methods. It is also important to determine whether the active part of the tangible fixed assets is technically advanced. Determination of the optimum ratio of the active and passive (that are not directly involved in the production and services provision process) assets is an important condition for using the assets effectively. Therefore all the elements of tangible fixed assets have to be estimated and reasons for their development have to be analysed.

Practice shows that the elements of tangible fixed assets vary differently. Thus it is important to conduct the analysis of not only all tangible fixed assets but of the dynamics of all its elements. The information of this analysis is especially significant if a longer period is analysed. It is related to the fact that some fixed assets are rarely renewed because they can be used for a long time. Active elements of tangible fixed assets should be renewed more often, however, as the practice shows, in some cases the passive part of the assets increases faster. When analysing the structure and dynamics of the tangible fixed assets, it is important to focus on one significant factor – the same elements have to be included into the active and passive parts of the assets every year. In other cases the data will be impossible to compare.

Change analysis. The change analysis of tangible fixed assets has to be related to the compositional, structural, and dynamic analyses since variation of any assets element has an impact on the general results of assets composition, structure and dynamics. During the tangible fixed assets change analysis the following things have to be determined: 1) how much and what type of assets there were at the beginning of the accounting year, what is the cost of acquirement (production) of such assets; 2) how much and what type of assets were acquired during the accounting year, what is the cost of acquirement of such assets; 3) how much and what type of assets were produced or constructed by the enterprise itself, how much of it was transferred to others, devaluated, revaluated or written-down; 4) how much and what type of assets there were left at the end of the accounting year.

Tangible fixed assets change analysis has to be conducted on the basis of the most important elements of such assets. It is important to determine the reasons due to which material changes in certain elements took place. Often the change of tangible fixed assets is influenced by the enterprise's reconstruction, division or merging, changes in organizational structure and management system, improvement of production processes and forms of work organisations; renewal of depreciated and obsolete assets; the level of production specialization and cooperation; changing of the enterprise's geographical location, etc.

Technical condition analysis. The enterprise's financial state and activity results are very dependant on the technical condition of tangible fixed assets. However there is an issue of evaluating the technical condition of such assets because tangible fixed assets can be very different depending on the types of enterprises' activities since their technical and usage characteristics, useful life, etc. are different. Therefore during the tangible fixed assets technical condition analysis, one must look for the most general indicators that can be compared in an enterprise during a longer period as well as with the indicators of related enterprises. The most general indicators describing the technical condition of tangible fixed assets are as follows: 1) renewal; 2) liquidation; 3) growth; 4) depreciation; 5) usefulness. Formulae for their calculations as well as their descriptions are provided in the Table 4. All these indicators may be calculated both for all tangible fixed assets in general and for the separate types of assets.

Table 4. Indicators describing the technical condition of tangible fixed assets

Indicators	Formulae for their calculation	Description of the indicators
1. Tangible fixed assets renewal ratio	$\frac{\text{Tangible fixed assets acquired during the year}}{\text{Tangible fixed assets at the end of the year}}$	This indicators shows what part do the newly acquired tangible fixed assets account for in the total acquisition value of all tangible fixed assets. The increase of active assets renewal ratio is considered favourable. It reveals the enterprise's potential in increasing the production capabilities and developing business
2. Tangible fixed assets liquidation ratio	$\frac{\text{Tangible fixed assets liquidated during the year}}{\text{Tangible fixed assets at the beginning of the year}}$	From this ratio one can make conclusions about the maintenance and usage of tangible fixed assets and even on production capacities. If the ratio has increased it can also mean that production capacities have decreased, that work is irregular, etc.
3. Tangible fixed assets growth ratio	$\frac{\text{Tangible fixed assets at the end of the year} - \text{Tangible fixed assets at the beginning of the year}}{\text{Tangible fixed assets at the beginning of the year}}$	This indicator shows the trends of changes in tangible fixed assets. If the indicator increases, it is considered as positive thing because it shows that the enterprise takes care of production development, invests into tangible fixed assets
4. Tangible fixed assets depreciation ratio	a) depreciation ratio at the beginning of the year: $\frac{\text{Depreciation of tangible fixed assets at the beginning of the year}}{\text{Tangible fixed assets at the beginning of the year}}$ b) depreciation ratio at the end of the year: $\frac{\text{Depreciation of tangible fixed assets at the end of the year}}{\text{Tangible fixed assets at the end of the year}}$	The change in depreciation level is determined by comparing the depreciation ratios at the beginning and at the end of the year. The changes in the value of the assets, increases in depreciation rates, low rate of assets renewal, etc. have an impact on whether this ratio at the end of year increases or not. It is important to make sure that land is not included in the fixed assets value because land is not a depreciable asset
5. Usefulness (suitability) ratio	or $\frac{1 - \text{Depreciation rate}}{\frac{\text{Book value of the tangible fixed assets}}{\text{Acquisition value of the tangible fixed assets}}}$	The ratio shows whether the tangible fixed assets are useful for further usage. The lower this ratio, the less useful the assets are for production or services provision. As the ratio approaches zero, it is necessary to start the assets renewal procedures.

In order to improve the technical condition of certain tangible fixed assets, enterprises often try not only to improve but also change the technical condition of such assets – the assets are repaired, reconstructed or otherwise reorganized. During the analysis it is important to determine whether the repair or reconstruction works on

tangible fixed assets have improved their useful characteristics and whether the useful life of the assets has changed.

Usage analysis. It is very important to use the tangible fixed assets effectively, i.e. all their elements have to contribute to the production, increase of provided services or achievement of other enterprise's goals to a certain extent. In order to estimate the effectiveness of the tangible fixed assets, it is suggested to estimate and evaluate various comparative ratios (see Table 5).

Table 5. Indicators describing the usage effectiveness of tangible fixed assets

Indicators	Formulae for their calculation	Description of the indicators
1. Tangible fixed assets productivity ratio	$\frac{\text{Production value}}{\text{Tangible fixed assets}}$	This indicator shows the value of cost of goods manufactured per one euro of tangible fixed assets. Changes in the active part of the assets have the biggest influence on this indicator. This indicator can be estimated by not only calculating the value of the cost of goods manufactured, but also the standard hours allowed to production or standard direct labour costs
2. Tangible fixed assets receptivity ratio	$\frac{\text{Tangible fixed assets}}{\text{Production value}}$	This indicator shows how many tangible fixed assets does an enterprise have, and whether it is enough for the planned production volumes
3. Tangible fixed assets turnover ratio	a) in times: $\frac{\text{Sales revenue}}{\text{Tangible fixed assets}}$ b) in days: $\frac{\text{Tangible fixed assets} \times 365}{\text{Sales revenue}}$ or $\frac{365}{\text{Tangible fixed assets turnover ratio in time}}$ or $\frac{\text{Tangible fixed assets}}{\text{Sales revenue per day}}$	This indicator shows how effectively does an enterprise use its assets to earn the sales revenue and what is the sales revenue per one euro of the assets ratio This indicator shows how many days does the tangible fixed assets circulation process take during the accounting period
4. Labour provision with tangible fixed assets	$\frac{\text{Tangible fixed assets}}{\text{The number of workers during the busiest shift}}$	This indicator shows the tangible fixed assets per employee
5. Technical labour provision with active tangible fixed assets	$\frac{\text{Active tangible fixed assets}}{\text{The number of workers during the busiest shift}}$	This indicator shows whether employees have enough machines, equipment, devices and other active assets required for certain production operations
6. Tangible fixed assets to long-term debt ratio	$\frac{\text{Tangible fixed assets}}{\text{Long - term liabilities}}$	This indicator shows how many times the tangible fixed assets can be used to settle the long-term liabilities

Table 5 shows that the usage of tangible fixed assets is assessed based on the production levels or sales revenue that result from this type of assets; also, whether there are enough assets to settle the long-term liabilities.

Profitability analysis. When analysing the tangible fixed assets profitability, not only the financial, but also productive, commercial and investment activities of an enterprise can be assessed. Thus not only managers are interested in profitability indicators but many external information users as well. Various indicators may be used to assess the tangible fixed assets profitability (see Table 6).

Table 6. The tangible fixed assets profitability indicators

Indicators	Formulae for their calculation	Description of the indicators
1. Gross profitability of tangible fixed assets	$\frac{\text{Gross profit}}{\text{Tangible fixed assets}}$	This indicator shows how much euros of gross profit go to one tangible fixed assets euro
2. Net profitability of tangible fixed assets	$\frac{\text{Net profit}}{\text{Tangible fixed assets}}$	This indicator shows how much euros of net profit go to one tangible fixed assets euro
<i>Factors influencing a level of net profitability of tangible fixed assets</i>	$\begin{aligned} & \text{Net profitability of sales} \\ & \times \text{Tangible fixed assets turnover} \\ & \text{ratio (in times)} \\ & = \\ & \frac{\text{Net profit}}{\text{Sales revenue}} \times \frac{\text{Sales revenue}}{\text{Tangible fixed assets}} \end{aligned}$	Identification of the factors creates a possibility to estimate the potential to increase the activity results. The main factors are the indicators of the changes in net profitability of sales and tangible fixed assets turnarounds. These indicators can be further divided into smaller indicators
3. Cash return on tangible fixed assets	$\frac{\text{Cash flows from operating activities}}{\text{Tangible fixed assets}}$	This indicator shows the role of the assets when generating cash from the main activity. It is a substitute for the assets profitability indicator

In practice, enterprises usually estimate the net profitability of the tangible fixed assets. Its level may be assessed by comparing the enterprise's profitability levels of several periods, by comparing it to the profitability levels of enterprises from the same industry or by comparing the profitability levels of different departments or responsibility centres of the enterprise.

However, it is not enough to conduct a comparative analysis of the tangible fixed assets profitability. It is important to examine the factors that had an influence on the profitability ratio. As the Table 6 shows, two factors have an influence on the tangible fixed assets profitability: net profitability of sales and tangible fixed assets turnover ratio. These factors can be further divided into the component elements by using the DuPont pyramid analysis method. Different authors provide different types of the DuPont assets profitability analysis. The prepared structure of the DuPont pyramid analysis does not matter, what matters is division of these indicators into elements as small as possible. Division of the aforementioned indicators into the sales revenue, net profit and tangible fixed assets has the largest practical significance. The influence of net profit and changes in assets for the tangible fixed assets profitability is of crucial significance. There is a direct relation between the tangible fixed assets profitability and net profit. As the amount of net profit increases or decreases, the net profitability of the assets increases or decreases accordingly. Whereas the relation between the profitability and tangible fixed assets value is inverse. As the value of the assets decreases, the net profitability of tangible fixed assets increases and vice-versa – as the assets value increases, the profitability decreases.

When conducting a more in-depth analysis of the factors influencing the tangible fixed assets profitability, is appropriate to divide the sales revenue, net profit and fixed assets indicators even further. For instance, the tangible fixed assets could be appropriately divided into active and passive assets; net profit can be divided into sales revenue, cost of goods sold, cost of services provided, selling expenses, general and administrative expenses; sales revenue into revenue from operating activities and revenue from untypical activities. Any of these elements can be divided further: active assets into machines, equipment, devices and other active assets required for certain production operations; cost of goods sold into raw materials cost, labour cost, overhead costs, etc.; revenue from operating activities into revenue of goods sold and revenue of services provided, etc. Such division helps to determine which component element of tangible fixed assets had the biggest or smallest influence for the tangible fixed assets profitability. It is important to analyse the factors determining the tangible fixed assets

profitability when predicting the enterprise's expansion possibilities. The analysis of the influence of these factors during several accounting periods can help to manage the tangible fixed assets profitability and for the managers to select the strategy – whether to increase the assets turnaround or sales profitability.

The complex tangible fixed assets analysis is completed by summarizing the results of all the mentioned stages. This part of the complex analysis is very important because the results underline the problems of the usage of tangible fixed assets, reveals the reserves as well as the unexploited possibilities to use all the elements of the assets. Suggestions on the composition, structure, dynamics, changes, technical condition, profitability and better usage of the tangible fixed assets have to be prepared as well.

Conclusions

Tangible fixed assets are very significant for the financial state of an enterprise and its activity results. They are used in production, provision of services, sale of goods, for administrative purposes; in other words, they provide specific economic benefits for the enterprise.

In 2017, the tangible fixed assets in Lithuanian business enterprises accounted for 29,033 million EUR and it increased by 2.53 compared to 2013. In 2017, they accounted for 37.0% of all assets and for 62.01% of fixed assets. The following categories accounted for the largest part: non-residential buildings (31.6%), construction (20.9%) and machinery and equipment (15.3%). Tangible fixed assets are used in enterprises from all types of economic activities. In 2017, the largest part of this type of assets was used in real estate activities (22.52%), transportation and storage (17.59%) and manufacturing (15.62%).

Not only managers, but also many external information users, such as investors, banks, insurance companies, tax authorities, economics experts, etc., are interested in the composition, structure, technical condition of the tangible fixed assets. With regards to the significance of this type assets, it is very important to carry out their complex analysis; no such analysis has been prepared so far. Recommended methodology for the tangible fixed assets complex analysis consists of the following stages: 1) compositional analysis; 2) structural and dynamic analysis; 3) change analysis; 4) technical condition analysis; 5) usage analysis; 6) profitability analysis. The results from specific stages of the analysis are used for the management decisions in order to use the assets more effectively, improve enterprise's activity results, its activity continuity and competitiveness in the market. This methodology of the analysis can be successfully applied in the enterprises of various sizes and economic activities.

Reference

12th Business Accounting Standard "Tangible Fixed Asset". 2016. The Authority of Audit, Accounting, Property Valuation and Insolvency Management. Retrieved from <http://www.bankrotodep.lt/assets/Veiklos-srityts/Apskaita/VAS/Priimti-standartai/12-VAS-13-redakcija-nuo-20160101.pdf>.

Bauer, K. 2014. Fixed assets valuation in the condition of bankruptcy risk: the role of estimates, *Journal of Modern Accounting and Auditing*, 10(6): 652–666.

Black, G. 2004. *Applied Financial Accounting and Reporting*. Oxford: Oxford University Press.

Bragg, S. 2017. *Financial Analysis: A Business Decision Guide*. 3rd edition. Accounting Tools.

- Del Giudice V.; Manganelli B.; De Paola P. 2016. Depreciation Methods for Firm's Assets. In: *Gervasi O. et al. (eds) Computational Science and Its Applications - ICCSA 2016*, 9788: 214 – 227, Springer, Cham. https://doi.org/10.1007/978-3-319-42111-7_17.
- Gibson, Ch. 2012. *Financial Reporting and Analysis. Using Financial Accounting Information*. 13th ed. Mason, OH: South-Western Cengage Learning.
- Hilkevics, S.; Semakina, V. 2019. The classification and comparison of business ratios analysis methods, *Insights into Regional Development* 1(1): 48-57. [https://doi.org/10.9770/ird.2019.1.1\(4\)](https://doi.org/10.9770/ird.2019.1.1(4))
- Jackson, S.B.; Rodgers, R.C.; Tuttle, B. 2010. The effect of depreciation method choice on asset selling prices, *Accounting, Organization and Society*, 35: 757-774. <https://doi.org/10.1016/j.aos.2010.09.004>.
- Juočiūnienė, D.; Stončiuvienė, N. 2008. Ilgalaikio materialiojo turto apskaitos metodologiniai neatitikimai [Methodological discrepancies in accounting for property, plant and equipment], *Vadybos mokslas ir studijos - kaimo verslų ir jų infrastruktūros plėtrai [Management theory and studies for rural business and infrastructure development]*, 14 (3): 150–159.
- Kamarauskienė, I.; Subačienė, R. 2013. Ilgalaikio materialiojo turto apskaitos viešajame ir verslo sektoriuose ypatumai ir problemos [Peculiarities and problems of accounting of tangible fixed assets in public and business sectors]. *Economic Development: Processes and Trends*, materials of 2nd International Conference, March 20, 2013, Vilnius University of Applied Sciences, 398-423.
- Kanapickienė, R.; Grundienė, Ž. 2015. The model of fraud detection in financial statements by means of financial ratios. *Procedia: social and behavioral sciences*, 213: 321-327. <https://doi.org/10.1016/j.sbspro.2015.11.545>.
- Kanapickienė, R.; Stankevičiūtė, I.; Grebliunė, A. 2019. Evaluation of tangible assets accounting information disclosure quality in the public sector: the case of Lithuania. *New challenges of economic and business development - 2019: incentives for sustainable economic growth*, proceedings of International Conference, May 16–18, 2019, Riga, University of Latvia, 375-387.
- Kovaliov, B.B. 2013. *Финансовый менеджмент: теория и практика. [Financial management: theory and practice]*. Москва: Проспект.
- Lakis, V., et al. 2009. *Finansinės apskaitos teorija ir praktika [Theory and practice of financial accounting]*. Vilnius: Vilniaus universiteto leidykla.
- Legenzova, R.; Gaigalienė, A.; Vilkaitė, I. 2016. Lietuvos įmonių ilgalaikio materialiojo turto apskaitos politikos pasirinkimo analizė [Analysis of PPE's accounting policy choices by Lithuanian companies], *Taikomoji ekonomika: sisteminiai tyrimai [Applied Economics: Systematic Research]*, 10(2): 59–79. <https://doi.org/10.7220/aesr.2335.8742.2016.10.2.4>.
- Liapis, K.J.; Kantianis, D.D. 2015. Depreciations methods and life-cycle costing (LCC) methodology, *Procedia Economics and Finance*, 19: 314 – 324.
- Mackevičius, J.; Giriūnas, L.; Valkauskas, R. 2014. *Finansinė analizė [Financial analysis]*. Vilnius: Vilniaus universiteto leidykla.
- Mackevičius, J.; Subačienė, R.; Senkus, K. 2012. Complex profitability analysis of fixed tangible assets, *Вісник Київського національного університету імені Тараса Шевченка [Bulletin of Taras Shevchenko National University of Kyiv]*, 17-21.
- Matei, N.C.; Ţole, M.; Stroe, M. A. 2017. The importance of tangible fixed – assets revaluation: a comparison between Romanian accounting regulations and the IPSAS 17 ‘Property, Plant and Equipment’. *Innovations in Science and Education. CBU International Conference proceedings*, March 22-24, Prague, Czech Republic.
- Mert, H.; Erkiran Dil, S. 2016. Effect of depreciations methods on performance measurement methods: a case of energy sector, *Journal of Economics, Finance and Accounting*, 3(4): 330-344.
- Mykolaitienė, V.; Večerskienė, G.; Jankauskienė, K.; Valančienė, L. 2010. Peculiarities of Tangible Fixed Assets Accounting, *Engineering Economics*, 21(2):142 -150. <https://doi.org/10.5755/j01.ee.21.2.11686>.
- Pāvāloaia, L. 2013. Valuation of Tangible Assets for Financial Reporting, *Revista Tinerilor Economisti [The Young Economists Journal]*, 10(20): 77–84.

Plenborg, T.; Petersen, Ch. 2011. *Financial Statement Analysis. Valuation - Credit Analysis - Executive Compensation*. Essex: Pearson Education.

Savickaja, T.B. 2005. *Методика комплексного анализа хозяйственной деятельности [Methodology of economic activity complex analysis]*. Москва: ИИФРА.

Stungurienė, S.; Christauskas, Č. (2013). Benefits of applying different depreciation methods of long- term tangible assets in a company, *Social Sciences*, 4(82): 38-47.

Subačienė, R.; Jakubauskaitė, Dž. 2012. Ilgalaikio materialiojo turto nusidėvėjimo finansinės ir mokesstinės apskaitos aspektai [Aspects of financial and tax accounting of tangible fixed assets], *Buhalterinės apskaitos teorija ir praktika [Accounting Theory and Practice]*, 11: 41-48.

Subačienė, R.; Senkus, K. 2012. Fixed tangible assets analysis in aspect of cash flows. *Sustainable economic development: international and national aspects*. Proceedings of international scientific conference. Novopolotsk: Polotsk State University, p. 214-218.

Verslo įmonių statistika 2017 [Business Statistics 2017]. 2018. Vilnius: Statistics Lithuania.

Zinkevičienė, D.; Stončiuvienė, N.; Martirosianienė, L. 2016. Ilgalaikio materialiojo turto apskaitos politika ir jos įtaka žemės ūkio verslo subjektų finansiniams rodikliams [Accounting policy of tangible assets and its influence on the financial indicators of agricultural business entities], *Apskaitos ir finansų mokslas ir studijos: problemos ir perspektyvos [Science and Studies of Accounting and Finance: Problems and Perspectives]*, 10 (1): 215-228.

Zinkevičienė, D.; Vaišnoraitė, G. 2014. Factors affecting the choice of tangible fixed asset accounting methods: theoretical approach, *European Scientific Journal*, Special ed., 1: 198-208.

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