SYSTEM OF PROFITABILITY INDICATORS IN THE CONSTRUCTION INDUSTRY

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Abstract. Profitability management of an enterprise represents an important role in modern conditions of business functioning, because of the level and dynamics of profitability indicators characterizes the profitability of various business areas of the enterprise, cost recovery, etc. The article is based on a structured system of profitability indicators. Methodological aspects are detailed and tested on the example of an analysis of return on assets for construction enterprises of the Republic of Moldova. This work consolidates knowledge in the field of the theory of economic analysis, pays attention to the methods of factor analysis, which make it possible to easily conclude about changes in the efficiency of the enterprise. The article will contribute to the development of economic thinking among specialists responsible for the analytical work at the enterprise, the formation of their understanding of the essence of economic processes, which will help to most accurately establish the reserves for growth of profitability indicators. This study contains a number of findings of practical interest to the management of contracting organizations.

Keywords: *assets, factor, efficiency, scorecard, profitability, calculation methodology.*

Rezumat. Gestionarea profitabilității întreprinderilor joacă un rol important în condițiile moderne de afaceri, deoarece nivelul și dinamica indicatorilor de rentabilitate caracterizează rentabilitatea diferitelor domenii ale întreprinderii, recuperarea costurilor etc. Articolul fundamentează un sistem structurat de indicatori de rentabilitate. Aspectele metodologice sunt detaliate și testate pe exemplul analizei rentabilității activelor pentru companiile de construcții din Republica Moldova. Această lucrare consolidează cunoștințele din domeniul teoriei analizei economice, atrage atenția asupra metodelor de analiză a factorilor, care fac posibilă formularea concluziei despre schimbările în eficiența întreprinderii. Articolul va contribui la dezvoltarea gândirii economice în rândul specialiștilor responsabili de munca analitică la întreprindere, la formarea înțelegerii lor despre esența proceselor economice, care va stabili cel mai precis rezervele pentru creșterea indicatorilor de rentabilitate. Acest studiu conține o serie de concluzii de interes practic pentru managementul contractanților.

Cuvinte cheie: *active, factor, eficiență, sistem de indicatori, rentabilitatea întreprinderii, metodă de calcul.*

Introduction

The national economy of Moldova consists of various industries, among which the construction industry is one of the leading industries, which largely determines the solution of the country's economic and social problems.

According to the data for 2018, the volume of contracted work performed by construction companies is amounted to 11356,4 million lei, which accounted for 7,9 % of the total GDP. The number of contractors for the same period totaled 1587 enterprises.

In particular, the largest share in the total number of construction organizations was occupied by small and micro enterprises, which accounted for more than 95,0 %, which is comparable to the share of small and micro enterprises in the total number of economic units operating in 2018 in the economy as a whole (96,4 %).

The average number of personnel in construction was 23,4 thousand people (3,8 % of the total number of employees in the economy) [1].

The total value of the property of contractors in 2018 was 31868,65 million lei, which in percentage terms amounted to almost a tenth of the total value of assets of the national economy (7,3 %) [1].

Of course, for the development of construction activities, as well as the economy as a whole, a fundamentally important issue is the effective management of the assets of contractors, based on the level of achieved profitability.

Profitability - is a complex and ambiguous economic category, represented by a set of relative indicators characterizing the profitability of various aspects of the enterprise, or the degree of profitability of the business as a whole [2 - 4].

The study of profitability indicators allows us to reveal the main reasons for changes in the efficiency of the enterprise and develop specific measures to mobilize internal reserves.

In this work are used methods of observation and collection of facts, mathematical modeling, analysis and synthesis.

System of indicators of profitability

In the specialized literature, you can find various options for structuring profitability indicators by groups. In particular, most authors identify groups of indicators in accordance with the interests of participants in the economic process: profitability of products, resources, capital [2 - 5].

At the same time, the composition of profitability indicators for each group from different authors is mutually exclusive.

For example, some specialists under the profitability of products mean the calculation and assessment of profitability indicators, calculated on the basis of the ratio of profit to income from sales or the cost of production [3, 4].

Other authors believe that the indicators calculated on the basis of the costs and expenses of various activities should be distinguished separately in the group of indicators based on the cost approach. As for the indicators of the profitability of resources, their calculation should be carried out by the ratio of profit to the total amount or individual parts of the capital invested in the enterprise [6, 7].

Some experts argue that the appropriate method for calculating profitability indicators (dividing profit by invested capital) characterizes the efficiency of using the *capital* of an enterprise [2, 3].

It becomes obvious that there is no consensus in the literature regarding the grouping of profitability indicators, so it is advisable to consider this controversial issue in more detail.

Taking into account the economic content of the enterprise's costs, from our point of view, the profitability indicators can be distinguished into the following groups: the profitability of the activities of current period and the profitability of resources. The first group of indicators should be calculated on the basis of current production costs, the second group - on the basis of capital costs (funds invested in the enterprise).

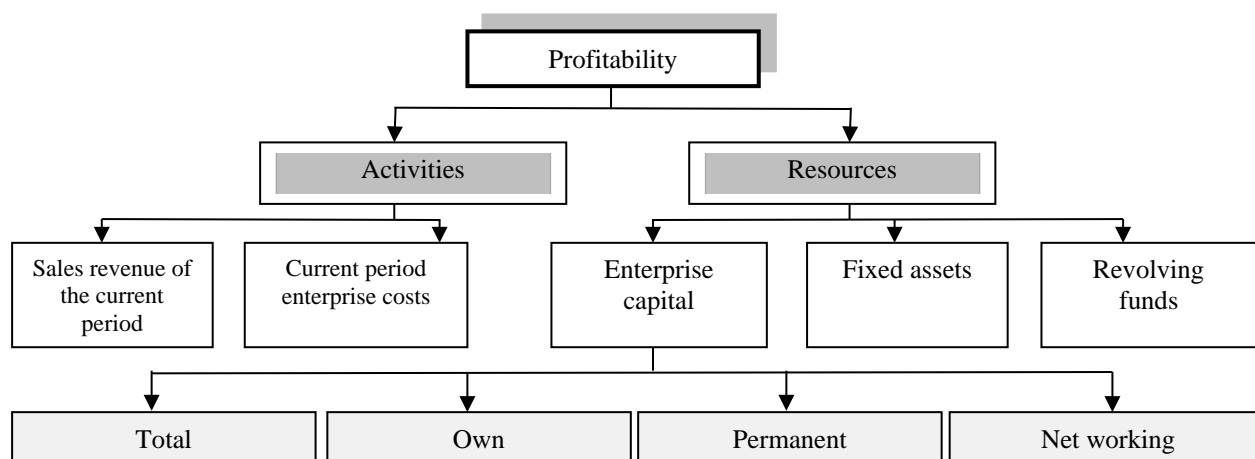A generalization of profitability indicators by groups is shown in Figure 1.

Figure 1. The system of indicators of profitability proposed by the author.
Source: compiled by the author.

Despite the fact that each of the indicators presented in Figure 1 plays a certain role in the mechanism for managing the overall profitability of the enterprise, author pays special attention to the profitability of the total capital of the enterprise (assets).

A review of special literature on the problem under study showed us that the position of some modern researchers in relation to the economic essence of business efficiency is reduced to calculating an identical economic and mathematical model of profitability - the profitability of assets [4, 8 - 10].

It seems interesting to consider the essence and features of the tools for analyzing research work, using the example of analyzing the profitability of assets of construction enterprises.

Methodology for analyzing profitability indicators

From the point of view of theory and practice, any method of analysis is a set of equally applicable guidelines and methodological advice for conducting analytical research.

In the opinion of economists on the composition and sequence of technological stages of analysis basically coincide, the difference is observed in the degree of detailing specific types of activities within each stage: from the most detailed algorithms (up to 7 stages) [6, 11], to the most simplified, generalized schemes [9].

The following main stages can be distinguished, when performing an analytical study of any economic phenomenon (Figure 2).
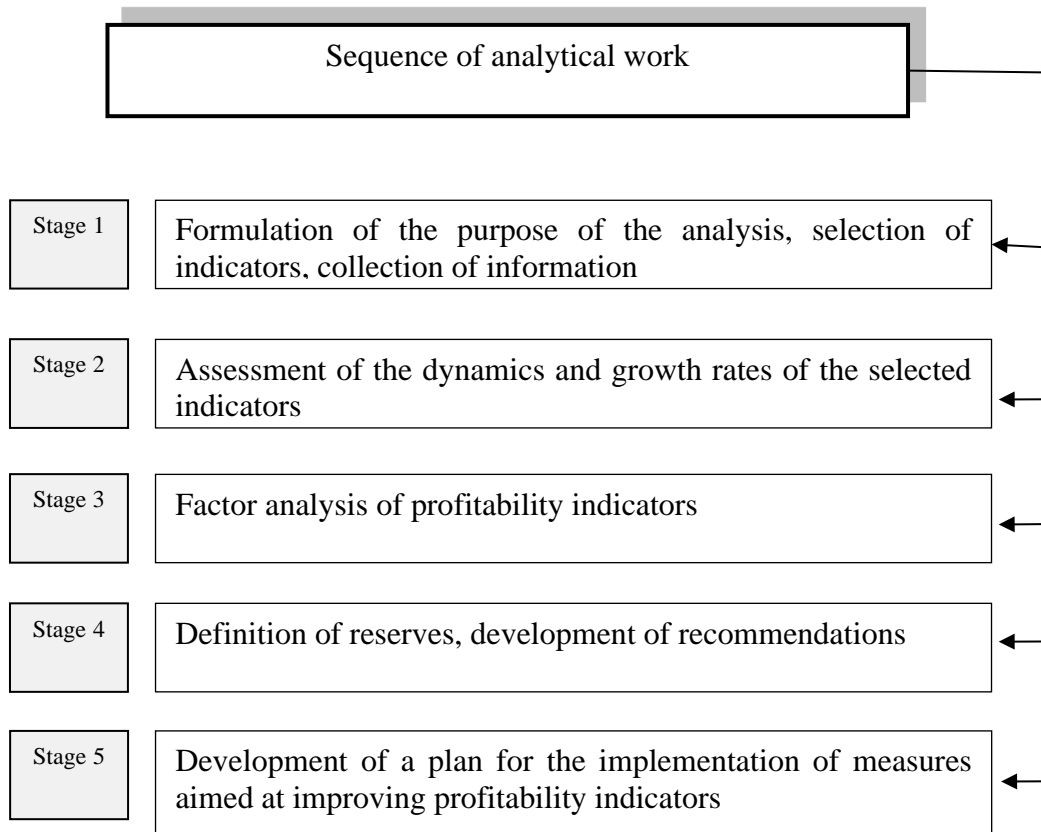
Figure 2. Sequence of analytical work.
Source: compiled by the author.

At each enterprise, the substantiation of the analysis methodology, as a rule, is assigned to a specialist who directs the analytical work at the enterprise [12]. Direct economic analysis will be performed by this specialist at the third stage of the proposed algorithm (Figure 2).

In the context of the research topic, it is proposed to detail the methodological support of analysis by specifying the analysis tools, on which, ultimately, the success of analytical work depends (Figure 3).
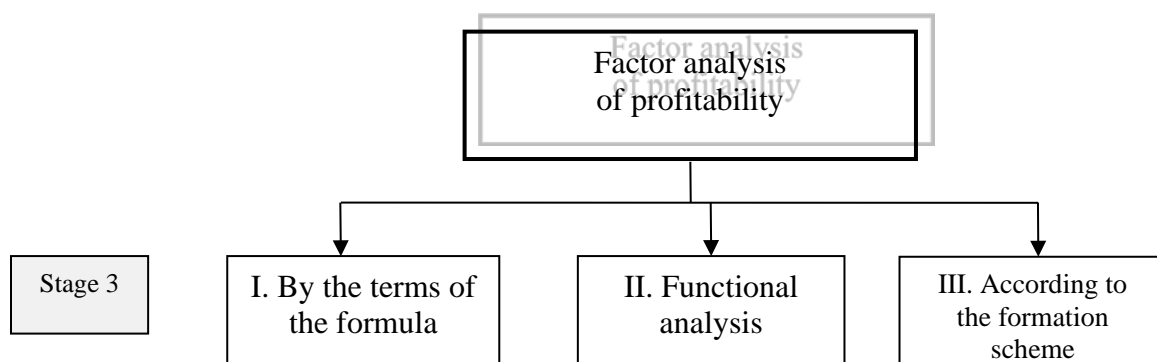

Figure 3. A detailed form of the 3rd stage of the analysis technology.
Source: compiled by the author based on [9].

Factor analysis of profitability is based on the study of the dependence of the studied indicator value on numerous factors through the use of various methods of deterministic factor analysis.

I. The study of the profitability of assets by the terms of its formula can be carried out by the method of chain substitutions, thus in the successive replacement of the levels of factors and the determination of their influence, formula (1).

$$RA = \frac{NP}{(LTA+CA)} \times 100\ \%, \tag{1}$$

where: RA - return on assets;
NP - net profit;
LTA - long-term assets;
CA - current assets.

Obviously, the presented model does not allow linking the growth factors of the return on assets with the growth rates of their turnover. To obtain more complete information about the phenomenon under study, it is advisable to develop a deterministic factor system, using the implementation of a functional analysis of the indicator in question.

II. The functional analysis of profitability is based on the presentation of profitability as the relationship of various indicators that are economically associated with profitability [9].

In the process of modeling a new factorial system, it is possible to transform the original multiple factorial model by expanding it: multiplying the numerator and denominator of the fraction by one or more new indicators. The result is a finite multiplicative model in the form of a product of a new set of factors [13].

The formula for the factor dependence of the return on assets can be presented as follows, formula (2):

$$RA = \frac{NP}{(LTA+CA)} \times 100\ \% = \frac{NP}{TA} \times \frac{SR}{SR} = \frac{NP}{SR} \times \frac{SR}{TA} = RS \times ATR, \tag{2}$$

where: TA - total assets;
SR - sales revenue;
RS - return on sales (sales profitability);
ATR - asset turnover ratio.

This formula, also called the DuPont two-factor model, is a calculation of the return on assets through two conceptual components: the return on sales and the asset turnover.

Accordingly, the model makes it possible to measure the contribution of the enterprise's sales system and the level of intensity of using its property in the formation of the return on assets [14].

Author notes that performing factor analysis in tabular form is the most rational form of presenting analytical information about the phenomenon under study in the presence of a large number of factors due to the transformation of the original model. The indicators (figures) presented in the table take up less space in comparison with the presentation of the text, at the same time the tabular material is perceived more clearly and faster [13].

However, the compilation of analytical tables presupposes a deep understanding of the essence of the indicator under study, knowledge of the methodology for its analysis and compliance with the rules for table design.

III. The most comprehensive and consistent study of the factors influencing the effective indicator is achieved through the construction of structural and logical models, in which the factors are placed in a certain order, taking into account their interconnection and subordination [6].

The development of a deterministic system assumes a step-by-step detailing of complex factors into less simple constituent elements, up to their complete decomposition in terms of their analytical content to elemental factors.

This graphical-analytical method for solving methodological problems allows us to visually display the structure or internal structure of the object under study on the graph, to establish the presence and direction of causal relationships with numerous factors, the form of dependence, which is very important when summarizing the analysis results and further managing the performance indicator [13].

The content and sequence of the analysis of the profitability of assets according to the scheme of its formation are shown in Figure 4.
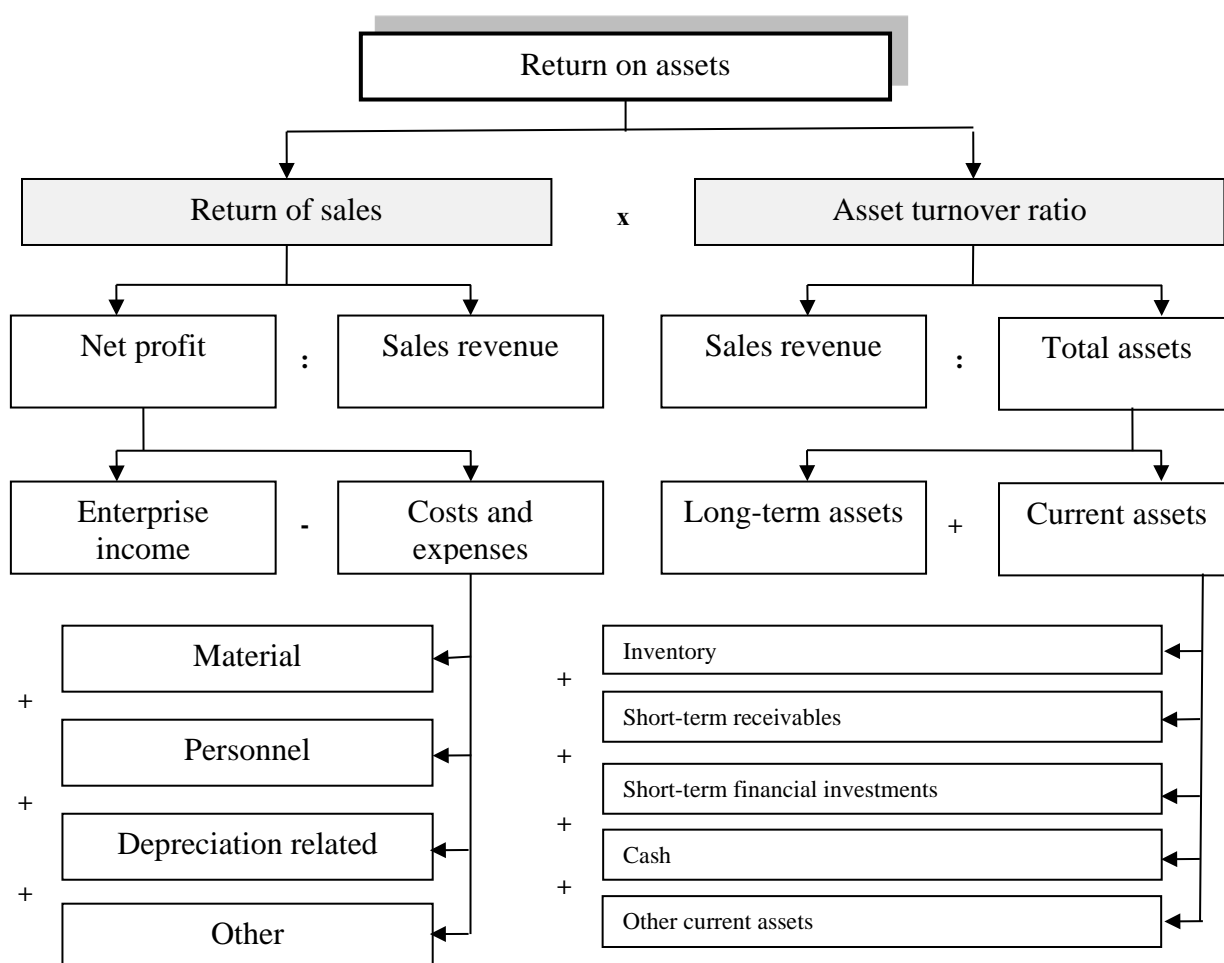
Figure 4. Structural and logical diagram of the formation of the profitability of enterprise assets.
Source: compiled by the author.

Considering the effective indicator through the prism of a systems approach, it can be possible to assess the contribution of each component to the development of the "system", as well as to understand how any managerial impact on one of the parts of the system is reflected in other parts of it [13].

It seems interesting to test the methodological aspects on the example of the analysis of the profitability of assets for construction companies in the Republic of Moldova.

Research results

The main goal of the management of any enterprise is to substantiate the decisions made on the basis of the effective use of assets, regardless of the sources of their financing for profit.

The assessment of the magnitude and dynamics of the profitability of the assets of construction enterprises is presented in Table 1.

Table 1

Assessment of the magnitude and dynamics of the profitability of assets of construction enterprises

Indicators	2016	2017	2018
Net profit, million lei	1170	1795	2230
Long-term assets, million lei	9365	9724	10760
Current assets, million lei	18125	18419	21109
Return on assets,%	4,3	6,4	7,0

Source: compiled by the author based on [1].

According to table 1, there is a positive growth trend in the profitability of construction enterprises. So, in particular, in 2018 the value of the indicator increased to 7,0 % or by 0,6 percentage points compared to the previous year, however, its actual level does not correspond to generally accepted standards of profitability of industrial enterprises (15,0 - 20,0 %) [15].

In 2018, each lei invested in assets brought enterprises only 7 bani of net profit. It can be concluded that there are reserves for increasing the efficiency of using the property of construction enterprises.

Figure 5 shows the growth rate of the return on assets of construction companies in comparison with the previous year.

The study of the growth rate of net profit and total assets for the period under review explains the slowdown in the growth rate of return on assets in 2018.

It becomes obvious that a detailed analysis of the reasons for its unsatisfactory level, as well as the reasons for reducing the rate of its relative growth is required, despite the positive change in the absolute value of the indicator under consideration.

Based on the data in Table 1, it seems possible to study the return on assets of construction enterprises by the terms of its formula in tabular form for the period 2017-2018 (table 2).

$$\text{Check: } + 0,6 = + 1,5 + (-0,3) + (-0,6).$$

The results of the analysis performed in Table 2 show that the increase in the level of return on assets by 0,6 percentage points compared to the previous year is due to the increase in net profit from 1,795 to 2,230 million lei. This resulted in a 1,5 percentage point increase in profitability.
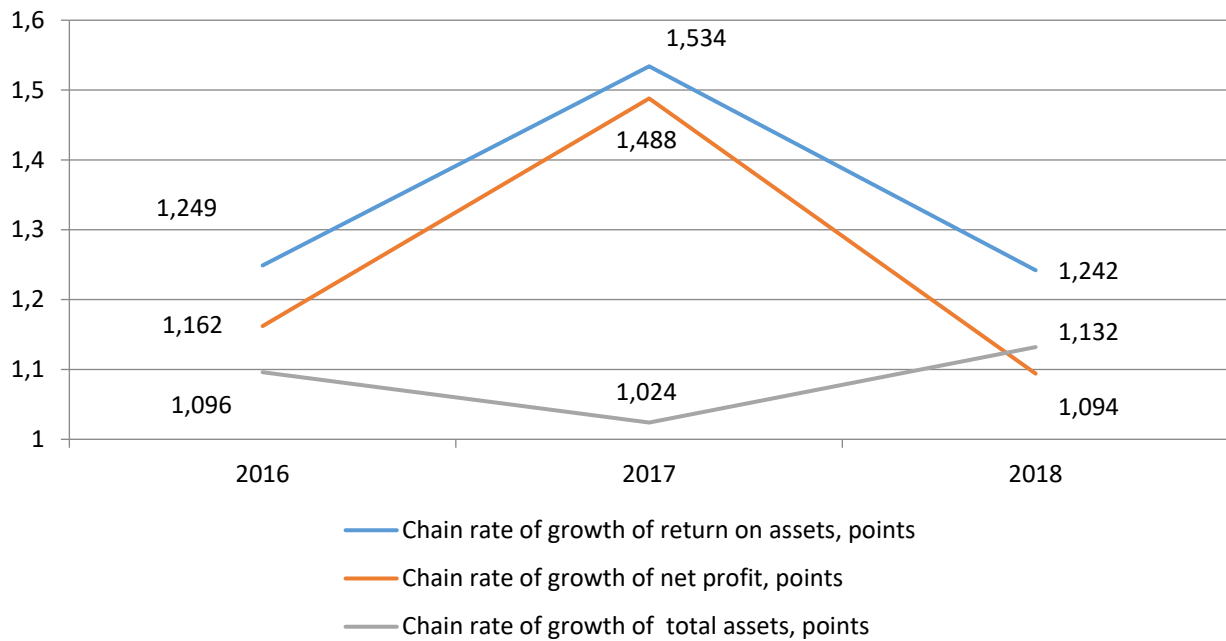
Figure 5. Growth rates of return on assets of construction enterprises in comparison with the previous year.
Source: compiled by the author based on [1].

Table 2

Calculation of the influence of factors on the change in the profitability of assets construction companies

Calcu-lation number	Substi-tution	Interacting factors			Return on assets,%	Calcu-lation of influ-ence	Size of influ-ence,%
		Net profit, million lei	Long-term assets, million lei	Current assets, million lei			
1	0	1795	9724	18419	6,4	-	-
2	1	2230	9724	18419	7,9	7,9-6,4	+1,5
3	2	2230	10760	18419	7,6	7,6-7,9	-0,3
4	3	2230	10760	21109	7,0	7,0-7,6	-0,6

Source: compiled by the author.

The positive impact of this factor was partially offset by the growth in the value of long-term assets and current assets, which led to a decrease in the return on assets by 0,3 and 0,6 percentage points, respectively. It should be noted that the decrease in the level of return on assets is due, to a greater extent, to the increase in the amount of current assets in 2018 compared to 2017.

Therefore, the analysis needs to be deepened in this direction.

The calculation of the influence of factors on the change in the profitability of construction enterprises assets, calculated according to formula 2 (based on functional analysis), is presented in table 3.

Calculation of the influence of factors on the change in the profitability of assets construction companies

Indicators	2017	2018	Absolute deviation	Including due to changes	
				Return on sales	Asset turnover ratio
Sales revenue, million lei	17129	18649	+1520		
Net profit, million lei	1795	2230	+435		
Total assets, million lei	28143	31868	+3725		
Return on sales,%	10,5	11,9	+1,4		
Asset turnover ratio, points	0,609	0,585	-0,024		
Return on assets,%	6,4	7,0	+0,6	1,4 * 0,609 = = +0,9	11,9 * (-0,024) = = -0,3

Source: compiled by the author based on [1].

Balance of influence: 7,0 − 6,4 = 0,9 + (-0,3).

In 2018, compared to the previous year, a decrease in asset turnover was registered by 0,024 times, which led to a decrease in the level of return on assets by 0,3 percentage points. It should be noted that the value of the asset turnover indicator in 2018 is a consequence of the excess of the growth rate of the average asset value (113,2 %) over the growth rate of sales income (108,9 %). The change in the profitability of assets was positively impacted by an increase in the profitability of sales by 1,4 percentage points. The degree of influence of this factor is estimated as +0,9 percentage points.

It is also acceptable to carry out an analysis of profitability according to the scheme of its formation, in order to consider a broader set of factors, to catch the influence of intermediate factors that determine the level of return on assets. Table 4 shows the calculations of some indicators that are the constituent elements of the phenomenon under study.

Assessment of composite indicators of asset turnover

Indicators	2017	2018	Absolute deviation
Sales revenue, million lei	17129	18649	+ 1520
Long-term assets, million lei	9724	10760	+ 1036
Current assets, million lei including:	18419	21109	+ 2690
— Inventory	8529	9996	+ 1467
— Short-term receivables *	7276	8167	+ 891
— Short-term financial investments	977	1036	+ 59
— Cash	1637	1910	+ 273
Long-term asset turnover	1,762	1,733	-0,028

Turnover of current assets	0,930	0,883	-0,047
Duration of turnover of current assets, days including:	387	407	+ 20
– Inventory	179	193	+ 14
– Short-term receivables *	153	158	+ 5
– Short-term financial investments	21	20	-1
– Cash	34	36	+2

* Including: other current assets.

From the data in Table 4, it follows that in 2018, compared to 2017, the number of turnovers of both long-term assets and current assets decreased by 0,028 and 0,047 times, respectively. This led to a 20-day slowdown in current asset turnover. Consequently, in 2018, the property of construction enterprises was used ineffectively. This situation requires a more detailed analysis of the turnover of current assets at all stages of their circulation.

As the main reasons for the slowdown in the turnover of the current assets of construction companies in 2018, it can be noted: a decrease in the number of turnover of inventories, as well as an increase in the duration of the period for repayment of receivables.

Conclusions

1. It is advisable to focus on one of the most representative and informative indicators of profitability when justifying any management decision, despite the presence of many indicators of profitability. This measure will facilitate analytical work and reflect the most accurately the economic content of profitability, as well as exclude the calculation and analysis of an excessive number of "useless" indicators.

2. Despite the positive dynamics of growth in the return on assets of contractors for the period 2017-2018, the analysis of the value and dynamics of the return on assets of construction companies in the Republic of Moldova showed that the level of this indicator remains rather low. This will prevent construction companies from renewing and increasing the value of their assets in the near future.

3. The results of the factor analysis of the return on assets indicate the presence in 2018 of problems with the management efficiency of construction companies current assets. In particular, a decrease in the number of turnover of inventories, as well as an increase in the duration of the period for repayment of accounts receivable, had a negative impact on the change in the profitability of assets. In this situation, the management of construction companies can be recommended to pay special attention to the issues of justifying the optimal volume of reserves, as well as to revise the policy in relation to debtors towards its tightening.

4. In order to maintain the trend of growth in return on assets outlined in 2018, construction companies in the Republic of Moldova need to further ensure stable growth in operating income as the main source of profit maximization of enterprises (subject to effective management of total costs and expenses), which is due solely to the outstripping growth in net profit over the growth in sales revenue.

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