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## ANALYSIS OF THE INFLUENCE OF VALUE-FORMING COMPONENTS ON MACHINE-BUILDING ENTERPRISES MARKET CAPITALIZATION DYNAMICS

The article determines the importance of the impact of value-forming components on the dynamics of the market capitalization of Ukrainian machine-building enterprises. The main objective of the conducted research is to implement a scientific and methodological approach to realization of factor analysis of the influence of value-forming components on the dynamics of market capitalization of enterprises. A critical analysis of the content of scientific publications on the researched topic determines expediency of using factor analysis and sensitivity analysis in determining the influence of value-forming components on machine-building enterprises market capitalization dynamics. The relevance of solving the specified problem is due to the importance of determining the set of value components that are considered by the market as the most most valuable for machine-building enterprises from the standpoint of impact on market capitalization in order to identify potential reserves for its increase. The methodological basis is a system of methods used to obtain research results: theoretical generalization – to clarify the content of scientific publications with the aim of forming a scientific and methodological approach to the implementation of a factor analysis of an enterprise market capitalization; factor analysis – to reveal the influence of changes in the value-forming components of the representative machine-building enterprises on the target indicator of their market capitalization; sensitivity analysis – to determine the degree of responsiveness of the market capitalization to changes in the discount rate and the terminal growth rate; logical generalization – to summarize conclusions based on research results. The object of research is the market capitalization of enterprises, formed under the influence of changes in the main components of their value. The article presents the results of evaluating the impact of the value-forming components on the market capitalization dynamics of Ukrainian machine-building enterprises. The results were obtained through the proposed author's scientific-methodological approach. The analysis and logical generalization of the research results served as the basis for determining the impact of value components on market capitalization dynamics, including the identification of those components that have the most significant impact, such as discount rate and terminal growth rate. The results of the study have practical value for the further development of a system of management solutions for increasing the market capitalization of the enterprise.

**Key words:** *market capitalization, enterprise value, factor analysis, sensitivity analysis, discount rate, terminal growth rate, machine-building enterprises.*

## АНАЛІЗ ВПЛИВУ СКЛАДНИКІВ ВАРТОСТІ МАШИНОБУДІВНИХ ПІДПРИЄМСТВ НА ДИНАМІКУ ЇХ РИНКОВОЇ КАПІТАЛІЗАЦІЇ

У статті визначено вагомість впливу складників вартості на динаміку ринкової капіталізації машинобудівних підприємств України. Основною ціллю проведеного дослідження є реалізація науково-методичного підходу щодо здійснення факторного аналізу впливу складників вартості на динаміку ринкової капіталізації підприємства. Критичний аналіз змісту наукових публікацій з досліджуваної проблематики визначає доцільність використання факторного та аналізу чутливості при визначенні впливу складників вартості на динаміку ринкової капіталізації підприємств. Актуальність вирішення визначеної проблеми зумовлена важливістю визначення сукупності складників вартості, які ринок вважає найбільш вартісними для машинобудівних підприємств з позицій впливу на ринкову капіталізацію з метою виявлення потенційних резервів для її нарощування. Методологічну основу становить система застосованих для отримання результатів дослідження методів: теоретичного узагальнення – для уточнення змісту наукових публікацій учених з метою формування науково-методичного підходу щодо здійснення факторного аналізу ринкової капіталізації підприємства; факторного аналізу – для встановлення впливовості зміни складників вартості репрезентативних підприємств машинобудування на цільовий показник їх ринкової капіталізації за період 2013–2021 рр.;

аналіз чутливості – для визначення ступеня реагування ринкової капіталізації підприємств на зміну ставки дисконтування та показника термінального зростання; логічного узагальнення – для отримання висновків за результатами досліджень. Об'єктом дослідження в роботі виступає ринкова капіталізація підприємств, сформована під впливом зміни складників їх вартості. У статті презентовано результати оцінювання впливу складників вартості машинобудівних підприємств України на динаміку їх ринкової капіталізації, що стало можливим завдяки запропонованому авторському науково-методичному підходу. Аналіз і логічне узагальнення результатів дослідження стали основою визначення впливу складників вартості на динаміку ринкової капіталізації, а також визначення серед їх числа тих, що мають найбільш суттєвий вплив – зокрема, ставки дисконтування та показника термінального зростання. Результати дослідження мають практичну цінність для подальшої розробки системи управлінських рішень з підвищення ринкової капіталізації підприємства.

**Ключові слова:** ринкова капіталізація, вартість підприємства, факторний аналіз, аналіз чутливості, ставка дисконтування, показник термінального зростання, машинобудівні підприємства.

**Introduction.** Market capitalization is one of the methods of assessing the value of enterprises as a means of extrapolating a set of factors that the market considers to be the most valuable for them. Therefore, the market capitalization indicator is “one of the most important indicators that reflects the current state and development prospects of the enterprise on the market, and also characterizes the entire potential of the enterprise, including its investment attractiveness” (Melnyk, 2009). Taking into account the importance of determining enterprise market capitalization, during its formation, the analysis of the value-forming components on its dynamics acquires special importance, in order to identify potential reserves for increasing market capitalization.

**Review of Literature.** In modern scientific publications dedicated to the research of forming a scientific and methodological approach to the analysis of market capitalization of enterprises, a lot of attention is paid to the disclosure of the relationship between the management of the market capitalization, its goals and methods of analysis, which are used to study the impact of factors on market capitalization. It was determined that in order to form an effective mechanism for managing the market capitalization of enterprises in order to achieve the goals of the strategy of its investment activity, it is important to take into account the influence of various factors (Kryvovyazyuk & Burban, 2021), the importance of which helps to clarify the analysis of the sensitivity of market capitalization (Kryvovyazyuk & Burban, 2022). At the same time, it is also important to harmonize the techniques and methods of analyzing the components' impact on the dynamics of market capitalization of the researched enterprises of Ukrainian machine-building industry.

According to a mathematical interpretation, enterprise market capitalization is equal to its value adjusted for the value of preferred stocks and net debt amount (Damodaran, 2015). Net debt is calculated as the difference between the company's total market debt and the amount of its cash and cash equivalents (Lambrecht & Pawlina, 2012). The objective consideration of net debt in the market value is justified by the fact that “in reality, a new owner also assumes responsibility for all outstanding debts of the company” (Bagatska, 2015). Among the number of methods used in the analysis of factors affecting market capitalization, one of the most common is the method of chain substitutions. However, after studying the work of a number of scientists, it can be concluded that the method has significant disadvantages. In addition, there is a need to consider the “sequence of factor effects” during calculations using this method, which is outlined by the change in the influence of each of the factors depending on its place in the model (Koshelek & Malysenko, 2016). However, the main drawback of chain substitutions method is the failure to take into account “the simultaneous action of all factors, which gives an additional (synergistic) effect that is not isolated, but distributed among all factors, except the first one” (Begun, 2020).

In general, supporting the opinion of scientists regarding the elimination of the listed disadvantages by using the method of isolated factors impact, we consider it appropriate to take this method as a basis for determining the impact of changes in the value of Ukrainian machine-building enterprises on their market capitalization. In order to analyze the detailed impact on the market capitalization, it is appropriated to conduct an additional factor analysis of the main components of the cash flow of the listed enterprises. Because “with the help of cash flow the value of business is

estimated, while cash flow is considered as the most important source of generating corporate value” (Koshelek, 2016).

In order to study the variability of the market capitalization, the analysis of the influence of the main factors on its dynamics should be supplemented with an analysis of market capitalization sensitivity. Such a methodology is “a crucial step in the process of model building and results summarizing”. Modern scientists are convinced that “thanks to sensitivity analysis, we get a significant insight into the behavior of the model, its structure and response to changes in the input data of the model” (Borgonovo & Plischke, 2016). It is important to emphasize the broad applicability of this analysis, noting its effectiveness in quantifying the contribution of input data to the output result (Saltelli et al., 2019).

**The purpose** of the article is to implement a scientific-methodical approach to factor analysis of the influence of value-forming components on the enterprise market capitalization dynamics.

**Methodology.** The theoretical basis of this research is the scientific provisions of theories of capitalization and economic analysis. To solve the tasks set in the work, the following methods were used: theoretical generalization – to clarify the content of scientific publications with the aim of forming a scientific and methodological approach to the implementation of enterprise market capitalization factor analysis; factor analysis – to reveal the influence of changes in the value-forming components of representative machine-building enterprises on the target indicator of their market capitalization; sensitivity analysis – to determine the degree of responsiveness of the enterprises market capitalization to changes in the discount rate and the terminal growth rate; logical generalization – to obtain conclusions based on research results.

**Results.** For further research, we have chosen a branch of Ukrainian machine-building enterprises, whose share of the sales volumes during 2013-2021 is significant both in the industry (5.2%-8.8%) and in the overall volume of products sold by Ukrainian enterprises (1.7%-3.0%). Analyzed companies are leading enterprises, the share of which in the industry sales volume during the mentioned period was 15.5%. Among the mentioned enterprises are: JSC “Ukrayins’ki Enerhetychni Mashyny” (JSC “UEM”), PJSC “Dnipropetrovs’kyy Ahrehatnyy Zavod” (PJSC “DAG”), PJSC “Novokramators’kyy Mashynobudivnyy Zavod” (PJSC “NMZ”), JSC “Dniprovazhmash” (JSC “DVZh”) – a heavy machine-building sub-industry (HMB); JSC “Motor Sich” (JSC “MSCh”), JSC “Hidrosyla” (JSC “HDS”), JSC “Sums’kyy Zavod Nasosenerhomash” (JSC “NEM”), PJSC “Kalynivs’kyy Mashynobudivnyy Zavod” (PJSC “KMZ”) – a medium machine-building sub-industry (MMB); PJSC “SKF Ukraine” (PJSC “SKF”), JSC “Dnipropetrovs’kyy Strilochnyy Zavod” (JSC “DSZ”), JSC “Kryukivs’kyy Vahonobudivnyy zavod” (JSC “KVZ”), PJSC “Dniprovagonmash” (PJSC “DVG”) – a general machine building sub-industry (GMB).

By analyzing financial statements data of the representative Ukrainian machine-building enterprises for the period 2013-2021, their market capitalization was calculated (Table 1).

The results of the study revealed the existence of a strategy of cash and cash equivalents volume predominance of over the value of the representative companies debt, which is reflected in the “negative” value of net debt amount. It was revealed that the net debt of machine-building enterprises is equal to 2652.2 mUAH, the largest share of which (1491.3 mUAH), belongs to the general machine-building sub-industry. This strategy is defined from the standpoint of a company’s ability to buy back its own debt with “cash” (cash and cash equivalents) (Lambrecht & Pawlina, 2012), which, due to its high liquidity, is “a source of ensuring the company’s solvency” (Ostafiychuk, 2011). Based on the representative companies share in Ukrainian machine-building industry, market capitalization of the industry as of valuation date is determined to be 257205.9 mUAH.

Table 1. Formation of market capitalization of representative enterprises of Ukrainian machine-building industry

Enterprises	Market Value, TUAH	Total Debt, TUAH	Cash and Cash Equivalents, TUAH	Net Debt, TUAH	Market Cap., TUAH
HMB	8027482	912075	1155359	-243284	8270766
JSC "UEM"	2968154	808010	186549	621461	2346693
PJSC "DAG"	240167	42761	20	42741	197426
PJSC "NMZ"	4463495	0	940535	-940535	5404030
JSC "DVZh"	355666	61304	28255	33049	322617
MMB	23831591	273657	1191363	-917706	24749297
JSC "MSCh"	22342397	273657	1092085	-818428	23160825
JSC "HDS"	135481	0	119	-119	135600
JSC "NEM"	1207639	0	55640	-55640	1263279
PJSC "KMZ"	146073	0	43519	-43519	189592
GMB	5355600	10112	1501362	-1491250	6846850
PJSC "SKF"	896852	0	0	0	896852
JSC "DSZ"	804064	0	88864	-88864	892928
JSC "KVZ"	3033454	0	1267370	-1267370	4300824
PJSC "DVG"	621231	10112	145128	-135016	756247
Total	37214673	1195844	3848084	-2652240	39866913

Source: calculated by the author based on the enterprises financial statements

The results of the study revealed the existence of a strategy of cash and cash equivalents volume predominance of over the value of the representative companies debt, which is reflected in the "negative" value of net debt amount. It was found out that the net debt of machine-building enterprises is equal to 2652.2 mUAH, the largest share of which (1491.3 mUAH), belongs to the general machine-building sub-industry. This strategy is defined from the standpoint of a company's ability to buy back its own debt with "cash" (cash and cash equivalents) (Lambrecht & Pawlina, 2012), which, due to its high liquidity, is "a source of ensuring the company's solvency" (Ostafiyuk, 2011). Based on the representative companies share in Ukrainian machine-building industry, market capitalization of the industry as of valuation date is determined to be 257205.9 mUAH.

In order to determine the impact of machine-building enterprises value changing on the target indicator of their market capitalization, a high level of relevance has using factor analysis. Its model has the following form (Pudychева, 2018):

$$\begin{aligned} \Delta Y &= a_1 \times b_1 \times c_1 - a_0 \times b_0 \times c_0; \\ \Delta Y_a &= a_1 \times b_0 \times c_0 - a_0 \times b_0 \times c_0; \\ \Delta Y_b &= a_0 \times b_1 \times c_0 - a_0 \times b_0 \times c_0; \\ \Delta Y_c &= a_0 \times b_0 \times c_1 - a_0 \times b_0 \times c_0. \end{aligned} \tag{1}$$

Special attention within the model belongs to the balance ratio, which reflects factors synergistic effect and demands adding an additional factor into the model (Pudychева, 2018):

$$\Delta = \Delta Y - (\Delta Y_a + \Delta Y_b + \Delta Y_c). \tag{2}$$

In general, marketing capitalization of an enterprise, according to DCF-model, has a following form (Sotnikov, 2015):

$$EV = \sum_{i=1}^n \frac{CF_i}{(1+r)^i} + \frac{TV}{(1+r)^n}, \tag{3}$$

EV – Enterprise Value;  
 CF<sub>i</sub> – Annual Cash Flow (for year i);  
 r – Discount Rate;  
 n – Forecast Period duration;  
 TV – Enterprise Terminal Value.

The formula needs further modification in order to determine enterprise terminal value. Additionally, the modified formula will require further transformation to reflect market capitalization calculation (Murina, 2022).

Considering the fact of absence of preferred stocks in the capital of representative machine-building enterprises, as well as a low level of development of Ukrainian stock market, it is thought to be reasonable to exclude preferred stock component from factor analysis model. Therefore, the model of Ukrainian machine-building enterprises market capitalization calculation is following:

$$M_{cap} = \sum_{i=1}^n \frac{CF_i}{(1+r)^i} + \frac{CF_{n+1}}{(1+r)^n \times (r-g)} - D_n, \quad (4)$$

$M_{cap}$  – Enterprise Market Capitalization;  
 $CF_{i+1}$  – Terminal Period Cash Flow;  
 $g$  – Terminal Growth Rate;  
 $D_n$  – Enterprise Net Debt.

For further calculations, in accordance with the basic methodology of isolated factors impact method, the values will be assigned with the following designations,:  $Y$  – Enterprise Market Capitalization;  $a$  – Annual Cash Flow (for year  $i$ );  $b$  – Discount Rate;  $c$  – Terminal Growth Rate;  $d$  – Terminal Period Cash Flow;  $e$  – Enterprise Net Debt. So, the final form of the market capitalization calculation model will be as follows:

$$Y = \sum_{i=1}^n \frac{a}{(1+b)^i} + \frac{d}{(1+b)^n \times (b-c)} - e. \quad (5)$$

Actual market capitalization of Ukrainian machine-building industry was selected as a “Base period” of the model. The target indicator was calculated based on the data of machine-building industry representative enterprises during 2013-2021. For “Reporting period” projected data were used which were calculated based on increase of the value of each of the factors by 1.0%.

Using the market capitalization calculation model, as well as the described above assumptions regarding the projection of the identified factors, a table with the input data for the analysis will be built (Table 2).

Based on primary data of the factor analysis, it can be concluded that a 1.0% increase in the main influencing factors will lead to a 1.84% decrease in the market capitalization of representative enterprises of Ukrainian machine-building enterprises.

Table 2. Input data for factor analysis of market capitalization of Ukrainian machine-building industry representative enterprises

Indicator	Actual, mUAH	Projection, mUAH	Deviation	
			mUAH	%
Market Capitalization (Y)	39866.9	39132.3	-734.6	-1.84
Forecast Period Cash Flow (a)	39191.0	39582.9	391.9	1.00
Discount Rate (b)	22.97%	23.97%	–	1.00
– JSC “UEM”	22.85%	23.85%	–	1.00
– PJSC “DAG”	21.13%	22.13%	–	1.00
– PJSC “NMZ”	24.08%	25.08%	–	1.00
– JSC “DVZh”	21.76%	22.76%	–	1.00
– JSC “MSCh”	23.41%	24.41%	–	1.00
– JSC “HDS”	23.55%	24.55%	–	1.00
– JSC “NEM”	22.64%	23.64%	–	1.00
– PJSC “KMZ”	22.98%	23.98%	–	1.00
– PJSC “SKF”	23.41%	24.41%	–	1.00
– JSC “DSZ”	23.63%	24.63%	–	1.00
– JSC “KVZ”	22.63%	23.63%	–	1.00
– PJSC “DVG”	23.60%	24.60%	–	1.00
Terminal Growth Rate (c)	2.20%	3.20%	–	1.00
Terminal Period Cash Flow (d)	10072.5	10173.2	100.7	1.00
Enterprise Net Debt (e)	-2652.2	-2678.7	-26.5	1.00

Source: calculated by the author based on the enterprises financial statements

The next step will be the use of method of isolated factors impact, which will allow to reveal the main directions and strength of influence on each of the selected factors (Table 3).

Table 3. Determination of factors isolated impact on market capitalization of Ukrainian machine-building industry representative enterprises

Calculations base			
$Y = \sum_{i=1}^n \frac{a}{(1+b)^i} + \frac{d}{(1+b)^n \times (b-c)} - e$			
Indicator	Formula	Results	
$Mcap_0 (Y_0)$	$Y_0 = \sum_{i=1}^n \frac{a_0}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0-c_0)} - e_0$	$Y_0 = 39\,866.9$ mUAH	-
$Mcap_1 (Y_1)$	$Y_1 = \sum_{i=1}^n \frac{a_1}{(1+b_1)^i} + \frac{d_1}{(1+b_1)^n \times (b_1-c_1)} - e_1$	$Y_1 = 39\,132.3$ mUAH	-1.84%
$\Delta Mcap_a (\Delta Y_a)$	$Y_a = \sum_{i=1}^n \frac{a_1}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0-c_0)} - e_0$	$\Delta Y_a = 206.2$ mUAH	+0.52%
$\Delta Mcap_b (\Delta Y_b)$	$Y_b = \sum_{i=1}^n \frac{a_0}{(1+b_1)^i} + \frac{d_0}{(1+b_1)^n \times (b_1-c_0)} - e_0$	$\Delta Y_b = -1\,840.3$ mUAH	-4.62%
$\Delta Mcap_c (\Delta Y_c)$	$Y_c = \sum_{i=1}^n \frac{a_0}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0-c_1)} - e_0$	$\Delta Y_c = 821.9$ mUAH	+2.06%
$\Delta Mcap_d (\Delta Y_d)$	$Y_d = \sum_{i=1}^n \frac{a_0}{(1+b_0)^i} + \frac{d_1}{(1+b_0)^n \times (b_0-c_0)} - e_0$	$\Delta Y_d = 166.0$ mUAH	+0.42%
$\Delta Mcap_e (\Delta Y_e)$	$Y_e = \sum_{i=1}^n \frac{a_0}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0-c_0)} - e_1$	$\Delta Y_e = 26.5$ mUAH	+0.07%
$\Delta Mcap_s (\Delta Y_s)$	Synergetic effect influence	$\Delta Y_s = -114.9$ mUAH	-0.29%
Balance: $206.2 - 1840.3 + 821.9 + 166.0 + 26.5 - 114.9 = 39\,132.3 - 39\,866.9 = -734.6$			

Source: calculated by the author based on the enterprises financial statements

From the calculations above, it can be concluded that the most significant impact on the market capitalization of representative enterprises has the change in discount rate. The increase of the factor by 1.0% caused the reduction of the target indicator of market capitalization by 4.62%.

The objectivity of this correlation lays in the economic essence of the factor, which is revealed in the latitude of its functional purpose, which is outlined in the following main directions: bringing cash flow to the present value; an illustration of the risk level of investing funds in the object of assessment; reflection the value of capital raised by the company (Korbutyak & Mykhailiuk, 2019).

Special attention has to be paid to the factor of net debt amount change. In general, there is an inverse relationship between the factor and the size of the market capitalization, however, in the context of the calculations, its growth led to an increase in the target indicator. This is caused by the negative value of the net debt of representative enterprises of Ukrainian machine-building industry.

The formula for calculating company free cash flow (FCFF), in its general form, is the following (Kalabukhova & Davydkova, 2019):

$$Y = \sum_{i=1}^n \frac{a^1 + a^2 - a^3 - a^4}{(1+b)^i} + \frac{d}{(1+b)^n \times (b-c)} - e. \quad (7)$$

Taking the developed model as a base, its main input data have been formed and presented in Table 4.

Table 4. Input data for factor analysis of cash flow components impact on market capitalization of representative enterprises

Indicator	Actual, mUAH	Projection, mUAH	Deviation	
			mUAH	%
Market Capitalization (Y)	39866.9	40073.1	206.2	0.52
Earnings Before Interests After Taxes Expenses (EBIAT) (a <sup>1</sup> )	30161.0	30462.6	301.6	1.00
Annual Amortization (a <sup>2</sup> )	9438.8	9533.2	94.4	1.00
Capital Expenditure (a <sup>3</sup> )	7803.3	7881.3	78.0	1.00
Changes in Working Capital (a <sup>4</sup> )	-7394.4	-7468.4	-74.0	1.00
Discount Rate (average) (b)	22.97%	22.97%	–	–
Terminal Growth Rate (c)	2.20%	2.20%	–	–
Terminal Free Cash Flow (d)	10072.5	10072.5	–	–
Net Debt (e)	-2652.2	-2652.2	–	–

Source: calculated by the author based on the enterprises financial statements

The results of the analysis demonstrates (Table 5) that EBIAT indicator (the indicator of earnings before interests after tax expenses) is the most important among cash flow components of representative enterprises of the industry, the growth of which by 1.0% led to an increase in the target indicator by 0.35%.

Additional attention has to be paid to the factor of change in the working capital of machine-building enterprises, the growth of which caused the growth of the industry's market capitalization, which is due to its negative value.

Таблиця 5. Determination of factors isolated impact on market capitalization of Ukrainian machine-building industry representative enterprises

Calculations base			
$Y = \sum_{i=1}^n \frac{a^1 + a^2 - a^3 - a^4}{(1+b)^i} + \frac{d}{(1+b)^n \times (b-c)} - e$			
Indicator	Formula	Results	
$Mcap_0 (Y_0)$	$Y = \sum_{i=1}^n \frac{a_0^1 + a_0^2 - a_0^3 - a_0^4}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0 - c_0)} - e_0$	$Y_0 = 39866.9$ млн грн	–
$Mcap_1 (Y_1)$	$Y = \sum_{i=1}^n \frac{a_1^1 + a_1^2 - a_1^3 - a_1^4}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0 - c_0)} - e_0$	$Y_1 = 40073.1$ млн грн	+0.52%
$\Delta Mcap_{a^1} (\Delta Y_{a^1})$	$Y = \sum_{i=1}^n \frac{a_1^1 + a_0^2 - a_0^3 - a_0^4}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0 - c_0)} - e_0$	$\Delta Y_a = 139.5$ млн грн	+0.35%
$\Delta Mcap_{a^2} (\Delta Y_{a^2})$	$Y = \sum_{i=1}^n \frac{a_0^1 + a_1^2 - a_0^3 - a_0^4}{(1+b_0)^i} + \frac{d_0}{(1+b_0)^n \times (b_0 - c_0)} - e_0$	$\Delta Y_b = 51.0$ млн грн	+0.13%

$\Delta M_{cap_{a^3}} (\Delta Y_{a^3})$	$Y = \sum_{i=1}^n \frac{a_0^1 + a_0^2 - a_1^3 - a_1^4}{(1 + b_0)^i} + \frac{d_0}{(1 + b_0)^n \times (b_0 - c_0)} - e_0$	$\Delta Y_c = -39.2$ МЛН ГРН	-0.10%
$\Delta M_{cap_{a^4}} (\Delta Y_{a^4})$	$Y = \sum_{i=1}^n \frac{a_0^1 + a_0^2 - a_0^3 - a_1^4}{(1 + b_0)^i} + \frac{d_0}{(1 + b_0)^n \times (b_0 - c_0)} - e_0$	$\Delta Y_d = 54.9$ МЛН ГРН	+0.14%
$\Delta M_{cap_s} (\Delta Y_s)$	Synergetic effect influence	Absent	-
Balance: $139.5 + 51.0 - 39.2 + 54.9 = 40\ 239.1 - 39\ 866.9 = 206.2$			

Source: calculated by the author based on the enterprises financial statements

Illustrating the results of the analysis of the influence of value-forming components on the dynamics of the market capitalization of Ukrainian machine-building enterprises (Figure 1), it can be concluded that the discount rate and the terminal growth rate are the factors with the most influential impact. In order to study the variability of the market capitalization indicator, its sensitivity analysis to changes in the mentioned indicators has to be conducted (Table 6).

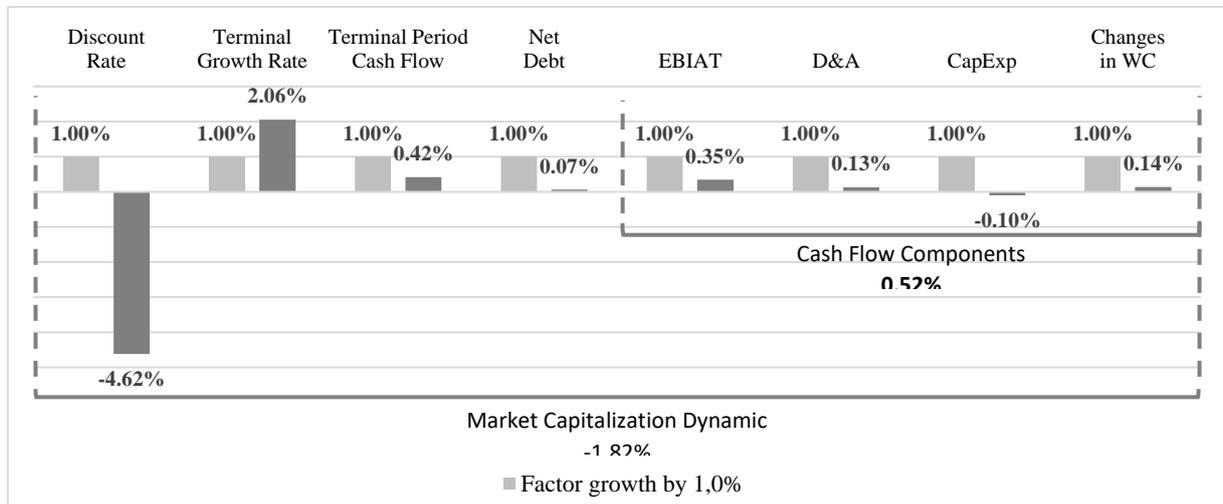


Fig. 1. Illustration of the impact of the main value-forming components on the dynamics of Ukrainian machine-building enterprises

Source: calculated by the author based on the enterprises financial statements

Table 6. Sensitivity analysis of Ukrainian machine-building enterprises market capitalization on dynamics of discount rate and terminal growth rate

		Discount rate									
		21.97%	22.22%	22.47%	22.72%	22.97%	23.22%	23.47%	23.72%	23.97%	
		-1.00%	-0.75%	-0.50%	-0.25%	+0.00%	+0.25%	+0.50%	+0.75%	+1.00%	
Terminal Growth Rate	1.20%	-1.00%	41039.4	40541.9	40056.3	39582.2	39119.1	38666.7	38224.7	37792.7	37370.3
	1.45%	-0.75%	41245.7	40741.4	40249.2	39768.8	39299.7	38841.5	38393.9	37956.5	37529.0
	1.70%	-0.50%	41457.1	40945.6	40446.7	39959.7	39484.4	39020.2	38566.9	38124.0	37691.2
	1.95%	-0.25%	41673.6	41154.8	40648.9	40155.2	39673.4	39203.1	38743.8	38295.3	37857.0
	2.20%	+0.00%	41895.4	41369.1	40855.9	40355.3	39866.9	39390.2	38924.9	38470.5	38026.6
	2.45%	+0.25%	42122.9	41588.8	41068.1	40560.3	40065.0	39581.8	39110.1	38649.7	38200.0
	2.70%	+0.50%	42356.1	41813.9	41285.5	40770.3	40267.9	39777.9	39299.7	38833.1	38377.4
	2.95%	+0.75%	42595.3	42044.7	41508.3	40985.5	40475.8	39978.8	39493.9	39020.8	38559.0
	3.20%	+1.00%	42840.8	42281.5	41736.8	41206.1	40688.8	40184.5	39692.7	39213.0	38744.8

Source: calculated by the author based on the enterprises financial statements

The conducted analysis illustrates the importance of the discount rate factor, which is confirmed by the dynamics of market capitalization from 39866.9 mUAH to 38924.9 mUAH as a result of an increase in the mentioned indicator by 0.50% (from 22.97% to 23.47%). The dynamics of the terminal growth indicator by 1.0% (from 2.20% to 3.20%) only partially compensates for the change in market capitalization under the influence of the mentioned dynamics of the discount rate (by 81.5%, which is 767.8 mUAH from 942.0 mUAH). In order to research the compensation of the given dynamics more carefully, a detailed representation of the sensitivity analysis of the market capitalization with a step of the discount rate change in the amount of 0.15% was conducted. This made it possible to reveal the most accurate level of mutual compensation of these factors, in which an increase in the value of the terminal growth indicator (in the amount of 1.8%) compensates the dynamics of the discount rate (an increase in the amount of 0.75%) by 99.98%. Wider ranges of changes in factors, the occurrence of which in practice is possible due to the adoption of enterprises strategic decisions regarding the optimization of the main components of their weighted average cost of capital, require additional calculations.

**Conclusion.** The article solves a complicated scientific task – the further development of a scientific-methodical approach to the implementation of a factor analysis of the influence of value-forming components on the dynamics of the market capitalization of enterprise, which is implemented on the basis of the materials of machine-building enterprises of Ukraine. The results of the study revealed that the basis of the formation of the market capitalization of representative enterprises is their market value, as well as the level of total debt, cash and cash equivalents. According to factor analysis data, it was determined that the most significant level of influence on the market capitalization indicator of machine-building enterprises has the dynamics of the discount rate, which is represented by the indicator of the companies weighted average cost of capital (WACC). The analysis revealed that terminal growth rate, based on macroeconomic trends and global trends in the development of the world economy, is beyond the influence of enterprises, however, the degree of influence of this indicator, as confirmed by the results of the sensitivity analysis, is completely neutralized by the optimization of the weighted average cost of capital. It is proven that the component of the terminal cash flow is under the partial influence of enterprises, which is described by the nature of the formation of terminal growth, as well as the ability to form the level of cash flows during the forecast period, which are the basis of post-forecast growth. During the analysis, it was found out that the components of the forecast period cash flow, which are under the direct influence of enterprises, have an impact measured by the growth of the target indicator by 0.52% with their positive dynamics by 1.00%, which is largely based on the weight of the change in the EBIAT indicator (growth of market capitalization by 0.35% with growth of EBIAT indicator by 1.00%). The obtained research results have high practical value for the further development of a management solutions system for increasing the market capitalization of Ukrainian machine-building enterprises.

#### **Author contributions**

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Funding acquisition: Oleksandr Burban

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