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ASSESSMENT OF THE IMPACT OF FINANCIAL AND NON-FINANCIAL INSTRUMENTS ON EQUITY AND CASH FLOWS AS THE BASIS FOR DECISION-MAKING TO INCREASE ENTERPRISE MARKET CAPITALIZATION

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ABSTRACT

The market capitalization of an enterprise is one of the key indicators that characterize the degree of influence of financial and non-financial instruments on its volumes and dynamics. Establishing the relationship between such instruments and metrics of equity and cash flows best outlines the plane of their direct impact on stimulating market capitalization and implementing effective management measures in the context of optimizing the use of equity and cash flows. The purpose of the study is to establish how the impact of indicators of financial and non-financial instruments on equity and cash flows forms an appropriate basis for making managerial decisions to increase the market capitalization of enterprises. As a result of the study, the toolkit for increasing the market capitalization of the enterprise from the standpoint of its grouping in terms of financial and non-financial plane was clarified. It was found that among the 36 analyzed indicators of the impact on equity and cash flows of the studied machine-building enterprises in Ukraine during the period 2010-2021, the most significant are bank lending, investment and technical metals, research and development costs, foreign scientific and technical services received, production investments, work-in-progress, and accounts payable for products, goods, and services. The results were transformed into a model of ranked instruments for stimulating the market capitalization of machine-building enterprises, which demonstrates the degree and directions of the influence of indicators of financial and non-financial instruments on the dynamics of equity and cash flows, which ensures the formation of an information database for making decisions on the further use of such instruments. The structuring of the toolkit serves as the basis for forming a system of management decisions containing practical recommendations within each group of instruments aimed at optimizing market capitalization through increased equity and cash flows of the enterprise. The obtained results will be beneficial to financial analysts of enterprises in preparing databases for making financial and non-financial decisions.

Keywords: market capitalization, financial instruments, non-financial instruments, impact, equity, cash flow, enterprise

JEL Classification: C25, D24, G23

INTRODUCTION

Studying the impact of financial and non-financial instruments on the dynamics of enterprise equity and cash flows plays a crucial role, both in terms of developing measures for further optimizing these indicators and in terms of their influence on increasing market capitalization. This is particularly relevant for machine-building enterprises, whose stocks are often traded outside the stock exchange and which must constantly seek additional opportunities to increase their equity, enhance cash flows, and grow their market capitalization. Despite the extensive development of this issue in corporate finance theory, there is still vigorous debate surrounding the choice of instruments for stimulating enterprise market capitalization in terms of studying the relationship with the dynamics of equity and cash flows.

Firstly, because enterprise market capitalization is most often characterized by its dominant value-based nature, expressed in its relationship with the value of the enterprise (Herciu, 2018; Sari Permata & Alkaf, 2020), the market value of its issued shares (Manu, 2018; Kumar et al., 2021), as well as capital growth (Kuvshinov & Zimmermann, 2022). An alternative is an approach that considers expectations of future benefits from the efficiency of enterprise operations and is formed based on current and future cash flows (Wang, 2022; Laghari et al., 2023). A compromise solution should be an approach that models the degree and strength of the influence of financial and non-financial instruments in order to further systematize management decisions regarding the optimization of the dynamics of equity and cash flows. This is precisely what has been done in this study.

Secondly, this is driven by the trends in the development of financial and non-financial markets (Schmidhuber, 2021), which determine the priority in selecting the appropriate toolkit to influence the dynamics of the researched metrics. In particular, economic growth will have a favourable effect on the formation of such trends, stabilization will form neutral influences, while decline and stagnation or crisis manifestations will have a negative effect on the development of such trends.

Thirdly, this is determined by the significance of studying the impact specifically on the dynamics of enterprise equity (Friedrich & Guerin, 2020) and cash flows (Derrien et al., 2022), which can significantly influence market capitalization and enterprise value metrics. Thus, the relationship between the nature of market capitalization formation and the dynamics of its capital highlights the importance of the equity metric, which, when invested in long-term assets, is characterized by high capitalization capable of approaching 100%. Through cash flows, the market value of the enterprise is determined and a plane of instruments of direct influence on the stimulation of market capitalization is formed.

Fourthly, there is also a lack of established approaches to evaluating the impact of financial and non-financial instruments on the dynamics of enterprise equity and cash flows, as well as their differentiation according to the degree and direction of influence.

Fifthly, evaluating the impact of key instruments on equity and cash flows should be accompanied by corresponding financial decisions that have long-term perspectives and shape financial strategic opportunities (Kryvovyazyuk & Strilchuk, 2016). However, in practice, due to the influence of subjective and objective factors, such decisions tend to be predominantly narrow-focused and fragmented.

The mentioned points indicate the relevance of the developed theme aimed at addressing the complex scientific and applied task outlined in the work.

LITERATURE REVIEW

The exploration of possibilities and ways of increasing enterprise market capitalization has always been at the centre of the attention of modern scientists. At the same time, their thoughts on how to accomplish this, which financial and non-financial instruments to utilize, and which methods to apply for evaluating their impact have significantly varied. Additionally, their choices were influenced by whether they were directly evaluating stocks of companies traded on the stock exchange or companies whose market value is formed outside of stock exchange trading, which is characteristic of Ukrainian enterprises lacking sufficient investment attractiveness.

It has been proved that for assessing the impact of financial instruments, there is a positive correlation between market capitalization and the ratio of indicators such as price/earnings, operating income/earnings per share, and working capital per share, and a negative correlation between market capitalization and ROE, ROA, and profit margin, the impact of which on the target indicator is evaluated using multiple regression models (Al-Afeef, 2020; Pavone, 2019). However, the authors themselves note that the variables considered are not decisive factors, and the lack of analysis of the formation characteristics of the selected evaluation instruments, as well as their relationship with the financial decisions made based on research results, pose significant limitations to the implementation of the proposed approaches.

In other studies, indicators of environmental, social, and corporate governance (ESG) have been chosen as measures of the impact of non-financial instruments on market capitalization, which are becoming increasingly important and popular among investors. Among financial instruments, value-added, calculated based on the consolidated financial statements of companies, has been identified as key (Șerban et al., 2022).

Herciu (2018) evaluates and demonstrates the correlation between market capitalization and company value, brand value, and corporate reputation. To assess the impact of both financial and non-financial instruments on market capitalization, similar to previous academic research, a multiple linear regression model was applied. That is, determining the direct

influence of the selected instruments on a company's market capitalization is the predominant approach used in the scientific works of modern scientists. A significant drawback is that it does not allow for determining potential reserves, structuring such impact instruments properly, and forming a system of targeted recommendations for managerial decision-making to stimulate enterprise market capitalization, whether through increasing their equity, cash flows, or comprehensively.

At the same time, in the conditions of the development of market relations in Ukraine, it is important to pay attention to the fact that because of the accumulation of capital, capitalization becomes an important factor in the transformation of its market. Current realities in the Ukrainian economy limit the widespread use of enterprise market capitalization both in assessing their current state and in determining future development prospects (Pronko et al., 2021). This is due to the significant economic problems caused by the hostilities on the territory of Ukraine since 2014, the weak development of the domestic stock market, and the high price of borrowed resources in the period 2010-2021. Consequently, exploring the influence of financial and non-financial instruments on business capital, particularly the metric of equity characterized by high capitalization, emerges as a logical pursuit.

To analyze the capital of enterprises from the standpoint of managing its structure, scientists mainly use the method of comparative analysis of changes in order to assess the impact of external risks and crisis factors in the past, as well as predict changes in the capital structure (Bagatska et al., 2020). The cost of equity is an important element of the financial decision-making process of a business. Hence, some authors emphasize the importance of thoroughly studying the influence of numerous indicators on its dynamics, including ownership structure, dividend policy, ability to forecast financial results, earnings stability, capital flexibility (internal), as well as long-term and short-term interest rates, inflation, sovereign debt, and risks associated with the banking system and financial market (external) (Mokhova & Zinecker, 2019). Evaluating their impact on equity is also conducted using multiple regression models. At the same time, there are other approaches to evaluating company capital (Klimek, 2020). It's worth noting that the selection of impact instruments in each specific case is based on rating assessments and prioritizing the influence on the resultant metric (equity). The disclosure of information about financial instruments also has an indirect impact on the cost of equity (Yamani et al., 2021).

The concept of cash flow plays an important role in the modern theory of financial analysis (Bukvic & Pavlovic, 2023). Assessing the impact of financial and non-financial instruments on cash flows is considered by scholars from two perspectives: traditional (Laghari et al., 2023; Gül & Taştan, 2020) and non-traditional (Kulakov & Kastro, 2018) cash flows. In particular, for the first case, the methodology of generalized estimating equations is used to study the impact of changes in cash flow indicators and metrics, the advantage of which over other methods is its "ability to reliably estimate the variances of regression coefficients for data samples that show a high correlation between repeated measurements" (Laghari et al., 2023). Another paper examines the impact of monetary policy, financial macroeconomic conditions, and the global financial crisis (external instruments) on the sensitivity of cash flows to firms' fixed asset investments for two samples: listed and unlisted firms (Gül & Taştan, 2020). These results are interesting in terms of the instruments used for the analysis and the similarity with the development of the stock market in Ukraine, where more attention is paid to unlisted firms. Taking into account the fact that some instruments have a borrowing cash flow (non-traditional cash flow), Kulakov & Kastro (2018) discuss how to use the generalized net present value method to calculate the yield of a financial instrument with a non-traditional cash flow based on the average rate of return. At the same time, this approach is limited to banking operations.

Among the instruments of stimulating influence on the market capitalization of enterprises, researchers also identify foreign investment (Kim & Jo, 2019), certain types of securities (Uchendu, 2023), intangible assets, research and development costs (Postuła & Chmielewski, 2019), and technological changes (Yemelyanov et al., 2022).

A review of the scientific literature demonstrates certain shortcomings of the applied scientific approaches, which are most often limited to assessing the impact of financial instruments on equity and cash flows, and the indicators used for the assessment do not allow for the preparation of a proper justification for financial decision-making. This is due to the limited number of analyzed instruments of influence on equity and cash flows, and the lack of a comprehensive approach to addressing the issues under study. At the same time, the above indicates the expediency of using multiple linear regression models for such an assessment. The above convinces us of the need to develop theoretical and methodological foundations and practical recommendations for assessing the impact of financial and non-financial instruments on equity and cash flow indicators on the basis of an integrated approach, with a view to preparing the necessary information database for financial decision-making.

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AIMS AND OBJECTIVES

The main purpose of this study is to demonstrate how the impact of indicators of financial and non-financial instruments on the equity and cash flows of enterprises forms an appropriate basis for making managerial decisions to increase the market capitalization of an enterprise.

In order to achieve this goal, the following tasks have been solved:

- to build an architecture of the impact of instruments for stimulating the market capitalization of an enterprise on the dynamics of equity and cash flows;
- to determine the impact of indicators of financial and non-financial instruments on the equity and cash flows of machine-building enterprises of Ukraine;
- differentiation of financial and non-financial instruments in accordance with the degree and direction of influence of their indicators on the dynamics of equity and cash flows of machine-building enterprises of Ukraine is carried out;
- a system of managerial decisions on the implementation of a toolkit to stimulate the market capitalization of machine-building enterprises of Ukraine is proposed.

METHODS

In the framework of our study, we propose a comprehensive scientific approach to solving the problem of adequate assessment of the impact of financial and non-financial instruments on the equity and cash flows of Ukrainian machine-building enterprises, which is intended to clarify the system of decisions on increasing their market capitalization.

For this purpose, in the research process, we used the following methods: generalization and grouping – to build the architecture of the impact of the toolkit for stimulating the market capitalization of an enterprise on the target indicator, multiple linear regression models – to determine the impact of indicators of financial and non-financial instruments on the equity and cash flows of an enterprise, the method of direct ranking – to determine the degree and direction of influence of indicators of financial and non-financial instruments on the dynamics of equity and cash flows, the method of establishing cause-and-effect relationships – for the formation of a system of management decisions to implement toolkit to stimulate the market capitalization of an enterprise, logical generalization and analytical method – for formulating conclusions.

The formation of the information database was carried out using the targeted sampling method based on the consolidation and processing of financial statements of machine-building enterprises for the period 2010-2021. 189 joint-stock companies representing the heavy, medium and general machine-building industries were included in the studied sample of machine-building enterprises, taking into account the specifics of market capitalization formation in accordance with the stock and financial aspects. Subsequently, taking into account their specialization and indicators of stability of business activity, availability of financial and economic statements and databases, geographical representation, issuance activity and the impact of military factors, their number was reduced to 12, including JSC "Ukrainian Energy Machines", PJSC "Dnipropetrovsk Aggregate Plant", PJSC "Novokramatorsky Mashinostroitelny Zavod", JSC "Dneprotyazhmash", JSC "Motor Sich", JSC "Hidrosyla", JSC "Sumy plant Nasosenergomash", PJSC "Kalynivsky Machine Building Plant", PJSC "SKF Ukraine", JSC "Dnieper Railway Switch Plant", JSC "Kriukov Car Building Works", PJSC "Dniprovagonmash". Their share in the volume of sold products in the machine-building industry amounted to 15.5% in the reporting period.

The impact of indicators of financial and non-financial instruments on the equity and cash flows of machine-building enterprises is determined using a multiple linear regression model since it most adequately allows for establishing the relationship between the selected values and assessing their quantitative impact on the resulting indicator. This is also due to the formation of a sample with a significant number of factors while ensuring a high level of mathematical accuracy of the results. An overview of the model used is presented below:

$$Y = a_0 + a_1 \times X_1 + a_2 \times X_2 + \ldots + a_n \times X_n + e \qquad (1)$$

where Y – indicator of representative enterprises' equity/cash flow; $X_1, X_2, \ldots, X_n$ – defined incentive instruments for increasing the market capitalization of enterprises; $a_0, a_1, \ldots, a_n$ – modelled value of the strength of the incentive instruments; e – error value (random variable).

In order to scale the direct values of the indicators to their uniformity, the initial data were further standardized.

The sample of the studied incentive instruments that could affect equity/cash flows included 36 indicators that took into account the impact of financial markets (debt capital, insurance, securities, currency, metals, real estate) and non-financial instruments (technological, innovative, organizational, internal investment, operational, and liability management) and were statistically significant. The selected indicators became the basis for building models of the impact of financial/non-financial instruments to stimulate market capitalization on the equity/cash flows of machine-building enterprises. As a result of subsequent observations, the resulting variables were selected from among the analyzed indicators by checking the pairwise correlation coefficients of all variables and the calculated significance levels for each of the analyzed models.

Determination of the degree and direction of influence of the instruments is based on their rank division, which is based on the results of the regression analysis of representative indicators and selected components of market capitalization. In the context of the analysis, the following ranks are allocated: Rank A – high level of direct influence; Rank B – medium direct influence; Rank C – low direct influence; Rank D – low indirect influence; Rank E – medium indirect influence; Rank F – high indirect influence. The rank ranges were calculated using the direct ranking method by determining the step of negative and positive values based on the minimum (for the step of negative values) and maximum (for the step of positive values) regression parameters. A significant advantage of this method is its ease of use.

The results obtained are transformed into a model of ranked instruments to stimulate the market capitalization of machine-building enterprises, which demonstrates the relationship between the degree and direction of influence on the dynamics of their equity and cash flows, providing the formation of an information database for making decisions on the further use of financial and non-financial instruments to stimulate the increase of their market capitalization.

Thus, the results of the study obtained at the previous stages serve as a starting point for the formation of a system of management decisions on the implementation of tools to stimulate the market capitalization of an enterprise. Taken together, this is aimed at increasing the equity capital and increasing the cash flows of the analyzed enterprises.

RESULTS

The architecture of the impact of instruments for stimulating the market capitalization of an enterprise on the dynamics of equity and cash flows

In the context of the stimulating impact on the market capitalization of an enterprise, we propose to divide the instruments into financial and non-financial ones, which is due to the dual nature of the interpretation of the essence of market capitalization (Figure 1).

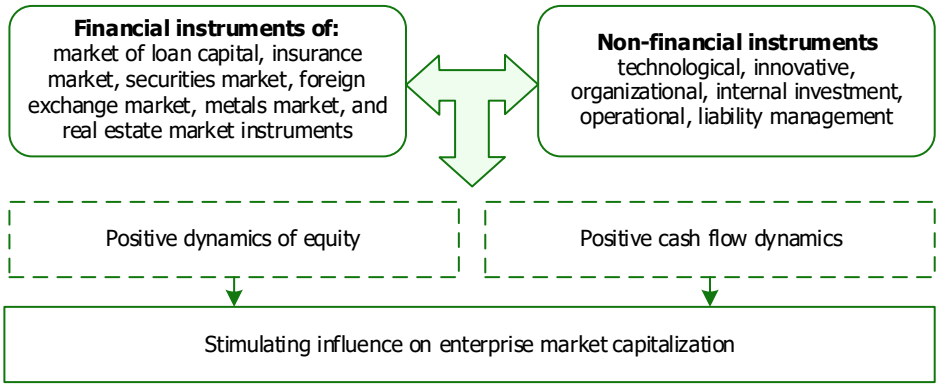

Figure 1. Financial and non-financial instruments for stimulating enterprise market capitalization from the standpoint of their impact on the dynamics of equity and cash flows.

In the context of the use of financial instruments by enterprises, the task of increasing the efficiency of financial resources management and further development of a system of measures to optimize the process of their attraction and use was solved. In order to achieve these goals, in the context of the main financial markets the following instruments were systematized: instruments of the market of loan capital (effective use of the range of banking services), the insurance market (implementation of insurance services in the company's activities), the securities market (raising capital by issuing securities), the foreign exchange market (effective use of exchange rate differences and their dynamics), the metals market (stockpiling and effective use of metals for technical and investment purposes), and instruments of real estate market (mortgage loans, purchase and sale of land plots, etc.).

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Within the framework of the formation of the non-financial plane and the appropriate use of non-financial instruments, the task of increasing the efficiency of the enterprise is solved. At the same time, there is a need to distinguish such instruments in terms of external and internal components of the non-financial plane and to further differentiate them based on the nature of the formation of the relevant instruments.

In terms of the external component, which is formed outside the enterprise and is determined by global and national market trends, peculiarities of development of productive forces at a particular stage, etc., it is proposed to divide non-financial instruments into technological (implementation of advanced technologies available on the market), innovative (production of new products or creation of qualitatively new solutions) and organizational instruments (use of best practices in the field of building and organizing operational activities).

Non-financial instruments in terms of the internal component, which, being generated within the enterprise, is determined by the results of the optimal use of its internal potential, we propose to divide it into operational instruments (aimed at improving the operational activities of the enterprise), internal investments (expansion by redirecting the available funds of the enterprise to the implementation of investment projects), liability management tools (optimization of incoming and outgoing obligations of the enterprise).

The architecture of the influence of instruments for stimulating the market capitalization of an enterprise on the dynamics of equity and cash flows demonstrates the system of interrelations that is formed in the process of finding management solutions that will ensure the increase of the enterprise's market capitalization.

The impact of financial and non-financial instrument indicators on the equity and cash flows of Ukrainian machine-building enterprises.

To determine the impact of financial instruments on the amount of equity of representative enterprises, we will form a table of initial data within the framework of the main capital-forming indicators of the main financial markets (Table 1), the results of standardization of which are summarized in Table 2.

Table 1. Data for calculating the impact of financial instruments to stimulate market capitalization on the equity of machine-building enterprises. Notes: Y – the value of equity of representative enterprises, UAH billion; X_1 – the amount of loans granted by banks to business entities, UAH billion; X_2 – the amount of bank liabilities to business entities, UAH billion; X_3 – provision of factoring services, UAH billion; X_4 – the amount of funds lent by financial organizations, UAH billion; X_5 – the value of financial leasing agreements concluded with legal entities, UAH billion; X_6 – net insurance payments, UAH billion; X_7 – the value of the Ukrainian stock index UX, UAH; X_8 – the value of the S&P 500 index of the US stock market, USD; X_9 – Euronext 100 index of the European stock exchange of the same name, EUR; X_{10} – official NBU exchange rate of the USD to the Ukrainian, UAH; X_{11} – price per 1 ounce of gold (London fixing), USD; X_{12} – price per 1 ounce of silver (London fixing), USD.; X_{13} – volume of mortgage loans to non-financial corporations, UAH billion.

Variables	Research period											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
X_1	508.2	580.9	609.2	698.8	802.6	830.6	840	864.4	919.1	821.9	749.3	795.5
X_2	144.0	186.2	202.6	234.9	261.4	318.6	369.9	404	406.4	498.2	646.5	758.4
X_3	6.4	6.9	11.7	10.0	23.5	16.6	16.9	31.4	48.1	56.5	84.8	72.4
X_4	0.02	0.2	1.2	2.6	3.4	1.8	5.8	26.9	51.9	79.2	89.2	125.5
X_5	5.0	11.3	14.7	31.5	7.2	6.2	9.8	12.8	21.5	24.6	24.1	39.1
X_6	5.9	4.7	5.0	4.5	4.9	7.6	8.6	10.3	12.4	14.0	13.6	13.2
X_7	2493.2	1476.7	973.6	910.0	1033.6	685.9	795.8	1339.1	1710.7	1518.7	1617.1	1738.2
X_8	1256.8	1265.3	1413.6	1782.6	1995.0	1940.2	2278.9	2823.8	2704.1	3225.5	3714.2	4515.6
X_9	690.8	592.9	684.3	786.6	906.3	874.3	916.7	1063.0	973.1	1120.2	1085.4	1318.5
X_{10}	7.91	7.97	7.99	7.99	15.18	23.47	25.74	26.75	27.95	24.19	28.28	26.66
X_{11}	1368.5	1598.0	1656.0	1226.0	1172.0	1106.4	1189.5	1314.9	1292.2	1553.6	1943.2	1792.6
X_{12}	40.5	29.2	30.4	20.2	16.4	14	16.5	17.1	15.8	17.9	27.5	22.5
X_{13}	4.6	4.7	1.1	4.1	3.6	1.7	1.3	3.8	1.8	1.1	1.2	0.5
Y	11.8	14.7	19.1	21.6	24.1	29.6	31.7	38.3	40.7	38.3	40.6	42.6

Table 2. Standardized data for calculating the impact of financial instruments to stimulate market capitalization on the target indicator.

Variables	Research period											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
X_1	-1.926	-1.351	-1.127	-0.419	0.403	0.624	0.698	0.892	1.324	0.555	-0.019	0.346
X_2	-1.194	-0.970	-0.883	-0.712	-0.572	-0.268	0.003	0.184	0.197	0.683	1.469	2.062
X_3	-0.953	-0.935	-0.757	-0.820	-0.319	-0.575	-0.564	-0.026	0.593	0.905	1.954	1.494
X_4	-0.740	-0.736	-0.713	-0.681	-0.663	-0.700	-0.608	-0.124	0.449	1.075	1.304	2.137
X_5	-1.137	-0.556	-0.242	1.310	-0.934	-1.027	-0.694	-0.417	0.386	0.673	0.626	2.012
X_6	-0.742	-1.057	-0.978	-1.110	-1.005	-0.296	-0.033	0.414	0.965	1.386	1.281	1.175
X_7	2.217	0.232	-0.750	-0.874	-0.633	-1.311	-1.097	-0.036	0.689	0.314	0.506	0.743
X_8	-1.128	-1.119	-0.974	-0.613	-0.406	-0.459	-0.128	0.405	0.288	0.798	1.276	2.060
X_9	-1.081	-1.547	-1.112	-0.624	-0.054	-0.207	-0.005	0.692	0.264	0.965	0.799	1.910
X_{10}	-1.260	-1.254	-1.251	-1.251	-0.447	0.481	0.735	0.848	0.982	0.561	1.019	0.838
X_{11}	-0.245	0.608	0.824	-0.775	-0.976	-1.219	-0.910	-0.444	-0.529	0.443	1.891	1.332
X_{12}	2.274	0.860	1.010	-0.267	-0.743	-1.043	-0.730	-0.655	-0.818	-0.555	0.647	0.021
X_{13}	1.370	1.434	-0.869	1.050	0.730	-0.485	-0.741	0.858	-0.421	-0.869	-0.805	-1.253
Y	-1.614	-1.348	-0.945	-0.717	-0.488	0.016	0.208	0.813	1.032	0.813	1.023	1.206

Independent variables X_1-X_5 are representative indicators of the debt capital market, variable X_6 – of the domestic insurance market, variables X_7-X_9 – of the securities markets, variable X_{10} – of the foreign exchange market, variables X_{11}-X_{12} – of the metals market, and variable X_{13} – of the real estate market.

In order to exclude from the model, the factors that do not have an impact on the dependent variable, as well as to avoid the phenomenon of multicollinearity of the factor (dependent) variables, a correlation analysis of all variables was carried out. The analysis based on the Statistica 10.0 software allowed to form a multivariate regression model of the impact of financial instruments to stimulate market capitalization on the equity of representative enterprises:

$$Y = 0.661X_1 + 0.205X_2 + 0.443X_3 + 0.182X_4 + 0.202X_5 \quad (2)$$

where X_1 – is the amount of loans granted by banks to economic entities; X_2 – the value of financial leasing agreements concluded with legal entities; X_3 – official NBU exchange rate of the US dollar to the Ukrainian hryvnia; X_4 – the price per 1 ounce of gold (London fixing); X_5 – the price per 1 ounce of silver (London fix).

The model illustrates that bank lending and the official NBU exchange rate of the US dollar to the Ukrainian hryvnia, which represent the instruments of the debt capital market and the foreign exchange market, have the greatest impact on the formation of equity capital of machine-building enterprises. This dependence emphasizes the significant role of the banking sector and the high impact of currency fluctuations on the activities of enterprises, which is due to their export-oriented nature.

The obtained results demonstrate a high level of adequacy of the constructed model, as evidenced by the values of the multiple correlation coefficient (R = 0.997), the coefficient of determination (R^2 = 0.994) and the adjusted coefficient of determination for the number of observations and the number of parameters ($Adj.R^2$ = 0.989). As well as the Fisher's adequacy criterion, the value of which (190.4) exceeds the table value.

The calculations for the other models were performed in a similar manner. The final results of the regression analysis are summarized in Table 3.

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Table 3. Summary results of multivariate regression analysis of indicators of incentive instruments for market capitalization of machine-building enterprises. Note: factors with the most significant impact are in italics.

Objects of impact	Groups of tools		
	Financial	Non-financial	
		External	Internal
Equity	$Y = 0.661X_1 + 0.205X_2 + 0.443X_3 + 0.182X_4 + 0.202X_5$	$Y = 0.422X_1 - 0.424X_2 - 0.214X_3 + 0.930X_4$,	$Y = 0.057X_1 - 0.104X_2 + 1.235X_3 + 0.250X_4 + 0.136X_5 + 0.157X_6 - 0.462X_7$,
	where X_1 – the amount of loans granted by banks to economic entities; X_2 – the value of financial leasing agreements concluded with legal entities; X_3 – official NBU exchange rate of the US dollar to the Ukrainian hryvnia; X_4 – price per 1 ounce of gold (London fixing); X_5 – price for 1 ounce of silver (London fixing).	where X_1 – the amount of R&D services exported by domestic enterprises; X_2 – the sum of R&D services imported by domestic enterprises; X_3 – the sum of scientific and technical services imported by all domestic enterprises X_4 – the price growth index for manufacturers of machine-building products.	where X_1 – the cost of purchasing non-current assets; X_2 – the value of current financial investments; X_3 – amount of depreciation and amortization; X_4 – additional capital; X_5 – increase in work in progress; X_6 – tax burden ratio; X_7 – current accounts payable for products.
Cash flows	$Y = -2.842X_1 - 1.323X_2 + 0.344X_3 + 1.095X_4 + 0.886X_5 - 0.471X_6 + 0.962X_7 + 0.634X_8 - 3.541X_9$,	$Y = -0.984X_1 + 1.403X_2 - 1.089X_3 + 0.453X_4 - 1.236X_5 + 0.749X_6$,	$Y = 0.134X_1 + 0.904X_2 + 0.218X_3 - 0.181X_4$,
	where X_1 – the amount of loans granted by banks to economic entities; X_2 – provision of factoring services; X_3 – amount of funds lent by financial organizations; X_4 – net insurance payments; X_5 – Ukrainian stock index UX; X_6 – S&P 500 index of the US stock market; X_7 – official NBU exchange rate of the US dollar to the Ukrainian hryvnia; X_8 – price per 1 ounce of gold (London fixing); X_9 – price for 1 ounce of silver (London fixing).	where X_1 – the volume of exports of high-tech domestic products; X_2 – the amount of R&D services exported by domestic enterprises; X_3 – the sum of R&D services imported by domestic enterprises; X_4 – the sum of scientific and technical services imported by all domestic enterprises X_5 – the share of R&D expenditures in GDP; X_6 – the number of registered utility models in the field of mechanical engineering.	where X_1 – is the cost of purchasing non-current assets; X_2 – level of operating profitability; X_3 – increase in work in progress; X_4 – tax burden ratio;

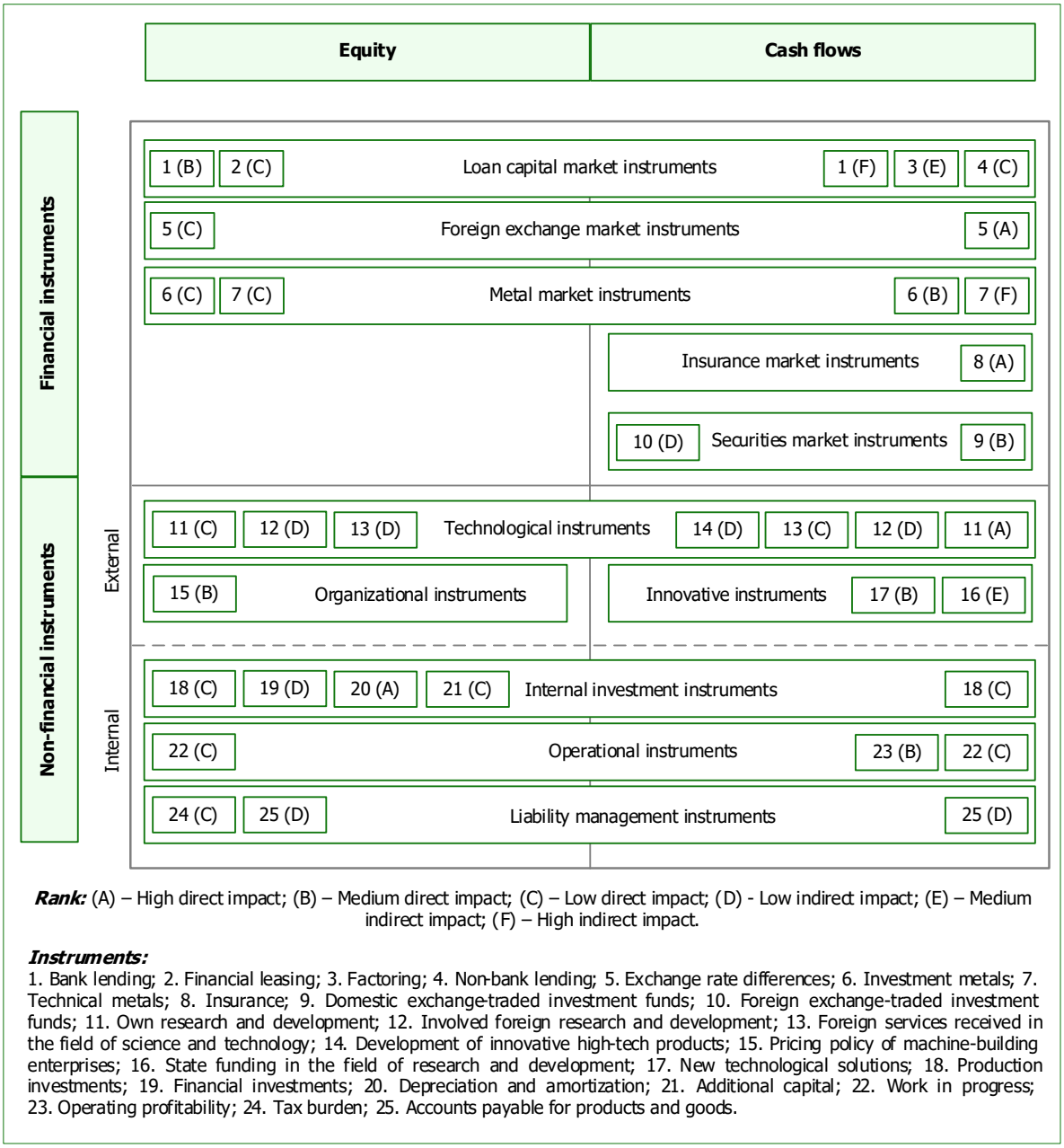
The summary results of the multivariate regression analysis of the indicators of stimulating instruments of the market capitalization of machine-building enterprises show that the most stimulating impact on the dynamics of their equity was made by such a financial instrument as the amount of loans granted. Among non-financial instruments, the most stimulating impact had price growth (external) and the amount of depreciation and amortization (internal). As for the impact on the cash flows of machine-building companies, the most negative impact on the change in the target indicator among financial instruments was made by the volume of loans granted by commercial banks and the volume of factoring services. The stock market development, changes in the US dollar exchange rate, and the dynamics of gold and silver prices had a positive impact. Regarding the impact of non-financial instruments, among external instruments, the largest negative impact was made by the volume of exports of high-tech domestic products and the share the share of R&D expenditures in GDP. The growth in the number of registered utility models had a positive impact. Among internal non-financial instruments, the most significant positive impact on the cash flows was the growth of operating profitability.

The obtained research results are the basis for determining the degree and vector of influence of financial and non-financial instrument indicators on the dynamics of equity and cash flows of machine-building enterprises of Ukraine.

Differentiation of financial and non-financial instruments according to the degree and influence direction of their indicators on the dynamics of equity and cash flows of Ukrainian machine-building enterprises

For further interpretation of the research results, it is important to rank financial and non-financial instruments for increasing the market capitalization of machine-building enterprises. This is significantly facilitated by the authors' developed method of analyzing the stimulating impact on market capitalization, which demonstrates the degree and direction of influence of the main instruments, in particular, in the context of their groups, on the target indicator. In the developed model, the ranges of ranks are calculated using the direct ranking method, meaning by determining the step of negative

and positive values based on the minimum (for the step of negative values) and maximum (for the step of positive values) regression parameters (Figure 2).



Rank: (A) – High direct impact; (B) – Medium direct impact; (C) – Low direct impact; (D) - Low indirect impact; (E) – Medium indirect impact; (F) – High indirect impact.

Instruments:
1. Bank lending; 2. Financial leasing; 3. Factoring; 4. Non-bank lending; 5. Exchange rate differences; 6. Investment metals; 7. Technical metals; 8. Insurance; 9. Domestic exchange-traded investment funds; 10. Foreign exchange-traded investment funds; 11. Own research and development; 12. Involved foreign research and development; 13. Foreign services received in the field of science and technology; 14. Development of innovative high-tech products; 15. Pricing policy of machine-building enterprises; 16. State funding in the field of research and development; 17. New technological solutions; 18. Production investments; 19. Financial investments; 20. Depreciation and amortization; 21. Additional capital; 22. Work in progress; 23. Operating profitability; 24. Tax burden; 25. Accounts payable for products and goods.

Figure 2. Model of ranked instruments for stimulating market capitalization of machine-building enterprises.

It is established that among the above financial instruments, the broadest range of impact (both on equity and cash flows) is provided by: bank lending – from the standpoint of reflecting the amount of loans granted by banks to business entities; investment metals – outlined by the price of 1 ounce of gold; industrial metals – formed by the price of 1 ounce of silver, due to the active use of this metal in industrial production.

Among the analyzed non-financial external instruments, the broadest range of impact have: own and foreign research and development – measured by the amounts of research and development-related services exported and imported by enterprises; foreign services received in the field of science and technology – measured by the amount of scientific and technical services imported by enterprises.

The results of creating a model of ranked instruments for stimulating the market capitalization of machine-building enterprises serve as a basis for further development of a system of management decisions on increasing equity and cash flows.

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Formation of a system of managerial decisions for implementation of the toolkit to stimulate market capitalization of Ukrainian machine-building enterprises

Modern management, based on the analysis of the influence of financial and non-financial instruments on the dynamics of equity and cash flows, to ensure comprehensive impact on the growth of market capitalization of the researched machine-building enterprises, requires comprehensive approaches to address the set tasks. This is primarily due to the importance of considering all useful results for managers, orientation towards achieving long-term goals, and the necessity of comprehensive justification of implemented managerial decisions. Accordingly, we recommend a number of practical measures in these areas.

1. *In the sector of developing and adopting finance-oriented managerial decisions to ensure the use of appropriate instruments of stimulating of:*

- the equity of machine-building enterprises: through optimizing the use of the "financial leverage" effect, minimizing devaluation risks by preserving existing capital in currency, and utilizing financial leasing for acquiring fixed assets;
- the cash flows of enterprises: by minimizing the volumes of consumer credits used, stimulating product exports to optimize the impact of exchange rate differences, and hedging production risks;
- both equity and cash flows simultaneously: based on restructuring loans with high interest rates, as well as through optimizing raw material prices by exploring alternative suppliers.

2. *In the sector of preparation and adoption of non-financial external decisions, which will optimize the increase of:*

- enterprise equity: by raising product prices while minimizing the negative impact on demand levels;
- cash flows of machine-building enterprises: by ensuring technological upgrading of the enterprise through the implementation of new technological solutions;
- both equity and cash flows simultaneously: through the implementation of in-house research and development, as well as leveraging advanced international experience in technology transfer.

3. *In the sector of justifying non-financial internal decisions to promote the implementation of instruments for enhancement of:*

- equity – when establishing the most economically feasible useful life of property, implementing the most efficient depreciation mechanisms, and increasing requirements for financial investment selection standards;
- cash flows – by maximizing the level of operating profitability of the enterprise through the implementation of an integrated approach, increasing requirements for the standards of production investments selection;
- equity and cash flows – in normalizing the level of work-in-progress, optimizing production-related accounts payable and preventing the emergence of overdue, doubtful or irrecoverable accounts receivable.

The recommended system of managerial decisions (Figure 3) will ensure the implementation of instruments to stimulate the market capitalization of machine-building enterprises in terms of increasing indicators of equity, cash flows, or a combination of these indicators comprehensively.

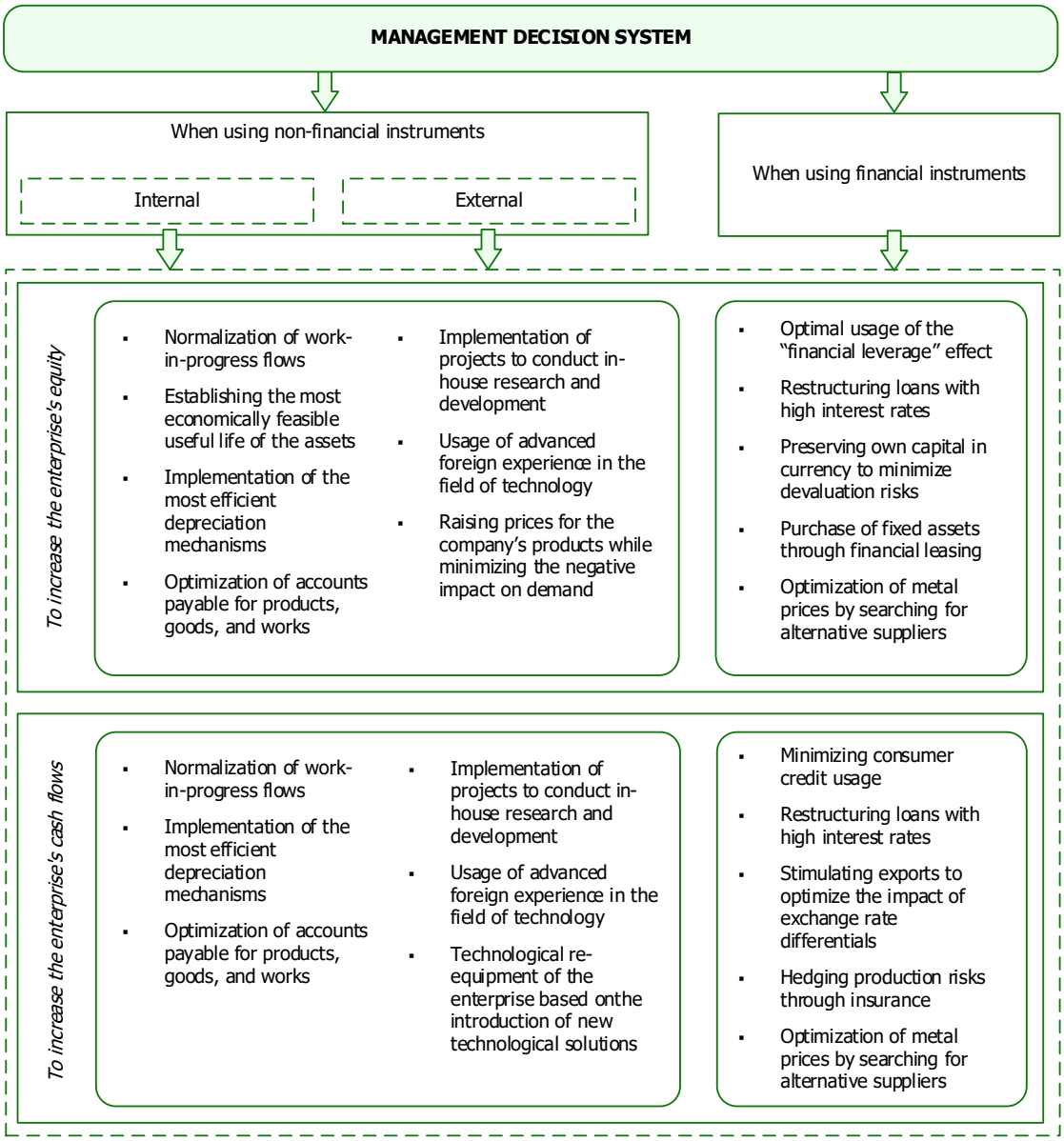

Figure 3. Management decisions system for implementing the toolkit to stimulate market capitalization of Ukrainian machine-building enterprises.

The results of regression analysis regarding the correlation between the stimulating instruments of market capitalization and the metrics of equity and cash flows, along with the developed model of ranked instruments and management decision system for the application of capitalization stimulation toolkit in machinery enterprises, serve as the basis for further optimization of enterprise market capitalization. This optimization is approached from the perspective of refining the objective component of the capitalization management mechanism and implementing effective management measures in the context of capital structure optimization.

DISCUSSION

The analysis carried out in the article allows to determine which indicators of financial and non-financial instruments and to what extent affect the dynamics of equity and cash flows of machine-building enterprises. In addition, the results of the analysis serve as an analytical basis for developing a system of management decisions that will have a positive impact not only on the dynamics of equity and cash flows but also indirectly contribute to the increase in the market capitalization of the enterprise. At the same time, it should be mentioned that the market capitalization of domestic enterprises, in particular machine-building enterprises, is much lower compared to similar indicators of European or American companies. The main obstacles to the increase of equity and cash flows of enterprises, and therefore the growth of the market capitalization of

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machine-building enterprises, are the low level of efficiency of financial management of domestic enterprises, insufficient level of introduction of own research and development, weak development of the stock market, low investment attractiveness of enterprises due to high depreciation rates of fixed assets and low rates of technological re-equipment, low operational efficiency, use of credit resources with high interest rates, unfavourable country export policy, hostilities on the territory of Ukraine in centres of concentration of industrial enterprises, including machine-building enterprises. On the other hand, this lag is also due to the constant introduction of innovations in business, including in the financial sector (Kryvovyazyuk et al., 2023), to which Ukrainian machine-building enterprises are unable to respond in a timely manner.

Due to the novelty of the methodology implemented in the article, it is difficult to conduct a comprehensive comparison of the results obtained with the results of previous studies. The research findings presented in this work are only partially reflected in the scientific works of other researchers, primarily at the level of assessing the impact of financial and non-financial instruments on equity and cash flows as separately researched indicators or on the overall market capitalization of the enterprise.

In particular, Mokhova & Zinecker (2019) identified that among the indicators of financial and non-financial instruments for Czech companies, significant influences on the value of equity have informational asymmetry, corporate governance, and financial performance (internal environment), long-term and short-term interest rates, inflation, government debt, credit and financial risks associated with the banking system (external environment). The proposed solutions are focused on increasing the number of companies entering the public and private equity markets and improving the efficiency of financing choices in the business environment. It can be concluded that such results are only partially consistent with the obtained in the article, which can be explained by significant differences in the indicators of economic development between Ukraine and the Czech Republic, as well as the conditions in which enterprises operate.

Gül & Taştan (2020) note the importance of studying the impact on cash flows of some external instruments. They prove that the marginal effect of cash flow on investment may vary depending on the central bank's monetary policy, financial macroeconomic conditions, and the impact of the global financial crisis. The macroeconomic perspective on the researched issue has undeniable value, which is both an advantage and a disadvantage. This is because a narrowly focused analysis does not provide a comprehensive understanding of the impact of instruments and, as a result, does not consider the internal nature, particularly the non-financial instruments.

A certain addition to the research results obtained in the article can be considered the proposals of some authors to use the method of generalized estimating equations when studying the impact of changes in cash flow indicators. The method allows for obtaining more accurate results in assessing the impact of indicators, which is achieved through improved estimation of the variance of regression coefficients for data samples (Laghari et al., 2023).

As ways of increasing market capitalization, the works suggest attracting foreign and domestic investors to purchase shares by getting to know the markets in which companies operate, relying not on the fact of presence of shares on stock exchanges, but on the reputation of the company, as well as high rates and stability of dividend payments (Sönmezer & Sözen, 2014). However, these ways can also be criticized, considering the conditions of implementation of Ukrainian machine-building businesses today.

At the same time, we should not ignore the proposals of scientists to improve methods for assessing the impact of financial and non-financial instruments on the dynamics of equity and cash flows and increasing the market capitalization of enterprises. It is better to consider them as a harmonious addition to this article, because today's market conditions are fast-moving, and management decision-making requires the preparation of information databases of problems and solutions for finding opportunities to solve the tasks set by financiers.

CONCLUSIONS

The scientific approach outlined in the paper solves the problem of adequately assessing the impact of financial and non-financial instruments on the equity and cash flows of Ukrainian machine-building enterprises, providing an opportunity to refine decisions regarding the increase of their market capitalization. The novelty of this research lies in the integration of such components of the process as "methodology – evaluation – result – decision" which was absent in previous scientific publications by scholars on the addressed issue. At the same time, this approach is part of the authors' vision of the management decision-making process in the context of optimizing the use of equity and cash flows to determine the stimulating impact of financial and non-financial instruments.

The article clarifies the instruments for increasing the market capitalization of an enterprise from the standpoint of its grouping in terms of financial and non-financial dimensions. The results of the study have proved the need for a comprehensive and simultaneous assessment of the impact of both financial and non-financial instruments on the indicators of equity and cash flows of enterprises through the integrated use of grouping methods, linear multivariate regression, direct ranking, establishing cause and effect relationships, logical generalization and analytical. This allows for a comprehensive view of further financial management decision-making.

The application of the linear multiple regression method confirmed the feasibility of increasing market capitalization in terms of the growth of equity capital and cash flows of the enterprise, as evidenced by the established interdependence among the 36 analyzed indicators and the defined performance metrics. In particular, the most influential indicators of financial and non-financial instruments during the period 2010-2021 for Ukrainian machine-building enterprises were identified as bank lending, investment and technical metals, research and development costs, foreign scientific and technical services received, production investments, work-in-progress and accounts payable for products, goods, works.

On the basis of the obtained results, a model of ranked tools for stimulating the market capitalization of machine-building enterprises was developed. The model illustrates the relationship between the degree and direction of the influence of financial and non-financial instruments (external and internal) on the equity of enterprises and their cash flows. The developed model became the basis for the formation of a system of management decisions to increase the market capitalization of enterprises by increasing their equity and cash flows.

The use of the system of methodological recommendations and developments proposed in the article is of practical value for domestic machine-building enterprises, as they summarize the results of their practice over a long period of time and in today's conditions. They will also be of interest to foreign companies that operate in an underdeveloped stock market and should focus on optimizing their financial activities, including creating conditions for the growth of equity and cash flows.

Further research and development should be directed towards the formation of a mechanism for managing the market capitalization of enterprises, which, based on the results of assessing the impact of financial and non-financial instruments on equity and cash flows, will determine promising areas for increasing the value and market capitalization of enterprises.

ADDITIONAL INFORMATION

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Project administration: *Iryna Vakhovych*
Writing – review & editing: *Igor Kryvovyazyuk*
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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ОЦІНЮВАННЯ ВПЛИВУ ФІНАНСОВИХ І НЕФІНАНСОВИХ ІНСТРУМЕНТІВ НА ВЛАСНИЙ КАПІТАЛ І ГРОШОВІ ПОТОКИ ЯК ОСНОВА УХВАЛЕННЯ УПРАВЛІНСЬКИХ РІШЕНЬ ІЗ НАРОЩЕННЯ РИНКОВОЇ КАПІТАЛІЗАЦІЇ ПІДПРИЄМСТВ

Ринкова капіталізація підприємства є одним із ключових індикаторів, що характеризують ступінь впливу фінансових і нефінансових інструментів на її обсяги та динаміку. Установлення взаємозв'язку між такими інструментами та метриками власного капіталу й грошових потоків найкраще окреслює площину їхнього прямого впливу на стимулювання ринкової капіталізації та впровадження ефективних управлінських заходів у контексті оптимізації використання власного капіталу й грошових потоків. Мета дослідження – установити, як вплив індикаторів фінансових і нефінансових інструментів на власний капітал і грошові потоки формує відповідну основу для ухвалення управлінських рішень із підвищення ринкової капіталізації підприємства. У результаті дослідження уточнено інструментарій підвищення ринкової капіталізації підприємства з позицій його групування в розрізі фінансової та нефінансової площини. Установлено, що серед 36 аналізованих індикаторів впливу на власний капітал і грошові потоки досліджуваних машинобудівних підприємств України за період 2010-2021 рр. найбільш значимими є банківське кредитування, інвестиційні й технічні метали, витрати на дослідження та розробки, отримані іноземні наукові й технічні послуги, виробничі інвестиції, незавершене виробництво й кредиторська заборгованість за продукцію, товари, роботи. Результати трансформовано в модель ранжованих інструментів стимулювання ринкової капіталізації машинобудівних підприємств, яка демонструє ступінь і напрями впливу індикаторів фінансових і нефінансових інструментів на динаміку власного капіталу та грошових потоків, що забезпечує формування інформаційної бази даних для ухвалення рішень із подальшого використання таких інструментів. Структуризація інструментарію слугує основою формування системи управлінських рішень, що містить практичні рекомендації в межах кожної з груп інструментів, спрямованих на оптимізацію ринкової капіталізації за рахунок приросту власного капіталу та грошових потоків підприємства. Отримані результати будуть корисні фінансовим аналітикам підприємств при підготовці баз даних для ухвалення рішень фінансового та нефінансового характеру.

Ключові слова: ринкова капіталізація, фінансові інструменти, нефінансові інструменти, вплив, власний капітал, грошовий потік, підприємство

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