










“Influence of cost drivers on value-oriented management of investment activity of companies”

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INFLUENCE OF COST DRIVERS ON VALUE-ORIENTED MANAGEMENT OF INVESTMENT ACTIVITY OF COMPANIES

Abstract

Nowadays, there is a constant need to build an appropriate system for assessing the company's value for shareholders, which implies that the company chooses an adequate model based on drivers, which allow making decisions at all management levels associated with investment activity, ensuring an increase in value for owners. The purpose of the article is to improve the methodology for assessing the influence of drivers as a critical element of value-oriented management on the investment activity of companies. The analysis technique consists of two parts. In the first part, regression models of factors influence and cost drivers on the value multipliers and shareholder profits were built. Based on the interpretation of the coefficients obtained, it should be noted that the cost-effectiveness of assets has the most powerful impact on the market value of the company and shareholder's profitability.

Thus, the presence of sustainable competitive advantages, resulting simultaneously in higher company value and profitability, the variable profitability in its turn does not fully reflect the potential for generating cash flows in the future. In the second part of the analysis, the authors built the probit models of the factors influence and cost drivers on the probability that the value multipliers of the market average values and the total profitability of shareholders are above the market average. Based on the relative strength model of the influence factors and drivers of value on value-based management, the recommendations were formulated.

Keywords

probit model, modeling of assessments, shareholders' profitability, cost multipliers

JEL Classification

G11, G17, G32

INTRODUCTION

The development of the business environment offers opportunities to the participants of the capital market. Targets most investors are not so much in the plane to ensure the operational efficiency of the company, finding ways to increase profitability as an increase in revenues due to growth in value. That is why the concept of value-oriented management is gaining ground in the theory and practice of corporate finance.

The aims of value-oriented management of investment activity of companies are: increase in capitalization, value growth (Core values, Aspirational values, Permission-to-play values, Accident values) enterprises for owners. Accordingly, all decisions of the company should aim at achieving these goals. Based on the achievement of goals, VBM (value-based management) can be viewed as a comprehensive company management system aimed at maximizing of the most likely value that should be created by a business, in which an assessment of an organization's performance and applied reward systems are based on added value indicators.

The value measurement system is a fundamental element of the concept of value-oriented management of investment activity of companies, defining the architecture of an organization's management system, and providing management with practical tools for decision-making. Many companies have succeeded, but a large number of them have failed to implement these approaches. The reason for the failure was the performance targets, which were uncertain or did not correspond to the ultimate goal of creating the value. Determining the degree of influence of value drivers based on value-oriented management in a company solves this problem.

VBM assumes the fact that the discounted future cash flows determine the value of a company. Value is created only when companies invest capital with a yield exceeding the value of that capital. VBM extends these concepts by focusing on how companies use them to make key strategic and day-to-day operational decisions. Accurately indicated cost drivers solve this problem by providing VBM - combining the company's overall aspirations, analytical methods, and management processes to focus management decision-making on key value factors. Thus, the issues of building a theory of value-oriented management of the companies' investment activity in the financial and accounting sense are limited to building a theory of measuring drivers as a critical element of value-oriented management.

Among the discussion questions considered in the article is the construction of a system for measuring the value of a company for shareholders, which implies that the company chooses an adequate model based on drivers that allows to make decisions at all management levels that ensures company's value growth for owners.

1. LITERATURE REVIEW

Within the framework of the concept of a value-oriented approach in managing the investment activity of the companies, the following procedures and decisions are organically combined:

- selection of a model and methods for determining the value of a company for its owners;
- monitoring value changes;
- identification of drivers for creating new value;
- establishing a clear relationship between the value of the company for the owners and corporate and business strategies;
- development of financial policies aimed at creating the value;
- identification of mechanisms for coordinating the interests of owners and managers;
- creating a system for measuring the performance results and material incentives (Van Duuren et al., 2015).

It is generally agreed today that the basic tenets of value-oriented investment activity management of companies are no longer in doubt; this concept has taken a decent place in the theory and practice of strategic management. At the same time, a sharp controversy is underway on the choice of management tools for implementing this concept in practice (Law Commission, 2014).

The purpose of the literature review is to determine the value drivers (variables affecting the market cost of a company) concerning the formation of value-oriented management of investment activity of companies, based on previous studies. The formation of common values, principles, processes within the company influences the efficiency of the company's activity, thereby ensuring success in the fight against competitors, which ultimately leads to the achievement of the company's primary goal – maximizing profits and that it is possible to maximize the shareholder value through VBM, which is based on a coherence of a strategy that combines: policies, expected results, remuneration, organization of processes, company employees.

The approach to value-oriented management in which the main aim is to maximize the share-

holder's wealth was investigated by Arnold (1998). The main factors for maximizing the well-being of shareholders are defined: the company's goal, its subsystems, strategy, processes, analytical methods, productivity measures, and culture. The advantages and disadvantages of VBM are as follows:

- advantages:
 - one approach is used both for internal and external use;
 - is effectively used in terms of comparative analysis of competitiveness;
 - is optimal for creating additional value of the company;
 - by optimizing the work of the company positive financial;
 - by focusing on individual business units, it helps to create higher shareholder value;
 - suitable as a strategic tool;
- disadvantages:
 - a diverse number of forms and methods complicate the task of use;
 - the difficulty of predicting a product or service value;
 - high management costs for implementation;
 - the complexity of the transformation of financial indicators in the reporting indicators for customers' shareholders;
 - technical difficulties in measuring – such as the cost of capital of a company.

Above all it defines the strategic drivers of value-oriented investment activity management of companies as a control that influences the process of tactics determination for achieving the goals, taking into account the capabilities, resources, structure, and management system. An essential part of VBM is identifying the priority drivers. Management cannot influence the capitalization of an enterprise unless key drivers are determined and describe new drivers affecting production systems, as well as the process of investing in new technologies. That provides customers' needs satisfaction, as well as ensures the company's com-

petitiveness at the global environmental level. No doubt, the key driver of the company is its size, i.e., the larger the company, the easier it is to engage in the implementation of innovations on all functional elements, gaining maximum risk management capacity, due to the larger amount of available resources and strong infrastructure. Overall, IIF (2015) challenged this assertion in her work, arguing that a large company is not able to make quick management decisions since they have more sophisticated management system, which is characterized by high bureaucracy.

Undoubtedly, the key driver must have the ability to revolutionize. This is because the world is entering the fourth industrial revolution (Industry 4.0) through the capitalization of digitalization (Cenamor, Sjödin, & Parida, 2017). In the same way, Ayda and Affes (2014) determined digitalization as the main driver influencing the formation of company value, which encourages continuous improvement and provides long-term value for customers, outpacing competitors. Intensive data exchange, analysis of the Internet of Things (IoT), it was identified such key drivers affecting the values formation of the company (Lenka, Parida, & Wincent, 2017).

The main benefits were justified: automation and optimization of processes can increase productivity and profitability through saving the costs, accelerating the production, and significantly reducing errors when making management decisions. Using digitalization, a company forms an innovative business model that offers and determines the creation of value-oriented approach between suppliers, customers, and the company.

It offers value-based management to be considered as a comprehensive organization management system, which organically includes four main modules: assessment, strategy, finance, and corporate governance. The system approach the author to all of the control system modules proposed data are interdependent and form a single complex (Armitage & Jog, 1999).

Value-oriented management focused on the new philosophy of analysis and control in the company, the need to link value thinking with the system of management procedures (Copeland, Koller, &

Murrin, 2000). Management innovation, in this case, in our opinion, is a complex of combinatorial registered mutual financial and non-financial factors in the management of the organization, aimed at maximizing the value of their new combinations in all of the modules (Andriushchenko et al., 2019a).

The full value of the organization, as a system, can be considered as the sum of its internal and external values. In turn, the intrinsic value of an organization depends only on its condition (fixed assets, working capital, intangible assets, the skill level of employees, and the perfection of the management system used) (Jensen, 2001). Thus, in the projects, there are two interconnected groups of resources: material and technical – raw materials, materials, structures, components, energy, technological resources, installed equipment; labor – carry out direct work with material and technical resources. Upon transition from one state to another, the internal value of the organization will be equal to the difference between its values in the final and initial states, regardless of the path along which the transition took place. Armitage and Jog (1999) insist that the intrinsic value includes the value of all types of resources of the organization and is a function of its condition.

The article argues the use of the term “value”, including the combination of “value to shareholders”. The logic of the proponents of this position is that the “value” of an asset for an owner becomes “value” only if it is sold. Considerably more interesting is the discussion regarding the validity of the use of the terms “value” in a managerial context, considered in the article of Malmi and Ikäheimo (2003).

Based on the foregoing, the purpose of this study is to develop a methodology for assessing the influence of drivers as a key element of value-oriented management on the investment activity of companies.

2. DATA AND METHODOLOGY

The sampling set analyzed by us was formed based on the data presented for Ukrainian companies in the financial sector for the pe-

riod 2010–2018; the sample set is based on the data on companies listed on the Ukrainian Interbank Currency Exchange. Predominantly large companies were included in the data panel, which is caused by the fact that the shares of small companies are not sufficiently liquid, and the market quotation is less likely to represent their fundamental value. The analysis of panel data is dictated by the need to expand the sample and to take into account the non-observed individual effects of the company in econometric modeling.

We cannot ignore the fact that many new approaches to improving the efficiency of value-based management have emerged: quality control, empowerment, continuous improvement, reengineering, kaizen, team-building, and so on (Figure 1).

Thus, the panel data are unbalanced, since the number of observations for companies is different. However, one should note that, in accordance with the missing at random concept, coefficient assessments will be consistent if the absence of information is random, that is, the probability of the presence/absence of data on a variable does not depend on its value. Figure 2 shows the descriptive statistics of the analyzed variables and the order of their calculation.

The age variable of the company was formed based on the specified date of registration of the company as a legal entity. One limitation should be noted here, because, in reality, companies may not be so young since they have been created in the Soviet years. As for the indicators of shareholder value formation, the average “price/book value” and “price/profit” multipliers were 1.21 and 11.6, respectively, the total shareholder profitability was 13%. At the same time, the explained variables are largely volatile.

Figure 3 demonstrates such volatility, which is mainly due to the financial and economic crisis. Thus, on average, in the sample, the return on assets was about 7%, the growth rate of the fixed assets value was about 19%, and the share of debt financing in the capital structure was 46%. About 37% of companies were represented in the ownership structure by the state, about

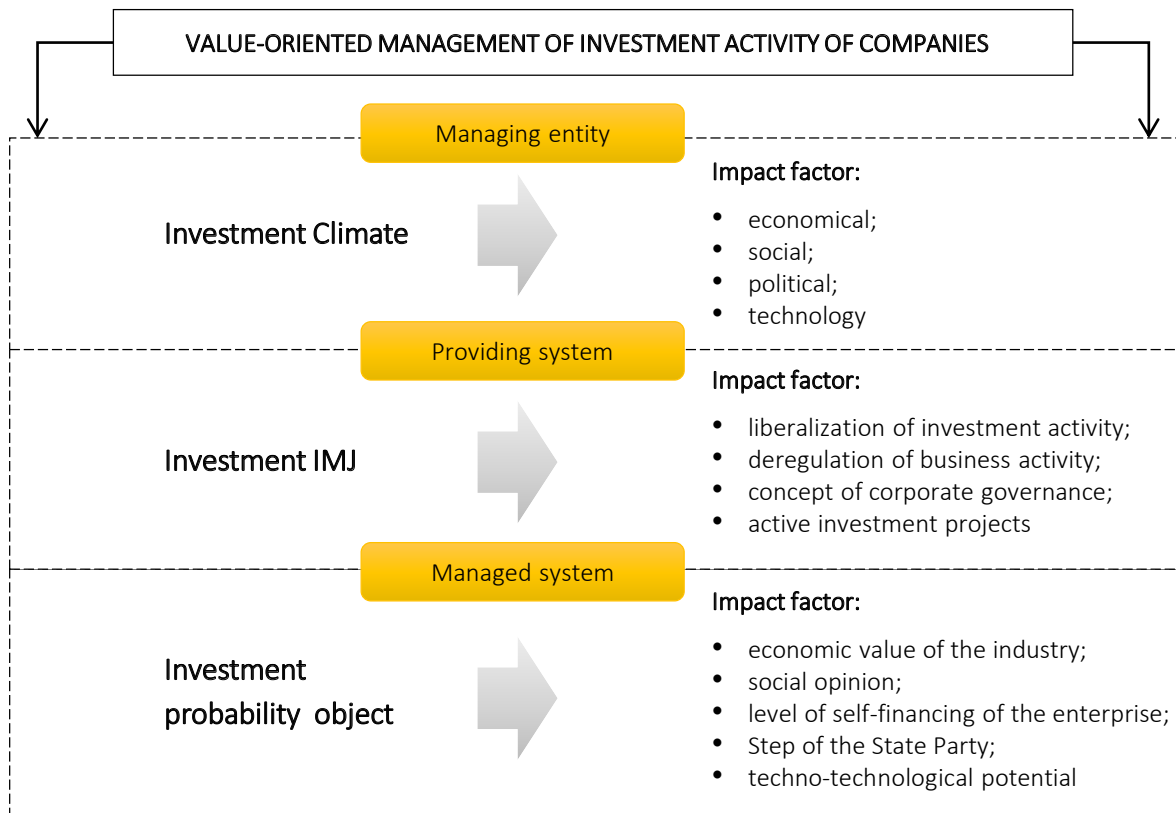


Figure 1. Value-oriented management of investment activity of companies

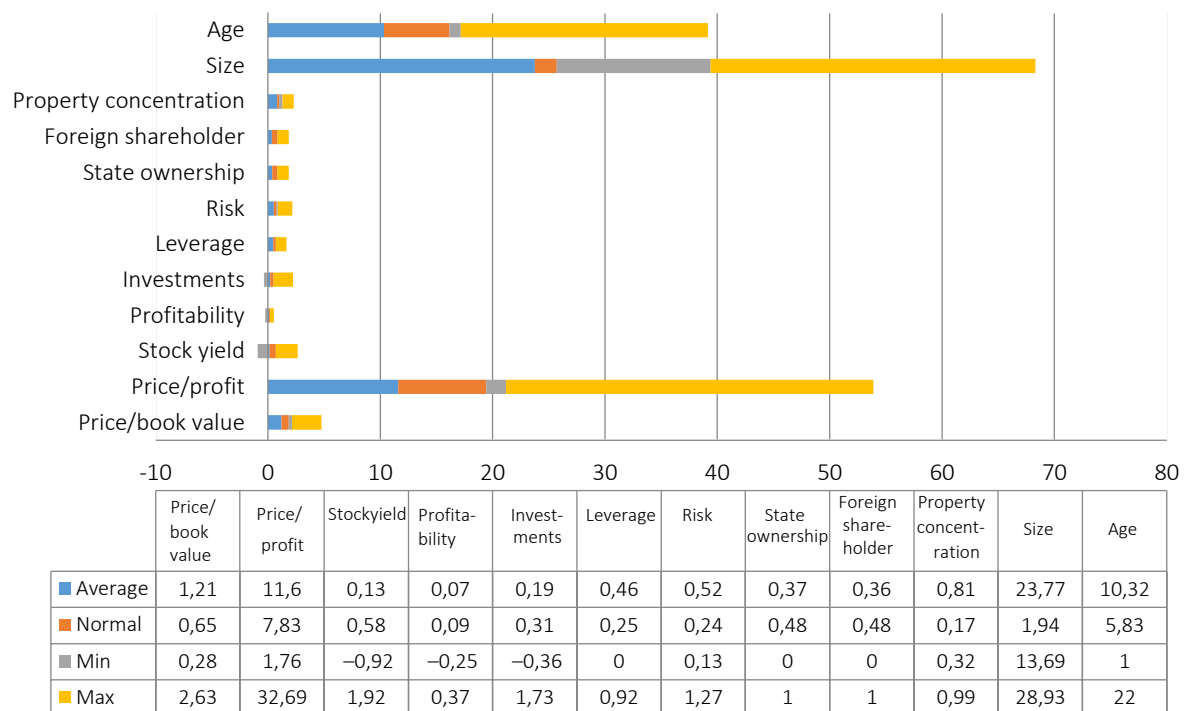


Figure 2. Descriptive statistics, 2010–2018

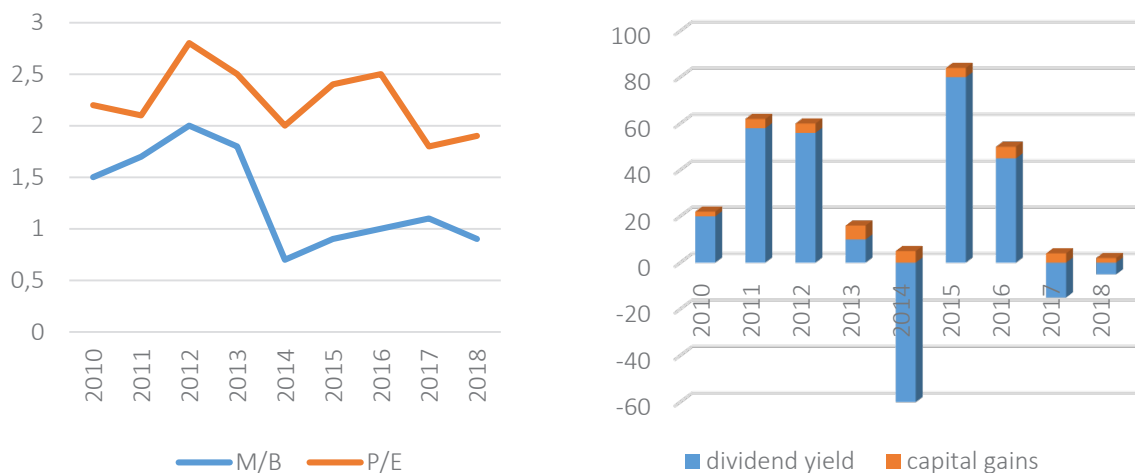


Figure 3. The average of the sample values of the value multipliers and shareholder return

36% – by non-resident investors. The ownership share of the three largest shareholders in the ownership structure was approximately 81%. The age of the “average” company is about ten years.

At the same time, some independent variables are significantly volatile; however, the indicators of shareholder value formation are generally characterized by higher volatility. The method of analysis consisted of two parts. In the first part, regression models of the influence of factors and cost drivers on the cost multipliers and shareholder returns were built. However, as will be demonstrated below, the company’s market value is largely determined by the general economic situation, so the second part analyzes the influence of factors and cost drivers on shareholder value formation indicators in their relative assessment. For this purpose, the explained variables were transformed into binary ones.

A variable was equated to one if the value of the dependent variable for a certain period was above the average for the same period, and was equated to zero otherwise. Then, based on the probit models, the influence of factors and cost drivers on the probability that the market multipliers exceed the market average values and realize the total shareholder return above the market average (however, the variable itself was not corrected for the risk level; in the models, the risk level was controlled by the independent variable of the same name).

Regression models of three classes were constructed: models with random effects, models with fixed effects, cross-cutting regressions (IIF, 2015):

1. Models with random effects (RE):

$$y_{it} = X'_{it}\beta + \alpha_i + \varepsilon_{it}, \quad (1)$$

where X is the vector of independent variables, β is the regression coefficients. The random effects α_i and the regression residues ε_{it} are equally distributed independent random variables $\alpha_i \sim iit(0, \sigma_\alpha^2)$ and $\varepsilon_{it} \sim iit(0, \sigma_\varepsilon^2)$, which are independent of x_{it}, \dots, x_{it} . A model with random effects will be the most appropriate if the unobserved individual effects of the company are not correlated with independent variables (Bondarenko, Liganenko, Kalamani, & Niekrasova, 2018).

2. Models with fixed effects (FE):

$$y_{it} - \bar{y}_i = (x_{it} - \bar{x}_i)' \beta + \varepsilon_{it} - \bar{\varepsilon}_i. \quad (2)$$

Provides the possibility of taking into account the invariant in time unobserved heterogeneity (individual effects), and also allows to eliminate the problem of possible endogeneity due to the non-inclusion of relevant explanatory variables in the models (Bruehlheide et al., 2019). For the same reason, such models do not allow analyzing the influence of explanatory variables insignificantly changing in 66 times; in our study, such should include dummy variables belonging to the state, the

presence of shareholder-resident, specific sectors of the economy.

3. Pass-through or cross-cutting regressions (PA). Within this class, the premise is made about the heterogeneity of the regressors; end-to-end FGLS (feasible generalized least squares) evaluation of coefficients is carried out without decomposition of residuals: $u_{it} = \alpha_i + \varepsilon_{it}$.

All types of models take into consideration the cross-correlation between the regression residuals for an individual company. Selection of the most adequate model was carried out through their pair-wise comparison: the Hausman test was used to compare the model with fixed effects and the model with random effects, the Wald test was used to compare the model with fixed effects and pass-through regression, the Breusch-Pagan test was used to compare the model with random effects and pass-through regression. In the second part of our analysis, on the basis of probit model, the dependent variables y'_{it} ("price/book value", "price/profit", shareholder return) were converted into binary variables (Chornei, Daduna, & Knopov, 2005):

$$y_{it} = \begin{cases} 0, & \text{if } y'_{it} \leq \bar{y}_t \\ 1, & \text{if } y'_{it} > \bar{y}_t \end{cases}, \quad (3)$$

ss-through probit model with random effects were constructed and analyzed. A comparison of pass-through probit model with random effects was made using the likelihood ratio test (LR). The formula for calculating linear regression coefficients and the coefficients and marginal effects of probit-models.

3. EMPIRICAL RESULTS

Table 1 presents the evaluation of factors and drivers for creating the shareholder value of models with random (RE) and fixed (FE) effects.

Table 2 presents the estimates of the regression coefficients of the influence of factors and cost drivers on the market valuation of the capital share of Ukrainian companies and the full shareholder return indicator. The calculation procedure for the variables studied is presented in Table 2. The values of t statistics corrected for heteroscedasticity are presented in parentheses. The models include dummy variable industry affiliations and dummy variables of time. Wald statistics and F-statistics are used to test the joint value of independent variable models with random and fixed effects, respectively. The Breusch-Pagan test is presented for comparing the models with random effects and pass-through regressions, and the Hausman test is for comparing the models with fixed effects and models with random effects.

Figure 4 shows the graphs of the interdependence of the value of domestic companies on their individual financial characteristics. The analytical capabilities of such graphical tools are very limited, however, it provides us with some data about the nature and form of empirical dependencies, useful for further analysis. This allows us to assert that unobservable heterogeneity plays a greater role in explaining the relative market value of a company than in explaining shareholder return. Now we want to show you the hypotheses about financial company value drivers. However, we present the estimates of the regressions of the two classes

Table 1. Evaluation of drivers and factors of company value

Variables	Price/book value		Price/profit		Stock returns	
	RE	FE	RE	FE	RE	FE
Profitability	1.682	0.850	–	–	1.135	0.616
Leverage	1.065	0.860	2.378	9.773	0.234	0.138
Investments	0.122	0.086	2.399	2.156	0.22	0.026
Risk	0.426	–	7.148	–	0.070	–
State ownership	–0.163	–	1.210	–	0.035	–
Foreign shareholder	0.177	–	1.932	–	0.014	–
Ownership concentration	0.079	–	3.733	–	–0.114	–
Size	0.095	–0.150	0.493	–0.584	0.010	0.048
Age	–0.022	–0.027	0.041	–0.372	0.001	–0.035
Dummy time	–1.614	4.582	–7.619	24.972	–0.124	–0.695

of models, since some independent variables are practically unchanging in time and, accordingly, cannot be evaluated in models with fixed effects. One cannot deny that we can reject the null hypothesis of the joint insignificance of independent variables of all models at the 1% level of value. The results show that about 2/3 of the explanatory power of the models is determined by the macro-economic conjecture, and not by individual characteristics of the companies.

Thus, with the exclusion of the dummy variable time group, the value of the coefficient of determination, in between, decreases from 46% to 15% in the model explaining the “price/book value” multiplier, from 14% to 5% in the model describing the “price/profit” multiplier. Such behavior may be due to the higher volatility of the Ukrainian stock market compared to fluctuations in the company’s fundamental cost variables. Turning to the interpretation of the obtained coefficients, we note that the return on assets has the most powerful effect on the company’s market value and shareholder return. Thus, a 10% higher return on assets, other things being equal, led to an approximately 0.09

“price/book value” multiplier and larger approximately 6% shareholder multiplier. In this case, the regression coefficients with random effects are somewhat higher; this suggests that the variable profitability is correlated with unobserved individual company characteristics, for example, the presence of sustainable competitive advantages, leading simultaneously to higher company value and profitability. The profitability variable, in turn, does not fully reflect the potential for generating cash flow in the future (CFA, 2015).

The variable “return on assets” was omitted from the regression explaining the “price/earnings” multiplier due to the direct correlation of these variables, since the profit indicator is directly used in calculating these variables.

The obtained results also demonstrate a positive relationship between the level of financial leverage and the company’s market value (*H2*). Formally speaking, a 10% larger share of borrowed capital in the structure of financing sources, other things being equal, was associated with higher “price/book value” and “price/profit” ratios by approxi-

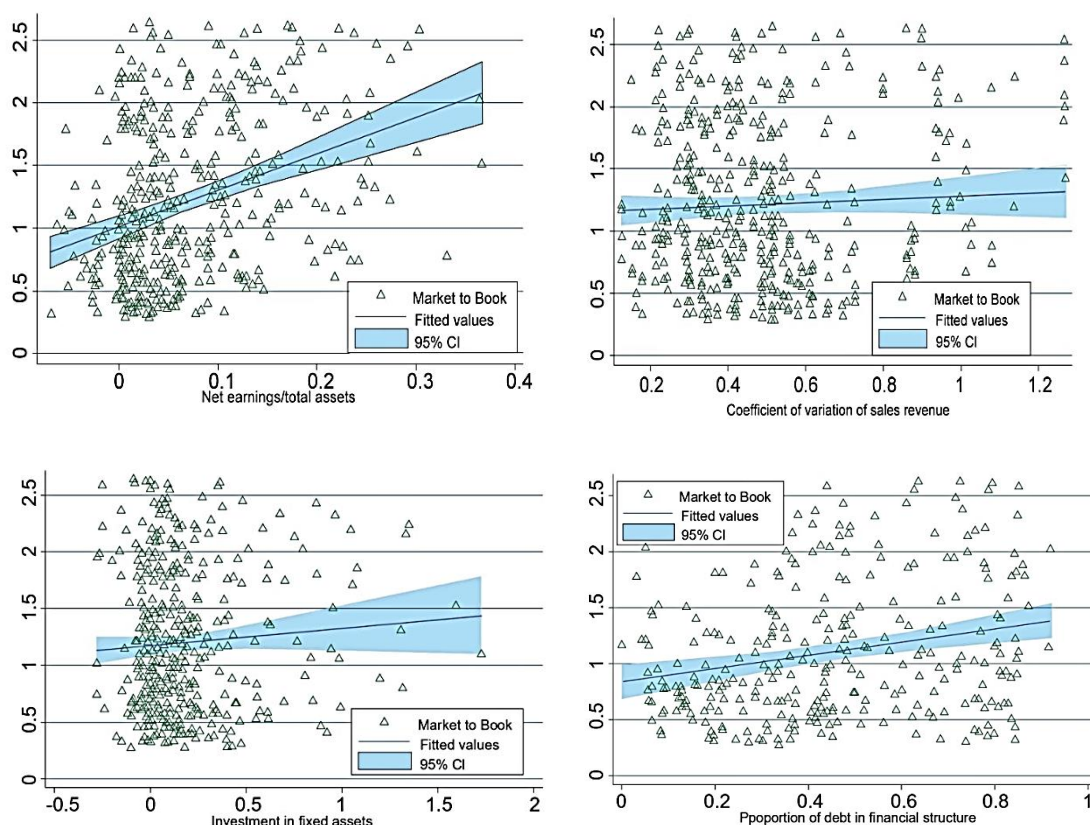


Figure 4. Financial company value drivers

mately 0.09 and 0.97, respectively, and with about 2.3% higher shareholder return.

As we expected, within the framework of *H3*, a positive impact on the company's value of the company's investment activity was found, although the coefficients are less statistically reliable. Evaluation of the coefficient before the variable "investment" is reliable only in the model explaining the "price/profit" multiplier. Thus, a 10% larger investment in major assets led to a higher "price/earnings" multiplier by 0.22 (FE estimates). In the model explaining the "price/book value" multiplier, the evaluation of the coefficient before the variable "investment" becomes significant only when using a one-way criterion.

The risk level is also positively associated with value multipliers (*H4*). Formally speaking, a higher by 0.25 coefficient of variation in sales led to higher cost multipliers "price/book value" and "price/profit" by 0.11 and 1.79, respectively. At the same time, the coefficient before the variable "risk" is statistically insignificant in the model explaining the dynamics of the shareholder return indicator. This allows us to conclude that riskier stocks are traded on the market on average with premium, but this does not mean a higher shareholder return.

As for the group of variables that characterize the ownership structure of companies, the coefficients of variables of this group are statistically less reliable than the coefficients of variables of the group "financial drivers" (Crifo & Sinclair-Desgagné, 2013). The coefficient in front of the dummy variable "state property" is significant only in the model explaining the "price/book value" multiplier and has a negative sign (*H5*). So, other things being equal, the "price/book value" coefficient is lower for companies with state participation by approximately 0.163.

According to the results, the presence of a shareholder-resident in the ownership structure is positively associated with the company's value (*H6*). At the same time, the relationship between these variables and shareholder return is insignificant. The independent variable characterizing the level of ownership concentration does not have a statistically significant impact on the value multipliers, but it has a weak negative effect on the shareholder return (Eurosif, 2016).

We should immediately note some limitations of our analysis. The databases, according to which the "ownership structure" groups were formed, may reflect the actual ownership structure of the company not entirely correct. For example, Ukrainian companies registered in a foreign jurisdiction may be "listed" under a non-resident. There are also problems in reflecting the shares of large shareholders that may be represented by nominal holders, and not by the ultimate owners.

Turning to the analysis of the influence of control variables on the value of the company, we note that the size of the company is positively related to its value. Thus, a higher sales volume caused a higher "price/balance value" multiplier and shareholder profitability indicator: an increase in sales from UAH 50 to 100 billion, other things being equal, led to a larger "price/balance value" multiplier by 0.0667 and a higher shareholder return on 0.7% 8 (RE estimates). However, assess of models with fixed effects are statistically insignificant, and this demonstrates that unobserved heterogeneity (individual effects of the company) is somewhat correlated with the size of the company.

The age of the company is negatively related to the shareholder return indicator. In formal terms, all other things being equal, for ten years, a more mature company is associated with less than about 3.5% shareholder return. At the same time, in the models explaining the cost multipliers, the coefficient before the variable "age" is insignificant. Also, the estimates obtained show that the type of activity and the effects of individual sectors of the economy are significant determinants of shareholder value formation. In the second part of our analysis, we constructed the probit models of the influence of factors and cost drivers on the probability that the value multipliers of market average and the realization of total shareholder return exceed the market average (Figure 5).

Perhaps, we should also point out the fact that the results generally correspond to the estimates obtained in linear regression models. In particular, a higher by 10% profitability, other things being equal, increased the likelihood (by 40%) of the "price/book value" multiplier the average market value and obtaining shareholder returns above the market average (22% higher probability). Other financial value drivers also have a significant im-

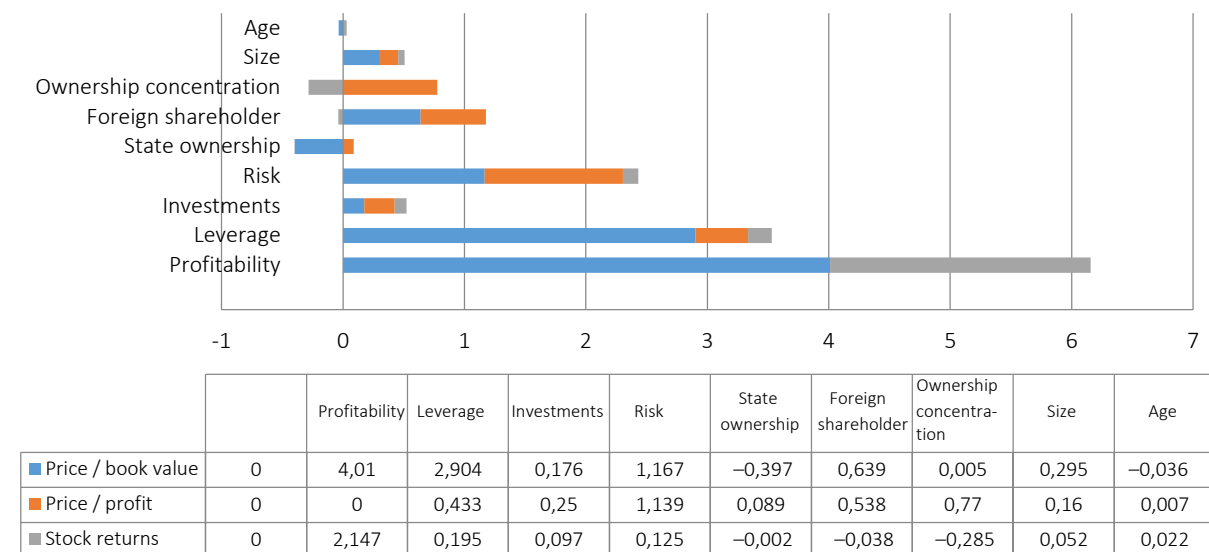


Figure 5. Probit model estimates

pact, although the effect of the “ownership structure” group variables is a little weaker than in linear regressions. Control variables are significant determinants of value multipliers and shareholder returns (Andriushchenko et al., 2019b).

Note that getting the estimates through probit modeling that do not contradict linear regression models is quite logical; a higher value multiplier value increases the likelihood that it will exceed the market average. However, the probit analysis provides additional verification of evidence within the framework of the hypotheses put forward, since the analysis of the potential for the formation of shareholder value is made in relative assessment in the context of the macroeconomic situation (Dietz et al., 2016).

Nevertheless, one should accept that the results of testing the hypotheses obtained in the simulation are summarized in Table 2.

To verify the estimates obtained, we conducted a series of diagnostic tests. VIF values (Variance Inflation Factor – VIF) were analyzed to analyze the potential multicollinearity. VIF values for explanatory variables in all models are below 1; the average VIF value in all models does not exceed 3, which allows us to reject the hypothesis about the correlation of independent variables. Since the Breusch-Pagan test shows heteroscedasticity, we use robust standard error estimates to conduct a two-way t-test of the significance of the regression coefficients (Clark et al., 2015).

Furthermore, we include a wide range of control variables in the models and analyze the models with fixed effects that allow us to take into account the unobservable heterogeneity of companies to alleviate the possible problem of endogeneity of variables due to omitted important variables. Note the limitations of the conduct-

Table 2. Norms for assessing factors and cost drivers of Ukrainian companies

Hypotheses				Results	
H1	Competitive advantages	+	Company value	Confirmed ($p < 0.01$)	
H2	Capital structure	+	Company value	Confirmed ($p < 0.01$)	
H3	Investment activity	+	Company value	Partially confirmed ($p < 0.1$)	
H4	Risk level	+	Company value	Partially confirmed ($p < 0.05$)	
H5	State ownership	−	Company value	Partially confirmed ($p < 0.1$)	
H6	Majority foreign shareholder	+	Company value	Confirmed ($p < 0.1$)	
H7	Ownership structure concentrated	−	Company value	Not confirmed	
H8	Company size	+	Company value	Confirmed ($p < 0.1$)	
H9	Company age	−	Company value	Partially confirmed ($p < 0.1$)	
H10	Industry effects	−	Company value	Important determinants ($p < 0.01$)	

ed simulation. Firstly, due to the inaccessibility of primary data, some variables may poorly describe the parameters under study. Secondly, when forming a sample even on the basis of large companies, we face the problem of the low stocks liquidity of some of them, and, as a result, their market and fundamental value may differ significantly. Thirdly, regressions show correlations and not casual dependencies of the analyzed variables.

CONCLUSION

The impact of value drivers on the value-oriented management of companies' investment activity has been identified in the article, which is important, first of all, from a practical point of view. The analysis conducted in the article allows determining the extent to which the increase in company's value over the past period is the result of effective value-oriented management. Considering the value-oriented management in determining the influence factors and drivers of value on the company's shareholder profitability, the following recommendations were formulated:

- general economic situation is more powerful factor in the market value of a company the compared to its individual characteristics;
- the group of financial value drivers is positively correlated with the value of the company;
- characteristics of the ownership structure affect company's market valuation;
- state-owned companies bargain with a certain discount, and those represented in the ownership structure by a foreign shareholder – with a certain premium to the market;
- no relationship was found between the degree of ownership concentration and cost multipliers; however, the variable of ownership concentration is negatively associated with the amount of shareholders' returns;
- control variables are statistically significantly associated with indicators of shareholder value formation;
- individual characteristics of companies are more important in explaining company's market valuation than in explaining the shareholders' return indicator.

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