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INFORMATION ASYMMETRY, SHORT-TERMISM AND FIRM SURVIVAL: EVIDENCE FROM RUSSIA

**(Исследование выполнено при финансовой поддержке РФФИ
в рамках научного проекта № 19-310-90085 «Аспиранты»)**

Nowadays, the question of a long-run strategy and sustainable development of large companies is vital. The problem is of a high importance for several reasons, among them are unsteady global financial markets, geopolitical tensions, and macroeconomic instability. Speaking particularly about short-run planning horizons, attention has been focused on the topic of short-termism (investment myopia), information asymmetry as a source of short-termism and poor corporate risk-management policy as its' consequence. Further, instruments were developed which aim to mitigate the outcomes of short-termism's negative impact in light of risk-management theory.

This article describes how and to what extent managerial short-termism influences company's survival. The main concern is the heightened interest of large companies in short-term results which may lead to unpredicted destructive consequences. This strategy can ruin a company's long-term value, create obstacles to effective capital management, and reduce overall market efficiency and investment returns.

At present, several tools for detecting information asymmetry and measuring the degree of its' manifestation have been developed (Bharath, Pasquariello, Wu, 2009). Still, there are just a few methods of determining the presence of managerial short-termism.

More specifically, the following research questions and practical goals are addressed:

1. How does information asymmetry contribute to the appearance of short-termism?
2. Does risk-management reduce the effects of short-termism and how?
3. How should information asymmetry, risk-management, and short-termism (principal-agent) theories be integrated in a consistent model?
4. Do risk-management practices increase the investment horizon and how?

The main goal of the study is to determine factors that reduce the consequences of short-termism. Obviously, the problem of short-termism cannot be examined without a complex and comprehensive analysis of the current literature. For this reason, a deep study of the literature on topics such as information asymmetry and short-termism is a mandatory part of this work.

Moreover, the research would be impossible without the following subtasks: 1. To evaluate corporate risk-management effectiveness in relation to the extreme degree of default risk realization;

2. To design a model, which examines the influence of short-termist behaviour on company's survival;
3. To assess the relationship between short-termism indicators that reflect enterprise-wide risk management (ERM) effectiveness.

We provide evidence from Russian market, enhancing previous research by defining

Overview of information asymmetry and short-termism

Definition of information asymmetry

Kenneth J. Arrow first addressed the issue of asymmetric information in an article on health care in 1963. This term was described as a knowledge misbalance between parties in negotiation process (Arrow, 1963). Such asymmetry presents a competitive advantage for individuals, who possess exhaustive and complete sets of information. The phenomenon is considered as a source of market failures because it affects the quality of goods and services available on the market and disturbs the process of allocating resources efficiently (Akerlof, 1970). We summarized studies on evolution of information asymmetry theory in the table 1.

Table 1

The evolution of information asymmetry theory

Author(s) and Title	Model	Aim	Methodology	Main Findings
Akerlof (1970) <i>The Market for "Lemons": Quality Uncertainty and the Market Mechanism</i>	Adverse selection	To study the interaction of quality and uncertainty by determining the economic costs of dishonesty.	The decline in quality in the automobiles market caused by asymmetry of information is estimated. Author uses a utility function to illustrate equilibrium state in the case of asymmetric information.	Author finds that it is impossible for buyer to distinguish a good and a bad car. The sellers have incentive to market poor quality goods, because they cannot receive the true value for a good car. Thus, average quality of goods and the size of the market are reduced.
Spence (1973) <i>Job Market Signaling</i>	Signaling	To outline definition and properties of signaling and interaction of signals in the job market.	Job seekers are considered as investments a company has incomplete information about. Author draws a parallel between asymmetric information about skills and education of job candidates and a lottery.	Author identified information asymmetry between an employer and an employee which refers to the situations when low-paid jobs cause persistent equilibrium trap, preventing an increase in level of wages in some markets.
Jung, Kim, Lee (2000) <i>An Incentive Contract with Asymmetric Information</i>	Moral hazard	To consider the problem of designing an optimal incentive contract in the presence of information asymmetry.	Authors modeled information asymmetries in a multi-period framework, where the retailer has private information about his own costs and consumers' preferences and defined an incentive vertical contract with franchise fee and resale price maintenance.	Study shows that the incentive franchise contract can bring to the first-best outcome of vertical integration when the retailer has complete information about consumers' preferences.
Richard, Kang, Kumar (2002) <i>Corporate Governance, Takeovers, and Top-Management Compensation: Theory and Evidence</i>	Agency theory	To examine top-management compensation in the presence of agency problem when Board of Directors (BOD) bears governance responsibilities.	Study models a negotiation process between the BOD and chief executive officer (CEO) on CEO compensation. Authors assess the relationship between manager's performance- and non-performance-related compensation and ownership structure by using Pearson and Spearman correlations.	Equity ownership of largest outside shareholder and the firm's bankruptcy risk are negatively related to the size of CEO compensation.

End of table 1

Author(s) and Title	Model	Aim	Methodology	Main Findings
Fu, Kraft, Zhang (2012) <i>Financial reporting frequency, information asymmetry, and the cost of equity</i>	Signaling	To examine the impact of financial reporting frequency on information asymmetry and the cost of equity.	For the purpose of the study authors use OLS regression model, regression model with fixed effects and 2SLS model and hand-collected data on firms' interim reporting frequencies from 1951 to 1973.	Results of the study show that increased reporting frequency reduces information asymmetry and the cost of capital.
Petacchi (2015) <i>Information asymmetry and capital structure: Evidence from regulation FD</i>	Signaling	To identify the effect of information asymmetry on corporate financing behavior in light of new Regulation Fair Disclosure.	Author measures extrinsic information asymmetry among investors using the adjusted probability of information based trading (AdjPIN), estimated as the volume of information-based trades. Equity market information risk proxies are the amount of private information trading and the adverse selection component of the bid-ask spread.	It was found that firms with a high level of information asymmetry increase their financial leverage more than firms with a low level of information asymmetry after Regulation Fair Disclosure was imposed.
Amiram, Owens, Rosenbaum (2016) <i>Do information releases increase or decrease information asymmetry? New evidence from analyst forecast announcements</i>	Signaling	To study the effect of earnings announcements on information asymmetry for sophisticated and unsophisticated investors.	Authors estimate a model based on finance theory (Demsetz, 1968, Stroll, 1978). Bid-ask spreads as a measure of information asymmetry is used as dependent variable (Glosten, Milgrom, 1985).	Findings demonstrate that analyst earnings forecasts decrease information asymmetry in short post-announcement period. Authors suggest that the strength of the relationship is influenced by how new release relates to prior information held by sophisticated and unsophisticated investors, which underpins extant disclosure theory.
Tchamyou, Nwachukwu, Asongu (2018) <i>Effects of Asymmetric Information on Market Timing in the Mutual Funds Industry</i>	Signaling	To investigate the effects of information asymmetry on market timing in the mutual fund industry	Information asymmetry is measured as the standard deviation of idiosyncratic risk. Authors use time-dynamic fund-specific betas for 1488 active open-end mutual funds for the period from 2004 to 2013. The model is based on endogeneity-robust Difference and System Generalised Method of Moments.	Study shows that information asymmetry is sensitive to market risk exposure. The level of risk taken by managers is positively related to market liquidity. Equity funds tend to converge in term of their levels of market risk exposure.

Source: compiled by authors on the basis of Akerlof (1970), Spence (1973), Jung, Kim, Lee (2000), Richard, Kang, Kumar (2002), Fu, Kraft, Zhang (2012), Petacchi (2015), Amiram, Owens, Rosenbaum (2016), Tchamyou, Nwachukwu, Asongu (2018).

Information asymmetry is considered as one of the sources of short-termism, which is overweighting short-term results and failing to attain long-term goals. Managers have more complete information on company's state and use their competitive advantage to provide positive signals to the market such as short-term profit statements (Akerlof, 1963). Being in highly competitive environment set by capital markets, they are forced to make

decisions, which lead to unfavourable long-term results (Dallas, 2012). Investors often do not possess complete information about company's long-term strategy, which makes short-term financial results an important measure of manager's success in maximizing investors' wealth.

Sources of short-termism

According to Minsky's study on financial instability, one of the sources of short-termism is generally accepted management strategy which leads to excessive levels of leverage in the period of economic growth and low interest rates. The increasing leverage results in financial instability. The phenomenon was seen in financial industry prior to the crisis of 2008, when average level of leverage in investment banks reached 30% (Minsky, 1994).

Another source of short-termism is a competition for funds among asset managers. Investors do not possess complete information about long-term investment strategies resulted from asymmetric information issue. Moreover, clients with short investment horizons tend to withdraw their funds and change a portfolio manager more often. These issues lead to higher required rate of return, which makes short-term investments more preferable for portfolio managers. If a manager's strategy is based on picking undervalued stocks, then long-term investments are exposed to higher risks, since the period, when an asset's market price becomes equal to its fundamental value, is longer (Dallas, 2012). Additionally, lower uncertainty and higher flexibility associated with short-term investing attract more investors to a fund (Dallas, 2012).

Marginson and Mcaulay studied sources of short-termism emergence by interviewing employees of a telecommunication company. Results of their research come along with the findings of Laverty (1996) that orientation on short-term results is not caused by a pressure from capital markets or inappropriate performance indicators. According to the authors, this issue should be considered in the context of individual and organizational characteristics (Marginson, Mcaulay, 2008).

In his study Thakor presented three main factors that explain a presence of short-term behaviour among managers. The first is a pressure from capital market players, who prefer high short-term profits to sustainable financial results. Secondly, agency problem between shareholders and CEO makes long-term projects less attractive to the former. Capital budgeting strategy is the third reason highlighted by the author. He finds that immature firms apply payback period as an investment decision criteria, consequently, downgrading long-term projects rankings. However, Thakor notices that short-termism does not correlate with company's inefficiency and questions a negative attitude toward this phenomenon. He concludes that early announcement of financial results reduces manager's ability to choose projects which aim to improve personal reputation in company's expense (Thakor, 2016).

Another source of short-termism is associated with a level of director's independency, considered as a total of compensation package, experience, education and background. It was found that there is a negative relationship between a level of independency and a quality of board of directors' oversight, which leads to short-termist behaviour (Leisen, Swan, 2019).

Methodology and Data

To assess the effectiveness of a company's risk-management in the context of short-termism, one must highlight the most influential evaluation criteria. The results of the survey grounded the risk-management effectiveness assessment model developed for studying the problems of short-termism.

The main assumption of the research is that companies with strong ERM have lower variance of key performance values. Insufficient value of indicators provokes the occurrence of losses and excess is a sign of short-termism and provokes the emergence of speculative premiums, destroying long-term value.

Cox regression analysis was selected as the research method. An analysis of the proportional hazards made it possible to conclude that some factors are exogenous — systemic risks affecting all companies as a whole.

The general formula of Cox regression is as follows:

$$h_i(t) = h_0(t) \cdot \exp(\beta_1 X_{i1} + \dots + \beta_m X_{im}), \quad (1)$$

where $h_0(t)$ is the basic risk function, which is the same for all objects and is achieved when all the regressors are equal to zero, and $(\beta_1 X_{i1} + \dots + \beta_m X_{im})$ is a linear function of explanatory variables. It is important to note that $\exp(\beta_1 X_{i1} + \dots + \beta_m X_{im})$ is a relative risk function, and since it cannot be negative, we write it through exponent. Index i is responsible for the number of the company, m is for the year.

To construct the model we used the results of several recent articles which showed the following:

- A company with more information asymmetry between investors and managers and, consequently, a short-term focused strategy has a higher debt (Bharath, Pasquariello, Wu, 2009).
- A company with a longer investment horizon has lower liquidity and lower value growth (Uno, Kamiyama, 2009).
- A company that neglects investment activity and research and development (R&D) investments tends to have shorter CEO tenure and neglect human capital (Olesiński, Opala, Rozkrut, Torój, 2014).
- If a firm was not the object of acquisitions, then it is almost impossible to observe the manifestations of short-termism in its pure form (Stein, 1988).
- In the medium term the profit returns to the average level (Chan, Lakonishok, 2004).
- Myopic companies maximize short-term profit to the detriment of long-term goals.

Propositions were tested under a sample of companies which present a promising Russian metal industry. The research period was 5 years and total number of observations is 1368. The goods of the metallurgical industry are equally in demand, both on the home and export markets. Most of the companies were Joint Stock Companies (JSC) with a long history. For panel data, all companies with public financial reports are used; for a deeper private analysis, only companies with disclosed ERM costs and processes are included.

The model is based on the values of redundancy (insufficiency), that is, excess (shortage) of individual values of the upper (lower) boundary of the predictive interval. Such data mapping allows the use of an abnormal distribution of the base value as a signal, indicating a high-risk company management policy.

Analysis of the «redundancy» of indicators was carried out by profitability, current liquidity, and interest coverage ratio using the exponential method. The main assumption was that excessive indicators provoke additional risk; insufficient ones inhibit the development of the company. This model does not study individual risk-management procedures. Internal corporate management systems are not a subject to mandatory disclosure and their effectiveness can only be judged by the results of the company.

Findings of the study confirm that companies seen as maximizing performance values are prone to short-termism. The next stage was the selection of an evaluation tool for the survival analysis under the short-termism policy. The key hypothesis (H0) of the study is the statement that maximizing the profitability of a firm increases the risk of default.

Additional hypotheses are that short-sighted companies with a low ERM efficiency
 H1 — have abnormal degree of leverage,
 H2 — risk their solvency,
 H3 — neglect long-term loans in favour of short-term liabilities,
 H4 — save on R&D investments;
 H5 — the type of business entity and the size affect the evidence of the short-termism.

Evaluation Toolkit

Next, we used sources of short-termism identified in the literature review to model an evaluation tool. Its' goal is to give quantitative measures to qualitative indicators as well as to provide accurate estimates of some characteristics chosen for comparative analysis.

The dependent variable is binary, where “1” means the liquidation of the company. The term to liquidation is counted in days.

The covariates are as follows:

The first item is *ROTA_SHT_exceed* — the excessive profitability. The excessive profitability was calculated on the basis of the return on assets, based on EBITM (EBIT margin). This variable was calculated using the method of constructing a 95 percent prediction interval according to the following formula:

$$ROTA_{EXC} = X - ROTA_i \quad (2)$$

$$x = \overline{ROTA} + 1.96 \cdot \alpha_{ROTA};$$

$$x_{ROTA_exceed} = 0.17 \quad (3)$$

$$x_{ROTA_low} = 0.03$$

Variable *LT_bin* is a binary variable indicating the presence of long-term liabilities in the company. The presence of long-term liabilities in the company testifies to its interest in long-term development, trust from banks, and a positive credit rating. In the sample only 37% of companies have long-term liabilities.

The third indicator is capital cost of the company. This indicator is represented by two variables: weighted average cost of capital (*WACC*) and “hurdle” — the difference between profitability based on *CFROI* and cost of capital.

$$WACC = interest_payed \cdot (1 - Tax) \cdot \frac{Debt}{(Equity + Debt)} + \quad (4)$$

$$+ Return_on_Equity \cdot \frac{Equity}{(Equity + Debt)}$$

$$CFROI = \frac{CashFlow}{Capital_Employed}, \quad (5)$$

Leverage_exceed was calculated on the basis of a 95% prediction interval, but due to abnormal distribution, the 3σ rule for unimodal distributions was applied (Vysochanskij, Petunin, 1980).

$$Leverage_{exceed} = x - Leverage_i, \quad (6)$$

where

$$x_{leverage_exceed} = 0.74$$

$$x_{leverage_low} = 0.46$$

Interest Coverage Ratio (*ICR*) variable was included as a criterion of a company's ability to make interest payments on its debt in a timely manner. This value used as the evidence of short-term solvency. The insolvency of a firm is characterised with *ICR* lower than 1. The binary variable *ICR_low* equal to 0 means that a company has an *ICR* less than "1". Also, the predicted interval was calculated. The threshold value of *ICR* burdening the company starts from 2.26. Also as a solvency measure the current ratio variable (*CR*) was used.

The analysis of long-term liabilities was conducted using two variables. *LTDebt* shows an amount of long-term debt in domestic currency. *LTDebt_bin* is a binary variable which reflects the presence of long-term liabilities in the capital structure.

Variables *Cash* and *Short_term_debt* are also involved in the study.

The value of R&D investments (*R_D_investm*) was chosen as one of the explanatory variables because stable investment in innovative projects illustrates manager's orientation on long-term growth.

The analysis of this sample using chi square, Cramer criteria, and the Wilcoxon signed-rank test revealed that there are no significant differences in the behaviour of the rating between years. Therefore, we can conclude that the rating value is determined exclusively by endogenous factors.

The distribution of each variable was checked for normality. Residuals and outliers were analysed further when building boxplots. For the analysis of corporate governance practices, the interdependencies of indicators are the most informative. Therefore, the correlation analysis on the extended sample was performed first (see appendix 1).

In the final equation 6 covariates, 5 continuous and one categorical, were included.

For the purpose of the study some additional variables were used:

Day_event — the duration of a company's life from 01.01.2013 — the starting date of the research.

Survival_bin — variable signalling the occurrence of an event (1 — company is liquidated).

Strata variables:

- Type (JSK or LTD) — variable reflecting the presence or absence of an agency problem;
- Code, narrow industry type based on the OKVED (Russian classifier of economic activities classification) — an analysis of intra-industry specificity, if any;
- Size — size of the company based on the cash flow turnover in four categories: micro, mini, medium, large. This criteria is necessary in order to test the assumption that small companies are less stable, invest less in management systems and apply simple risk-management practices.

For subsequent analysis, we used the statistical software IBM SPSS Statistics. A series of iterations (see appendix 2) were performed in order to obtain the optimal likelihood value. The Cox regression was built on the basis of "forward conditional" method which allows a researcher to stage and improve the survey. The method of forward selection finds the term that, when added to the model, achieves the largest value of R-squared. This method is comparatively fast but it does not guarantee that the obtained model is the best, except for the first step when it finds the best single term, but it is feasible with a large number of observations. In order to estimate the influence of an observation on each of the regression coefficients Schoenfeld residuals were used.

Results

The first stage of the study was aimed to construct a Cox regression with time-dependent covariates. Based on the collected data, several specifications have been built. Thus, most of hypotheses were approved (see table 2). The most significant model is presented in tables 3–5.

Table 2

Hypotheses Summary

No.	Result	Control variables	Notes
H0	confirmed	ROTA, cross-section ROTA* Short_term_debt	
H1	confirmed	Leverage_excess Short_term_debt,	The excessive leverage and short-term debt decrease the risk of default.
H2	not confirmed	ICR, ICR_low, CR, cross-section CR*ROA, cross-section CR*ROTA	Indicators of short-term solvency are not significant for survival, it makes sense to expand the research horizon.
H3	confirmed	Cash, Short_term_debt, ICR, ICR_low, LTDebtZaswq, LTDebt_bin, cross-section LTDebt_bin *ICR	A set of variables reflecting the neglect of long-term liabilities in favor of short-term liabilities, as well as solvency indicators showed that short-term liabilities reduce the risk of default, while cash and its equivalents increase it.
H4	confirmed	R_D_investm, cross-section R_D_investm*ROTA	Cumulative R&D investments reduce the risk of default. Interaction with excess profitability is not revealed.
H5	rejected	Type, size, code	The model is not sensitive to strata. This can be explained by industry specifics (vertical integration).

Source: compiled by authors.

Tables 3–5 and equation 7 present the main model of this study. The stability of the model was tested by Chow test.

Table 3

Case Processing Summary

		N	Percent
Cases available in analysis	Event ^a	185	15.6%
	Censored	1183	84.4%
	Total	1368	100%
a. Dependent Variable: DAY_event			

Source: compiled by authors.

We can see that about 15.6% of all companies in the sample have been closed since the beginning of the observation, i.e. from January 1, 2013. About 84.4% of companies remained in the market. The remaining companies were discarded from the analysis due to a lack of information about them.

Then the regression takes the form:

$$h = h_0(t) + \exp(-1.231 \cdot SHT\ Debt - 0.105 \cdot ICR_{low} - 0.056 \cdot LEVERAGE - 1.994 \cdot R\&D_{investments} + 2.780 \cdot Cash + 0.043 \cdot ROTA_{exceed}) \quad (7)$$

where $h_0(t)$ is a certain basic risk with all explanatory variables equal to zero. It should be noted that the risk in our case cannot be negative, therefore we write it down through exponent.

Table 4

Omnibus Tests of Model Coefficients^a

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
2585,885	36,874	6	0,000	60,205	6	0,000	60,205	6	0,000
a. Beginning Block Number 1. Method = Enter									

Source: compiled by authors.

Table 5

Variables in the Equation

Variable name	B	SE	Wald	df	Sig.	Exp(B)
Leverage_excess	-,056	0,017	11,117	1	0,001	,945
R_D_investm	-1,994	0,000	6,354	1	0,012	1,000
Cash	2,780	0,000	4,360	1	0,037	1,000
ICR_low	-,105	0,163	0,412	1	0,521	0,901
ROTA_sh_exc	,043	0,000	6,807	1	0,009	1,000
Short_term_debt	-1,231	0,000	4,086	1	0,043	1,000

Source: compiled by authors.

The results presented in the table above state that extremely huge financial leverage increases the risk of default of a firm. The negative number for this value means an excess of leverage over the threshold (0.74). *Cash* and *ROTA_sh_exc* have the same effect.

Volume of R&D investments along with short-term debt decrease the risk of default of a firm. ICR ratio is less than 1.

An analysis of the residuals of the proportional hazards was done using Schoenfeld residual. Despite the fact that the *Cash* was significant, analysis of the residuals showed that the proportionality rule for this variable does not hold. At the same time, initially insignificant variable *ICR_low* turned out to be significant. However, the coefficient next to the variable indicates a positive effect of the ratio on survival.

Martingale residuals were used to search for outliers. The value of martingale residuals indicates the coincidence of the predicted and actual risks.

The results of the study clearly indicate that from 625 days, the overall risk associated with short-termism is increasing, and the company's ability to survive begins to decline (see appendix 4).

The inclusion of strata in the research model revealed the following:

companies that mine iron ore by underground mining are the most sustainable, while companies of primary ore processing are more prone to basic risk; the cumulative hazard of joint stock companies is generally less than the rest.

Discussion

The research confirms most of the hypotheses raised before. It was argued that maximizing short-term profitability would destroy the firm's long-term goals. In neoclassical economic theory, profit maximization is the mainstream of the modelling and seems to be a reasonable assumption about firms' behaviour. However, in practice, it is impossible to manage a business guided by the principles of maximization. Managers make decisions guided by the concept of "average industry profitability". There are a number of sources devoted to the industry average performance values (damodaran.online.org, Russian tax authority) or even techniques for comparison with best practices (benchmarks).

The standard deviation of net sales divided by the standard deviation of return on assets was used to measure the effectiveness of risk-management and reduce bankruptcy costs as part of an adverse selection approach (Andersen, 2009). The question of the "paradox of profitability" (Chan, Lakonishok, 2004) and "return to the average" (Christensen, Raynor, 2003) has been widely studied, and the behavioural theory of profit maximization states that agents are equally sensitive to maximizing profits and maximizing management costs. That is why we usually talk about the excessive and normal profitability.

This survey confirms the statement that a company with excessive profitability will die faster. Our model showed that an excess of profitability above the upper threshold of the industry predictive interval increases the risk of default by 4.5 points.

The results of the study confirm the importance of R&D investments for company's endogenous growth (Estrada and Montero, 2009) and their role as a signal of agent's interest in sustainability and long-termism (Olesiński et al., 2014). We found that R&D investments reduce the risk of default by approximately 2 percent. In confirmation of the positive impact of investments in R&D, we can say that the growth of R&D investments by 1% causes an increase in capitalization by 3 units. The impact of innovation has been widely studied by ERM experts, who argue that due to efficient risk-taking and regulatory compliance managers have "the best tool for innovation..." (Barton et al., 2002).

Special attention should be paid to the variable *Cash*. Cash management is a core of financial stability. Cash management practices serve to keep a balance between greater stability, diversification, and potential protection against inflation. A high value of "Cash and Cash equivalents" is evidence of a conservative policy of current management that prevents sustainable growth and burdens a firm with opportunity costs. Moreover, cash is important because it has an indirect impact on a firm's demand for external funds (Muller et al., 2014). Discussion on the optimal cash balance is incredibly extensive. In this work, the growth of cash increases the risk of default by 2.8 percent. It should be noted that *Cash* variable in this study is measured in nominal values without normalisation to the size of the company.

Financial leverage and risk are inherently linked to one another, since excessive use of external liabilities can lead to default and bankruptcy. Excessive financial leverage is most likely formed under the influence of exogenous factors, mostly related to the availability of tax shields (Fernández, 2004). On the basis of the Harris-Pringle model, we can state that leverage is a fixed ratio target. The cash flow from tax breaks is stochastic, and the risk of this flow corresponds to the operational risk of the company. Thus, the proportion of excessive leverage (*Leverage_exceed*) is a sustainable indicator which is formed according to the preferences of managers. Excessive leverage, as well as a low interest coverage ratio disciplines management (Jensen, Meckling, 1976), but becomes an obstacle in investing in high-yield projects (Stulz, 1990). Thus, the excess indicator is formed under the influence of endogenous factors and has a positive effect on survival. In our model, excessive leverage decreases the risk of default by 5.6 points.

ICR_bin variable indicates the problems with the short-term solvency of a firm. A problem arises when operating profit is not enough to cover the interest to be paid. However, there is a large amount of research that develops the Minsky theory of financial fragility (Minsky, 1985), explaining that the value of a coverage ratio of less than one is an exogenous factor and may not be a reason for default. The significance of the fragility signal and the conclusions of Minsky coincided. The risk proportionality condition is not met. It is worth paying attention to the choice of default as a signal of management inefficiency.

As for short-term debt, it can be seen that growth of this value has a positive effect on survival. However, by studying it further we observe that despite the growth of total debt (see fig. 1), the share of debts in the invested capital is going down (see fig. 2).

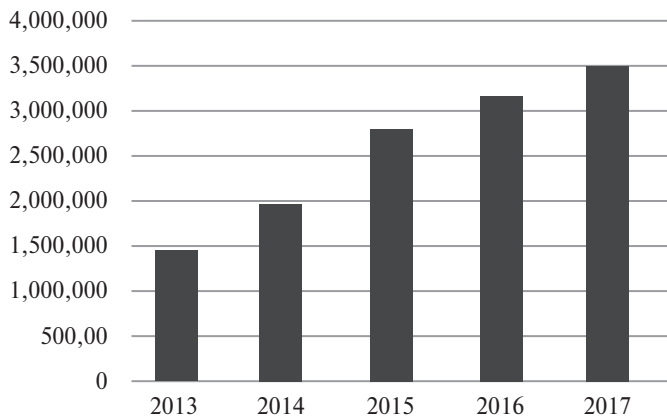


Fig. 1. Total debt per year, bln

Source: compiled by authors on the basis of SPARK Interfax database.

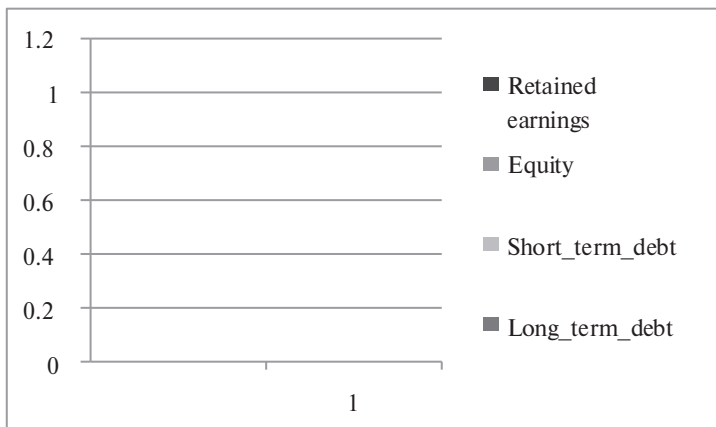


Fig. 2. Capital employed, shares

Source: compiled by authors on the basis of SPARK Interfax database.

Nominal values of short-term liabilities used in this study pointed out that external employed capital has a positive effect only if debt is in the predictive intervals' thresholds.

Special attention should be paid to corporate risk-management efficiency. Initially, this study was devoted to the role of corporate risk-management in reducing the consequences of investment myopia. Nevertheless, corporate risk-management is a well-studied field and it is impossible to reveal a unique set of indicators describing its' efficiency as well

as clearable market signals of its' efficacy. The suggestion was that the market reacts to good ERM, but it does not.

Thus, the correlation of volatility and market liquidity with efficiency of ERM shows the market reaction to the corporate risk-management of a firm. The issue was studied by Beasley, Pagach, and Warr, but did not receive any significant confirmation (Beasley et al., 2008). In general, the issue of market reaction to ERM implementation was studied extensively in relation to market crises (Aabo, Fraser, Simkins, 2005; Smithson, Simkins, 2005) and in relation to the market value of the company (Beasley et al., 2008; Hoyt, Liebenberg, 2006). In most cases, the statistical significance of the studies is not confirmed, but the positive relationship between the availability of management and the positive reaction of the market is traced. As a result, short-termism was chosen as a sign of poor risk-management policy and a default was a result of it.

In conclusion, it is worthwhile to answer the question of the information asymmetry raised at the very beginning. Information asymmetry between agents and principals provokes uncertainty and exacerbates the short-termism of agents. Agents embellish reporting to attract investors, and investors choose companies with potential growth. In this regard, the problem of adverse selection is realized through the quality of the decisions made — short-termism. Therefore, it makes sense to consider the profitability growth paradox in reverse order. Lack of investment encourages agents to pay higher premiums in the short-run and often with debt. Efforts to maintain liquidity, solvency, and attractiveness deplete the company. At the same time, companies with average performance values have better survival rates; however, in the face of frequent shocks they are not so attractive.

The practical significance of this paper is to obtain threshold values of indicators that signal a high risk of default. The study contributes to the existing literature by applying a survival model to evaluate agent actions based on the performances reflecting agent behaviour. The model used indicators of “redundancy”, characteristics associated with the deviation of the performance value from the predictive interval upwards. Concerning financial performance, such values indicate an aggressive and high risk-management policy.

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Correlation		ICR_calc	ROA_EBITM	Cash	CR	ICR_exceed	CFROI	Wacc	Hurdle	Leverage	Leverage_exceed	ROTA_exceed	P_D_investm
ICR_calc	Pearson Correlation	1	0,489**	-0,002	0,004	-0,988**	0,398**	0,001	0,004	-0,003	0,003	-0,489**	0,589**
	Sig. (2-tailed)		0,000	0,938	0,884	0,000	0,000	0,948	0,847	0,899	0,899	0,000	0,000
ROA_EBITM	N	2310	955	1482	1534	1075	2310	2301	2304	1728	1728	955	2310
	Pearson Correlation	0,489**	1	0,002	0,011	-0,560**	0,997**	0,000	0,004	-0,021	0,021	-1,000**	0,668**
Cash	Sig. (2-tailed)	0,000	0,000	0,936	0,619	0,000	0,000	0,984	0,858	0,426	0,426	0,000	0,000
	N	955	1938	1741	1879	908	1938	1935	1938	1465	1465	1938	1938
CR	Pearson Correlation	-0,002	0,002	1	-0,003	0,003	0,001	0,004	-0,002	-0,005	0,005	-0,002	0,024
	Sig. (2-tailed)	0,938	0,936		0,866	0,931	0,957	0,818	0,924	0,834	0,834	0,936	0,203
ICR_exceed	N	1482	1741	2850	2478	1008	2850	2850	2695	1979	1979	1741	2850
	Pearson Correlation	0,004	0,011	-0,003	1	-0,003	0,001	0,002	-0,001	-0,004	0,004	-0,011	0,000
CFROI	Sig. (2-tailed)	0,884	0,619	0,866	3093	0,926	0,965	0,892	0,969	0,874	0,874	0,619	0,995
	N	1534	1879	2478	3093	1074	3093	3092	2933	1808	1808	1879	3093
wacc	Pearson Correlation	-0,988**	-0,560**	0,003	-0,003	1	-0,434**	-0,015	-0,003	0,005	-0,005	0,560**	-0,643**
	Sig. (2-tailed)	0,000	0,000	0,931	0,926	0,000	0,000	0,625	0,930	0,871	0,871	0,000	0,000
ROTA_exceed	N	1075	908	1008	1074	1076	1076	1076	1076	915	915	908	1076
	Pearson Correlation	0,398**	0,997**	0,001	0,001	-0,434**	1	0,000	0,000	-0,001	0,001	-0,997**	0,669**
Leverage_exceed	Sig. (2-tailed)	0,000	0,000	0,957	0,965	0,000	0,000	0,981	0,990	0,967	0,967	0,000	0,000
	N	2310	1938	2850	3093	1076	4075	4043	3838	2664	2664	1938	4075
P_D_investm	Pearson Correlation	0,001	0,000	0,004	0,002	-0,015	0,000	1	0,000	-0,313**	0,313**	0,000	0,001
	Sig. (2-tailed)	0,948	0,984	0,818	0,892	0,625	0,981	0,978	0,978	0,000	0,000	0,984	0,940
Hurdle	N	2301	1935	2850	3092	1076	4043	4043	3820	2664	2664	1935	4043

End of table

Correlation	ICR_calc	ROA_EBITM	Cash	CR	ICR_exceed	CFROI	Wacc	Hurdle	Leverage	Leverage_exceed	ROTA_exceed	P_D_investm
Hurdle	Pearson Correlation	0,004	-0,002	-0,001	-0,003	0,000	0,000	1	0,002	-0,002	-0,004	,000
	Sig. (2-tailed)	0,847	0,924	0,969	0,930	0,990	0,978		0,912	0,912	,858	,985
	N	2304	2695	2933	1076	3838	3820	3838	2516	2516	1938	3838
Leverage	Pearson Correlation	-0,003	-0,005	-0,004	0,005	-0,001	-0,313**	0,002	1	-1,000**	,021	-,001
	Sig. (2-tailed)	0,899	0,834	0,874	0,871	0,967	0,000	0,912		0,000	,426	,940
	N	1728	1979	1808	915	2664	2664	2516	2664	2664	1465	2664
Leverage_exceed	Pearson Correlation	0,003	0,005	0,004	-0,005	0,001	0,313**	-0,002	-1,000**	1	-0,021	,001
	Sig. (2-tailed)	0,899	0,834	0,874	0,871	0,967	0,000	0,912	0,000		,426	,940
	N	1728	1979	1808	915	2664	2664	2516	2664	2664	1465	2664
ROTA_exceed	Pearson Correlation	-0,489**	-0,002	-0,011	0,560**	-0,997**	0,000	-0,004	0,021	-0,021	1	-,668**
	Sig. (2-tailed)	0,000	0,936	0,619	0,000	0,000	0,984	0,858	0,426	0,426		,000
	N	955	1741	1879	908	1938	1935	1938	1465	1465	1938	1938
P_D_investm	Pearson Correlation	0,589**	0,024	0,000	-0,643**	0,669**	0,001	0,000	-0,001	0,001	-0,668**	1
	Sig. (2-tailed)	0,000	0,203	0,995	0,000	0,000	0,940	0,985	0,940	0,940	,000	
	N	2310	2850	3093	1076	4075	4043	3838	2664	2664	1938	4075

**, Correlation is significant at the 0.01 level (2-tailed)

Appendix 2

Iteration History^b

-2 Log Likelihood a	Coefficient						
	Leverage_exceed	Short term debt	ROTA_exceed	P_D_investm	Cash	ICR_bin (1)	ICR_bin (2)
2623,003	-0,056	-3,508	0,050	8,362	-2,199	0,368	0,180
2604,753	-0,069	-1,742	0,005	5,732	-8,844	1,698	1,007
2601,600	-0,067	-4,098	0,005	3,649	-1,360	2,699	2,068
2600,481	-0,066	-6,479	0,000	1,110	-1,496	3,705	3,102
2600,269	-0,066	-7,582	0,000	-5,848	-1,462	4,708	4,115
2597,350	-0,066	-7,070	0,000	-3,453	2,399	5,708	5,123
2589,176	-0,065	-6,062	0,000	-1,889	1,324	6,711	6,162
a. Beginning Block Number 0, initial Log Likelihood function: -2 Log likelihood: 2646,090							
b. The information matrix became singular after 7 iterations							

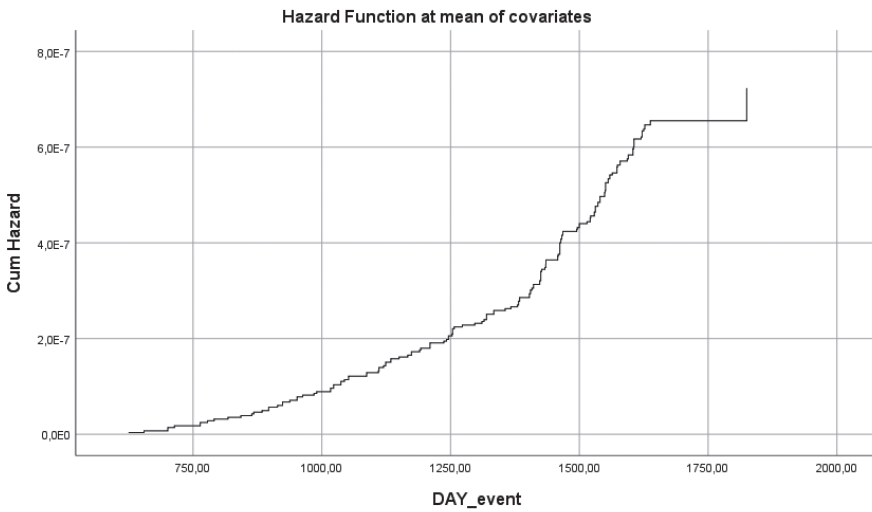
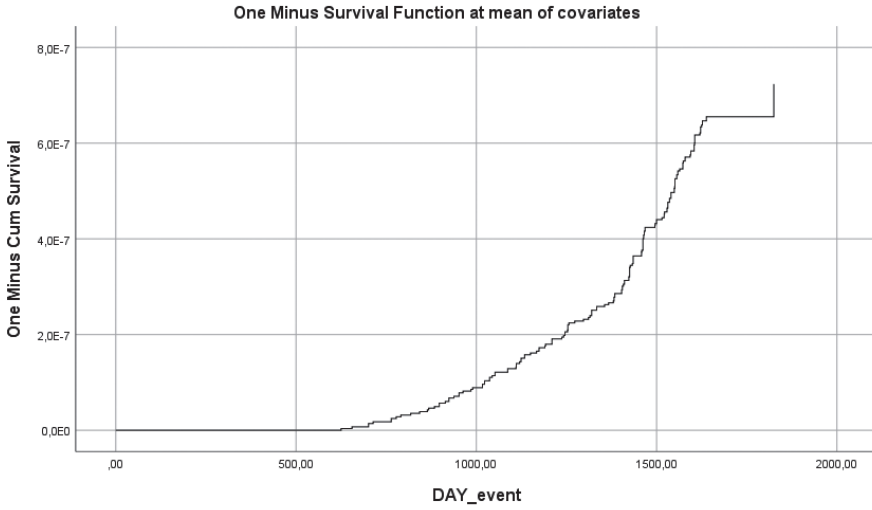
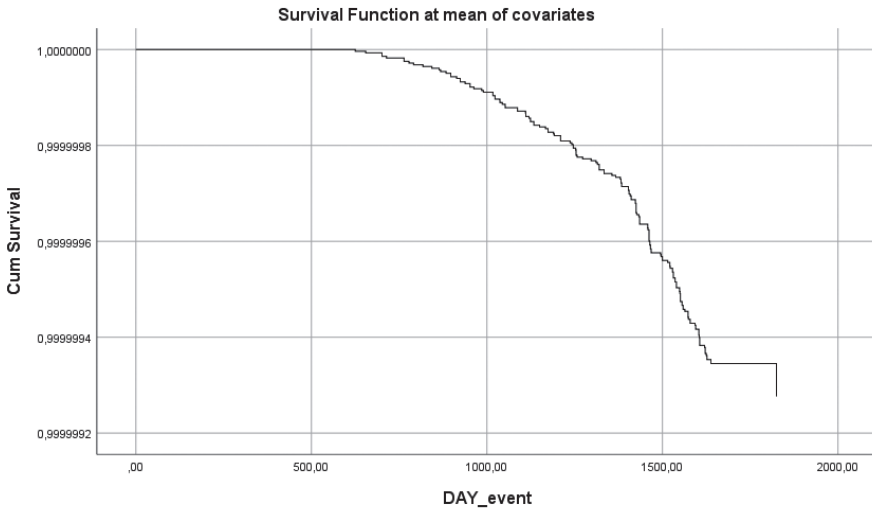
Omnibus Tests of Model Coefficients^a

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
2586,301	36,502	5	0,000	59,789	5	0,000	59,789	5	0,000
a. Beginning Block Number 1. Method = Enter									

Correlation Matrix of Regression Coefficients

	Leverage_exceed	Short term debt	ROTA_exceed	P_D_investm
Short term debt	-0,013			
ROTA_exceed	-0,008	0,002		
P_D_investm	-0,044	-0,043	0,019	
Cash	0,007	-0,875	0,001	0,031

Appendix 3



Appendix 4

Survival Table

Time	Baseline Cum Hazard	At mean of covariates		
		Survival	SE	Cum Hazard
1	2	3	4	5
625,00	0,001	0,999	0,001	0,001
655,00	0,002	0,999	0,001	0,001
701,00	0,003	0,998	0,001	0,002
714,00	0,004	0,997	0,001	0,003
764,00	0,006	0,996	0,002	0,004
778,00	0,006	0,995	0,002	0,005
791,00	0,007	0,995	0,002	0,005
818,00	0,008	0,994	0,002	0,006
843,00	0,009	0,993	0,002	0,007
864,00	0,010	0,993	0,002	0,007
868,00	0,010	0,992	0,002	0,008
884,00	0,011	0,992	0,002	0,009
897,00	0,013	0,990	0,003	0,010
914,00	0,014	0,990	0,003	0,010
924,00	0,015	0,988	0,003	0,012
938,00	0,016	0,988	0,003	0,012
952,00	0,018	0,987	0,003	0,013
963,00	0,018	0,986	0,003	0,014
985,00	0,019	0,985	0,003	0,015
990,00	0,020	0,985	0,003	0,015
1017,00	0,022	0,984	0,003	0,017
1023,00	0,023	0,982	0,004	0,018
1037,00	0,025	0,981	0,004	0,019
1044,00	0,026	0,981	0,004	0,020
1052,00	0,027	0,979	0,004	0,021
1087,00	0,029	0,978	0,004	0,022
1110,00	0,030	0,978	0,004	0,023
1111,00	0,032	0,976	0,004	0,024
1120,00	0,032	0,976	0,004	0,025
1124,00	0,034	0,975	0,004	0,026
1134,00	0,036	0,973	0,005	0,027
1150,00	0,036	0,973	0,005	0,028
1167,00	0,037	0,972	0,005	0,028
1174,00	0,039	0,971	0,005	0,030
1190,00	0,040	0,970	0,005	0,030
1192,00	0,041	0,970	0,005	0,031
1210,00	0,043	0,968	0,005	0,033
1237,00	0,044	0,967	0,005	0,033

Continuation of table

1	2	3	4	5
1242,00	0,045	0,967	0,005	0,034
1246,00	0,046	0,965	0,005	0,035
1253,00	0,047	0,965	0,005	0,036
1254,00	0,050	0,963	0,006	0,038
1257,00	0,051	0,962	0,006	0,038
1273,00	0,052	0,962	0,006	0,039
1297,00	0,052	0,961	0,006	0,040
1311,00	0,053	0,960	0,006	0,040
1315,00	0,054	0,960	0,006	0,041
1320,00	0,057	0,958	0,006	0,043
1334,00	0,058	0,957	0,006	0,044
1356,00	0,059	0,956	0,006	0,045
1367,00	0,060	0,955	0,006	0,046
1380,00	0,061	0,955	0,006	0,046
1382,00	0,063	0,954	0,006	0,048
1384,00	0,064	0,952	0,006	0,049
1403,00	0,066	0,951	0,007	0,050
1405,00	0,068	0,950	0,007	0,052
1408,00	0,069	0,949	0,007	0,052
1411,00	0,071	0,948	0,007	0,054
1423,00	0,072	0,947	0,007	0,055
1425,00	0,077	0,943	0,007	0,058
1427,00	0,078	0,943	0,007	0,059
1433,00	0,078	0,942	0,007	0,059
1435,00	0,082	0,940	0,008	0,062
1458,00	0,084	0,938	0,008	0,064
1459,00	0,085	0,938	0,008	0,064
1462,00	0,090	0,934	0,008	0,068
1464,00	0,092	0,933	0,008	0,070
1466,00	0,093	0,932	0,008	0,071
1468,00	0,095	0,930	0,008	0,072
1495,00	0,096	0,930	0,008	0,073
1496,00	0,097	0,929	0,008	0,074
1500,00	0,099	0,928	0,008	0,075
1515,00	0,100	0,927	0,009	0,076
1521,00	0,102	0,926	0,009	0,077
1522,00	0,102	0,925	0,009	0,078
1529,00	0,104	0,924	0,009	0,079
1531,00	0,107	0,922	0,009	0,081
1536,00	0,109	0,921	0,009	0,082
1540,00	0,111	0,919	0,009	0,085
1549,00	0,113	0,918	0,009	0,086

End of table

1	2	3	4	5
1550,00	0,114	0,917	0,009	0,087
1551,00	0,118	0,915	0,010	0,089
1556,00	0,120	0,913	0,010	0,091
1559,00	0,121	0,912	0,010	0,092
1564,00	0,122	0,911	0,010	0,093
1573,00	0,125	0,909	0,010	0,095
1574,00	0,126	0,909	0,010	0,096
1579,00	0,128	0,908	0,010	0,097
1593,00	0,129	0,907	0,010	0,098
1595,00	0,131	0,906	0,010	0,099
1604,00	0,133	0,904	0,010	0,101
1605,00	0,134	0,903	0,010	0,102
1606,00	0,138	0,901	0,011	0,105
1620,00	0,139	0,900	0,011	0,105
1622,00	0,142	0,898	0,011	0,108
1625,00	0,143	0,897	0,011	0,108
1627,00	0,145	0,896	0,011	0,110
1638,00	0,146	0,895	0,011	0,111
1825,00	0,162	0,885	0,012	0,123