

## WEALTH

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### **WEALTH**

## International Journal of Money, Banking and Finance

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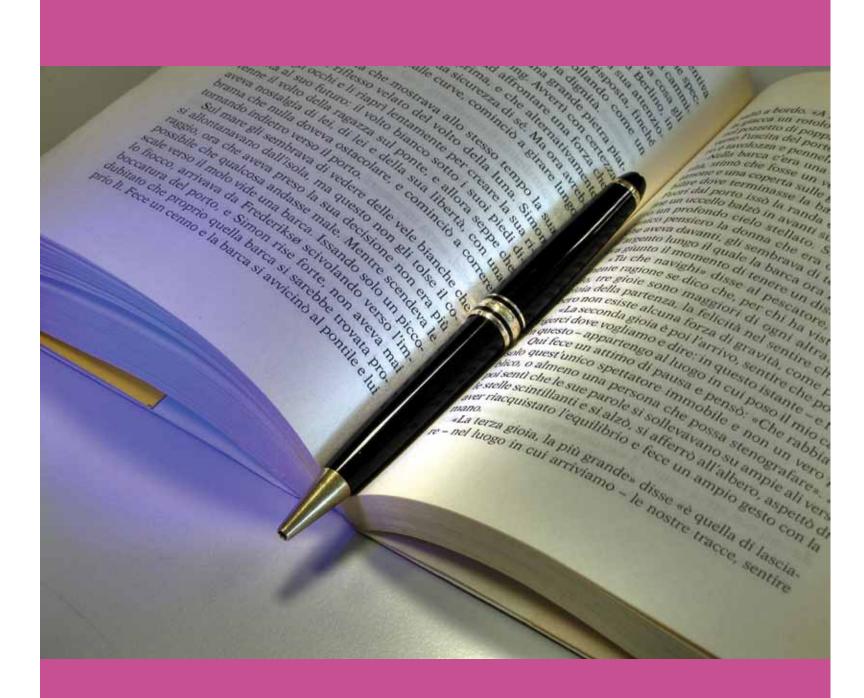
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## Chairman's Message

Dear Readers,

The SENSEX record that Bombay Stock Exchange shown in November 2014 is indicative of up trends in Indian financial markets. This is reflective of investor's confidence in reforms in the finance sector the new Governments has sometime back announced and now being implemented. The other development was after much debate, Brazil, Russia, India, China and South Africa - often referred to as BRICS - finally announced the establishment of a 'new development bank' that hopes to rival the strength and influence of the World Bank. The decision to give birth to the new financial institution. This not only signals a shake up in the international development scene, but also underlines the growing prominence of new and emerging world economies. The Bank is set up to foster greater financial and development cooperation among the five emerging markets. The BRICS Bank marks a major step to de-dollarization, and a new monetary system. Increasing cooperation between Russia and China is a clear example - the two countries started to carry out rubleyuan swaps in June 2014 in order to free themselves from the traditional trading currency, the US dollar. The potential of BRICS is promising indeed, as the members account for almost 30 percent of world GDP and about 45 percent of the global population. Raghuram Rajan, governor of the Reserve Bank of India, has said that rich countries are pursuing selfish policies with no thought of their impact on emerging economies. For example the US Federal Reserve, without warning, announced plans to 'taper' its bond purchases showed it was willing to turn the monetary controls on and off even at the expense of turmoil in emerging economies of the poor countries. However, - Financial Darwinism - for 'survival of the fittest' is also analogous to evolution and natural selection in politicofinance sector. Anyway its is an interesting and emerging area for research in finance sector.

Dr. P. V. Ramana Chairman, ITM Trust

## From Editor's Desk

After the passing of the Banking Laws (Amendment) Bill by the Indian Parliament in 2012, the landscape of the banking industry started changing. There has been a noticeable upsurge in transactions through ATMs, and also Internet and mobile banking. India's banking sector is constantly growing. The Bill 2012 allows the Reserve Bank of India (RBI) to make final guidelines on issuing new licenses, which could lead to a large number of new banks in the country. Some banks have already received licenses from the government. Over the next decade, the banking sector is projected to create up to two million new jobs, driven by the efforts of the RBI and the Government of India to integrate financial services into rural areas. Also, the traditional way of operations will slowly give way to modern technology.

Currently total banking assets in India has touched USD 1.8 trillion in FY13 and are anticipated to cross USD 28.5 trillion in FY25. India is yet to tap into the potential of mobile banking and digital financial services. Only forty-seven per cent of the populace have bank accounts. Still, the industry holds a lot of promise. India's banking sector could become the fifth largest banking sector across the globed by 2020 and the third largest by 2025. The new Government's policy initiatives in 2014 in baking sector are showing positive trends in its journey towards becoming one of the largest banking sectors in the world. We solicit the cooperation of serious researchers to write for WEALTH to publish your quality research papers on Indian banking and finance sector which showing continuous growth trends during last few years.

**Prof. Vinod Sople, Ph.D.** Chief Editor, Director, ITM - SIA Business School

# Practices of Suboptimal Investments in Russian Companies Depending on Life-cycle Stages

Victoria Cherkasova<sup>1</sup> Valentina Rechinskaya<sup>2</sup>

#### **Abstract**

The focus of this paper is the reasons of suboptimal investment policy that consists of over- or underinvestment. We consider the definitions of risk-shifting and risk avoidance effects that lead to suboptimal investments. These problems are connected with the agency conflicts in the firm between different parties: shareholders, debt holders and managers. Since the preferences of claimholders vary from one stage of the life-cycle to another, the incentives for over- and underinvestment differ in the stages of the life-cycle. The originality and the focus of this paper are the reasons for the exposure of overinvestment and underinvestment at different life-cycle stages.

The research was conducted on a sample of Russian nonfinancial companies from the period 2003-2012. This sample was divided into three life-cycle stages: growth, maturity and decline. The method of life-cycle stages identification was modified in order to use only available data and make the model more business oriented. Risk-shifting and risk avoidance, as the reasons to the problem of suboptimal investment were studied. For this purpose the estimations with one of the effects were identified. The life-cycle stages, at which the effects took place, were determined, and also the strength of risk-shifting and risk avoidance was identified with the help of the regression analysis. In addition there was considered a way to mitigate these effects. A ccording to the results they might be eliminated by the adjustment of short-term debt level.

Keywords: Corporate Investment, Firm Value, Cost of Capital, Investment Policy, Agency Conflict, Shareholders' Interests.

JEL Classification: G310

#### 1. INTRODUCTION

In recent years researchers have become increasingly interested in the interrelation of the financial and investment policies which impact company performance. Therefore it is important that these decisions must be solved in complex.

Since a firm has different claimholders and each wants to maximize their yield, agency conflicts are likely to occur. If owners or managers receive lower cash flow when maximizing total value then, in the case of maximizing equity value or remuneration, they will improve their own income. Hence, the increasing interest in companies has heightened need to research the problems of underinvestment and overinvestment that decrease their value.

There are several reasons for such problems, but this study considers only two of them, namely, risk-shifting and risk avoidance effects. Both are connected with firms' investment risk characteristics, but are based on different agency conflicts: risk-shifting concerns the owners-creditors conflict, risk avoidance - the manager-owners one. In order to cope with the problems of over- and underinvestment in detail it is important to identify the incentives to distort. Thus, the central issue of the study is to investigate risk-shifting that leads to overinvestment and risk avoidance effects that lead to underinvestment.

Considerable research has been devoted to the risk-shifting effect which encourages owners to accept risky investment projects. If a project is successful, shareholders receive a higher average return, and bondholders get fixed payments.

In contrast, when the project fails, only creditors incur losses. In the case of risk avoidance, managers accept only safe investment projects in order not to lose valuable growth opportunities in case of the project's failure and the company's bankruptcy. Therefore in the first situation shareholders are inclined to over-invest, and in the second one managers tend to under-invest. Both cases are possible when the proportion of debt in the capital structure is high, but the influences on investment differ.

Each of these effects has been studied previously. However, they have never been fully investigated in the context of a company's life cycle. Nevertheless the motivation for financial and investment decisions, and claimholder incentives may change depending on the stage of the firm's development. Therefore, the power of risk-shifting and risk avoidance effects can vary from stage to stage. An understanding of this would be helpful for managers making corporate decisions.

The second feature of this paper is the study of the risk-shifting and risk avoidance effects on the example of Russian companies since they are becoming more integrated into the global capital markets. Russian companies have special nuances when they are experiencing risk avoidance and risk-shifting effects at different stages of the life cycle. There are differences between indicators of investment activity and debt burden at every phase of the firm's development.

The paper is organized as follows: Section 2 contains basic concepts and review of theoretical studies on the topic. Section 3 contains the methodology of risk avoidance and risk-shifting

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study, and the life cycle of a company, comments about testing of hypotheses and the data description. Section 4 consists of empirical results and finally section 5 contains conclusions

#### 2. LITERATURE REVIEW

The interrelation of financial and investment decisions has been one of the most important issues of corporate finance for over half a century. The theoretical basis for this area was laid by Modigliani and Miller (1958), who argued that under an efficient capital market, the lack of taxes, bankruptcy costs, asymmetric information and agency costs, firms make decisions on financing and investing separately. However, relaxing each of the premises, it can be observed that the questions of the choice of capital structure and investment are interrelated. This theory was criticized by Jensen and Meckling (1976), Myers (1977), and later by Parrino and Weisbach (1999) who highlighted the problems of asymmetric information and the agency costs of conflicts between claimholders as the main factors determining financial and investment policies. The influence of the latter aspect of capital market imperfections on the relationship between financial and investment decisions is the focus of this paper.

There are different explanations for the relationship between capital structure and investment decisions. A significant contribution to the theory of corporate finance was made by Jensen and Meckling (1976), who proposed considering a firm in terms of the existence of groups of security holders whose interests differ. So when the debt burden of a company increases, less of the cash flow goes to shareholders and more to debt holders. In this regard the manager, acting on behalf of owners, is more inclined to accept high-risk projects and over-invest in order to increase the average income of the shareholders. If such a project gives the expected result, the shareholder wealth increases and creditors receive fixed payments. Otherwise, no single group of security holders receives remuneration. However, the owners risk less than claimholders, i.e. shareholders transfer the risk to the shoulders of creditors trying to increase wealth at their expense. This phenomenon is called risk-shifting.

The first who classified risk avoidance as a separate reason of underinvestment were Brito and John (2002). In this case, if the debt burden is high and company has good growth opportunities managers may be inclined to reject risky investment projects and accept safer ones, even with lower NPV (Net Present Value). The reason is that managers want to save control of the company and receive all the advantages from the future growth opportunities. If they realize risky investment in conditions of high leverage the firm probably may become bankrupt and valuable growth opportunities will disappear.

These authors also considered risk avoidance with other reasons of sub-optimal investment, namely risk-shifting and risk avoidance. Brito and John proved that risk-shifting incentives may be mitigated by high growth prospects of the company and firm's investment decisions may become more conservative. So, risk avoidance and risk-shifting are mainly connected with the company's risk choice.

The effect of risk-shifting has received serious attention in economic literature. The existence and significance of riskshifting were investigated by Eisdorfer (2008) in the case of companies that were experiencing financial distress. Existence of risk-shifting was later considered in financially healthy companies (Danielova, Sarkar, Hong 2013).

Contrary to this, risk avoidance has received lower popularity. Keeley (1990) and Acharya (1996) for the first time described the mechanism of risk avoidance behavior on the example of charter value. They investigated the question, why banks do not maximize the risk of their assets, even if they have insured deposits. The key answer there was that banks had valuable illiquid charters, which were hard to sell even if the bank became a bankrupt due to excessive risk taking. Further, Brito and John (2002) developed this mechanism and formed the determination of risk avoidance effect. They also proved that risk-shifting incentives could be mitigated by risk avoidance ones if the company has high growth prospects.

All studies explored the relationship of capital structure and investment regardless of the level of a company's development, the stage of its life cycle. However, the motivation of financial and investment decisions changes depending on the life-cycle stages. The theory of business cycles is worth considering in detail.

The majority of theoretical and empirical studies of this theme are based on the biological concept of the organization, in which the passage of stages is a consistent and iterative process. All studies on concept of organizational life cycle differ one from another due to the number of life-cycle stages, key organizational structures and main drivers of organizational effectiveness triggering change of life-cycle stage (Miller 1984, Downs 1967, Scott 1971, Greiner 1972, Adizes 1979, Kimberley 1980).

The most comprehensive theory was elaborated by Adizes I. He stated that organization goes through several stages relating to its main activities (Adizes, 1979). The life of organization begins with birth stage associated with entrepreneurship activities. Administrative procedures aimed at formalization of organizational activities become main feature of maturity stage. Finally, company moves to decline stage because of stability overestimation, burdening accountability and compliance. In the current research the Adizes'es concept of corporate life cycle that includes growth, maturity and decline stages will be used.

All methods of life-cycle stages determination may be split into two major groups. The first one relies on fundamental characteristics of the company. This group may be represented by Myers' study which chooses five parameters as determinants: strategic focus, management type, ownership type, administrative systems, and financial specifics (Myers, 1997). This method is appropriate for case studies rather than for research with panel data. Second one uses for life cycle determinants quantitative financial and non-financial data related to company's activities.

Second group is the most common across different studies on organizational life cycle. Method proposed by Anthony and Ramesh assumes that company moving though stages of life cycle may assess its effectiveness with some quantitative criteria (Anthony J., Ramesh K. 1992). There were chosen four determinants of life-cycle stages: age of organization, growth of revenue, growth of capital expenditures, and

dividend payout ratio. Splitting the sample into percentiles groups per every factor is necessary for grading. The sum of grades for each factor allows determining the life-cycle stage of organization.

The financial and investment decisions of the company vary during its development. The first stage is characterized by unstable cash flows of long-term capital investments, and thus the difficulty of attracting debt. When a company enters the maturity stage, stabilizing the cash flow from operations, borrowing becomes more affordable due to a lower required rate of return. Going into a recession, the company usually has a high proportion of debt in the capital structure. Significant investment injections are also required in order to revive the business, but the possibility of funding is reduced due to the deterioration of investors' expectations. After the recession, the company goes bankrupt and ceases to exist or overcomes the crisis and begins a new life cycle. Thus, the problem of risk-shifting is more likely to arise at maturity and decline stages, when debt burden is high and there are no good growth prospects. On the contrary, risk avoidance effect is more common for the companies at growth and maturity stages, where leverage is significant, but growth opportunities still exist.

#### 3. SAMPLE AND METHODOLOGY

#### 3.1. Methodology and Hypotheses

There are several steps in this research. At the beginning life-cycle stages are identified. The second step is the determination of samples of companies that have features of risk-shifting and risk avoidance effects at each stage of the life cycle. Finally we identify life-cycle stages at which the effects take place with the help of regression analysis, and also determine the strength of these effects at each stage of the life cycle. Now each step is going to be considered in detail.

First step is the determination of life-cycle stages for the sample of companies. Considering the features of different methods and data constraints, the Anthony and Ramesh concept is used for sorting companies by life-cycle stage. This method needs some adjustments caused by the specifics of the initial data and by the inherent disadvantages of the approach.

Firstly, dividend payout ratio is replaced by share of retained earnings in total assets. This replacement is necessary, since 90% of sampled companies are 'non-listed' and do not disclose information about dividends. This modification was practiced in a study on life-cycle stages by DeAngelo, Owen & Yawson (2010). Secondly, market share is included into the initial concept, since this parameter is important for determining corporate strategy. The increase of market share is associated with the growth stage, retention of market share refers to maturity, and decrease of market share is associated with decline stage.

The initial concept of Anthony and Ramesh reflected only related stages of life cycle. Even though the sample consists of growing companies, it is split into growing, mature, and declining companies. In order to avoid this bias, the shift to determination of absolute stages is needed – revenues growth, investment growth, and retained earnings share to be recalculated using industry average values. Firstly, industry indicators are calculated on the basis of NACE-codes. Secondly, indicators of every company are adjusted with a

calculated industry average. For each industry there is one constant average. It helps to prevent the influence of industry changes that occur from year to year and account only constant effect. This modification allows taking into account industry specifics in the research and is important for the two indicators on top. Companies of capital-intensive industries have typically double-digit capital expenditures growth. In contrast, companies of the service sector are not as capitalintensive. This does not necessarily mean that companies of capital-intensive industries refer to the growth stage and the service companies to the decline stage. Industry specifics may be important for retained earnings share in total assets. Some industries may apply a financial margin of safety if company indicators either are volatile or depend highly on the business environment. For such companies it seems to be relevant to have some excessive retained earnings for covering liabilities and not to jeopardize business activities.

In total, five indicators for distributing companies among lifecycle stages were used: age (Age), capital expenditures adjusted for industry average (Investment Growth adjusted), revenues growth adjusted for industry average (Revenue Growth adjusted), retain earnings share in total assets adjusted for industry average Retained Earnings adjusted, and incremental market share (Change of Market Share).

$$Investment \ Growth \ adjusted_t = \frac{capex_t}{capex_{t-1}} - Industry \ average \left(\frac{capex_t}{capex_{t-1}}\right) \quad \ (2)$$

where Capex - yearly value of company's capital expenditures;

$$Revenue \ Growth \ adjusted_t = \frac{Revenue_t}{Revenue_{t-1}} - Industry \ average \left(\frac{Revenue_t}{Revenue_{t-1}}\right) \ (3)$$

where Revenue - yearly value of company's revenue;

$$\frac{Retained \ Earnings}{Total \ Assets} \ adjusted_t = \Re/TA_t - Industry \ average \ \Re/TA_t \ (4)$$

where RE/TA – yearly ratio of company's retained earnings;

$$Change \ of \ Market \ Share_t = \frac{Revenue_t}{Industry \ Revenue_t} - \frac{Revenue_{t-1}}{Industry \ Revenue_{t-1}}$$

Where Revenue – yearly value of company's revenue, Industry Revenue – yearly market value;

Then, all companies on the yearly basis are ranked according to the calculated indicators. For each observation, a specific grade is assigned (see Table 1).

Table 1: Life-cycle Stages - Grades of Determinants

Level\ Index	Investment/ Total assets (in %, correct)	Revenue growth (in %, correct.)	Retained earnings/ Total assets (in %, correct.)	Age	Growth of the market share (in %)	
Low	1	1	3	3	1	
Middle	2		2	2	2	
High	3	3	1	1	3	

Source: Authors' methodology

Summarizing grades for all indicators final rating of every observation is calculated. Marks from 5 to 7 correspond to the decline stage, from 9 to 11 - to the maturity stage, from 13 to 15 - to the growth stage. For dividing the companies into life-cycle stages, the modification of Jenkins (2006) is used to exclude

companies on transitory stages from the analysis. Companies with a grade equal to eight or twelve are considered on the transitory stage.

Now it is time to determine reasons of overinvestment and underinvestment, i.e. risk-shifting and risk avoidance. For this purpose the method of La Rocca and Gerace (La Rocca & Gerace 2008) is used. In their study the effects of risk-shifting and risk avoidance were characterized by the 2 same conditions:

- · High leverage,
- · Low availability of cash flow.

Growth opportunity is the only characteristic that differs these effects. In case of risk shifting they are low, and in case of risk avoidance they are high.

Therefore after the identifying the life-cycle stages the sample of Russian companies is firstly ranked according to debt burden and availability of cash flow (see Table 2).

Table 2: Method of Identification of Estimations
With Risk-Shifting or Risk Avoidance

Level\Index	Debt ratio (correct.)	Availability of cash flow (correct.)
Low	0	1
High	1	0

Source: Authors' methodology

After that estimations that have a score equal to 2 are divided into two subsamples according to level of growth opportunities.

Since the availability of data about Russian companies is limited some amendments are used. First of all, the leverage is replaced by share of long-term debt in total assets, because the majority of the indices in the study are normalized by total assets, and it would be better to use single methodology. Also the same reasons apply as to why the average industry values are subtracted from all the indices. This variable represents the debt burden of the company in comparison with average industry level of debt. In this way we can make conclusions about companies from different sectors. If this difference is high it means that the company is more likely to have incentives to sub-optimal investment. Conversely, if the difference is low, such incentives are not typical for the company.

Debt ratio 
$$_{correct.t} = \frac{LTD_t}{TA_t} - Industry average \left(\frac{LTD_t}{TA_t}\right)$$
 (6)

where LTD - long term debt, TA - total assets;

It is difficult to collect sufficient data of cash flow, therefore EBITDA is used as a proxy to this indicator.

Availability of cash flow 
$$correct.t = EBITDA \ ratio_{correct.t}$$

$$= \frac{EBITDA_t}{TA_t} - Industry \ average \left(\frac{EBITDA_t}{TA_t}\right)$$

where *EBITDA* – Earnings before interest, tax, depreciation and amortization, *TA* – Total Assets

According to La Rocca & Gerace's methodology, other empirical research, and general notion, the growth potential of a company is measured by indicators from market data. The most popular one is Market-to-Book index. It shows how many times the market capitalization of the company exceeds the book value of equity holders' funds. If this ratio is high, it means that investors who buy the company's shares are ready to buy much more than they can get if the firm becomes a bankrupt. This situation happens if the company is thought to have high potential of growth and therefore could bring high income to shareholders. However, most of Russian firms are closed joint-stock companies. This fact makes it impossible to use market data to measure growth potential. Therefore in this study growth potential is calculated as the percentage change in value of company's capital, excluding extra cash that often is used to settle the liabilities.

$$\begin{array}{ll} 2 \\ Growth \ potential & correct.t \end{array} = \Delta (Total \ Equity + Total \ Debt - \\ Cash) - \Delta Industry \ average (Total \ Equity + Total \ Debt - Cash) \\ \end{array}$$

Since both effects are connected with the company's investment risk, additional conditions for their identification are needed. The right way to determine risk-shifting and risk-avoidance problems is to control the growth of the operating risk as long as the investment increases. Therefore, for risk-shifting identification it is necessary to select those companies that have investment level and project's risk growth simultaneously (Mao 2003; Danielova, Sarkar 2013). The opposite relation is used for risk avoidance identification. In this case the more the company invests, the safer the projects are. So, it is necessary to select companies that have investment level growth and at the same time the project's risk decreases. In this study the measure of risk is EBITDA volatility, which is calculated as follows:

$$EBITDA\ volatility_t = \frac{\Delta EBITDA_t}{\Delta EBITDA_{t-1}}$$
(9)

where *EBITDA* – Earnings before interest, tax, depreciation and amortization.

In this case Investment growth  $_{\rm i,t}$  that is not adjusted for industry average values is used.

Finally, estimations are selected according to following method (see Table 3).

Table 3: Additional Condition for the Identification of Estimations With Risk-Shifting or Risk Avoidance

Index\Effect	Risk-shifting	Risk avoidance
$\left  \mathit{EBITDA}\ \mathit{volatility}_{i,t}  ight $	>1	<1
Investment growth <sub>i.t.</sub>	>0	>0

Source: Authors' methodology

The model that identifies the relation between debt burden and investment is the following:

where Investmentt and Investment $_{t-1}$  are calculated as in equation (2).

 $Investment_{correct.i,t} =$ 

$$\begin{split} \beta_1 + \beta_2 \times Debtratio_{correct.i,t-1} + \beta_3 \times Growth potential_{correct.i,t-1} + \\ \beta_4 \times EBITDA ratio_{correct.i,t} + \beta_5 \times Investment_{correct.i,t-1} + \varepsilon_t \quad (10) \end{split}$$

Debt ratio is calculated as in equation (6), EBITDA ratio is calculated as in equation (7), Growth potential is calculated as in equation (8),

All other independent variables are control ones. They are needed in order to identify whether the relation between the company's debt and investment is significant in comparison with the main determinants of investment. According to Aivazian, et al. (2005), Dang (2011) they are the following: growth opportunities, availability of cash flow and investment of the previous period. Since the consequences of investigated effects are over- and underinvestment the major difference between these effects is the relation of debt burden and investment. It is positive in case of risk-shifting and negative when risk avoidance occurs. In terms of the regression analysis the sign of the coefficient before Debt ratio must be negative if risk avoidance takes place and positive if risk-shifting occurs.

Now, for the analysis of the effects depending on the life-cycle stages, it is needed to formulate hypotheses for further testing.

Since the main characteristics of the investigated effects is hard debt burden, it is necessary to find out how it changes from stage to stage. If company's debt increases along with the firm development, risk-shifting and risk avoidance are more likely to be stronger at later stages of life cycle (La Rocca & Gerace 2008). At the growth stage, the company benefits by having a minimum level of debt to make the entire cash flow from operating activity go to owners. Then, at the stage of maturity, when capital costs are significantly reduced, the company will probably increase the proportion of debt in the implementation of investment projects to utilize a tax shield. In decline, the level of debt is usually large, which increases the costs of bankruptcy.

*H1.* Company debt increases from growth stage to maturity, and then from maturity to recession.

Now it is necessary to consider the risk-shifting problem. The characteristics of this effect outlined by La Rocca and Gerace are logically related to the indices, chosen to identify the stage of a company's life cycle. Also according to some evidence in the papers Fang, Zhong (2004), Eisdorfer (2008), Danielova, Sarkar, Hong (2013) the risk-shifting effect is more likely to occur either when there is a risk of default or when a company is financially «healthy».

*H2*. The effect of risk-shifting is more likely to occur at the stages of maturity and decline than at the growth stage.

The next hypothesis is intended the consideration of risk avoidance. The nature of this problem entitles us to make a suggestion that it is likely to occur when growth prospects are high but the debt burden is significant. Brito and John (2002) proved that in such conditions managers want to receive benefits from the future growth prospects, therefore they reject risky investment in order not to become a bankrupt and lose valuable growth opportunities.

H3. The effect of risk avoidance is more likely to occur at the stage of growth and maturity stages than at decline one.

Short-term debt is considered as a way of risk-shifting elimination. Leland (1998) and Ericsson (2000) and Djembissi (2008) suggested that debt maturity and debt covenants are those things that affect equity holders' incentives to shift risk onto creditors. In this case short-term debt plays a disciplining role for owners and mitigates the risk-shifting effect. Also another logic is applicable: for example, the less the maturity of corporate bonds, the less their price is sensitive to the risk of investment projects. Therefore companies that have incentives for risk-shifting should restructure debt in the context of its maturity. Thus, the companies that experience risk-shifting are more likely to have debt with longer maturity.

H4. Companies that experience risk-shifting have on average smaller share of short-term debt at maturity and decline stages.

Another logic might be applicable for companies that experience risk avoidance. These companies underinvest, because they do not want to lose valuable growth opportunities due to failure of risky investment project. In this case if such firms have relatively high share of short-term debt, there is a significant cash outflow for debt holders and many investment projects might be rejected. The extending of debt maturity probably can help these companies to realize investment projects and get financial results before debt repayment that significantly reduces the probability of bankruptcy. Therefore enlargement of the debt maturity may be a solution to the risk avoidance problem.

*H5.* Companies that experience risk avoidance have on average a larger share of short-term debt at growth and maturity stages.

It is also interesting to test the hypothesis concerning the structure of ownership, bargaining power that has this or that type of claimholders, since it highly correlated with the severity of the agency conflict. However, there is no such available data for Russian companies. These hypotheses can be tested with the example of other emerging countries, and by using other databases.

#### 3.2: Data and Sample Characteristics

In order to carry out the analysis, financial and non-financial information from the database Ruslana Bureau Van Dijk is used. The sample contains only Russian companies and the estimated period is from 2003 to 2012.

At first the sample has been refined from companies of the financial sector, since they have disparate with other industries share of debt in capital. Firms from the sector of social services, and national and governmental organizations have been excluded too. In this study NACE-code is the base of industries classification. Also the filter on the form of incorporation has been set. Only opened and closed joint stock companies are present in a sample.

Also holding groups' members have been excluded from the sample, because such companies do not have independent financial and investment policies. For this purpose the indicator Global Ultimate Owner (GUO) is used. It means that if a single

GUO possess 50% and 1 share in more than 1 company, all the dependent organizations are excluded from the sample.

At the next step minimal value for revenues and assets was defined on the level of 1 million USD. There are two reasons for limitation:

- it excludes from the analysis small companies with some important parameters unavailable (capital structure, retained earnings);
- it helps to exclude the companies that are actually on the seed stage and get out of scope, since Anthony and Ramesh concept is appropriate only for growth, maturity, and decline stage.

Finally, the sample contains information about 9884 companies, which can be divided into several groups according to belonging to particular industry. The composition is presented in the Chart 1. More than 40% of all companies in a sample belong to the manufacturing sector. Also significant shares have construction (12%), agriculture, forestry and fishing (10%), wholesale and retail (10%), transportation and storage (9%). It could be concluded, that the industry structure of the sample is quite diversified. The study suggests the use of panel data, therefore pooled regression is applied.

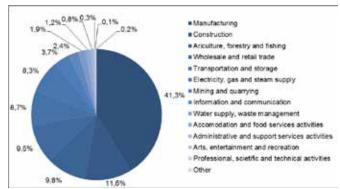


Figure 1: The Sectorial Composition of the Sample of the Russian Companies

Source: Ruslana Bureau Van Dijk

#### 4. EMPIRICAL RESULTS

At the first stage, the sample of Russian companies is divided into three subsamples that refer to stages of the life cycle: growth, maturity and decline. This procedure is based on the methodology of Antony and Ramesh that has been mentioned above. As a result 64070 company-year observations contain:

- 5331 company-year observations at the growth stage,
- 30975 company-year observations at the maturity stage,
- 10228 company-year observations at the decline stage.
- 17536 observations are omitted, since they have boundary final index (8 or 12) (see Table 4).

These figures are consistent with the fact that the majority of Russian firms were founded after privatization in 1990s and now they are mature companies.

Further, the first hypothesis is tested for determination of stages on which the effects mostly take place. In order to conduct this procedure, a t-test with different variances is used. It compares average levels of debt burden at each lifecycle stage. Table 5 contains the results of the test.

Table 4: The Distribution of Estimations through the Period and According the Stages of the Life-cycle

	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Growth	282	617	191	824	193	169	1189	306	1560	5331
Maturity	3440	3839	2617	3283	3375	3938	3496	4209	2778	30975
Decline	1246	754	2032	1422	1795	1335	589	811	244	10228
Total	4968	5210	4840	5529	5363	5442	5274	5326	4582	46534

Source: Ruslana Bureau Van Dijk

Table 5: The Results of Testing the 1st Hypothesis

Stage	1st hypothesis (Debt ratio)					
	Mean	Variance	Number of obs.	t-statistics		
Growth	-0,0016	0,219	5331	0,8399		
Maturity	0,0044 0,175		30975			
Maturity	0,0044	0,175	30975	-22,003***		
Decline	0,1863	0,321	10228			

Levels of significance: \* - 0.1, \*\* - 0.05, \*\*\* - 0.01.

Source: Authors' calculations

The difference between average levels of Debt ratio in growth and maturity stages is insignificant. However, it becomes more obvious when comparing average levels of Debt ratio of maturity and decline stages. It can be interpreted as an increase of debt in capital structure when the company moves from a growth stage to a maturity one, and then to the stage of decline. Since the investigated problems are harder when the debt burden is larger, it can be assumed that the risk-shifting and risk avoidance problems are likely to take place in later stages of the life cycle. These results and conclusions are used in further testing of other hypotheses.

Now hypotheses 2 and 3 must be tested in order to determine the extent of the effects with the help of the model (10) on panel data on each subsample that referred to life-cycle stage. At this stage, company-year observations that probably have one of the effects, risk-shifting or risk avoidance, are identified. As a result there is following structure of estimations for each of the effects (see Table 6). It is partially proportional to the distribution of companies according to life-cycle stages stated above.

Table 6: Structure of the Number of Observations for Risk-shifting and Risk Avoidance Testing

Stage\Effect	Risk-shifting	Risk avoidance
Growth	266	218
Maturity	907	543
Decline	131	128

Source: Ruslana Bureau Van Dijk, authors' calculations

The 2nd hypothesis that concerns risk-shifting effect is confirmed. The model (10) gives following results. A positive dependence of debt level on investment can be observed at all the life-cycle stages. The level of coefficients before Debt ratio reflects the strength of dependence on Investment and it increases from stage to stage. The relation is weak at the growth stage and then its strength improves at the maturity stage. At the stage of decline the positive dependence between debt and investment is the strongest. In other words the

risk-shifting effect becomes harder when a company moves from one life-cycle stage to another. However, it is hard to conclude that the risk-shifting effect is relevant for high growth companies than for others, because such positive relation may exist due to low cost of debt since investors' expectations are high; and this has no relationship with the agency conflict. These results also correspond to Danielova and Sarkar's logic (Danielova, Sarkar, 2013). Risk-shifting might be typical not only for companies experiencing financial distress, which are often at the decline stage, but also for 'healthy companies' at the maturity stage.

The 3rd hypothesis is also confirmed. There is a strong negative relation between debt ratio and investment at the growth stage of the life cycle. At the maturity stage the relation becomes weaker. However, at the stage of decline negative effect does not take place and risk avoidance is mitigated by risk-shifting incentives. It can be concluded that the risk avoidance effect takes place only at the 2 first stages and decreases as a company moves from growth to maturity.

Thus, it can be concluded that risk-shifting and risk avoidance problems take place at different stages of the life cycle. Risk-shifting is more common for companies at the maturity and decline, and risk avoidance appears mainly at growth and maturity. In addition, risk-shifting is harder for companies at the decline stage, while – risk avoidance is harder for companies at the growth stage (see Table 7).

Table 7: Determination of Risk-shifting and Risk Avoidance Effects

Dependent variable	Investment								
Effect	F	Risk-shiftin	 g	Risk avoidance					
Stage	Growth	Maturity Decline		Growth	Maturity	Decline			
Intercept	0,125***	0,079***	0,046***	-0,255***	0,015*	-0,160***			
estimate	(12,53)1	(14,06)	(9,64)	(8,93)	(1,65)	(-9,87)			
Debt ratio	0,032***	0,049*	0,099*	-0,222***	-0,066*	0,164***			
	(2,67)	(1,73)	(1,76)	(-2,90)	(-1,72)	(2,14)			
Value	0,001	0,001*	-0,001**	0,001	0,001	-0,001***			
growth ratio	(0,32)	(1,51)	(-2,36)	(0,83)	(-0,89)	(-9,63)			
BITDA ratio	-0,046**	-0,124**	0,008	-0,355***	0,181*	0,050			
	(-1,88)	(-2,01)	(0,36)	(-2,68)		(1,05)			
Investment	-0,011***	0,073***	-0,008	-0,037	-0,011*	-0,011			
t-1	(-45,88)	(3,08)	(-1,52)	(-0,33)	(1,64)	(-0,59)			
Number of obs.			131	218	543	128			
R-squared	0,271	0,265	0,316	0,284	0,213	0,279			
Prob>F	0,0000	0,0005	0,0000	0,0000	0,0001	0,0000			

Levels of significance: \* - 0.1, \*\* - 0.05, \*\*\* - 0.01.

Source: Authors' calculations

1 – t-statistics.

Finally, testing of the hypotheses connected with short-term debt influence on the strength of risk-shifting and risk avoidance is held. It is considered as one of the decisions to these problems. The analysis is based on the stages at which risk-shifting and risk avoidance have been identified: maturity and decline stages for risk-shifting, growth and maturity stages

for risk avoidance. For testing a two-sample t-test with different variances is used. The average values of indicator of the sample of companies that engage effect are compared with average values of indicator of the initial sample. Short-term debt ratio is calculated as follows:

$$STD\ ratio = \frac{Short - term\ Debt_t}{Total\ Assets_t} \tag{11}$$

Then it is averaged at industry level and in this way average industry values are calculated. Therefore the estimations here will be industry-year.

In this test H0 suggests that the difference of mean values equals to 0. It means that if H0 is confirmed, there are no grounds to conclude that on average companies engaging risk-shifting or risk-avoidance have higher or lower level of the stated above indicators than all companies in the sample.

The 4th hypothesis is confirmed at both stages, maturity and decline. The result can be interpreted as following. Companies that experience risk-shifting have a lower share of short-term debt on average. Therefore the reducing of short-term debt share can be considered as a solution to the risk-shifting problem. This conclusion is more relevant for declining companies than for those at the maturity stage.

The 5th hypothesis is confirmed at stages of growth and decline. It means that firms engaging risk avoidance have a higher share of short-term debt on average; and it will be better for such companies to enlarge debt maturity in order to have more time to implement investment projects before debt repayment.

The results of testing hypotheses about the short-term debt influence on risk-shifting and risk avoidance problems are summarized in Table 8.

Table 8: The Results of Testing 4th and 5th Hypothesis

Stage	4th hypo	thesis (	risk-shif	5th hypothesis (risk avoidance)				
	tobserved	Mean (r.s.)	Mean (i.s.)	N.obs	tobserved	Mean (r.a.)	Mean (i.s.)	N.obs
Growth					1,997*	0,513	0,509	40
Maturity	1,981*	0,397	0,436	62	1,993**	0,491	0,429	47
Decline	2,011**	0,289	0,378	38	-	-	-	-

Levels of significance: \* - 0.1, \*\* - 0.05, \*\*\* - 0.01.

Mean (r.s.) – average company short-term debt among observations that tend to have risk-shifting;

Mean (r.a.) – average company short-term debt among observations that tend to have risk avoidance;

Mean (i.s.) – average value of short-term debt among the initial sample.

 $\mbox{N.obs}$  -  $\mbox{Number of observations}$  in 4 and 5 hypotheses – industry-year

Source: Authors' calculations

#### 5. CONCLUSION

Such reasons of overinvestment and underinvestment as risk-shifting and risk avoidance effects seem to have a serious negative impact on a company's performance, especially on its value. Both effects mostly occur under the conditions of the high proportion of debt in the capital structure and low availability of cash flow. The only difference is the level of growth potential: for companies that experience risk-shifting

it must be low, and for companies engaging risk avoidance high. However, the influences of debt on the investment are different: when risk avoidance occurs, less investment projects are approved, since managers do not want to lose valuable growth opportunities due to failure of risky investment projects. This situation leads to underinvestment. On the contrary, equity holders tend to overinvest even in risky projects, when there is a significant share of debt. It gives possibility to receive higher income in case of investment project success, and lose less in the case of failure. This situation leads to overinvestment. Since these agency conflicts are connected with risk, but cause overinvestment and underinvestment, it is better to investigate the risk-shifting and risk avoidance effects simultaneously. The originality of the study is the linkage of these problems with the life cycle, and the investigation into the strength of their occurrence at different stages.

The testing of the formulated hypotheses gives the right to conclude that risk-shifting and risk avoidance problems take place at different levels of firm development: risk-shifting is more common for later life-cycle stages, and risk avoidance occurs at growth and maturity stages. It is also stated that risk-shifting is stronger at the decline stage, while risk avoidance has more power at the growth stage of the life cycle.

The ways of mitigating these effects are also investigated. The conducted analysis gives the right to conclude that companies experiencing risk-shifting effect have lower share of short-term debt on average, and this is more applicable for firms at the decline stage. For such companies it would be better to enlarge the share of short-term debt since it could cause a disciplining effect on the owners' behavior. Contrary, firms engaging in risk avoidance have a higher share of short-term debt on average, and this is more relevant for companies at the maturity stage. Longer debt maturity would help such firms to implement more investment projects before debt repayment, and finally decrease the probability of bankruptcy.

It was stated that the strength of risk-shifting and risk avoidance effects and investigated way of their mitigation vary from stage to stage. This understanding might be helpful for top-management while making corporate decisions. It is also interesting to study risk-shifting and risk avoidance effects using the example of Russian companies since they are becoming more integrated into the global capital markets.

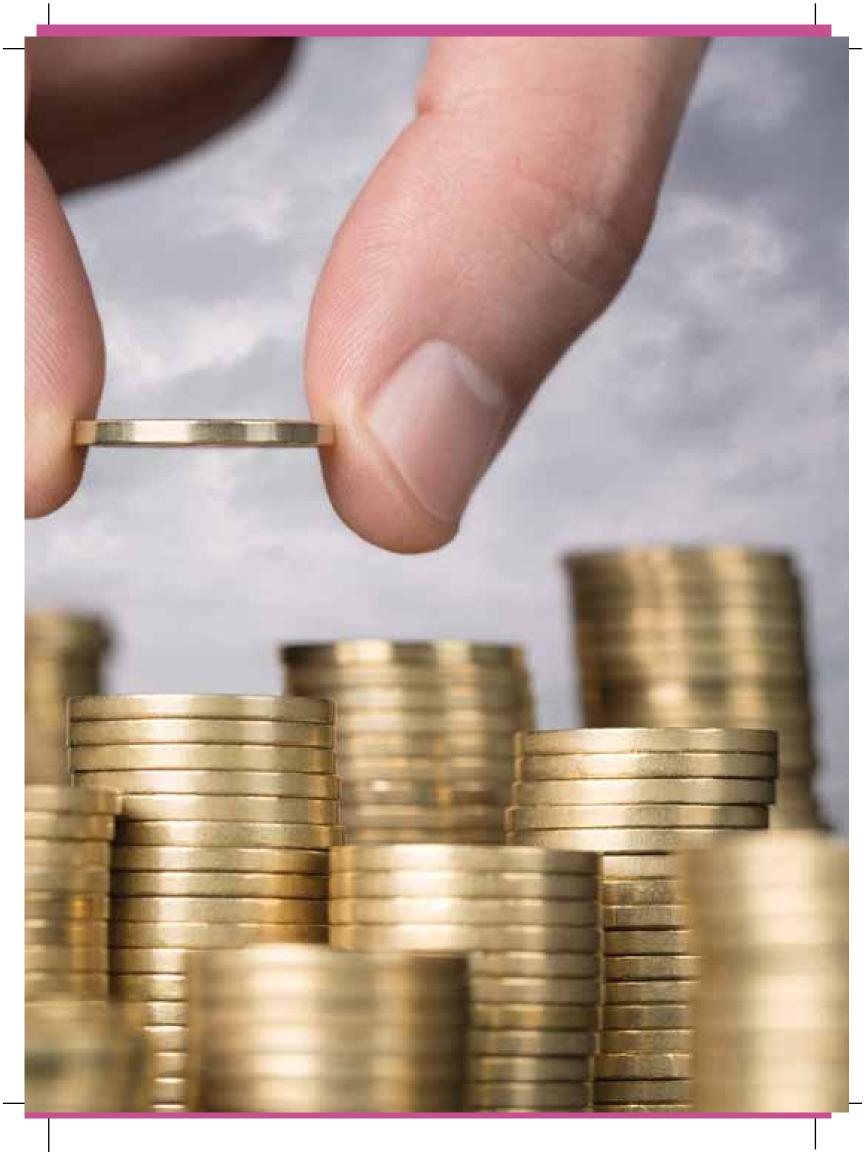
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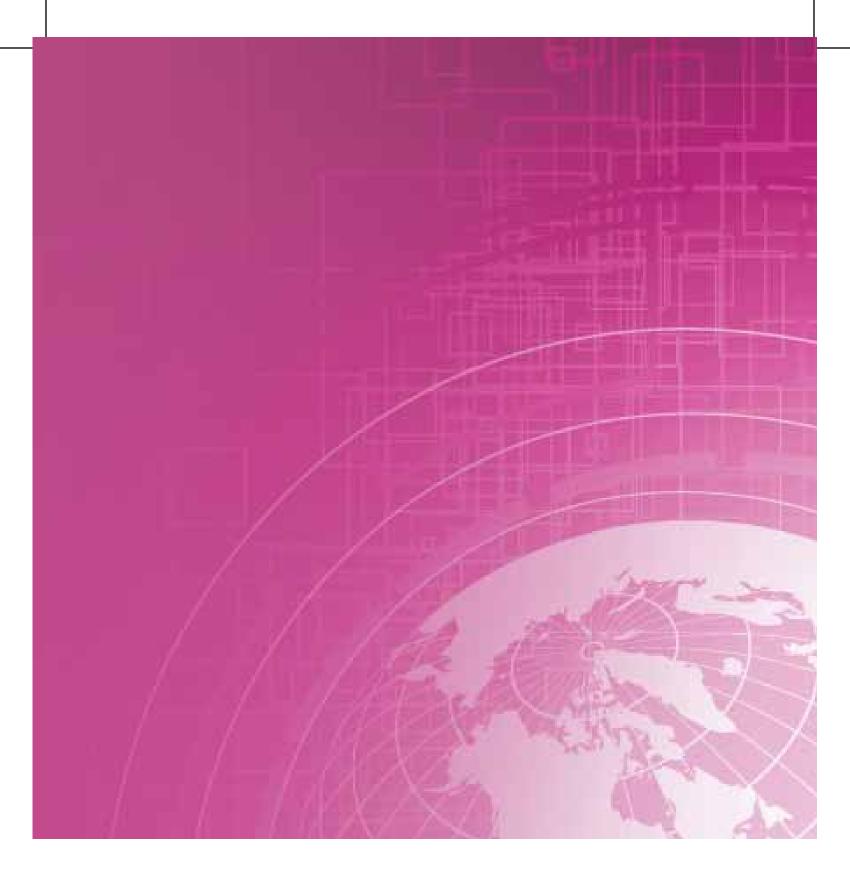
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