# DOES INTEREST RATE MATTERS: STUDY OF INVESTMENT MANAGEMENT OF ESTONIAN COMPANIES

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**Abstract**

The paper examines determinants of investment decisions of Estonian companies. Within investment decision determinants the influence of interest rates and cost of capital get special attention as well as the analysis of liquidity constraints. The study is based on answers of questionnaires received from 44 companies of Estonia. Results of the study show that most important determinants of investments are related to risk and uncertainty followed by liquidity constraints and business confidence determinants. Interest rate determinant and cost of capital consideration has small influence to investment decisions as well as have a low profile in overall management focus. Liquidity constraints on other hand should be considered an important decision factor behind investment decisions.

**Keywords:** investement management, intrest rates, liquidity management, channels of monetary transmission mechanisms

**JEL Classification:** E22, G31

## Introduction

Do macroeconomic factors and specifically interest rates improve the allocation efficiency of investments? This question has intrigued both academic and business people. First significant concept in this field is the work of J. Miller and F. Modigliani where they state the independency of investment decisions from financial decisions (Miller, Modigliani 1958). Several empirical studies on that field are reporting different findings on relationship between financial market characteristics and corporate investment decisions showing large variety on their magnitude and direction of correlation. Even though assumptions of Miller and Modigliani model nowadays have been questioned still many studies would lean to strong influence of interest rates to investment decisions.

The purpose of this study is to analyze determinants of investment decisions of Estonian companies. Special attention has given to the interest rate influence on investment decisions. Different to most of empirical studies on that field where sophisticated econometric models are tested in the pool of aggregated data we have analyzed decision making motives through the direct questions from top managers of companies. The research method gives a possibility to analyze not only interest rate influence to investment decisions but more specifically the interest rate and other financial variables influence through the framework of cost of capital. Therefore our study do not argue as much over the interest rate influence to investment decisions but rather the usage of cost of capital framework within the

management of companies. Even though we have reached close to the investment decision makers of companies there remains still the question of interpretation of results. Therefore we used extensive literature review to work out questions and explain our considerations.

Beside the cost of capital variables influence to the investment decisions there is analyzed the wider set of variables important for companies considering investments. There is excessive number of empirical studies discussing the significance of certain variable to investment decisions whereas in our study the rank of important characteristics is presented. Due to the multiple choice questionnaire there is closed set of possible answers even though we have used large set of characteristics from other previous studies. For better interpretation we later group these characteristics into several sub-groups and discuss results in line with other studies. Even though the methodology and questions are not unique the results of the study are rather unique and could be used in further academic discussions as well as in practical purpose.

Within the analysis of determinants we also focus more deep to financial constraints of companies. Based on model from literature we discuss the existence of liquidity constraints of companies and possible reasons behind of it. According to studies of monetary transmission mechanisms the financial constraints could be another important framework explaining the interest rate influence to investment activities. Therefore the simultaneous study of several decision making frameworks gives unique opportunity not to study them separately but also compare their significance and rank their influence to the management of companies.

The paper is organized as follows. Literature review contains overview of classical investment theories where several costs of capital variables used in other studies are discussed. Also there has given a brief review of other important variables of investment activity discussed deeply in the literature as liquidity constraints and uncertainty influence to investments. Finally some other aspects of investment management as industry influence, ownership structure and the size of a company is discussed. Methodology and data part explains the composition of questionnaire and gives short overview of responding companies as well as the questioning procedure. As the sample of companies consisted 44 biggest non-financial companies of Estonia the interpretation of results should be carefully considered. Results of the study have been organized in three sub-sections to give a better distinction of findings. There is a section for ranking of several investment variables as well as separate sections for cost of capital variables analysis and liquidity constraints analysis. Finally, some conclusions are drawn about the investment management in Estonian companies.

**Literature review**

The neoclassical interest-profit theory of investments says that investment depends on the interest rate, given a demand curve for investment which is defined by decreasing marginal product (rather similar to the Keynesian marginal efficiency of

capital). The objective of investment is to maximize the market value of the company. “The (neoclassical) theory states that the size of the capital stock and the rate of interest are mutually determined by the supply and demand of capital services, both of which are expressed as a function of the rate of interest” (Lund 1971). Investment will be approved as long as expected rate of profit is higher than the rate of interest whereas expected rate of profit is determined along the marginal product curve. Therefore the interest rate determines the amount of investments made by the company.

The further development of theory replaces the interest rate by the cost of capital stating that investments are dependent on opportunity cost of investments (which means the weighted average of the expected return of capital) (Miller, Modigliani 1958). With the unlimited and easy access to money and capital market and assumptions of rational behavior the cost of capital for every company is determined and is the same for every company independently of its origin (for example, no distinguish of internal and external origin). This theory strongly influences modern mainstream economics in micro level as well as in macro level.

The empirical studies test the cost of capital influence to investment decisions using variety of cost of capital determinants. Despite the obvious selection of interest rate as the main determinant of cost of capital the test through the interest rate has some disadvantages. There has been pointed out the interest rate influence to investments through the overall demand in economy and possible influence to investment decisions through the expected revenue of company (House *et al.* 2007; Gilchrist, Zakrajsek 2007). Also the direct questionnaire methodology includes the risk of positive feedback phenomena from respondents and therefore the cost of capital influence should be studied through several questions (Wilkes *et al.* 1996). In the current study inflation and taxes are included as the two most quoted cost of capital variables beside the interest rate. Inflation and inflation uncertainty has been considered an influential variable influencing the cost of capital (Huizinga 1993; Dewald 1998). Increasing inflation uncertainty means larger realizations of unexpected inflation which is incorporated into interest rates and thereby affects the intertemporal allocation decisions made by people and companies. Based on those studies the importance of inflation expectation is the same as the expectation of future interest rates due to the same transmission mechanism to the cost of capital. There are empirical studies investigating inflation uncertainty influence to investment decision of companies which find mostly positive causality (Dewald 1998; Wu 2006). The transmission mechanism for the possible link is uncertainty about the real net present value of capital expenditure where investors are motivated on real interest rates rather than nominal interest rate[1].

The influence of taxes is not so obvious. There is a theoretical framework presented by J. Stiglitz (Stiglitz 1973) that investment decisions are done based on before-tax results. The main argument for this phenomenon is that a change in the tax rate would not change the ranking of investment projects' expected profitability. Thus,

[1] see for further disussion Wu (2006) and Bercenau (2006)

tax rates would not influence investment choices directly. Tax rates however would influence investment choices indirectly because tax rates would affect savings and through that market-clearing real interest rate reducing the propensity to save in society. These indirect phenomena would cause negative causality between tax rates and investment activity. Empirical studies of taxation cover more wide range of taxes from property tax, personnel tax etc to income tax and other capital taxes. Generally could be stated that within the country the influence of taxes to investment decision is rather mild whereas the influence of taxes to foreign direct investment decisions are significant (Dewald 1998; Schanz 2006; Tanzi, Howell, 2000; Canh *et al.* 2004). There also has been found that tax incentives play higher role in developing countries than in developed countries (Tanzi, Howell 2000; Canh *et al.* 2004) even though there is not clear the reason of that. Non of those groups of countries tax incentives are not considered (most) important determinants of investments therefore the high usage of tax incentives would not ultimately indicate the high efficiency of the method to stimulate investments. Even though the industrial policies which provide incentives to retain profits and through that encourage investments in growth-oriented strategies are important instruments perhaps with major impacts on the capital structure and investment policy of small growing high tech companies (Heshmati 2001). Therefore the influence of taxes in monetary terms – the impact transmission mechanism through the cost of capital – might be relative small whereas the influence of taxes in liquidity constrained companies – the impact transmission mechanism through the availability of internal equity – might be high.

In a world of perfect capital markets the investment decision of a company would be independent of its financing decision (Miller, Modigliani 1958). However in a world with asymmetric information, moral hazard, agency costs, adverse selection and other market imperfections internal and external funds will not be perfect substitutes. Therefore in world with imperfections investment spending could be affected by restrictions and constraints. Due to the asymmetric information and agency costs banks will charge a higher interest rates from companies on which they have less information. The risk premium in interest rates will be lower and depend of net worth of a company which can be seen as collateral for financing institutions. Due to the moral hazard effect banks will raise premium of external financing based on relative indebtedness of a company. This is also the basic concept for credit channel view of monetary policy transmission mechanism which lay on idea that the investment decision of a company is dependent from financing decision.

As examples of credit rationing and impact of financial constraints of investment decisions of companies there are studies which empirically test relationship between companies generated cash-flow and their investment activities (Love 2001; Cleary *et al.* 2007; Bopkin, Onumah 2009; Heshmati 2001). According to the cash-flow influence to investments companies prefer to use internal resources for investments which would indicate the liquidity constraints of companies. However, there is considerable debate about interpretation of these positive correlations. Beside the constraint theory there are explanations of “excessive conservatism” of managers (Kaplan, Zingales 2000) or agency conflict between managers and shareholders

(Fathi, Gailly 2007). According to the agency conflict managers can act contrary to the interest of shareholders and pursue other goals then maximizing the company's value. Thus, managers tend to over-invest and adopt investment projects as long as these investments increase the size of the company. There are more agency constraint explanations in literature – cash-flow sensitivity to diluted structure of shareholders (Goergen, Renneboog 2001) or investment analysis within Keiretsu's (Hoshi *et al.* 1991) etc – where they all confirm the positive relationship between the free cash-flow and investment activity.

Since late 1980s several authors have stressed the impact investment-uncertainty relationship (Abel, Eberly 1994; Dixit, Pindyck 1994). The irreversibility of investments refers to the situation that machinery and equipment may be difficult to sell afterward or resale price is substantially below the replacement costs. While the investment is irreversible, this introduces an option-value of postponed investments until later time when more information about relevant future events is available. If uncertainty is higher then the value of that investment option of waiting is increasing leading to lower current investment outlays.

One can see that under the assumption of competitive markets and constant return of scale uncertainty may not necessarily lead to lower level of investments (Abel, Eberly 1999; Wu 2006; Cleary *et al.* 2007). This inverted U-curve - low levels of uncertainty investment-uncertainty relation may show positive correlation whereas at high level of uncertainty this relationship starts to become negative - may be explained by so-called hangover effect of irreversible investment. It means that on the stage of small uncertainty the irreversibility would inert companies invest more than their desired level of investment would be. Few empirical studies would support this theory (Bo, Zhang 2003) but wider empirical approach is to study the linear impact of investment and uncertainty (Abel, Eberly 1999). Studies also show that this negative relation is related to the degree of irreversibility of investment (Ogawa, Suzuki 2000).

Usually empirical studies of determinants of investment decisions include a number of other parameters not directly related to any significant economic theory. Due to the specific sample analyzed in empirical part of the study we shortly refer two of those parameters: industry influence to the investment determinants and ownership structure to investment determinants. There has been found that industry affects the capital structure choices of companies (Chung 1993) as well as determinants within different industries might be different (Wilkes *et al.* 2002; Ogawa, Suzuki 2000). Also the ownership structure has an impact of determinants of investments. Some studies (Goergen, Renneboog 2001; Fathi, Gailly 2007) find that concentration of ownership increases the sensitivity of investment determined by free cash-flow.

Last but not least, the influence of companies size to investment determinants. Several empirical studies show that bigger companies are less constrained financially (Love 2001; Fathi, Gailly 2007) as well as the cost of capital consideration is higher in publicly traded large companies (Pinegar, Wilbricht 1989; Kjellman, Hansen 1995; Sander 2003). This might be explained higher information

asymmetry in case of small companies as well as the higher influence of agency costs per output of companies. Therefore the results of current study could be applied to the total Estonian companies even though the size of average sample company is much higher then the size of an average Estonian company.

**Data and methodology**

The method of current empirical study is the direct questionnaire studying investment decision making motives of Estonian companies. There are number of empirical studies using aggregated data to analyze motives and behavior of investment management having later on difficulties to interpret results. The direct questionnaire avoids the problem of later interpretation but still has data enough to draw statistically significant findings.

Questionnaires accompanied with a letter explaining the aims of the research were sent to the CFOs of 200 biggest Estonian non-financial companies. The questionnaire itself contained wider spectrum of financial management issues of companies; in this study investment-related topics are discussed. 44 companies out of 200 replied which makes the response rate ca 22% which is an average response rate of such kind of studies. Questionnaire was composed in Estonian language. The study sample was consisted of big companies where the knowledge and ability to follow and manage capital costs and financial indicators should be bigger (Pinegar, Wilbricht 1989; Kjellman, Hansen 1995; Sander 2003) and the influence of liquidity constraints should be rather moderate (Love 2001; Fathi, Gailly 2007). The ranking of companies was done on the basis of companies' turnover which somehow increased the representation of trade companies in the study sample.

The questionnaire consisted mostly closed questions and statements which respondents were asked to rate on a scale of "strongly agree" or "strongly disagree" (for example, "which of the following determinant plays important role on investment decision?") or to rank in order of importance to their company. Some questions were behavior situations with possible reactions (multiple choices) from which respondents could choose most suitable reaction (for example "which of the following choices would describe better your financing decision making new investment?").

The questionnaire used in the current study is a modified version of the questionnaire designed by J. M. Pinegar and L. Wilbricht (Pinegar, Wilbricht 1989). Main modification considered the fact that most of Estonian companies were not listed companies and therefore questions and terminology had to be rearranged. Current study differs also by fact that study results are not anonymous. On one hand it enables to mix data from different sources but on other hand may discourage respondents and reduce the response rate. Still, respondents were assured that obtained information would be revealed to third parties only in aggregate form.

Respondent companies were quite different from an average Estonian company (Table 1). They were bigger in size and had smaller financial leverage as an average

Estonian company. Therefore companies in our sample have more analytical resources to study investment projects, have wider and easier access to different options of financing investments as well as better knowledge of financial management issues then an average Estonian company. The financial capability, better knowledge, more human resources with higher specialization within company should be considered interpreting results and drawing conclusions.

**Table 1.** The comparision of sample companies to an average Estonian company

| | average Estonian company | respondent company |
|---|---|---|
| Average Size of Assets (Mio Euros) | 0.402 | 53.177 |
| Average Number of Employees | 11.7 | 574 |
| Average Debt-Equity Ratio | 0.535 | 0.28 |
| Average Return on Equity (%) | 12.43 | 10.5 |
| Average Growth of Assets (%) | 15.44 | 15.51 |

Also the structure of responding companies does not represent the structure of Estonian companies nor does the structure of companies from other study (Wilkes *et al.* 1996; Sangster 1993). The structure has illustrated in Figure 1.

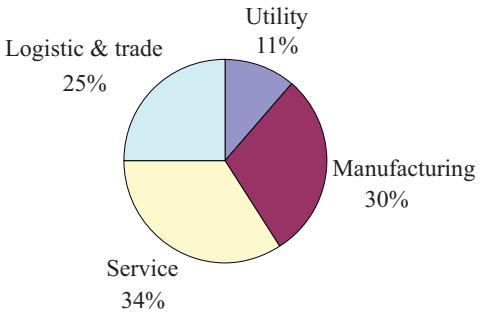


**Figure 1.** The structure of responding companies by field of activity.

The ownership structure illustrates well the origin of the bigger non-financial companies but is not a typical ownership structure of Estonian companies. State-owned and municipality-owned companies are 14 (32%) within our sample group. Subsidiaries of foreign-owned or domestic-owned companies were 12 (27%). Publicly traded companies were 5 (11%) within the sample group of respondents. Therefore the sample would not match the structure of Estonian companies nor in the field of activity nor by the ownership.

Even though direct questions from managers of companies would help to overcome the problems of later interpretation of data there still should be carefully avoid confusing questions. Similar studies conducted on investment management issues have found that interpretation of direct study of interest rate influence to the investment management can be confusing and easily misinterpreted. On study of F. M. Wilkes et al (Wilkes *et al.* 1996) they found that high and rising interest rate would be seen from the management perspective as a negative determinant in management of investments due to the fact that high interest would reduce demand for goods and therefore unstimulating the further investment of a company. The direction of an answer – high negative correlation between the interest rate and the amount of investment – is in line with the neoclassical interest-profit theory but the reason behind of it is something very different.

In the current study has deliberately avoided direct questions of interest rate influence. Instead of a questioning interest rate influence to investment decisions interest rate influence has been compared with other possible determinants of investment decision. The set of questions would give a context of overall management and help better to interpret results. This behavior approach has been used to describe cost of capital framework within companies.

We are fully aware of possible distortion of answers due to the close set of multiple options. Still we consider the influence of closed set relatively small due to the high number of multiple choices as well as interpretation of results through the many questions. Also should be stressed that the main focus of the study is not to analyze behavior of companies in investment management but to test a certain hypothesis on management behavior on investment decisions presented in the literature review.

Most of the studies in the field of investment management recommend to use real interest rate instead of nominal interest rate (Huizinga 1993; Dewald 1998) whereas some studies argue the importance of goals and objectives of investments to decide for the usage of nominal or real interest rate (Bercenau 2006). When the revenues and costs within the investment horizon are determined by market rather than fixed by some contracts companies should use the real interest rate instead of nominal interest rate. Therefore the expectations to inflation for companies would be as important as the expectations for interest rates. Within the current study inflation and expectation for inflation are rather important variables to estimate the usage of cost of capital framework within the companies.

Even though other empirical studies would not consider taxes as important determinant of investment decision they all have included the taxation part in their studies. In the current study taxation issues are also included in the set of multiple options as a determinant of investments. Whereas the saving ratio within the country is relatively unimportant on the point of availability of financial resources the influence of taxes could be seen in the context of financial management of companies. The influence of taxes could be considered as a determinant of cost of capital and have similar effect as the interest rates or inflation.

## Results of the study

The results of the study have organized through the three separate parts. First, respondents were asked to rank determinants of investments from the given set of determinants including determinants related to the cost of capital of companies. Findings of investment determinants are discussed in first subsection of the study results. Second subsection includes analysis of cost of capital to the management of companies. It consists three different set of questions related to the interest rate risks and interest rate management. Through the analysis of answers to those questions the purpose of interest rate management within companies becomes obvious. Third subsection analyzes the influence of liquidity constraint through the preferences to finance investments.

## Determinant of investment decisions

The set of multiple choices to analyze determinants of investments were based on similar studies from other countries (Pinegar, Wilbricht 1989; Kjellman, Hansen 1995) as well as consideration of authors. Those determinants obviously included determinants of cost of capital of companies. Results of relative importance of determinants affecting investment decisions are brought in table 2.

**Table 2**. Relative importance of factors and principles affecting investment decision of Estonian non-financial companies

| Factors and Principles by order of importance[a] | Number of responses within each rank | | | | | | Mean[b] |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Not ranked | |
| Expected cash flows from project to be financed | 0 | 0 | 2 | 7 | 34 | 0 | 4.74 |
| Ensuring long-term survivability of the firms | 0 | 0 | 3 | 8 | 32 | 0 | 4.67 |
| Maintaining financial flexibility | 0 | 1 | 3 | 20 | 19 | 0 | 4.33 |
| Risk of project to be financed | 0 | 0 | 6 | 19 | 18 | 0 | 4.28 |
| Size of the project to be financed | 0 | 2 | 14 | 8 | 19 | 0 | 4.02 |
| Maintaining financial independence | 0 | 5 | 7 | 16 | 15 | 0 | 3.95 |
| Maintaining voting control | 2 | 6 | 11 | 8 | 16 | 0 | 3.70 |
| Growth potential of the firm | 1 | 3 | 17 | 15 | 7 | 0 | 3.56 |
| Avoiding dilution of common shareholders' claims | 3 | 10 | 10 | 8 | 12 | 0 | 3.37 |
| Tax considerations | 2 | 9 | 15 | 14 | 3 | 0 | 3.16 |
| Maximizing security prices | 8 | 5 | 12 | 8 | 9 | 1 | 3.12 |
| Inflationary expectations | 6 | 6 | 15 | 13 | 2 | 1 | 2.98 |
| Depreciation | 8 | 11 | 12 | 10 | 2 | 0 | 2.70 |
| Considering financial decisions of competitors | 12 | 10 | 9 | 8 | 4 | 0 | 2.58 |
| Bankruptcy costs | 22 | 7 | 7 | 4 | 3 | 0 | 2.05 |

[a] The managers were asked to rank the factors on a scale from 1 as "unimportant" to 5 as "important".

[b] The mean is calculated from rankings 1 through 5. A source not ranked is neglected.

As one can see the set of important determinants is much wider than discussed in the literature review. By analyzing the relative importance of different factors becomes obvious the high importance of the investment project characteristics as expected cash flow, risk and the size of investment. Other important characteristics are related with the survivability and business confidence as financial flexibility, long-term survivability, financial independency and voting control.

For better interpretation of results brought in table 2 determinants could be grouped into following groups: cost of capital determinants (as inflation expectation, taxation, maximizing share price etc), business confident determinants (expected cash-flow, survivability, financial independency, bankruptcy etc), uncertainty and risk determinants (risk of project) and liquidity determinants (size of the project, financial flexibility). The basis for division of determinants is the internal behavior motives of companies like their vision to future or confidence, their cost of capital determinants, their risk evaluation and their financial ability constraints. Results are presented in table 3 where the rank has been calculated as the weighted average mean of total group.

**Table 3.** Relative importance of group of factors determining investment decisions of Estonian companies

| | number of determinants | rank |
|---|---|---|
| uncertainty and risk determinants | 1 | 4.280 |
| liquidity determinants | 2 | 4.175 |
| business confident determinants | 5 | 3.794 |
| cost of capital determinants | 3 | 3.087 |
| other ungrouped determinants | 4 | 3.053 |

As it can be seen that uncertainty and risk determinants are most important consideration in investment management followed by liquidity determinants and business confident determinants. Based on the multiple choices within the questionnaire becomes obvious that those risk and uncertainty issues are rather related with investment project then failure or bankruptcy risk of company or overall business confidence. As the differences between those top rankings are relatively small and number of determinants in some subgroup is very little then those top rankings could change including more characteristics into the list of multiple choices. Even though could be stated that determinants related with uncertainty, liquidity constraints and business confidence are important for Estonian companies to make investment decisions.

The low importance of cost of capital determinants is in line with other empirical studies (Bopkin, Onumah 2009; Kjellman, Hansen 1995; Pinegar, Wilbricht 1989; Wilkes *et al.* 1996). One explanation to the low importance of cost of capital determinants could be the fact that the current sample consists only 11% of publicly traded companies and could therefore be biased towards the inefficient feedback of capital market and shareholders value. Also there are many companies owned by

local municipalities or solely by other companies. Still the low importance of cost of capital determinants are viable in other studies were the sample consists only publicly traded companies. Therefore the reasons why costs of capital determinants have low importance need deeper analysis. The influence of cost of capital and behavior towards the interest rate risks within companies are analyzed in next subsection.

Another group of determinants, liquidity constraints, will also be analyzed more deeply in further subsection. As presented in table 2 and table 3 the relative importance of liquidity constraints is high on investment decisions of companies. To give a better understanding of liquidity constraints the absolute importance should be discussed similar to the cost of capital.

Surprisingly strong influence to investment decisions have determinants which are related to business confidence. Those characteristics include cash-flow expectations from business projects, long-term survivability as well as financial independency. All those parameters reflect the aspects of attitude towards the external economic processes. Previous micro level studies have not stressed the influence of business confidence on decisions of investment management. Still there are several macro level studies which refer to the business confidence influence to investment decisions (Amato, Gerlach 2001; Borio, Zhu 2008). They state that companies treat the risk of projects as exogenous and risk premiums also exogenously given (or absent totally). Then the defaults when they will occur will not change the behavior but rather will change the attitude or confidence of companies. This would cause easily the over-exuberance or disappointment of companies which depends on the cycle of economy. Those procyclical business confidence stages would impact the investment behavior of companies. Therefore also is plausible to assume that the relative importances of business confidence determinants are cyclical and have strong time dependency.

As one can see there are many determinants which are ungrouped. Due to the fact that weighted mean of those determinants are close to three their influence to investment decision is rather neutral. Therefore determinants as the behavior of competitors or diluted shareholding would have little impact to the investment management decisions of companies.

**Cost of capital**

As the analysis of determinants showed the interest rate determinants have relative insignificant influence on investment decisions. In this subsection we analyze interest rate management and cost of capital consideration on management decisions of companies. Instead of direct questions to interest rate influence and other variables of cost of capital we approach to that issue analyzing meaning of interest rate management to companies and through that the importance of cost of capital framework in the management of companies.

A sustained environment of lower interest rate should mean a lower cost of capital and therefore also lower required rate of return. How much lower depends on the method of funding and structure of balance, but definitely it should be lower. If a company does not adjust its cost of capital in phase of low interest rate it cuts out potentially profitable investments. In opposite case, if a company does not adjust its cost of capital on high interest phase, it lowers substantially the wealth of owners of a company.

The current questionnaire consisted many questions about the follow-up of interest rate exposure and expenditure as the main source of cost of capital of a company. Due to the fact that most of sample companies were not publicly traded and have loans from banks then we do not expect active capital structure management as could be on the case of publicly traded companies. Instead of that the focus of questionnaire was the active follow-up of interest costs and active interest risk management. This would not only describe the interest follow-up and interest risk management but also explains motives behind those decisions.

First, we were asking to specify how they would interpret possible interest rate risk to their company 41 companies out of 44 considered interest risk as possible interest cost influence to the profitability to the company. Only 3 companies considered interest rate risk as a determinant to the cost of capital whereas 2 of them were concerned possible influence to their share price. This result would indicate that most of Estonian companies would consider interest rate as a determinant of profitability of company and interest rate influence to cash-flow rather than the determinant of cost-of-capital.

Second question was to specify the target of interest rate management. 12 companies (36%) answered the direct interest costs, 6 companies (18%) answered the profit/profitability of company and 1 company mentioned influence to company's investments. 14 companies out of 44 did not specify the target of interest rate management. This result is in line with a first question that companies are dealing with interest rates as a determinant of interest costs and therefore determines also profitability of company. Interest rates are not considered as a determinant of cost of capital in investment management and therefore determinant of shareholders value. The result is also in line with the finding that companies would consider more the business confidence instead of cost of capital issues (motives as avoidance of bankruptcy, stability of profit, stable liquidity etc).

Last but not least, we asked from companies also directly the importance of cost of capital management as a part of interest rate management of company. More than half of respondents (23 out of 44 companies) said that interest rate risks are unimportant in management of company. Even though it does not indicate the unimportance of interest costs or interest rate influence to the company but rather would reflect the interest rate importance on cost of capital follow up of the company. It would be difficult to imagine companies being passive in interest rate management and having active follow-up of interest rate influence to cost of capital in investment management.

Passiveness of management of cost of capital is in line with findings of other studies (Dewald 1998; Love 2001; Wilkes *et al.* 1996). According to those studies companies prefer to use cost of capital figures or discount ratios for investment analysis for a longer period of time. They tend to use approximate figures which have been calculated some times ago where fluctuating interest rates and inflation would not have a intimate influence to the discount factor of investments nor through the expected cash flows or through the expected cost of capital.

The stickiness of discount rates on investments within the sample group might be also explained by the ownership structure. Should be stressed that 59% of respondents were not a typical privately owned companies – 14 of them (or 32%) were owned by state or local municipalities and 12 of them (27%) were solely owned by foreign or domestic company. Therefore required rates of investment projects may also be determined by parent companies abroad on the basis of interest rates elsewhere. Some international companies have established required rate of return which is applicable in all countries they operate. Also there are studies stating the industry effect on capital structure choices (Chung 1993) which could have influence to low importance of cost of capital determinants.

We still would consider the influence of ownership structure as well as industry influence to cost of capital determinants rather mild. There are results of other studies were the industry structure is different (Wilkes *et al.* 1996) or different ownership structure (Pinegar, Wilbricht 1989) and still those studies refer to low importance of cost of capital on investment decisions. Therefore the significance of cost of capital framework should be carefully considered in academic studies as well as on practical exercises of corporate finance.

**Liquidity constraints**

Our first part of study showed how important is liquidity constraints within other determinants of investment management decisions. In this part we analyze how important are liquidity constraints as determinant of investment decisions in companies using more traditional approach studying the financing preferences of investments. The financing preferences approach – also referred as pecking order approach – is probably most used approach for examining the liquidity constraints in companies and overall economies[2].

As we showed earlier in literatures review the positive correlation between investments and generated liquidity is highlighting possible financing constraints. In the current study we analyzed financing constraints in opposite way by asking respondents to rank their financing source preferences on investment management. Results are brought in table 4 where the mean of the rankings were calculated and higher mean imply higher preferences.

[2] See for further discussion Fazzari *et al.* 1988; Hennessey *et al.* 2007

**Table 4.** Preference ranking of financing sources among Estonian companies

| Financing source | Mean |
|---|---|
| Internal equity | 6.79 |
| Bank loans | 6.16 |
| Bond issue | 5.00 |
| External equity from existing shareholders | 4.53 |
| External equity from strategic partners | 3.16 |
| Convertible debt | 3.05 |
| Open public emission of shares | 2.26 |
| Preferred equity | 2.21 |

Survey results indicate that internal equity is the most preferred financing source of investments followed by bank loans and bond issue. Also one can see strong relative preferences within financing options brought in Table 4.

65% of respondents ranked internal equity as their first choice while 16% preferred to take bank loans as a first choice and 7% had first choice to issue bonds. The current survey results are unanimously support the internal equity as the most preferred and most used source to finance investments. Even though there are explanations as high transaction costs or agency costs of other sources we would consider main reason for high usage of internal equity as a typical example of liquidity constraints of companies. The argument of agency costs would not be proper on companies where they already use bank loans and transaction costs would not be significant on total amount of investments. On other hand there is not enough data to model precisely the behavior of companies. Based on current findings companies prefer internal equity for financing investments which strongly indicates the problem of credit rationing and liquidity (or collateral) constraints of companies. Existence of liquidity constraint would be also in line of other findings of the current study.

There are several studies arguing existence of liquidity constraints of companies operating in less-developed countries with weak financial system and high agency costs (Canh *et al.* 2004; Mickiewitcz *et al.* 2004). There are other studies which rather see dependency of liquidity constraints of development stage of company and dependency of industry (Valderrama 2002). Typical example is the fast-growing hi-tech companies which face strong liquidity constraints in the phase of product development. In our sample there are not so many companies to analyze industry dependency of liquidity constraints nor does our collected data structure not allow analyzing different development stage of companies. We could refer to number of studies from different countries and different industries referring to the importance of liquidity constraints on investment decisions (Pinegar, Wilbricht 1989; Kjellman, Hansen 1995; Canh *et al.* 2004; Tanzi, Howell 2000).

Should be also mentioned that since 2000 Estonian companies are eligible to pay corporate income tax on payment of dividend (s.c. deferred income tax system). This could affect the postponed dividend payout decisions and preference to use internal

equity on financing investment decisions. Still we could argue that the influence of tax system to investment activity is rather mild due to the relative importance of tax determinacy of investment decision presented in Table 2 and Table 3.

**Conclusions**

The aim of the current study was to analyze determinants of investment decisions of Estonian companies. More deep was analyzed interest rate influence to investment decisions through the framework of cost of capital and an existence of liquidity constraints motive on investment decisions. For that the questionnaire was composed and sent to 200 biggest non-financial Estonian companies. 44 out of those 200 answered (response rate 22%) and results were discussed and analyzed in the current study. Based on the results of previous studies confirming that bigger companies are less constrained financially as well as the cost of capital consideration is higher in publicly traded large companies we refer to our findings as findings of whole Estonian corporate sector.

Using similar research methodology of previous studies we found important investment determinants of Estonian companies and ranked them in line of importance. The most important group of determinants of investment decisions are uncertainty and risk determinants. Estonian companies consider risk issues as main issues considering their investments. Within the study we did not specify the source of the risk but based on different multiple choices which were used in questionnaires those risks are rather related with investment project then failure risk of company or overall business confidence. Second group of determinants important on investment management are liquidity determinants were companies consider their ability to invest and face a liquidity (or collateral) constraints. Third subgroup of determinants important on investment management was business confident determinants. Those determinants would rather reflect internal readiness of companies to invest. The importance of cost of capital determinants according to our study is rather low. Should be noted that questionnaire was carried through between biggest non-financial companies of Estonia which limits the usage of determinants to an average Estonian companies.

Investment decision determinants are broadly in line with other similar empirical studies. Different to other studies we have specified determinants related to business confidence and showed their relative importance on investment management. Should be stressed that business confidence determinants are by definition strongly procyclical with overall economic activity and therefore might have different level of influence in different moment of time. The low level of importance of determinants related with cost of capital is in line with findings of other empirical studies about companies' investment determinants.

In the second part of the study we analyzed more deeply the interest rate influence through the cost of capital framework to management of a company. As our study shows the interest rate management has been considered unimportant for management of companies. Mainly companies consider interest rate influence

through the direct interest costs and influence to the profit rather than the influence to the cost of capital and shareholders value. Therefore companies would rather see the focus of interest rate management to reduction of overall costs and through that the improvement of profit then the influence to the cost of capital and through that the shareholders value. Based on these findings could be stated that investment decisions are not determined through the framework of cost of capital whereas the influence of financial indicators as interest rates etc are rather weak to overall management of companies.

In third part of the study we analyzed the liquidity constraints influence separately from other determinants and ask their independent influence to the investment management decisions. For that we focused on preferences of investment financing. As we showed in literature review the preference to use internal equity to finance investment decisions is strongly related with liquidity constraint existence in corporate finance. Our survey shows that 65% of respondents ranked internal equity as their first choice of investment finance. Therefore we consider strong liquidity constraint existence within investment management of Estonian companies. Whereas the strong liquidity constraints´ influence is considered, the possible interest rate influence to the investments could be explained rather through the liquidity channel on monetary transmission then through the cost of capital channel.

As we specified already in the study there are certain limitations of our conclusions. First, our sample group is quite different of average Estonian companies – there is size effect of companies, there could be industry structure influence as well as the ownership structure influence. All those influences are discussed more deep in the study but they still may influence the overall conclusions. Second, determinants of investment decisions are dependent of cycles of economy and changing during the time (Pereira 1991). Therefore the interpretation of results should be in the context of socio-economic situation of country or otherwise these results should be taken as a snapshot in time.

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# INTRESSIMÄÄRADE MÕJU INVESTEERIMISOTSUSTELE EESTI ETTEVÕTETE NÄIDETEL

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## Sissejuhatus ja ülevaade kirjandusest

Käesoleva artikli eesmärgiks on analüüsida erinevate mõjurite olulisust ettevõtete investeerimisotsuste kujundamisel. Erinevatest mõjuritest on põhjalikumalt käsitletud intressimäärade mõju ettevõtete investeerimis-otsustele. Kuna intressimäärad on rahapoliitika kujundamisel üks olulisemaid instrumente on intressimäärade mõju uurimine monetaarpoliitika mõjususe hindamisel olulise tähtsusega.

Neoklassikalise investeerimismudeli kohaselt ettevõtted investeerivad seni kuni investeerimisprojekti oodatav tulunorm on suurem või võrdne ettevõtte kaasatud kapitali hinnaga. Moonutusteta kapitaliturg korral ettevõtete investeeringute maht on määratud üheselt kapitali hinnaga, mis on tihedalt seotud intressimääradega (Miller, Modigliani 1958). Samas intressimäärade mõju ettevõtete investeerimisotsustele võib olla mitmetähenduslik mõjutades nii kapitali hinda kui ka üldist nõudlust (Stiglitz 1973). Seetõttu on kapitali hinna mõjude uurimisel kasutatud erinevaid lähendusi. Erinevates varasemates uuringutes on kasutatud kapitali hinna lähenduses näiteks inflatsiooni ja inflatsiooniootusi (Huizinga 1993; Dewald 1998). Samuti on kasutatud lähendusena ettevõtete tulumaksu (Stiglitz 1973) või uuritud maksusoodustuste mõju investeerimisotsustele (Tanzi *et al.* 2000; Canh *et al.* 2004).

Olulise edasiarendusena eeltoodud käsitlusele on ettevõtete investeerimiskäitumine mittetäielike kapitaliturgude olukorras. Erinevatest asjaoludest tingituna (kõrged tehingukulud, informatsiooni asümmeetria kapitaliturg osapoolte vahel vms) on ettevõtetel likviidsuspiirangud, mis omakorda mõjutavad oluliselt ettevõtete investeerimiskäitumist. Likviidsuspiirangute olemasolu ja mõju ettevõtete investeeringutele on uuritud läbi rahavoogude mõju investeeringutele, dividendide mõju investeeringutele, üldise finantskäitumise mõju investeeringutele (Fazzari *et al.* 1988; Love 2001; Cleary *et al.* 2007; Bopkin *et al.* 2009; Heshmati 2001).

Täiendavalt on leitud, et erinevates tööstusharudes on investeerimisotsuste mõjuritel erinev kaal (Wilkes *et al.* 2002; Ogawa *et al.* 2000). Samuti on olulised mõjurite määramisel ettevõtete suurus (Love 2001; Fathi *et al.* 2007) ja omanike struktuur (Coergen *et al.* 2001; Fathi *et al.* 2007).

Erinevalt paljudest varajasematest uuringutest kasutatakse artiklis uurimismeetodina ettevõtete küsitlust. 200-le suuremale Eesti ettevõttele (v.a. finantsasutused) saadeti küsimustikud millele vastas 43 ettevõtet. Küsimustiku koostamise aluseks võeti J. M. Pinegar ja L. Wilbricht (1989) poolt koostatud sarnane küsimustik, mida kohandati Eesti oludele. Kuna suurematel ettevõtetel on paremad võimalused ja teadmised erinevatest kapitali kaasamise meetoditest ja investeeringute hindamise

metoodikatest, siis saadud tulemuste interpreteerimisel ja üldistamisel Eesti ettevõtetele tervikuna tuleb nimetatud asjaolusid rangelt silmas pidada.

**Uuringu tulemused**

Uuring koosnes kolmest osast, milles esimeses paluti uuringus osalejatel hinnata nimetatud investeerimisotsuste finantseerimist mõjutavaid tegureid Likerti 5-pallisel skaalal. Saadud tulemused on toodud järgnevas tabelis.

**Tabel 1**. Investeerimisotsuseid mõjutavate tegurite ja printsiipide suhteline olulisus Eesti suuremates ettevõtetes

| Tegurid ja printsiibid tähtsuse järjekorras | Mediaan[a] |
|---|---|
| Oodatav investeerimisprojekti rahavoog | 4,74 |
| Ettevõtte pikaajaline eksistentsi tagamine | 4,67 |
| Finantspaindlikkuse tagamine | 4,33 |
| Investeerimisprojekti riskantsus | 4,28 |
| Investeerimisprojekti suurus | 4,02 |
| Finantsilise sõltumatuse säilitamine | 3,95 |
| Enamusosaluse säilitamine | 3,70 |
| Ettevõtte kasvudünaamika tagamine | 3,56 |
| Aktsionäride struktuuri säilitamine | 3,37 |
| Maksukaalutlused | 3,16 |
| Aktsiahinna maksimeerimine | 3,12 |
| Inflatsiooniootustega arvestamine | 2,98 |
| Amortisatsioon | 2,70 |
| Konkurentide finantsseisu arvestamine | 2,58 |
| Pankrotikulud | 2,05 |

[a]Mediaan on arvutatud vastusevariantide põhjal, mis varieerusid 1st 5ni.

Tabelis toodud erinevate indikaatorite paremaks üldistamiseks on erinevad mõjurid grupeeritud. Grupeeritud tulemustest ilmneb, et olulisemad ettevõtete investeerimist mõjutavad tegurid on investeerimisprojekti üldine riskantsus, likviidsuspiirangutega seotud probleemistik ja üldine ettevõtjate/ettevõtete majandususaldus. Kapitali hinnaga seotud mõjurid nimetatud mõjurite kontekstis ei domineeri. Kapitali hinna vähene olulisus ettevõtete investeeringute kujundamisel teiste mõjurite hulgas on ilmnenud ka teistes varajasemates empiirilistes uuringutes (Bopkin *et al.* 2009; Kjellman *et al.* 1995; Pinear *et al.* 1989; Wilkes *et al.* 1996). Eraldi vääriks märkimist ettevõtete majandususalduse olulisus investeerimisotsuste kujundamisel, mis võiks monetaarpoliitika mõjukanalite uurimisel Eestis olla tõsiselt arvestatud.

Uurimuse teine osa käsitleb põhjalikumalt intressimäärade mõju ettevõtete investeeringutele ja juhtimisele. Põhjalikumalt on uuritud, kuidas ettevõtted käsitlevad intressiriske. Uuringust selgus, et 41 ettevõtet 44-st näevad intresside mõju läbi kasvavate finantskulude ja seeläbi ka mõjuna ettevõtte puhaskasumile. Vaid 3 ettevõtet käsitlesid intressiriske läbi mõju ettevõtte kapitali hinnale.

Samalaadne tulemus saadi ka ettevõtete intressiriskide juhtimise eesmärkide kohta, kus enamus vastanud ettevõtetest märkisid intressijuhtimise eesmärgina madalamaid finantskulusid või suuremat kasumit.

Passiivne kapitali hinna jälgimine ja kujundamine ilmneb ka teistes varajasemates empiirilistes uuringutes, mis kasutavad uurimustes küsitlusmeetodit (Dewald 1998; Love 2001; Wilkes 2002). Ilmneb, et ettevõtted kasutavad investeerimisprojektide hindamisel kapitali hinda pikema aja jooksul ning muudatusi sellesse tehakse oluliselt harvem, kui finantskäitumise teooria seda eeldaks. Uuringus osalenud Eesti ettevõtete puhul tuleb veel arvestada, et 27% ettevõtetest olid olulises osas väliskapitaliga ettevõtted ning 32% ettevõtetest kuulusid riigile või kohalikele omavalitsustele.

Uurimuse kolmas osa käsitleb likviidsuspiirangute olulisust ettevõtete juhtimises. Siin on palutud vastajatel märkida finantseerimisallikate eelistused vastavalt etteantud valikutele. Likviidsuspiirangute olemasolul peaksid finantseerimisallikates domineerima ettevõttesisesed finantseerimisallikad. Küsitluse tulemused on toodud järgnevas tabelis.

**Tabel 2.** Olulisemad finantseerimisallikad Eesti ettevõtetes tähtsuse järjekorras

| Finantseerimise allikas | Mediaan |
|---|---|
| ettevõtte sisemised finantsallikad | 6,79 |
| pangalaenud | 6,16 |
| võlakirjade emissioon | 5,00 |
| aktsiaemissioon suunatud praegustele aktsionäridele | 4,53 |
| aktsiaemissioon suunatud strateegilistele partneritele | 3,16 |
| Konverteeritavad võlakirjad | 3,05 |
| Avalik aktsiate emissioon | 2,26 |
| Eelisaktsiate emiteerimine | 2,21 |

Tabelis toodule võib lisada, et 65% vastanutest seadis esimeseks valikuks ettevõtte omad vahendid ja 16% vaid pangalaenu. Toodud tulemuste põhjal võib väita, et uuringus osalenud ettevõtted on finantspiirangutega, mis omakorda mõjutavad oluliselt ettevõtete finantskäitumist ja investeerimisotsuseid.

Tugevaid finantspiiranguid on seostatud nii nõrgaltarenenud finantssüsteemiga ja kõrgete tehingukuludega (Cahn *et al.* 2004; Mickiewitcz *et al.* 2004) kui ka erinevate ettevõtte enda arenguetappidega (Valderrama 2002). Tüüpilise näitena on kiirelt arenevad kõrge lisandväärtusega ettevõtted, mis toote rakendusfaasis vajavad suuri investeeringuid, mis omakorda põrkuvad sageli ettevõtte finantspiirangutele.

**Kokkuvõte**

44 Eesti suurima ettevõtte (v. a. finantsasutused) investeerimiskäitumist ja sellega seonduvat finantskäitumist uurides saab väita, et investeerimist mõjutavad investeerimisprojekti üldise riskantsuse kõrval ettevõtete likviidsus ja üldine

majandususaldus. Ettevõtte kapitali hinnal (intressimääradel sealhulgas) on investeeringute tegemisele marginaalne roll.

Intressimäärad ettevõtete üldises juhtimises on üldse pigem ebaolulised küsimused. Intressimäärade juhtimise all peetakse silmas eelkõige intressimäärde mõju finantskuludele ja seeläbi ettevõtte kasumile. Intressimäärade mõju ettevõtte kapitali hinnale arvestavad üksikud ettevõtted.

Likviidsuspiirangud samas omavad Eesti ettevõtete finantskäitumisele (dividendimaksed jms) ja investeeringutele suurt mõju. Suur osa ettevõtetest eelistavad investeeringutel kasutada sisemisi finantseerimisallikaid. Likviidsuspiirangute olulist rolli ettevõtete finantskäitumises on varajasemates empiirilistes uuringutes käsitletud nii nõrgaltarenenud finantssüsteemiga kui ka erinevate ettevõtte enda arenguetappidega. Eesti ettevõtete likviidsuspiirangute põhjuslikkus ja edasine dünaamika vajab edaspidiselt põhjalikumaid uuringuid.